

ATTACHMENT 3-5 DTTF FACILITY DESCRIPTION

1.0 INTRODUCTION

This attachment to the Dugway Resource Conservation and Recovery Act (RCRA) permit describes the Dugway Thermal Treatment Facility (DTTF) as required by 40 Code of Federal Regulations (CFR) §264.10; and the Utah Administrative Code (Utah Admin. Code) R315-264-10. This attachment is organized in the following sections:

- Facility description,
- Topographic map and general requirements,
- Facility location information,
- Hazardous Waste Facility Siting Criteria,
- Emergency Response And Transportation Safety,
- Traffic information,
- Other federal laws, and
- References.

2.0 FACILITY DESCRIPTION

The facility description is divided into the following sections:

- General description,
- Address and owner/operator,
- Facility operations, and
- Hazardous waste management operations.

2.1 GENERAL DESCRIPTION: 40 CFR 270.14(b)(1), 264.10; UTAH ADMIN. CODE R315-270-14(b)(1), 264-10

Dugway Proving Ground (DPG) is operated by the U.S. Army for the purpose of testing and evaluating military warfare and defense systems as well as flame, incendiary, and smoke obscurant systems.

DPG is located in a remote area of central Utah approximately 67 miles southwest of Salt Lake City as shown in Figure 1. DPG lies within Tooele County and occupies an area approximately 52 miles long and 35 miles wide. The tract is situated in the southwest corner of the Great Salt Lake Desert and extends into parts of Dugway and Skull Valleys.

The installation covers approximately 840,911 acres and includes mountains, valleys, and a large flat sparsely vegetated area that extends westward into the southern reaches of the barren salt flats of the Great Salt Lake Desert. Most of this land is unimproved, with 300 acres of improved land and 536 acres of semi-improved land, mostly in English Village.

The terrain is mainly flat or gently sloping with intermittent sand dunes and small hills. The Cedar Mountain Range extends from English Village northwesterly forming the northeast boundary of the installation. Little Granite Mountain, Camel Back Ridge, Wig Mountain, and Granite Mountain divide the installation into several minor areas.

The DTTF is located in the southeast portion of DPG as shown on Figure 2. The facility is located approximately 3.5 miles southeast of the Carr Facility along Durand Road. The Carr Facility is the nearest area where DPG personnel work on a regular basis. The closest residences are located in English Village, approximately 7.5 miles northeast of the facility. The closest DPG property boundary is located approximately two miles to the east. The land where the DTTF is located has been in use for approximately 30 years.

2.2 ADDRESS AND OWNER/OPERATOR

The address of DPG is as follows:

U.S. Army Dugway Proving Ground
Dugway Proving Ground
Dugway, UT 84022

Operator: Commander, U.S. Army Dugway Proving Ground
Facility Contact: Director, Directorate of Environmental Programs

2.3 FACILITY OPERATIONS

DPG began operation in 1942 when testing of military weapons commenced. DPG was activated in order to meet the need of the Chemical Warfare Service for expanded testing facilities. The site was selected because of its seclusion, low population density, and scarcity of wildlife. DPG major activity centers include:

- English Village – the housing and administrative area,
- Avery Technical Center – the location of ground support for Air Force activities,
- Baker Area – the biological defense testing laboratory area,
- Ditto Technical Center (DTC) – the administrative and test support for West Desert Test Center (WDTC), and
- Carr Facility – the primary storage location for materials and equipment required to support various testing and training activities and the location of several test facilities.

In the course of its research and testing operations, as well as routine functions, DPG generates various hazardous wastes that may be stored on site or transported to an off-site treatment, storage or disposal facility through the Defense Reutilization and Marketing Office (DRMO) or private contractor.

Demilitarization of reactive wastes can be accomplished by either open burning (OB) or open detonation (OD) at the DTTF. Since 1987, OB of waste military energetic materials has been conducted in specially constructed containment devices (burn pan) to prevent hazardous constituents and burning residues from coming in contact with the ground. Bulk propellants or other energetic materials are placed in a burn pan and ignited. OD of ammunition or explosives is conducted on the ground surface. Initiating charges are placed in intimate contact with the items to be detonated and are remotely initiated. Following OB treatment, all residual ash is containerized and later characterized for proper disposal. Following OD treatment, unexploded ordnance (UXO) and scrap metal visibly contaminated with residual explosive are retreated to ensure complete destruction. Uncontaminated scrap metal is collected and containerized for

recycling.

2.4 HAZARDOUS WASTE MANAGEMENT OPERATIONS

DPG thermally treats reactive hazardous waste by OB or OD at the DTTF. Units used to treat reactive wastes in this manner are classified as miscellaneous (40 CFR Part 264 Subpart X) units and are regulated by the State. The DTTF is a single Subpart X unit that is used to demilitarize waste propellants, explosives, and pyrotechnics (PEP) by OB within the burn pan and by OD on the ground surface. The DTTF site includes one 90-day storage area. The waste PEP is generated by tests and training exercises that are part of DPG's mission.

