

**ENVIRONMENTAL ASSESSMENT
OBSCURANT MUNITIONS TRAINING
FORT BLISS, TEXAS AND NEW MEXICO**



Prepared by:

**Fort Bliss
Directorate of Public Works
Environmental Division**

May 2010

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OBSCURANT MUNITIONS TRAINING
FORT BLISS, TEXAS AND NEW MEXICO**

PREPARED FOR:

1ST ARMORED DIVISION AND FORT BLISS

REVIEWED BY:

Joseph A. Wucik
LTC, U.S. Army
ACOFS, G3

Date

Joseph S. Barnes
LTC, Commanding
U.S. Army Combined Arms Battalion

Date

Vicki Hamilton, R.A.
Chief, DPW–Environmental Division

Date

APPROVED BY:

Howard B. Bromberg
Major General, US Army
Commanding

Date

Joseph A. Simonelli, Jr.
Colonel, U.S. Army
Commanding

Date

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3 **EXECUTIVE SUMMARY**

4 **Introduction:** In accordance with the requirements of the National Environmental Policy Act of 1969
5 (NEPA) (Public Law 91-190) and with regulations published at 40 Code of Federal Regulations (CFR)
6 1500 *et seq.* and at 32 CFR 651 *et seq.*, the United States (U.S.) Army Installation Management
7 Command Headquarters, U.S. Army Garrison, Fort Bliss, has prepared this Environmental Assessment
8 (EA) for the training with obscurant munitions within the New Mexico portion of the Fort Bliss Training
9 Complex (FBTC). This EA discusses the potential environmental effects of the Proposed Action, to
10 utilize obscurant munitions in Army training at Fort Bliss.

11 **Background:** Obscurants are deployed from field artillery, grenades, and mortars, and are essential for
12 the achievement of tactical objectives. Proper employment of obscurant and experience conducting
13 Army tasks and missions make U.S. forces more agile and capable of responding faster to changing
14 situations.

15
16 To ensure preparedness, utilization of smokes and obscurants also are necessary in military training areas.
17 Use of obscurant in training would enhance the soldiers' confidence in how to employ the various
18 obscurants and would provide them experience and knowledge on how obscurants would affect their
19 mission and how they can use obscurants to their advantage in the operational environment. The Army's
20 doctrine calls for such training.

21
22 **No Action Alternative:** Under the No Action alternative, obscurant munitions would not be used at the
23 FBTC. The No Action alternative would not provide the brigades with the necessary training, would not
24 implement the Army's doctrine for such training, and would not implement Fort Bliss's directives
25 requiring that such training be conducted within the FBTC. All conditions would remain the same, *i.e.*,
26 training with High Explosives (HE) and other munitions would continue in the designated areas, but
27 without the use of obscurant munitions. Units would be required to travel to other installations where
28 obscurant munitions are permitted, thereby delaying training, not meeting training standards, and using
29 scarce training resources.

30
31 **Proposed Action:** The Proposed Action is the training with obscurant munitions within the FBTC.
32 Obscurant munitions included under the Proposed Action include artillery fired from howitzers and
33 mortars. Training would be conducted within designated 2x2 km boxes within duded areas of the Doña
34 Ana Range, the Digital Air/Ground Integration Range (DAGIR, Range 88) and the Digital Multi Purpose
35 Range Complex (DMPRC, Range 83). The DMPRC would only be used if firebreaks/fire-equipment
36 access roads are constructed on the east side of the range. Obscurant munitions would be fired from
37 firing points into the obscurant impact boxes. The Doña Ana Range Deer Hill Obscurant Impact Area
38 would be utilized only for indirect (not within a line-of-sight, or target seen by forward observers only)
39 and stationary firing of obscurant munitions. Indirect firing to the Doña Ana from artillery firing points
40 east of War Highway would require occasional closure of War Highway and the Doña Ana firing ranges
41 as the obscurant munitions with air bursting fuzes are not authorized for overhead fire. Safety
42 requirements for the use of obscurant munitions would be added to the Fort Bliss Regulation 350-1,
43 Training Safety.

44
45 **Alternative A:** Alternative A would include obscurant training only on the Doña Ana Range Deer Hill
46 Obscurant Impact Area. Doña Ana Firing Range is currently available for training and an active range
47 with duded impact area, and relatively low fire potential.

48
49 **Alternative B:** Alternative B would include the obscurant training as described for the Proposed Action,
50 except that the DMPRC would not be utilized for obscurant training. The DMPRC currently does not
51 have a suitable network of roads for fire-fighting capabilities. Without the roads, a potential fire could

1 spread to the Otero Mesa grasslands. Current fire fighting capabilities would not be capable of staying
 2 ahead of a fire to contain it from spreading east to the Otero Mesa. Fire-fighting routes for the DAGIR
 3 are well established from Hay Meadow to Mack tanks and would provide protection from movement of
 4 fires on to the Otero Mesa.

