

Errant Rifle Shot Fall Presents a Clear Public Safety Hazard if the Proposed Outdoor Shooting Complex on Millville Plains is Constructed, Revision 2

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**Executive Summary**

Because errant shot fall (rifle bullets leaving the property boundaries) can impact 97 homes and businesses and over 5 miles of California Highway 44, the planned shooting complex on Millville Plains does not meet the Best Practices for a high-powered rifle range as specified by documents referenced and recommended by the National Rifle Association (NRA), and instead, presents a clear public safety hazard to thousands of people every day from falling bullets if the shooting complex were operating. Since any large-caliber rifle bullet that travels outside the proposed shooting complex will have sufficient velocity to penetrate the human skull when it falls to earth, this would put thousands of people at risk of being injured or killed by a falling bullet every day if the proposed shooting complex is operating.

1. Best Practices in the Design of a High-Powered Rifle Range

- a. The 2023 National Rifle Association (NRA) *Range Source Book* never uses the terms “Best Practices” when discussing design of rifle ranges (it does use the term “Best Management Practices” nine times relating to lead bullet reclamation), but instead lists several resources for the management of outdoor shooting ranges: “An ESP [Environmental Stewardship Plan] is a planning document for the sound environmental management of the shooting range. This planning focuses on the maintenance of the backstop and shot fall zones...The guidance documents from these organizations are mutually complimentary, and **together constitute a complete package of guidance and recommendations for environmental management of outdoor shooting ranges** consistent with national laws, regulations, and policies. ... Important resources for developing a site-specific ESP include:
  - 1) EPA-902-B-01-001...
  - 2) NSSF. 1997. Environmental Aspects of Construction and Management of Outdoor Shooting Ranges
  - 3) ITRC. 2005. Environmental Management at Operating Outdoor Small Arms Firing Ranges”<sup>1</sup>

b. Excerpts from ITRC 2005:<sup>2</sup>

“The central task in formulating an environmental management plan is the selection and implementation of effective and reliable pollution prevention and mitigation measures, otherwise referred to as ‘best management practices’ (BMPs). This document focuses on providing range operators with the guidance

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<sup>1</sup> *The Range Source Book*. National Rifle Association Range Services. 11250 Waples Mill Road, Fairfax, VA 22030. 2023, p. 146. Note: on page 7, it is stated: “This source book supersedes the previous Range Manual publications produced by the National Rifle Association. Destroy previous publications.” As of May 20, 2024, the 2023 edition of the *Range Source Book* is the current edition.

<sup>2</sup> *Environmental Management at Operating Outdoor Small Arms Firing Ranges: Technical Guidance*. Interstate Technology Regulatory Council (ITRC). 50 F Street NW, Suite 350, Washington, DC 20001. February 2005.

they need to identify and undertake BMPs that are appropriate for and tailored to the site-specific environmental conditions at their ranges.” (p. 1)

“The following questions help range operators collect and compile information necessary to adequately understand the characteristics of shot and bullet distribution ...

**Where are the property boundaries, and do any rounds or shot fall beyond them?”** (p. 7)

“The **goal of the safety plan is to keep projectiles within a defined area.** The range can then control the access to and use of that area.” (p.15)

“Bullet containment is extremely important not only for shooter/public safety reasons, but also metal recovery and containment to mitigate impacts to the environment. ... The selected containment system should be designed to meet site-specific training/shooting requirements, as well as available space for surface danger zone (SDZ), and address all of the environmental concerns. ... **Bullets should be contained in the defined area of the range.** ...

“**An open range,** with an earth berm and no overhead baffles, is the least expensive to build of all of the containment scenarios but has the largest SDZ and **is the range layout most likely to have rounds leave the range proper.** ...

“An engineering firm or other subject matter experts with range experience can provide assistance with new range construction or existing range upgrading, including calculation of the SDZ for the containment system selected. ... **The need for the safety of range users, workers, and nearby residents greatly emphasizes the containment ...**” (pp. 31-33)

c. Excerpts from NSSF<sup>3</sup>:

“...sites for outdoor shooting ranges should be chosen that are safe for the environment, the surrounding community and range patrons. ... **Initially, potential locations should be evaluated to exclude clearly inappropriate sites from consideration, such as sites ... too small for the proposed facility.**” (p. 35)

d. The NRA Staff state “A bullet from an errant shot or a miss may fly several miles before it impacts the earth. A knowledge of maximum range (as well as what lies beyond the target area) can help a shooter assess whether it is or is not safe to fire.”<sup>4</sup>

e. Ineffectiveness of the proposed downrange backstops

- 1) As noted above in documents referenced and recommended or produced by the NRA, **berms alone cannot keep all rifle bullets within the defined area of an open range, no matter how high the berm.** The proposed shooting complex on Millville Plains is an open range. In addition to bullets going over the top of the

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<sup>3</sup> *Environmental Aspects of Construction and Management of Outdoor Shooting Ranges.* National Shooting Sports Foundation, The Firearm Industry Trade Association; 11 Mile High Road, Newton, CT 06470

<sup>4</sup> “Gun Safety: Ammunition Maximum Range”, by NRA Staff, posted on November 7, 2019

berm, errant bullets could easily go to either side of the backstop berms. The proposed shooting complex has four rifle ranges: a 300-yard, 500-yard, 600-yard and a 1,000-yard range. Each range is designed with a dirt backstop 100 feet long and 20 feet high, with no side berms. The 300-, 500- and 600-yard ranges have a total of 60 firing positions. Assuming the three backstops each have 20 targets, then there would only be a few feet from the end targets to the outer edge of each backstop. Inadvertent movement of the rifle muzzle slightly to the side would then cause the bullet to miss the backstop.