2.4.1 OPEN BURNING OPERATIONS

DPG currently conducts OB operations in one burn pan located in the northern part of the DTTF. Burn Pan #3, installed in 1992, measure 8 feet wide by 20 feet long and are 1.5 feet deep. The pan is constructed of 3/4-inch thick carbon steel and is fitted with a two-piece, lift-off, aluminum cover. The cover is designed to prevent accumulation of precipitation. The burn pan has sides that slope in toward the bottom to create a slight dish shape. The 3/4-inch steel plate provides sufficient strength to prevent warping due to the heat generated during treatment. The joints in the unit are fully welded to prevent any cracks or seams where ash and waste propellant could settle. The pan is supported by two sets of crossed steel I-beams. The lower I-beams rest on 18-inch square concrete pad. The pan is not equipped with an engineered liner or secondary containment system. The concrete pad and I-beams raise the pan approximately one foot above the native soil of the unit.

Burn Pans #1 and #2 were removed in 2017.

The DTTF is graded with a road grader when necessary to remove vegetation and to fill craters caused by detonations. The removal of vegetative growth is performed as a precaution to prevent fire hazards from DTTF operations. Other maintenance of the DTTF (such as the burn pan) and any equipment used to operate the unit is performed on an as-needed basis when deterioration is noted during regular inspection of the unit.

2.4.2 OPEN DETONATION OPERATIONS

OD activities occur within the DTTF which consists of an approximately 40-acre, oval-shaped area which is maintained clear of all vegetation. The surface of the DTTF consists mainly of the native silty clay soil. All traces of any drainages, which existed in the area prior to construction of the unit, have been eliminated by regular grading of the DTTF. The presence of vegetation at the boundary of the unit is clearly visible on the ground surface at the unit.

There are no engineering plans or cross-sectional drawings of the OD Area because there are no engineered structures used in the OD process.

The treatment of PEP waste by OD can be conducted anywhere in the unit. However, OD operations are typically conducted in the center of the unit to ensure that the detonation will not disturb the burn pan and to minimize the potential of shrapnel falling outside the unit. The OD treatments will always be conducted at least 100 meters from the burn pan and 100 meters from the edge of the unit.

Treatment of PEP waste by OD can be conducted directly on the ground surface, within the craters left by previous detonations, or within a crater with soil packed around and above the PEP waste. The decision on whether to conduct the OD on the ground surface or below grade is based on information in the technical data sheets for the waste explosive to be treated. Generally, shells or bombs containing submunitions are treated below grade in open craters, or are tamped with earth, to prevent the individual submunitions from being ejected from the shell or bomb during treatment.

Typically, the first treatment event done at the OD Area after it has been re-graded involves a PEP waste that can be treated on the ground surface. After the first shot has produced a crater, wastes requiring treatment below grade can be treated. The PEP wastes to be treated are placed in intimate contact with an explosive initiating charge(s). The initiating charge is primed with an electric or non-electric primer. The DTTF personnel then move approximately 2,000 meters northwest along Durand Road prior to commencing the treatment. If the OD operation has been conducted without an associated OB, the personnel can return to the DTTF immediately. If an OB has also occurred, then the personnel must wait at least 30 minutes after the last visible flame before reentering the DTTF.

3.0 TOPOGRAPHIC MAP AND GENERAL REQUIREMENTS: 40 CFR 270.14(b)(19); UTAH ADMIN. CODE R315-270-14(b)(19)

A diagram of the DTTF is shown in Figure 4. Exhibit 3-1, a 1-inch to 200-foot scale topographic map of the DTTF, submitted as part of the Part A Permit Application process is maintained on file with the Director, Utah Division of Waste Management and Radiation Control, and at the Dugway Environmental Programs office. The DTTF area is generally flat to gently sloping to the northwest at a gradient of 48 feet/mile (0.01 feet/foot). The elevation of the DTTF ranges from 4,415 to 4,427 feet AMSL. As can be seen from the map, the topography of the land surrounding the DTTF is relatively flat.

The 100-year floodplain has never been defined at DPG by the Federal Emergency Management Agency (FEMA) and, therefore, was not defined on the maps. However, it is unlikely that DTTF will be affected by a 100-year flood since there has been no historical flooding of the DTTF by Government Creek, the nearest surface water source. This creek is an ephemeral stream located approximately one mile from the site.

