

APPENDIX B

RANGE INFORMATION/DESCRIPTIONS/CELLS

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Range cells included in this appendix were created, which included *historical* regulations, manuals, photos, drawings, and documents. They represent typical (general) layouts, which include firing lines, target areas, target berms, and danger areas (aka SDZ). Each cell is a two-dimensional model, which does not take into account (during time of use) terrain, boundaries, or local requirements and/or restrictions.

As stated in an obsolete Army Regulation, AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace*, dated May 22, 1939, "It is obviously impossible for any general range regulation to cover each local situation completely. Such additional regulations as may be necessary to meet local condition will therefore, be prepared and enforced by the post, camp, or station commander."

When the ranges were established, regulations such as AR 750-10 (now obsolete), along with others, such as TM 9-855, *Targets, Target Material, and Training Course Lay-Outs*, dated August 17, 1944 (now obsolete) would have been referenced. These guidelines would have been applied to the local environment at the time of construction.

Where applicable, right and left firing limits and down-range limits were required and set based on the local conditions. Taking in-to account the scores of ranges and the lack of first-hand knowledge, many ranges were estimated using the best available resources. Topographic maps were analyzed to determine if terrain features could be used to limit the extent of the range.

For most sites it's likely to locate numerous historical maps displaying firing ranges drawn in a various configurations, but not necessarily with a true representation. For instance, they may show the range as nothing more than a dot, a box, circles, or a V-shaped fan. However, in rare cases, a range map displays what appears to be a true fan with a calculated danger area. In these cases, the range fans may be a true representation of the actual range boundaries, and therefore be considered for use instead of the general *Range Cells*. An example where this applies is shown below:

A historical range map found for Fort Custer, Michigan identified numerous ranges, all having range fans drawn. The fans displayed on this map appear to be proportioned, and closely represent correct angles and distances according to regulations. It is believed this map was done with a high degree of accuracy; therefore the range fans were used instead of the general *Range Cells*. Also recovered, was a document referring to the artillery range. It explained the necessity to discontinue firing of artillery on this facility because of the inconvenience of reducing the propelling charges

on 155mm Artillery Shells. The rationale behind this reduced charge was to minimize the down-range distance the projectile would travel. At charge 7 (max), a 155mm projectile had a maximum range of approximately 17,400 yards. In addition to this distance, regulations required a mandatory 1,000-yard buffer zone beyond the max range. If the max charge had been used to calculate the danger area, the downrange distance for this artillery range would have extended more than 6-miles beyond the installation boundary. Maximum distance on artillery munitions can be calculated using appropriate Ammunition Firing Tables.

Unfortunately, this detailed information is seldom available. Other options to consider are included in the following example where the use of topographic maps and site inspections were used to determine the boundaries of Spencer Mountain Rifle Range in North Carolina.

The only available map displayed the range as a small rectangular box. Documents recovered stated that the range was positioned at the base of the mountain in order to reduce the danger area. The *range cell* for a rifle range was designed to include 50 firing positions, which calculates to a width of 400 yards. However, during the site inspection, the actual width of the range was determined to be no more than 150 feet. By reducing the width of the *range cell*, and using contour lines on a topographic map the delineated boundaries was realistically reduced from the standard 1259 acres down to 72 acres.

As indicated, there are many variables to account for when developing range boundaries, and it is unlikely that all of the data used when the range was originally laid out will be available. Therefore, the historical data found during research (maps, aerial photos, documentation, etc.) was utilized to represent the range as accurately as possible. In most cases, the only option was to use the general *Range Cell*.

Each range description contains a list of Ammunition Data sheets. The intention of this list is to provide a general idea of the ordnance that could have been used on the range. It is not intended to be all-inclusive and by no-means is an indication that these munitions are actually present.

A significant number of manuals, drawings, letters, instructions, reports, and miscellaneous documents were referenced in order to calculate the *Range Cells*. The following non-inclusive list are published Range Manuals that were referenced to create the range cells.