- 2) It should be noted that the proposed shooting complex is sited on an almost level plain. Assuming the first shot on a 300-yard range hits the center of the target 4 feet above the bottom of the backstop, it is easily seen that by inadvertently raising the muzzle of an 18-inch rifle barrel only 5/16 inch, the next round will clear the top of the backstop. Likewise, by raising the barrel 5/32 inch will cause the bullet to go over the top of the backstop when firing on the 600-yard rifle range.
- f. **It is clear that as a Best Practice, the only permanent safe solution to errant shot fall would be to have the rifle firing positions located far enough away from homes, businesses, and traffic so that the maximum range of any ammunition to be used on the shooting complex would not reach any homes, people, or vehicles.**

## 2. Maximum Range of Popular Ammunition and Large Caliber Rifles

The following is a partial list of current ammunition with a maximum range capable of reaching California Highway 44 (a distance of 5,233 yards from the 60 rifle firing positions) and many homes and businesses. The NRA defines maximum range as the “Approximate maximum distance a bullet will travel to point of first impact with the ground at standard conditions with the muzzle elevated between 28 and 34 degrees.”<sup>5</sup> The *NRA Firearms Sourcebook* lists standard and magnum rifle caliber ammunition, and states “Note that some military ammunition, special sporting ammunition and handloads may have greater flight distances than those listed.”<sup>6</sup>

- a. .300 Winchester Magnum. “Americans simply love .300 Magnums, and among the lineup, the .300 Winchester Magnum has become the most popular choice.”<sup>7</sup>
  - i) .300 Winchester Magnum 220 grain Sierra Match King has a maximum range of 6,994 yards<sup>8</sup>
  - ii) .300 Winchester Magnum 190 grain Sierra Match King has a maximum range of 6,577 yards.<sup>9</sup>

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<sup>5</sup> *NRA Firearms Sourcebook. Your Ultimate Guide to Guns, Ballistics and Shooting.* Michael E. Bussard and Stanton L. Wormley, Jr. 2006. Page 26. National Rifle Association of America, 11250 Waples Mill Road, Fairfax, VA 22030-9400.

<sup>6</sup> *Ibid.*

<sup>7</sup> “Top 5 All-Around North American Big-Game Cartridges;” Phillip Massaro, *NRA American Hunter*, posted on November 8, 2021, AmericanHunter.org. National Rifle Association, 11250 Waples Mill Road, Fairfax, VA 22030.

<sup>8</sup> Ammunition available by hand load or on line (\$87/20). Maximum range from *Range Safety*, USA 385-63

<sup>9</sup> *Ibid.*

- iii) .300 Winchester Magnum 180 grain commercial load has a maximum range of 5,312 yards<sup>10</sup>
  - b. The following commercial rifle ammunition is listed in the *NRA Firearms Sourcebook* with maximum range shown:<sup>11</sup>
    - i) .338 Lapua Magnum, 250 grain: 7,000 yards
    - ii) 7 mm Remington Magnum, 165 grain: 6,951 yards
    - iii) .300 Remington SAUM (Short Action Ultra Magnum), 190 grain: 5,800 yards
    - iv) .300 Weatherby Magnum, 180 grain: 5,800 yards
    - v) .300 WSM (Winchester Short Magnum), 180 grain: 5,700 yards
    - vi) .257 Weatherby Magnum, 115 grain: 5,400 yards
    - vii) .270 WSM (Winchester Short Magnum), 130 grain: 5,300 yards
  - c. .30-06. "...the 1906 design has certainly been getting it done in the hunting fields for well over a century."<sup>12</sup> Maximum range for the 200 grain bullet: 6,190 yards<sup>13</sup>
  - d. 450 Marlin. The .450 Marlin is listed by the NRA as having a maximum range of 7,000 yards.<sup>14</sup>
3. Homes, Businesses, and Highway Within the Maximum Range
- There are 97 homes and businesses, and 5.5 miles of California State Highway 44 within 7,000 yards (the range of the .300 Winchester Magnum 220 grain, .450 Marlin, and .338 Lapua Magnum 250 grain) of the firing positions for the three (300-, 500- and 600-yard) rifle ranges. As noted above, there is a portion (650 yards long) of Highway 44 that is at a distance of 5,233 yards from the three rifle ranges, which is the closest Highway 44 is to the proposed rifle ranges.
- a. Table 1 (sorted by increasing distance) provides a list of the 97 homes and businesses within 7,000 yards of the (300-, 500- and 600-yard range) rifle firing positions. Table 2 shows the same information, sorted by address.<sup>15</sup>
  - b. Figure 1 shows the three USGS topographic maps that were combined to depict the location of the proposed shooting complex and downrange area.
  - c. Averaging the Ahead AADT (Annual Average Daily Traffic) and the Back AADT on Highway 44 at Millville Plains Road, there was a traffic volume of 5,500 vehicles per

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<sup>10</sup> *NRA Firearms Sourcebook. Your Ultimate Guide to Guns, Ballistics and Shooting.* Michael E. Bussard and Stanton L. Wormley, Jr. 2006. Page 28. National Rifle Association of America, 11250 Waples Mill Road, Fairfax, VA 22030-9400.