A wind rose for DPG is presented in Figure 5. The data for the wind rose was collected at DPG's Ditto area weather station. The DTTF is located approximately six miles southeast of the Ditto Area weather station. The dominant direction of light winds, primarily of local origin, is southeasterly at night and northwesterly during the day. The winds over the DPG vicinity are strongly influenced by local topographic conditions. These local influences are not noticeable when strong winds, the result of large-scale weather storm patterns, are prevalent. The winds near the mountains usually have very different local effects and do not necessarily reflect the general local pattern.

Land use surrounding DPG is predominantly farming/grazing. All land within a radius of approximately 9,200 feet of the DTTF is located within DPG boundaries.

4.0 FACILITY LOCATION INFORMATION: 40 CFR 264.18; UTAH ADMIN. CODE R315-264-18

Compliance with facility location standards is discussed in the following sections:

- Seismic Standard, and
- Floodplain Standard.

4.1 SEISMIC STANDARD: 40 CFR 264.18(a), APPENDIX IV OF PART 264; UTAH ADMIN. CODE R315-264-18(a)

Although Utah is tectonically active, most of the earthquake activity occurs about 55 miles to the east of DPG along the Wasatch Range foothills. The U.S. Geological Survey (USGS) has conducted a study to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps in the Tooele 1 x 2 Quadrangle in northwestern Utah. The conclusions of the study state that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the late Pleistocene Era with no clear evidence of Holocene surface faulting. Several faults inferred based on geophysical evidence are located on DPG; however, there is no evidence of displacement during Holocene time.

Geographical data from a regional gravity survey conducted in the Camels Back Ridge Area indicate potential subsurface faulting. No evidence of these inferred faults exists at the surface in the area of the Defensive Test Chamber and Carr facilities. The Central Hazardous Waste Storage Facility (CHWSF) and the DTTF are more than 200 feet from these inferred faults, which do not figure evidence of displacement in Holocene time.

4.2 FLOODPLAIN STANDARD: 40 CFR 264.18(b); UTAH ADMIN. CODE R315-264-18(b)

A National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, has not been prepared for DPG. There are no permanent streams or other surface water bodies on DPG. Surface water from precipitation flows through well-established drainage channels into the flat plain and evaporates. Like other arid regions, DPG is subject to flash flooding following high-precipitation events. Flash floods have occurred only four times in the history of the installation, in 1944, 1952, 1973, and 1983. The major area affected during flash floods has been the Government Creek drainage channel, which has overflowed and caused minor inundation of roads at Ditto Technical Center. The culvert at Stark Road restricts the flow in the Government Creek channel during periods of high flow, thus causing the area south of the road to flood. The DTTF was not part of the flooded area.

The DTTF is in the path of several small drainage channels. However, due to the relatively small drainage area of these channels, inundation of the DTTF is not likely. According to facility personnel, the DTTF has never been inundated with runoff or runoff, even during storm events that caused flooding at Government Creek.

5.0 HAZARDOUS WASTE FACILITY SITING CRITERIA: 40 CFR 264.18; UTAH ADMIN. CODE R315-264-18

Hazardous waste facility siting criteria is described in the following sections:

- Land use compatibility and location, and
- Emergency response and transportation safety.

5.1 LAND USE COMPATIBILITY AND LOCATION: UTAH ADMIN. CODE R315-103

The land use compatibility and location section addresses regulations and laws that must be considered when locating a hazardous waste facility. The following topics are discussed in this section:

- Ecologically and scientifically significant natural areas,
- 100-Year floodplains,
- Areas above aquifers,
- Recharge zones,
- Drinking water source protection areas, and
- Archaeological sites.

5.1.2 ECOLOGICALLY AND SCIENTIFICALLY SIGNIFICANT NATURAL AREAS: UTAH ADMIN. CODE R315-103-3(a)(2)

The sensitive species (including threatened and endangered) likely to occur or documented at DPG are not year-round residents, and therefore, no special management practices have been implemented. The Army, in cooperation with the U.S. Fish and Wildlife Service, has special guidelines for managing threatened and endangered species, should they become residents of DPG.

One plant species at DPG is a species of concern. Sensitive species are those which still occur in numbers adequate for survival, but whose population has been greatly depleted and is declining in numbers, distribution, and/or habitat. Dune Four-Wing Saltbush could be found in association with the vegetated dunes at DPG. The Ute Ladies Tresses, a federally threatened orchid, occurs in wetland habitats just outside DPG's southern boundary. This threatened plant has not been found at DPG, but may occur there.