- TR 140-5, *Range Regulations for Firing Ammunition in Time of Peace*, dated November 1931
- AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace*, dated May 1939

- AAF Manual 85-0.1, *Army Air Forces Gunnery and Bombardment Ranges*, dated June 1945
- AD-A954 905, *Training in the Ground Army 1942-1945, Study No. 11*, dated May 1948
- *Second Air Force Ground Gunnery Range*, dated July 24, 1943
- TM 9-855, *Targets, Target Material, and Training Course Lay-Outs*, dated August 1944
- TM 9-855, *Targets, Target Material, and Training Course Lay-Outs*, dated November 1951
- AFM No. 66, *Poorman Flexible Gunnery Trainer*, dated March 1945
- TC 25-1, *Training Land*, dated August 1978
- TC 25-8, *Training Ranges*, dated February 1992
- AFI 13-212, Vols 1,2,3, *Space, Missile, Command, and Control, Weapons Ranges*, dated July 1994
- AR 210-21, *Army Ranges and Training Land Programs*, dated May 1997
- AR 385-62, *Regulation for Firing Guided Missiles and Heavy Rockets for Training, Target Practice, and Combat*, dated June 1983
- AR 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat*, dated November 1983

HISTORIC USE: OB/OD

BURN AREA

Range Type: OB/OD

Cell Name(s): BURNAR

The range is typically used to destroy unserviceable small arms ammunition, pyrotechnics, propellants, and explosives.

A danger area is established by application of the criteria given below.

If the net explosive weight (NEW) of burn material is more than 100 pounds the minimum safe distance shall be at least 1,250 feet. If the NEW of burn material is 100 pounds or less, the danger area shall be at least 670 feet.

If the facility is a military range and the material being destroyed is unknown consider the NEW to be 100 pounds or less and select a danger area of 670 feet.

If the facility is an ammunition plant or explosive manufacturing plant assume the danger area to be a minimum of 1,250 feet unless evidence indicates a lesser distance is applicable.

Unless the location of the actual burn pit is known, the danger area should be established from all edges of the working area the range.

Ammunition (probable)

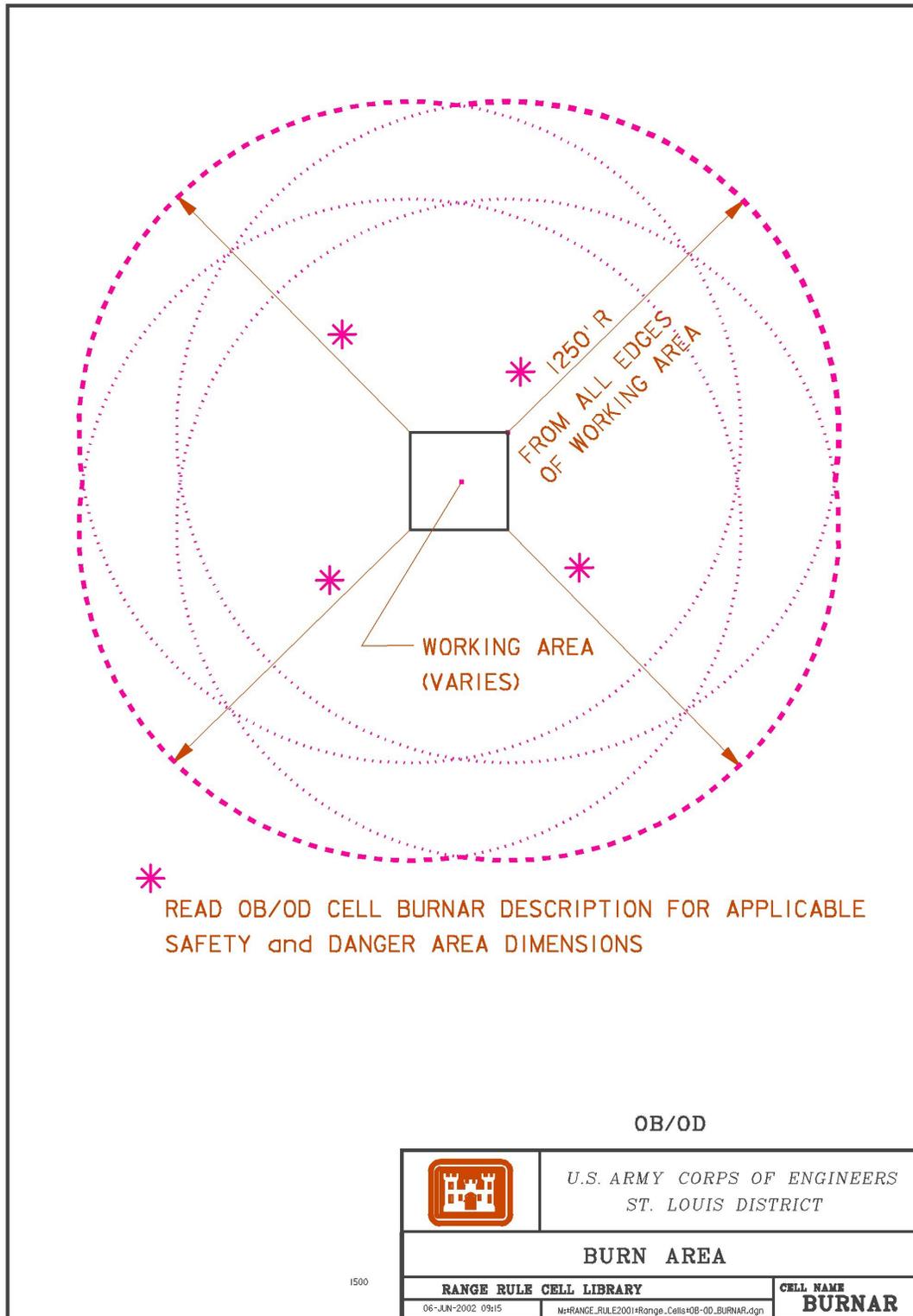
Small Arms ammunition, or applicable munitions