<sup>11</sup> Ibid

<sup>12</sup> "Top 5 All-Around North American Big-Game Cartridges;" Phillip Massaro, *NRA American Hunter*, posted on November 8, 2021, AmericanHunter.org. National Rifle Association, 11250 Waples Mill Road, Fairfax, VA 22030.

<sup>13</sup> *NRA Firearms Sourcebook.* 2006. Page 27

<sup>14</sup> "Gun Safety: Ammunition Maximum Range", by NRA Staff, posted on November 7, 2019

<sup>15</sup> Address and range data determined and measured from Shasta County Map Viewer, Geographic Information Systems (GIS) Division, shastacounty.gov; and Google Maps Imagery, ©2023 Maxar Technologies

day in 2017.<sup>16</sup> California Highway 44, as noted above, has 5.5 miles of road surface within 7,000 yards of the three rifle ranges. Likewise, 2.6 miles of Highway 44 are within 5,800 yards, or in range of eight of the popular rifle ammunition listed above. Note that this is not a complete list.

#### 4. Planning for Safety

##### a. From the 2023 *NRA Range Source Book*

“ENGINEER the range specifically to accommodate the chosen shooting activity. The use of the range facility outside its design limits violates accepted engineering practices and breeches the basic concept of a safety plan.”<sup>17</sup>

##### b. Engineering Controls vs. Administrative Controls

Within the realm of industrial safety, there is a hierarchy of controls to protect people from hazards. Engineering controls are always considered more effective than administrative controls. “Engineering Controls – Isolate people from the hazard; Administrative Controls – Change the way people work.”<sup>18</sup>

An example of an administrative control would be to teach your children to not play with firearms. An engineering control would be to securely lock those firearms in a safe. The administrative control requires constant vigilance; the engineering control is a built-in control that requires no supervision.

For a rifle range, engineering controls would be to site the range either with a mountain as the background or in a desert or similar location where there is no human habitation or travel within the maximum range of the ammunition to be used on the range.

#### 5. Danger from Falling Bullets to People, Livestock, Outdoor Propane Tanks, and High Voltage Lines

a. “Falling bullets or gravitational bullets are the ones that move under the effect of gravity force after the muzzle force diminished....the movement of the bullets will change to downward and their velocities will be accelerated by the effect of the gravity until the air resistance drag equalizes the effect of the gravity so the bullets will reach the terminal constant velocity....bullets travelling at 200 ft/sec can penetrate the skull.”<sup>19</sup>

b. .30 caliber rounds reach terminal velocity of 300 feet/second.<sup>20</sup>

c. “Experimental results found for an upwards fired 7.62 mm bullet terminal velocity is about 90 m/s [295, or approximately 300 ft/sec]...The typical terminal velocities given in literature for spent bullets are from 300 fps to 600 fps...In many simulated cases through the launch angle region the bullet possessed the estimated minimum

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<sup>16</sup> DOT.CA.GOV, 2017 Traffic Volumes: Route 44 at Millville Plains Road

<sup>17</sup> *The Range Source Book*. NRA Range Services. 11250 Waples Mill Road, Fairfax, VA 22030. 2023, p. 34

<sup>18</sup> “Identifying Hazard Control Options: The Hierarchy of Controls.” <https://osha.gov/safety-management>

<sup>19</sup> Abdali, H.A., et al. “Cranial Gravitational (Falling) Bullet Injuries: Point of View.” *Journal of Neurosciences in Rural Practice*. 2018 Apr-Jun; 9(2): 278-280. From the National Institutes of Health database.

<sup>20</sup> Hatcher’s Notebook. J.S. Hatcher. 1947

lethal energy 40 J [40 joules, or 29.5 ft/lbs] at the end of trajectory. The skull penetrating speed 60 m/s [197 ft/sec] was mostly clearly exceeded. A preliminary value for shooter-centered danger zone diameter obtained was found to be approximately 8 km [8,749 yards].<sup>21</sup>

- d. From this data we can conclude that any large-caliber rifle bullet that travels outside the proposed shooting complex will have sufficient velocity to penetrate the human skull when it falls to earth.
- e. In addition to the danger to humans (residents of homes in range, clients and staff of the Millville Veterinary Clinic, Parishioners of Millville Community Baptist Church, etc.), and in addition to danger to livestock, errant shot fall presents a significant hazard to the large (250-gallon, 500-gallon, and larger) outdoor propane tanks used by most of the rural homes and businesses within rifle range. For example, a 500-gallon propane tank has a shell thickness of 0.218 inches, and a head thickness of 0.185 inches steel<sup>22</sup>, with exterior shut-off valve(s), a pressure reducing valve, and related tubing made of bronze and copper that could be penetrated or shorn off by an errant bullet, causing a propane leak. High voltage transmission lines also cross into the errant shot fall zone of the 300-, 500- and 600-yard rifle ranges.

6. Scope of the Shooting Complex

Note: This accounting of firing ranges and shooting positions does not include the 3 law enforcement pistol ranges (two 25-yard and one 50-yard range) within their fenced enclosure.

- a. Firing ranges and number of shooting positions

The below table lists the firing ranges and number of firing positions for each, as shown on the Conceptual Plan.