Several animal species are also designated as sensitive species in the State of Utah. The Peregrine Falcon is a transient to DPG, and has not been found to nest within DPG boundaries. Bald Eagles are often observed at DPG during the winter. Two other hawks, the Ferruginous Hawk (state threatened) and the Swainson's Hawk (state sensitive), were found nesting at DPG from 1993 to 1995. The Burrowing Owl, a state sensitive species due to declining numbers, has also been found nesting at DPG. The Mountain Plover, Black Tern, and Long-Billed Curlew have been observed at DPG in the pickleweed area during wet periods. The two bat species of concern are sensitive species. The Fringed Myotis was documented in Tooele County, but has not been observed at DPG. Ringtails have been observed at DPG, but data on their distribution is unavailable. Hazardous waste management activities at the DTTF will not jeopardize the continued existence of any of these endangered or threatened species.

Additionally, several areas at DPG have been identified as being critical habitats or scientifically significant natural areas. These areas include natural springs, jurisdictional wetlands, unique vegetation, and unique habitat. None of these areas are near the DTTF. Therefore, hazardous waste management activities conducted at the DTTF will not jeopardize the continued existence of any critical habitats or scientifically significant natural areas.

5.1.3 100-YEAR FLOODPLAINS: UTAH ADMIN. CODE R315-130-3(a)(3)

The DTTF is not located within a 100-year floodplain. This is discussed in greater detail in Section 6-2, Floodplain Standard.

5.1.4 AREAS ABOVE AQUIFERS: UTAH ADMIN. CODE R315-103-3(a)(9)

The depth to the uppermost aquifer in the vicinity of the DTTF is approximately 97 feet below ground surface. This groundwater is considered non-potable due to brackishness and high salinity. The depth to water in the uppermost potable aquifer under the DTTF is not known; however, the potable aquifer is at least an additional 100 feet below the non-potable aquifer in the nearest extraction wells.

DPG requests an exemption from the criterion under Utah Admin. Code R315-4-11(b)(1)(ix) because the depth to the uppermost aquifer is nearly 100 feet and the total dissolved solids (TDS) in the groundwater range from 3,000 mg/L to above 10,000 mg/L. Treatment of hazardous waste by OB or OD leaves very little residue; remaining residue is collected and containerized. In addition, contaminants would have to be transported nearly 100 feet through low permeability soils to reach groundwater. Due to the non-potability and depth to the uppermost aquifer and the small amount of treatment residue, an exemption for this requirement is warranted.

5.1.5 RECHARGE ZONES: UTAH ADMIN. CODE R315-103-3(a)(10)

There is no recharge zone near the DTTF. The major source of groundwater in the Dugway Valley-Government Creek area is saturated older alluvium of Tertiary and Quaternary Ages. This groundwater reservoir covers approximately 1,538 sq km (380,000 acres). The total estimated annual groundwater recharge in the Dugway Valley-Government Creek area is approximately 15 million m³ (12,000 acre-ft). Recharge from precipitation is about nine million m³ (7,000 acre-ft) annually and occurs primarily in coarse alluvium of higher valleys and lower mountain slopes above 1,829 m (6,000 ft). About six million m³ (5,000 acre-ft) of groundwater enters the area annually as subsurface inflow from the Sevier Desert drainage basin through the Old River Bed. The areas with the greatest potential to contribute recharge to the deeper, confined parts of the Dugway Valley-Government Creek area groundwater system would be the Simpson Mountains, Sheeprock Mountains, alluvium and colluvium deposits around the flanks of the Simpson Mountains, and older alluvium between the Simpson and Sheeprock Mountains. The Cedar Mountains and Granite Peak, because of lower winter precipitation and lack of faults, have a low potential for contributing recharge to the groundwater system.

5.1.6 DRINKING WATER SOURCE PROTECTION AREAS: UTAH ADMIN. CODE R315-103-3(a)(11)

The closest groundwater extraction well to the DTTF is Well Number 5. The DTTF is outside the four drinking water protection zones defined for this well.

5.1.7 ARCHAEOLOGICAL SITES: UTAH ADMIN. CODE R315-103-3(a)(14)

Approximately 200 surface archaeological sites have been reported in the sand dunes area of DPG. Other archaeological sites have been identified near Wig Mountain in the northern portion of the installation. None of these sites are located 1,000 feet or less from the DTTF.

5.2 EMERGENCY RESPONSE AND TRANSPORTATION SAFETY: UTAH ADMIN. CODE R315-103-4

Emergency response and transportation safety is described in the following sections:

- Availability and adequacy of emergency services
- Trained emergency response personnel and equipment
- Routes of hazardous waste transport

5.2.1 AVAILABILITY AND ADEQUACY OF EMERGENCY SERVICES: UTAH ADMIN. CODE R315-103-4(a)

Emergency services are discussed in detail in the DTTF Contingency Plan (Attachment 3-7). DPG has its own health clinic, fire department, and spill response team that are capable of immediate response to an emergency situation on the installation.