5
 6 **Environmental Consequences:** Comparisons of potential effects of the alternatives are included in
 7 Table S-1. There would be less than significant effects on visual resources, soils, regional air quality,
 8 surface water and groundwater, vegetation (from obscurant compounds) wildlife and sensitive species
 9 populations, and hazardous materials.

10
 11 Potentially major effects to cultural resources and vegetation could result from the initiation of wildland
 12 fires by obscurant munitions. Of greatest concern is the potential for wildfires to spread to the grasslands
 13 of the Otero Mesa, particularly from fires that might initiate on the DMPRC or the DAGIR. Best
 14 Management Practices (BMPs) and increased resources would limit the impacts to wild lands from fires.

15
 16 Potential major effects could occur as a result of obscurant compounds exceeding short-term exposure
 17 guidelines outside of the impact areas. This appears most likely at the Doña Ana range. Potentially
 18 sensitive receptors (*i.e.*, Doña Ana firing ranges and War Highway) occur within distances of less than 3
 19 miles (5,000 meters) of the proposed Doña Ana Deer Hill Obscurant Impact Area. Under certain weather
 20 conditions (*e.g.*, inversions, wind directions) and munitions loadings, smoke screens and associated
 21 obscurant compound byproducts could reach potentially sensitive receptor locations. Safety and health
 22 restrictions and requirements would be incorporated into the Fort Bliss Regulations 350-1, Training -
 23 Army Training and Leadership Development; and Fort Bliss Regulation 385-63, Safety -Training
 24 Complex Range Operations. Potential exposures to sensitive receptors at either DMPRC or DAGIR are
 25 unlikely. All impacts would be less than significant given the areas proposed for the impact zones, the
 26 distances to settled areas, and the planning that would be required prior to initiation of and during
 27 training.

28
 29 **Table S-1. Potential Effects Comparison of No Action, Proposed Action and Alternative Actions**

Resource	No Action	Proposed Action	Alternative A	Alternative B
Visual Resources	No Effect	Potential short-term impacts to visual landscape from smoke drifting across landscape.	Same as proposed action	Same as proposed action
Soils	No Effect	Potential short-term, localized impacts to Doña Ana, DAGIR and DMPRC soil chemistry related to obscurant compounds and transformation products.	Same as proposed action	Same as proposed action
Air Quality	No Effect	Potential short-term effects to air quality related to obscurant.	Same as proposed action	Same as proposed action
Surface Water	No Effect	Less than significant potential impacts to surface water related to obscurant compounds and transformation products.	Same as proposed action	Same as proposed action
Groundwater	No Effect	No potential impacts to groundwater related to obscurant compounds and transformation products.	Same as proposed action	Same as proposed action

Table S-1, continued

Resource	No Action	Proposed Action	Alternative A	Alternative B
Vegetation	No Effect	Potential short-term effects to vegetation related to obscurant compounds and transformation products. Potential for increased fires, as a result of obscurant training to spread to Otero Mesa grasslands. Fires on Doña Ana are anticipated to be limited due to the low fire potential, but are possible.	Same as proposed action Limited potential for wild-land fires to spread to off base areas of Organ Mountains. No increased potential for Otero Mesa fires.	Same as proposed action Potential for fires to spread to Otero Mesa grasslands.
Wildlife	No Effect	Wildlife populations may be affected by obscurant compounds and transformation products. Fires may destroy habitat for animals.	Same as proposed action, but less possibility of fires since Deer Hill impact area sparsely vegetated.	Same as proposed action
Sensitive Species	No Effect	No potential for effect on sensitive species.	Same as proposed action	Same as proposed action
Cultural	No Effect	Potential for fires may affect surface cultural resources. Area has very little extant cultural resource sites within the impact zones.	Same as proposed action	Same as proposed action
Health & Safety	No Effect	Potential exposure of sensitive receptors (persons) to obscurant compounds and transformation products, mainly from obscurant use at the Doña Ana Range. Effects mitigatable through BMPs.	Same as proposed action	Same as proposed action
Hazardous Materials	No Effect	Continued deposition of munitions and munitions compounds at impact areas. Not considered RCRA waste per the Military Munitions Rule.	Same as proposed action	Same as proposed action

1
2 **Mitigation Measures:** Per Fort Bliss safety regulations, no obscurant firing would be conducted when
3 wind speeds are higher than 25 knots (~30 miles per hour). Training would cease if the Officer in Charge
4 (OIC) observes smoke moving onto War Highway and would close War Highway until the smoke
5 dissipates. Additionally, Fort Bliss would install 2 warning signs in each direction along War Highway
6 advising motorists of smoke and that they should not drive into the smoke. Range Control would, as a
7 general policy, not schedule obscurant firing on Doña Ana during the morning and evening commuting
8 hours. Unit OICs would observe all applicable safety and health requirements as outlined in the training
9 regulations, such as the range SOP, FB 350-1 and FB 385-63 and any other field manuals pertaining to
10 obscurant smoke training and safety. FB 385-63 would be amended to specifically address the obscurant
11 training on Fort Bliss to include use of protective masks by personnel, closing of War Highway if the
12 obscurant screen has the potential to reach the road, and keeping the road closed until the smoke is clear.
13 The number of munition rounds fired at any one time would be limited to the minimum training
14 requirement. Unit OICs would coordinate with Range Control and brigade weather officers regarding
15 weather conditions prior to commencement of any training exercise. Positive controls, (e.g., observation,
16 control points, communications, safety equipment availability) would be established to prevent exposure
17 of unprotected personnel. Periodic inspections of units in the field are conducted by range management

1 and safety personnel to monitor for compliance with site restrictions and other environmental
2 requirements and to identify any adverse effects from training. These inspections would continue under
3 the proposed action.