**Number and Type of Firing Ranges**

Firing Range	Number of Positions
25 Yard Pistol	45
50 Yard Pistol	25
300-, 500-, and 600- Yard Rifle	60
1,000 Yard Rifle	1
Shotgun (Skeet)	21
Shotgun (Trap)	8
Total	160

7. Was the Design, Documentation, and Review Process for the Shooting Complex Flawed?

How did the proposed outdoor shooting complex get this far? Why wasn't the proposal shut down at the start for reasons of public safety? The author of this paper feels that there were many occasions in the design and review process where errant rifle shot fall could have been

<sup>21</sup> Saileranta, T., et al. "Upwards Fired Bullet Terminal Velocity." 27<sup>th</sup> International Symposium on Ballistics, Freiburg, Germany, April 22-26, 2013.

<sup>22</sup> The American Society of Mechanical Engineers (ASME) specification.

noted, and the risk to the public realized. The NRA's own *NRA Firearms Sourcebook*, which was first published in 2006, clearly listed the maximum range of common rifle ammunition (as listed in Section 2), so that information should have never been in doubt.<sup>23</sup>

The Board of Supervisors approved the proposed shooting complex at their Regular Meeting on October 24, 2023 (by a vote of 3 to 1). The Staff Report prepared for this meeting, along with prior documentation, is available on the Shasta County website as "Packet #20231019165449696," and is hereafter referred to as "the Packet." Therefore, all of the information in the Packet was available to the public, and to the Shasta County Board of Supervisors for their consideration prior to their vote. The following sections in the Packet are occasions in the design, documentation, and review processes that the author of this paper believes could have flagged the shot fall danger:

- The Staff Report states "...the applicant [Patrick Jones]... clarifies that no firearms that may be used on the project site have a range that may reach California State Highway 44.... Because staff are not experts in ballistics, staff's recommendation is reliant upon the described best practices utilized in the design of the site and the described management and operations of the shooting range activities by the rangemaster."<sup>24</sup> Again, the *NRA Firearms Sourcebook*, published in 2006 and currently available for sale on their website for \$19.98, lists many of the most common big bore hunting rifles in use in the United States with a maximum range that will reach California State Highway 44.
- The Staff Report states "The project was designed to utilize best practices for outdoor shooting ranges which can be found in the *NRA Range Source Book* (2004) as well as other shooting range best practices guidebooks."<sup>25</sup> The 2004 edition of the *Range Source Book* has been superseded by the 2023 edition, and should have been destroyed (see footnote #1 of this paper). The 2023 *NRA Range Source Book* never uses the term "Best Practices." A simple request to the NRA would have determined that the 2004 *Range Source Book* was 19 years out-of-date. Also, the Staff Report never states the titles of the "other range best practices guidebooks."
- On page 28 of the Packet, it states: "x. Shot Fall Safety. Shot fall occurring off-site is prohibited. ... If shot fall, including bullet fragments and ricochets, both on-site or off-site is found by the Director of Resource Management to be a safety concern, the use would be subject to enforcement pursuant to Shasta County Code sections 17.92.100 and 17.94.060."<sup>26</sup> This is the only place in the Packet where shot fall occurring off-site is mentioned, and is Section 4.E.3.x (Development Standards, Operational Conditions and Mitigation Measures) of County Ordinance Number 378-2074, which is the final result of the Board of Supervisors vote.<sup>27</sup> So the possibility of shot fall outside the proposed shooting complex was recognized, and prohibited by

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<sup>23</sup> *NRA Firearms Sourcebook. Your Ultimate Guide to Guns, Ballistics and Shooting.* Michael E. Bussard and Stanton L. Wormley, Jr. 2006. Pages 27-28. National Rifle Association of America, 11250 Waples Mill Road, Fairfax, VA 22030-9400.

<sup>24</sup> Page 4 of the Staff Report, which is page 10 of Shasta County Packet #20231019165449696, October 24, 2023.

<sup>25</sup> *ibid*

<sup>26</sup> Page 28 of Shasta County Packet #20231019165449696, October 24, 2023

<sup>27</sup> Shasta County Ordinance NO. 378-2074, passed and adopted 10/24/2023 by a vote of 3 ayes (Supervisors Kelstrom, Crye, and Garman) and 1 no (Supervisor Rickert).

fiat. However, how does prohibiting errant shot fall in a county ordinance keep it from occurring in perpetuity? For example, how does the ordinance keep a 12 year-old boy or girl from flinching when firing a big bore hunting rifle for the first time? Why not be proactive during the review and design process for the proposed shooting complex and recognize that mistakes happen, and shooters flinch (especially young shooters when shooting a rifle with much more recoil than a .22)?

- The maps and aerial views provided in the Packet do not show detail to the north of the proposed shooting complex. **In fact, the maps and aerial views appear to be selected to show primarily land to the east and west of the proposed shooting complex. Since 60 rifle firing positions are aiming essentially due north, this presents a skewed presentation of the surrounding land with respect to the danger of rifle shot fall.** In particular, none of these maps or aerial views indicate the private residences, business properties, or the presence of California State Highway 44 to the north of the proposed shooting complex. **An individual reviewing the Packet and studying the maps and aerial views provided would never know that homes, businesses, and Highway 44 are in a direct path of the rifle firing line.** It would have been a simple matter to orient the maps and views in the Packet to show the land to the north to include Highway 44. Also, the text in the Packet never mentions the presence of homes, businesses, or highways in relation to the proposed shooting complex and in the direction of the rifle firing lines. As a result, unless someone was willing to conduct a simple computer search of the surrounding land using open-source programs (e.g., Shasta County Map Viewer and Google Maps Imagery), they would never know the true scope of the shot fall danger. Figures 2-8 of this paper show the maps and aerial views that are provided in the Packet:
  - The Proposed Zone District Map (Figure 2) shows the land to the east, west, and south, but less than 500 yards to the north of the proposed shooting complex.
  - The Site Plan (Figure 3) (dated 02/04/19) by the engineering firm shows only the property within the site boundaries
  - The Location Map (Figure 4) shows less than 2,640 yards to the north of the proposed shooting complex. Therefore, California Highway 44 is not shown.
  - The Aerial View (Figure 5) shows only the site boundaries.
  - The General Plan Map (Figure 6) and the Existing Zone District Map (Figure 7) show less than 500 yards to the north; Highway 44 is therefore not shown.
  - Project Area Aerial View (Figure 8) is oriented to primarily show the land to the east and west of the proposed shooting complex, and only 2640 yards to the north. California Highway 44 is therefore not shown. Furthermore, the resolution of the aerial view is too low to show any of the buildings to the west.