5.2.2 TRAINED EMERGENCY RESPONSE PERSONNEL AND EQUIPMENT: UTAH ADMIN. CODE R315-103-4(b)

Emergency response capability, including personnel and equipment, is described in detail in the Contingency Plan (Attachment 3-7).

5.2.3 ROUTES OF HAZARDOUS WASTE TRANSPORT: UTAH ADMIN. CODE R315-103-4(c)

Transportation routes are discussed in Section 6.0.

6.0 TRAFFIC INFORMATION: 40 CFR 270.14(b)(10); UTAH ADMIN. CODE R315-270.14(b)(10)

DPG is serviced by two hard-surfaced roads and one improved gravel road; none enters the installation. Utah State Route 199 connects DPG (via Johnson Pass) with Utah State Route 36 east of Clover. County Road B-15 connects DPG (via Skull Valley) with U.S. Interstate 80 at Timpie Junction. An improved gravel road connects DPG (via Lookout Pass) with Utah State Route 36 near Vernon. Only the road over Johnson Pass goes through towns and villages. The remaining major hard-surfaced roads in the vicinity are Utah State Route 73 in Rush Valley and Alternate U.S. Route 50 in Nevada.

Within DPG there are approximately 693 miles of road; about 371 miles of which are regularly maintained. By type the maintained roadways are classified as follows:

High grade bituminous pavement	74 miles
Low grade bituminous pavement	138 miles
Gravel	145 miles
Natural soil	<u>14 miles</u>
Total	371 miles

Roads within the grids and operation areas are, for the most part, single or double bituminous surface treatments. All roads leading to and within the built-up areas are bituminous surfaced.

Durand Road provides access to Carr Facility and the DTTF. Durand Road is 18 feet wide with no shoulders. This road is in good condition. Durand Road to the southeast of the Carr Facility and leading out to the DTTF and the range areas beyond is an improved gravel road. Only authorized traffic is allowed to travel down Durand Road to the DTTF. All traffic on Durand Road beyond the Carr Facility checkpoint must report to Range Control.

Traffic volumes at DPG include receiving and shipping trucks that travel primarily to and from the central receiving area, the warehouse area, the ammunition storage area, the fuel area, and the technical area. Transport records for 1988 show an average of 1.92 receiving trucks and 1.73 shipping trucks per day, carrying an average load of 13.46 and 3.02 tons per day, respectively. Information demonstrating the load-bearing capacity of the on-site roads used to transport hazardous waste is not available. These roads were constructed using U.S. Army Corps of Engineers standards. No structural failure of these roads has occurred, even under heavy truck traffic including semi-trucks, as well as an occasional Army tank. DPG has ongoing programs to maintain these roads.

7.0 OTHER FEDERAL LAWS: 40 CFR 270.3

Other federal laws and Executive Orders were reviewed for their applicability to the DTTF as required by 40 CFR Part 270.3. The Endangered Species Act is discussed in Section 5.1.2. The DTTF is a permitted facility under DPG's Title V Operating Permit.

8.0 REFERENCES

Barnhard, T.P., and R.L. Dodge, 1988, Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1° x 2° Quadrangle, Northwestern Utah, U.S. Geological Survey.