Data sheet(s):

When selecting datasheets, it is important to consider the time frame the range was used. Possibilities include:

CTT01 Small arms, General

Reference(s): DOD 6055.9-STD, *DOD Ammunition and Explosives Safety Standards*, July 1999



RANGE USED FOR DESTRUCTION OF AMMUNITION, DEMONSTRATIONS, AND EXPLOSIVE ORDNANCE DISPOSAL (EOD)

Range Type: OB/OD

Cell Name(s): EODRNG

The danger area for explosive demolitions, demonstrations, and EOD explosives operations is determined by application of the criteria given below.

The danger area should not be less than 1250 feet, for non-fragmenting explosive materials. This would generally pertain to explosive demonstrations, training, etc.

The danger area should not be less than 2500 feet, for fragmenting explosive materials. For bombs and projectiles with caliber 5-inches or greater use a minimum distance of 4000 feet.

If the type of ammunition destroyed on the range is unknown then the maximum distance should be applied.

Because the actual disposal pits may be positioned anywhere within the range area, the danger area should be established from all edges of the working area of the range.

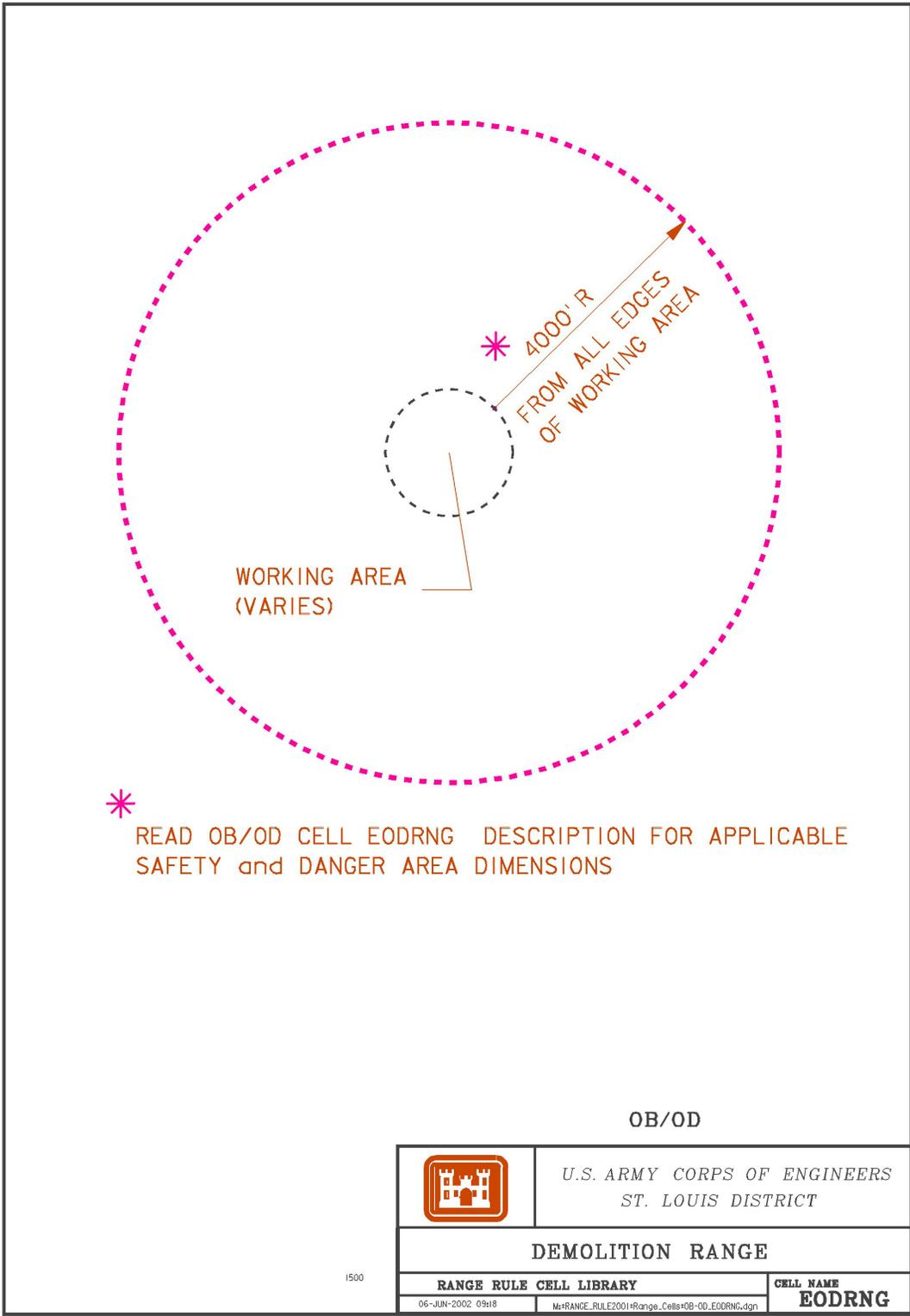
Ammunition (probable)

All ammunition, applicable to the installation. To include demolition materials.

Data sheet(s):

Must be determined for each site

Reference(s): DOD 6055.9-STD, *DOD Ammunition and Explosives Safety Standards*, July 1999



OB/OD



U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