So how did the proposed shooting complex get this far in the approval process without recognizing the public safety hazard of errant rifle shot fall? Was it simple negligence? Gross negligence? Willful disregard for the public safety? The author has no answer, but can only provide the facts and information easily available to anyone who was interested enough to research the issue well before January, 2023.



## **References**

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- Sailaranta, T., et al. "Upwards Fired Bullet Terminal Velocity." 27<sup>th</sup> International Symposium on Ballistics, Freiburg, Germany, April 22-26, 2013.
- Shasta County Map Viewer, Geographic Information Systems (GIS) Division, shastacounty.gov
- USA 2014. "Range Safety", Pamphlet 385-63, 16 April 2014.

### Notes regarding the following map:

Figure 1, the first map shown, is an accurate scan in an 11"x17" format of the 3 USGS topographic maps that were combined to show the location of the proposed shooting complex and downrange area. To retain the highest-quality reproduction, Figure 1 is provided as a separate attachment. To view Figure 1 in the correct orientation on a computer monitor may require clicking on the figure and rotate. An 11"x17" paper copy with all the detail of the original USGS topographic maps can be printed by copying this figure. Locations of homes and roads built since 1965 are determined from Shasta County Map Viewer, Geographic Information Systems (GIS) Division, shastacounty.gov; and Google Maps Imagery, ©2023 Maxar Technologies.

Table 1. Distance in Yards from Rifle Firing Positions to Homes and Businesses (Sorted by Distance)

	Address	Yards		Address	Yards
1	7447 Leopard Dr., Anderson	1716	50	23944 Hwy. 44, Millville	5947
2	7576 Bear Creek Way, Millville	2872	51	23932 Hwy. 44, Millville	5961
3	8095 Bear Creek Way, Millville	3664	52	23906 Hwy. 44, Millville	5961
4	24423 Bascom Rd., Millville	4260	53	25213 Hwy. 44, Millville	5961
5	24289 Bascom Rd., Millville	4275	54	24400 Old 44 Dr., Millville	6107
6	23991 Bascom Rd., Millville	4398	55	25000 Hwy. 44, Millville	6121
7	24561 Hwy. 44, Millville	4427	56	25241 Hwy. 44, Millville	6129
8	24288 Bascom Rd., Millville	4580	57	23848 Springwood Way, Millville	6143
9	8563 Bear Creek Way, Millville	4711	58	25147 S. Cow Creek Rd., Millville	6165
10	8232 Tompata Trl., Millville	4944	59	24524 Quail Terrace Ln., Millville	6165
11	24495 Hwy. 44, Millville	5067	60	23863 Deer Canyon Rd., Millville	6180
12	24609 Hwy. 44, Millville	5082	61	8605 Skylight Ridge Dr., Millville	6180
13	24185 Hwy. 44, Millville	5089	62	25100 Hwy. 44, Millville	6194
14	24325 Hwy. 44, Millville	5147	63	24530 Quail Terrace Ln., Millville	6194
15	24359 Hwy. 44, Millville	5191	64	8667 Oak Terrace Ln., Millville	6209
16	24403 Hwy. 44, Millville	5220	65	23653 Millville Way, Millville (Vet)	6216
17	24771 Hwy. 44, Millville	5242	66	25279 Hwy. 44, Millville	6230
18	24253 Hwy. 44, Millville	5249	67	25149 S. Cow Creek Rd., Millville	6230
19	24237 Hwy. 44, Millville	5263	68	24444 Old 44 Dr., Millville	6238
20	24219 Hwy. 44, Millville	5271	69	25281 Hwy. 44, Millville	6252
21	24801 Hwy. 44, Millville	5373	70	24708 Gypsy Moth Rd., Millville	6252
22	25025 Hwy. 44, Millville	5416	71	24691 Gypsy Moth Rd., Millville	6252
23	24887 Hwy. 44, Millville	5416	72	25002 Hwy. 44, Millville	6281
24	8500 Forevermore Dr., Millville	5460	73	24421 Old 44 Dr., Millville	6325
25	8504 Oak Terrace Ln., Millville	5489	74	23625 Millville Way, Millville	6325
26	24991 Hwy. 44, Millville	5503	75	23780 Springwood Way, Millville	6325
27	24510 Hwy. 44, Millville	5525	76	25150 S. Cow Creek Rd., Millville	6325
28	8600 Forevermore Dr., Millville	5547	77	23900 Sunnyslope Dr., Millville	6339
29	24140 Hwy. 44, Millville	5554	78	23662 Millville Way, Millville	6347
30	8519 Oak Terrace Ln., Millville	5583	79	24018 Deer Canyon Rd., Millville	6383
31	8556 Oak Terrace Ln., Millville	5612	80	23756 Springwood Way, Millville	6419
32	8615 Oak Terrace Ln., Millville	5642	81	23634 Millville Way, Millville	6434
33	8561 Oak Terrace Ln., Millville	5692	82	23606 Millville Way, Millville	6456
34	8574 Oak Terrace Ln., Millville	5729	83	8782 Hufford Way, Millville	6470
35	24326 Hwy. 44, Millville	5743	84	8764 Hufford Way, Millville	6470
36	24880 Hwy. 44, Millville	5743	85	8754 Hufford Way, Millville	6470
37	24900 Hwy. 44, Millville	5758	86	8718 Hufford Way, Millville	6470
38	25029 Hwy. 44, Millville	5765	87	8773 Hufford Way, Millville	6470
39	25151 Hwy. 44, Millville	5794	88	23703 Springwood Way, Millville	6507
40	8575 Oak Terrace Ln., Millville	5794	89	23950 Sunnyslope Dr., Millville	6528
41	24024 Hwy. 44, Millville	5801	90	24381 Old 44 Dr., Millville	6543
42	24522 Oswego Lake Rd., Millville	5816	91	23744 Springwood Way, Millville	6543
43	25195 Hwy. 44, Millville	5867	92	23694 Springwood Way, Millville	6565
44	8600 Oak Terrace Ln., Millville	5881	93	23712 Springwood Way, Millville	6565
45	24560 Oswego Lake Rd., Millville	5889	94	23720 Springwood Way, Millville	6565
46	24998 Hwy. 44, Millville	5903	95	23736 Springwood Way, Millville	6565
47	23972 Hwy. 44, Millville	5911	96	24370 Old 44 Dr., Millville	6579
48	25117 Hwy. 44, Millville	5911	97	25313 S. Cow Creek Rd., Millville	6797
49	8558 Skylight Ridge Dr., Millville	5925			