Figure 1. Regional Location of Dugway Proving Ground

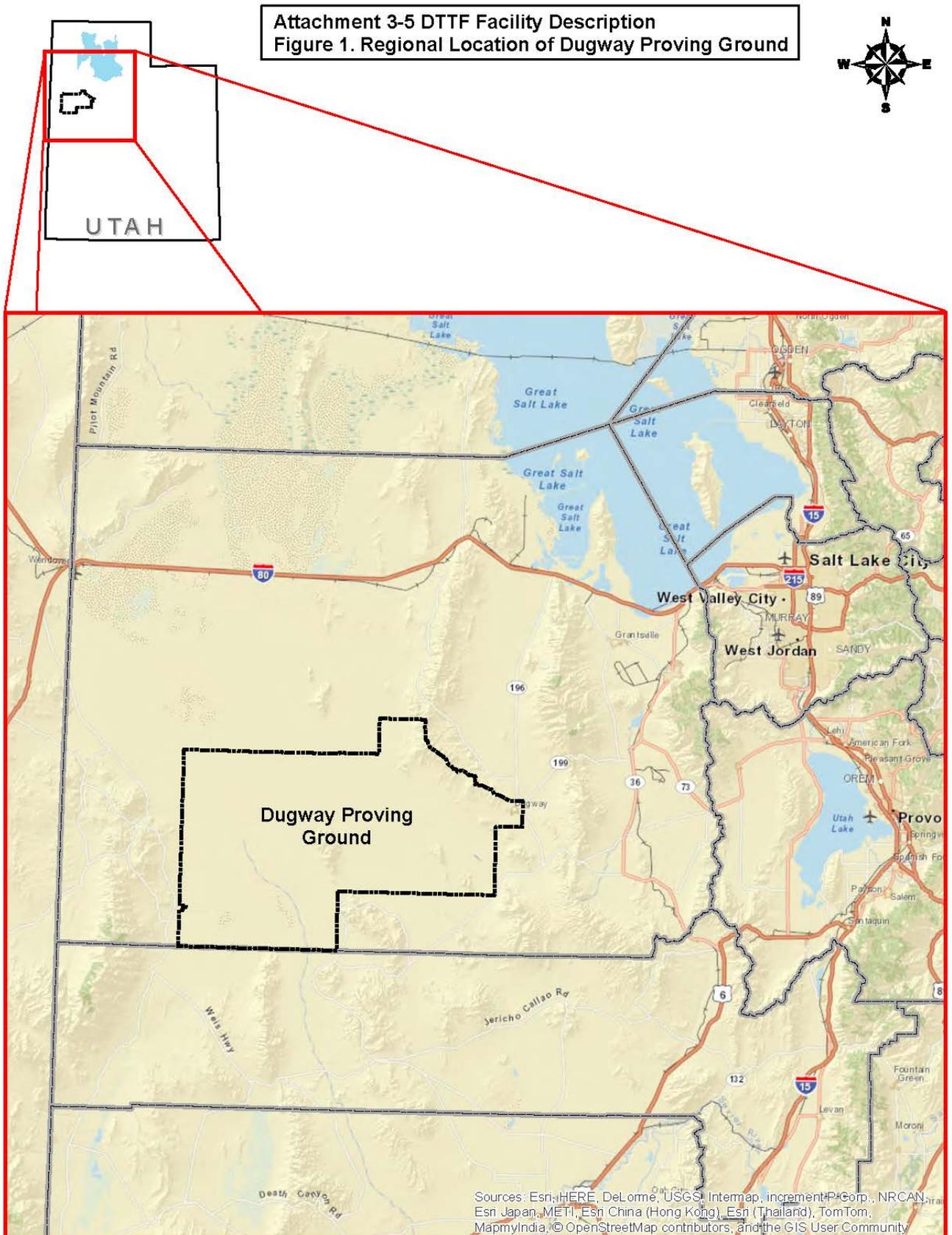


Figure 2. Dugway Thermal Treatment Facility (DTTF) Location