DEMOLITION RANGE

RANGE RULE CELL LIBRARY

CELL NAME
EODRNG

06-JUN-2002 09:18

M:\RANGE_RULE2001\Range_Cells\OB-00_EODRNG.dgn

HISTORIC USE: R&D

R&D

Range Type: R&D

Cell Name(s): None available

These types of areas were used in research and development (R&D) of explosives, ammunition, weapons, and weapon systems etc. The range does not correspond with standard ranges and their layouts. Typically R&D work is conducted within controlled environments with non-standard danger areas and range fans. R&D facilities may encompass anything from ballistic tests on .22-caliber ammunition to static detonations of missile warheads. Range development should take into account that tests are generally conducted with single items in areas where strict engineering controls are emplaced. There are no historical manuals or regulations available which cover these types of ranges and facilities. Each facility should be evaluated separately, and danger areas established based on available information. Keeping in mind, number(s) of weapons and rounds fired per given test, engineering controls used, types of tests conducted, and remoteness of site, it is possible to modify standard range fans. Likely candidates for modification of typical range fans to use are small arms ranges, and demolition ranges.

Ammunition (probable)

Varies

Max Range (yards)

Limit of Test Area

Data sheet(s):

Varies

Reference(s): AR 385-63, *Range Safety*, 19 May 2003; Also refer to the references listed for the standard range fans.