Table 2. Distance in Yards from Rifle Firing Positions to Homes and Businesses (Sorted by Address)

	Address	Yards		Address	Yards
1	23991 Bascom Rd., Millville	4398	51	25213 Hwy. 44, Millville	5961
2	24288 Bascom Rd., Millville	4580	52	25241 Hwy. 44, Millville	6129
3	24289 Bascom Rd., Millville	4275	53	25279 Hwy. 44, Millville	6230
4	24423 Bascom Rd., Millville	4260	54	25281 Hwy. 44, Millville	6252
5	7576 Bear Creek Way, Millville	2872	55	8718 Hufford Way, Millville	6470
6	8095 Bear Creek Way, Millville	3664	56	8754 Hufford Way, Millville	6470
7	8563 Bear Creek Way, Millville	4711	57	8764 Hufford Way, Millville	6470
8	25147 S. Cow Creek Rd., Millville	6165	58	8773 Hufford Way, Millville	6470
9	25149 S. Cow Creek Rd., Millville	6230	59	8782 Hufford Way, Millville	6470
10	25150 S. Cow Creek Rd., Millville	6325	60	7447 Leopard Dr., Anderson	1716
11	25313 S. Cow Creek Rd., Millville	6797	61	23606 Millville Way, Millville	6456
12	23863 Deer Canyon Rd., Millville	6180	62	23625 Millville Way, Millville	6325
13	24018 Deer Canyon Rd., Millville	6383	63	23634 Millville Way, Millville	6434
14	8500 Forevermore Dr., Millville	5460	64	23653 Millville Way, Millville (Vet)	6216
15	8600 Forevermore Dr., Millville	5547	65	23662 Millville Way, Millville	6347
16	24691 Gypsy Moth Rd., Millville	6252	66	8504 Oak Terrace Ln., Millville	5489
17	24708 Gypsy Moth Rd., Millville	6252	67	8519 Oak Terrace Ln., Millville	5583
18	23906 Hwy. 44, Millville	5961	68	8556 Oak Terrace Ln., Millville	5612
19	23932 Hwy. 44, Millville	5961	69	8561 Oak Terrace Ln., Millville	5692
20	23944 Hwy. 44, Millville	5947	70	8574 Oak Terrace Ln., Millville	5729
21	23972 Hwy. 44, Millville	5911	71	8575 Oak Terrace Ln., Millville	5794
22	24024 Hwy. 44, Millville	5801	72	8600 Oak Terrace Ln., Millville	5881
23	24140 Hwy. 44, Millville	5554	73	8615 Oak Terrace Ln., Millville	5642
24	24185 Hwy. 44, Millville	5089	74	8667 Oak Terrace Ln., Millville	6209
25	24219 Hwy. 44, Millville	5271	75	24370 Old 44 Dr., Millville	6579
26	24237 Hwy. 44, Millville	5263	76	24381 Old 44 Dr., Millville	6543
27	24253 Hwy. 44, Millville	5249	77	24400 Old 44 Dr., Millville	6107
28	24325 Hwy. 44, Millville	5147	78	24421 Old 44 Dr., Millville	6325
29	24326 Hwy. 44, Millville	5743	79	24444 Old 44 Dr., Millville	6238
30	24359 Hwy. 44, Millville	5191	80	24522 Oswego Lake Rd., Millville	5816
31	24403 Hwy. 44, Millville	5220	81	24560 Oswego Lake Rd., Millville	5889
32	24495 Hwy. 44, Millville	5067	82	24524 Quail Terrace Ln., Millville	6165
33	24510 Hwy. 44, Millville	5525	83	24530 Quail Terrace Ln., Millville	6194
34	24561 Hwy. 44, Millville	4427	84	8558 Skylight Ridge Dr., Millville	5925
35	24609 Hwy. 44, Millville	5082	85	8605 Skylight Ridge Dr., Millville	6180
36	24771 Hwy. 44, Millville	5242	86	23694 Springwood Way, Millville	6565
37	24801 Hwy. 44, Millville	5373	87	23703 Springwood Way, Millville	6507
38	24880 Hwy. 44, Millville	5743	88	23712 Springwood Way, Millville	6565
39	24887 Hwy. 44, Millville	5416	89	23720 Springwood Way, Millville	6565
40	24900 Hwy. 44, Millville	5758	90	23736 Springwood Way, Millville	6565
41	24991 Hwy. 44, Millville	5503	91	23744 Springwood Way, Millville	6543
42	24998 Hwy. 44, Millville	5903	92	23756 Springwood Way, Millville	6419
43	25000 Hwy. 44, Millville	6121	93	23780 Springwood Way, Millville	6325
44	25002 Hwy. 44, Millville	6281	94	23848 Springwood Way, Millville	6143
45	25025 Hwy. 44, Millville	5416	95	23900 Sunnyslope Dr., Millville	6339
46	25029 Hwy. 44, Millville	5765	96	23950 Sunnyslope Dr., Millville	6528
47	25100 Hwy. 44, Millville	6194	97	8232 Tompata Trl., Millville	4944
48	25117 Hwy. 44, Millville	5911			
49	25151 Hwy. 44, Millville	5794			
50	25195 Hwy. 44, Millville	5867			