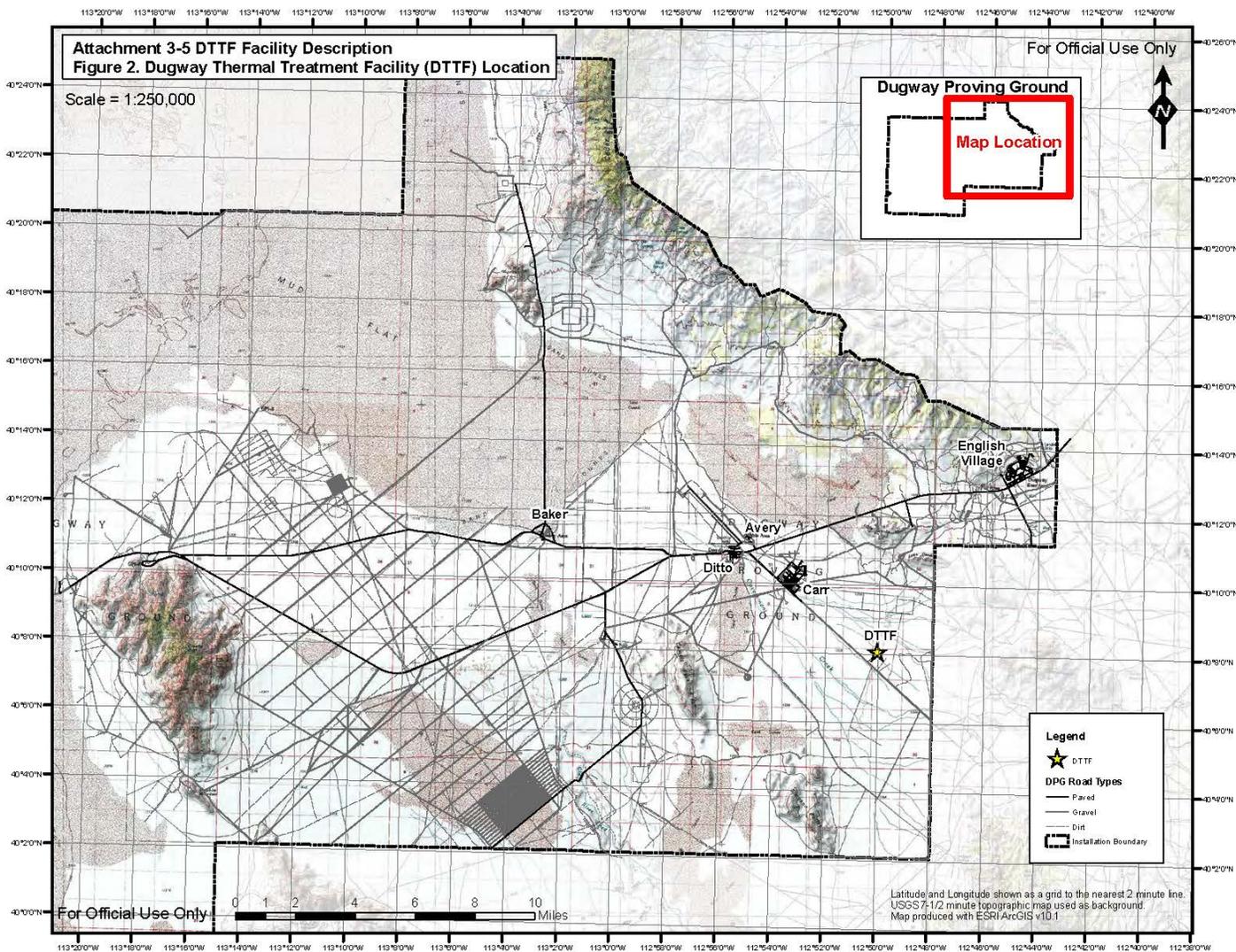
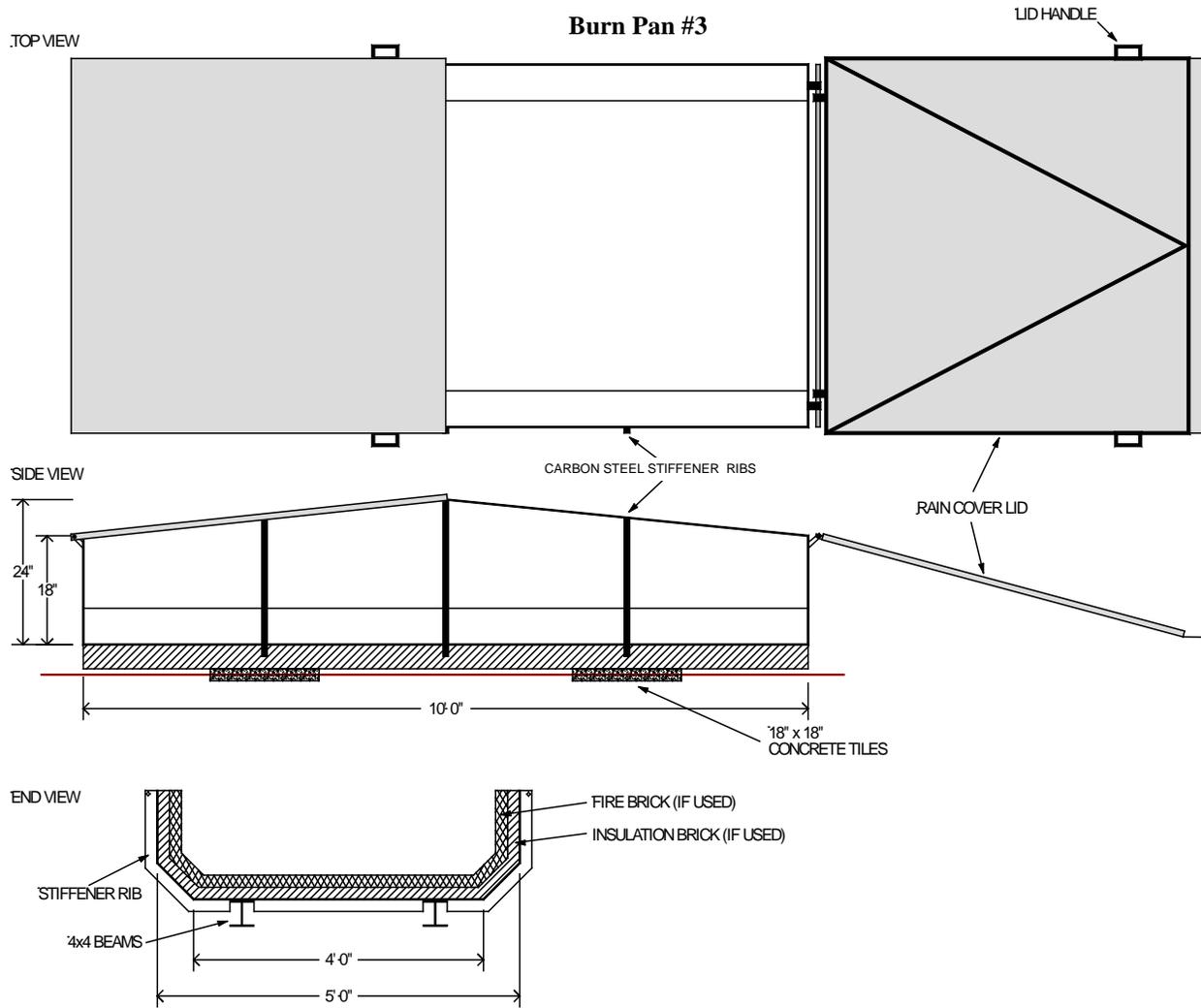


Figure 3. Burn Pan Drawings



Burn Pans #1 and #2 have been removed.

CARBON STEEL STIFFENER RIBS
 4"x4" CARBON STEEL I-BEAM

Figure 4. Dugway Thermal Treatment Facility

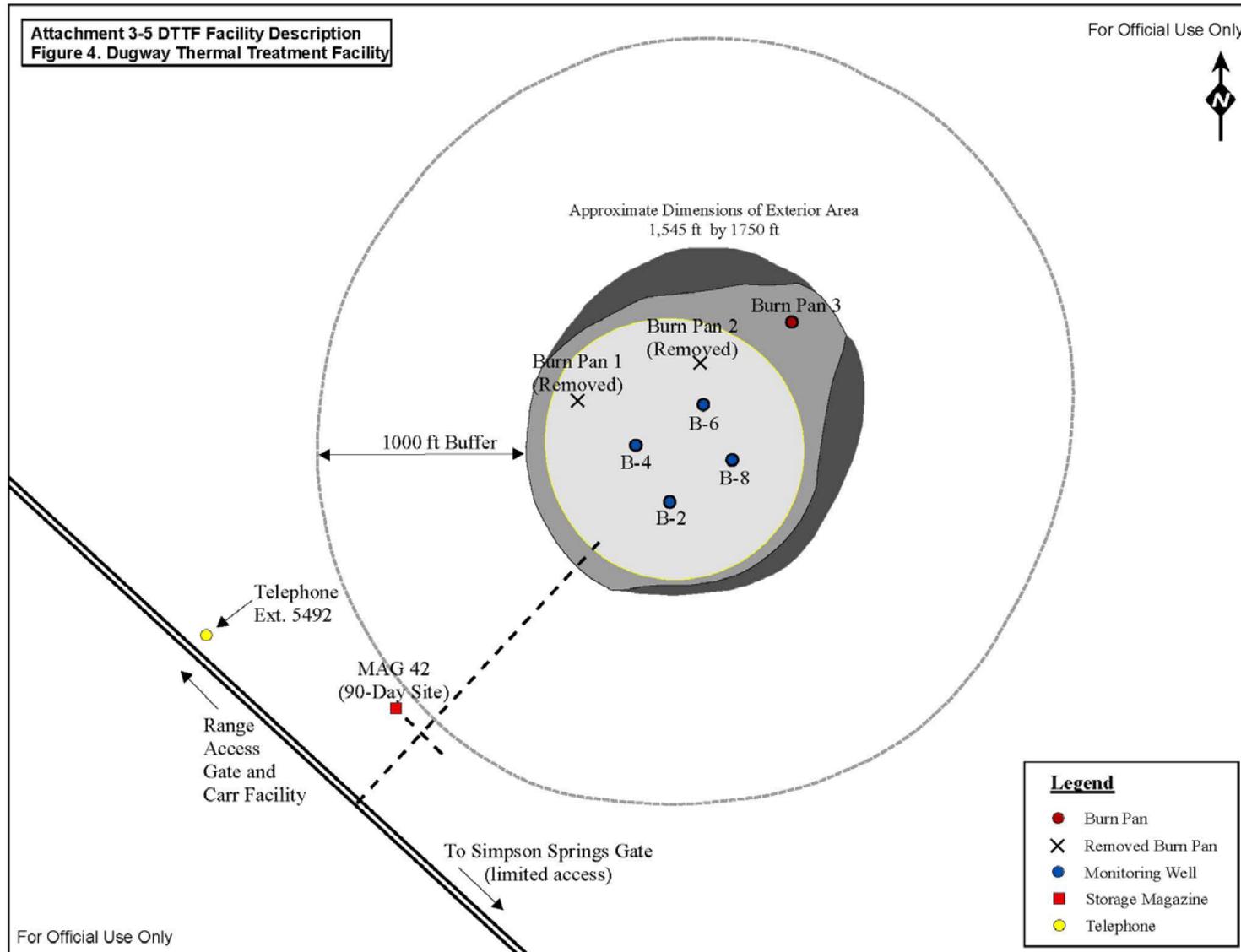


Figure 5. Typical Wind Rose for the DTTF