Figure 1:

To retain the highest-quality reproduction, Figure 1 is provided as a separate electronic file to this paper if being viewed electronically. An 11"x17" paper copy with all the detail of the original USGS topographic maps can be printed from Figure 1 when the printer paper is set for 11x17". An 8.5x11 inch copy of Figure 1 can be made by selecting letter size on the printer.

This paper may be printed, and Figure 1 attached as page 12.

Figure 2. Proposed Zone District Map: on page 30 of 10/24/2023 Packet, showing only parcel boundaries and less than 500 yards to the north with no detail.

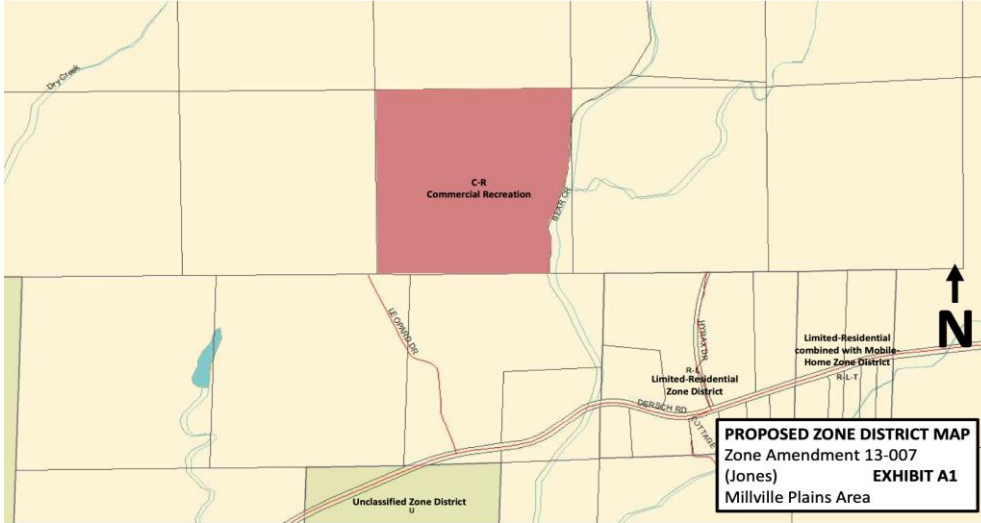


Figure 3. Site Plan: on page 31 of 10/24/2023 Packet

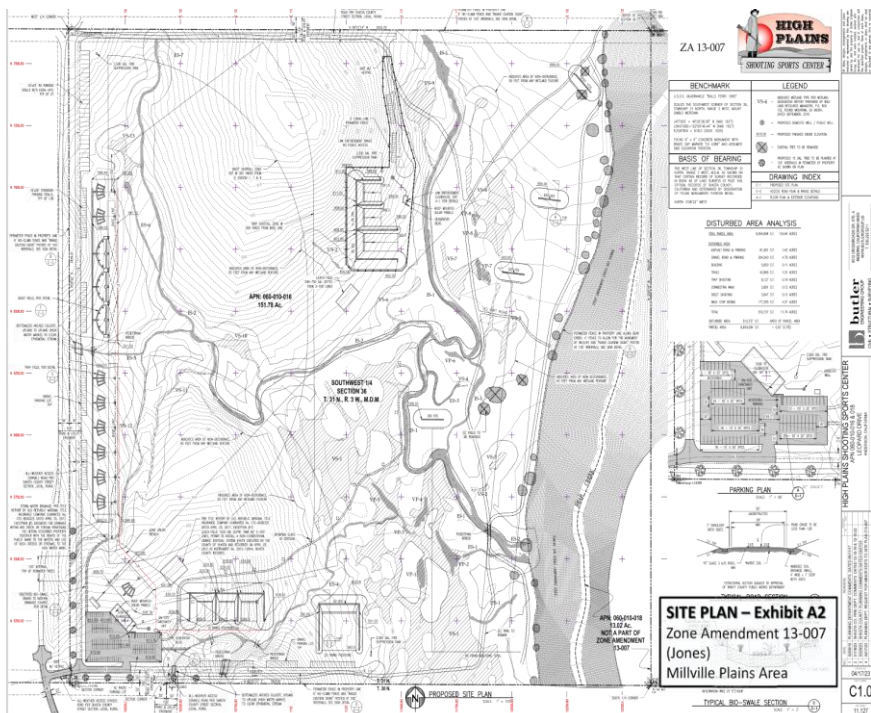


Figure 4. Location Map: on page 77 of 10/24/2023 Packet, showing parcel boundaries, and only 2640 yards to the north. CA Highway 44 not shown.

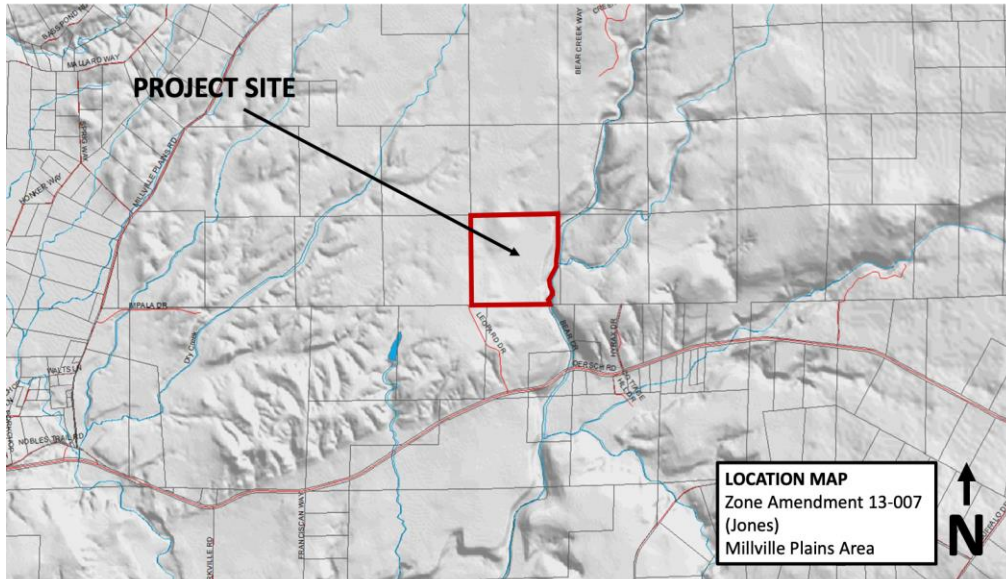


Figure 5. Aerial View: on page 78 of 10/24/2023 Packet, showing only the Site boundaries.



Figure 6. General Plan Map: on page 79 of 10/24/2023 Packet, showing less than 500 yards to the north. CA Highway 44 not shown.

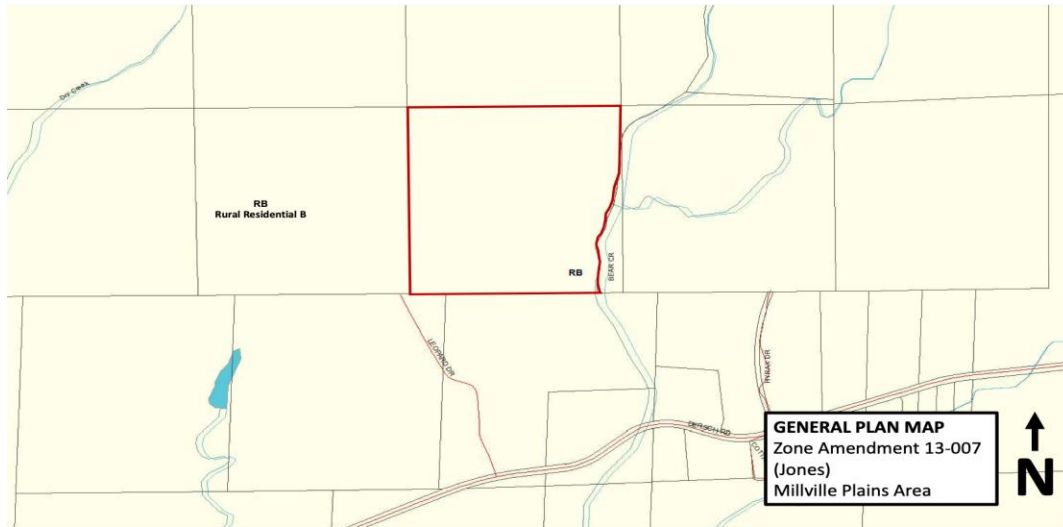


Figure 7. Existing Zone District Map: on page 80 of 10/24/2023 Packet, showing less than 500 yards to the north. CA Highway 44 not shown.



Figure 8. Project Area Aerial View: on page 142 of 10/24/2023 Packet. Oriented to primarily show the land to the east and west of the proposed shooting complex, and only 2640 yards to the north. California Highway 44 is therefore not shown. Furthermore, the resolution of the aerial view is too low to show any of the buildings to the west.