4
5 Tracers, pyrotechnics and illumination projectiles are subject to restriction/suspension during dry periods
6 in accordance with New Mexico State Forestry laws and regulations. Under the Fire Conditions
7 (FIRECON) Rating System established by the New Mexico State Forestry, no firing of white phosphorus
8 is allowed under FIRECON 3 (High Danger) or FIRECON 4 (Very High Danger). As there is always a
9 potential for fires to occur within the FBTC, with or without obscurant munitions use, the potential for
10 fires cannot be totally eliminated. Construction of fire fighting lanes/firebreaks at the eastern end of
11 DMPRC and maintenance of fire fighting lanes/firebreaks east of DAGIR would reduce the potential for
12 spread of fire resulting from obscurant munitions.

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Figure A-2. Location of the 400 Hectare Obscurant Target Boxes at the DAGIR and DMPRC Firing Ranges. Boxes are notional and may move within the impact boundaries per Range Control delineation.

1 **1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION**
2

3 **1.1 INTRODUCTION**

4 Fort Bliss is a multi-mission Army installation located in Texas and New Mexico (Figure 1). It consists
5 of a cantonment area, an airfield, and the Fort Bliss Training Complex (FBTC). The FBTC contains
6 approximately 1.1 million acres of land and is used for training and maneuvers by Army and other units.
7 The FBTC is generally separated into three large geographical segments: the South Training Areas in El
8 Paso County, Texas; the Doña Ana Range-North Training Areas, in Doña Ana and Otero Counties, New
9 Mexico; and the McGregor Range, in Otero County, New Mexico. McGregor Range is further divided
10 into the Tularosa Basin, Otero Mesa South of Highway 506, Northeast McGregor Range North of
11 Highway 506, and the Southeast McGregor Range. The FBTC is subdivided into numbered training areas
12 to manage and schedule the different training missions.

13 As a result of recent Department of Defense (DoD) initiatives, Fort Bliss is in transition from an Air
14 Defense Center to a Mounted Maneuver installation supporting multiple types of Brigade Combat Teams
15 (BCTs) under Forces Command (FORSCOM). These initiatives include Base Realignment and Closure
16 (BRAC), Army Transformation, Grow the Army, and Global Defense Posture Realignment among others.
17 A major result of these initiatives is the re-stationing of the First Armored Division (1AD) from Germany
18 to Fort Bliss. The 1AD consists of four heavy maneuver brigade combat teams (HBCTs), an aviation
19 brigade, and a fires brigade. Additionally, Fort Bliss has an air defense (Patriot) brigade, an Army
20 Evaluation Task Force and a Sustainment Brigade. These units require additional ranges and capabilities
21 for heavy artillery training. Land use changes and range construction to accommodate these units were
22 analyzed in the *Fort Bliss Texas and New Mexico Mission and Master Plan Final Supplemental*
23 *Programmatic Environmental Impact Statement*, for which a Record of Decision (ROD) was signed in
24 April 2007.
25

26 In December 2007, the Army signed the Record of Decision (ROD) for the 2007 Grow the Army
27 Programmatic Environmental Impact Statement, programming the stationing of up to two light Infantry
28 Brigade Combat Teams (IBCTs) at Fort Bliss. In June 2010, the Army will sign the ROD for the *Fort*
29 *Bliss Army Growth and Force Structure Realignment Final Environmental Impact Statement*, which will
30 allow training of the IBCTs, as well as up to two Stryker Brigade Combat Teams (SBCTs) at Fort Bliss.
31 Most if not all of these units require some training in the use of live munitions, both high explosive (HE)
32 and smoke generating. Resource areas among others analyzed in these two stationing and training EISs
33 include land use, regional geology, mineral resources, water/wastewater demand and infrastructure, noise,
34 socioeconomics, and facilities and are not discussed further in this document.
35

36 **1.2 PURPOSE AND NEED**

37 The Fort Bliss mission is to train, mobilize, deploy, sustain, transform, and reconstitute conventional
38 forces providing relevant and ready land power to combatant commanders worldwide in defense of the
39 nation, both at home and abroad. The 1st Armored Division Soldiers have recently been stationed to Fort
40 Bliss and require training, not only in standard munitions, but also those that generate smoke. Munitions
41 that generate smoke are called obscurant munitions. These munitions simply create a smoke screen that
42 hides or obscures troops from being seen by an enemy, thus protecting them from enemy fire and
43 observation. Obscurants also conceal materiel, screen targets, and create a state of confusion among
44 enemy forces.

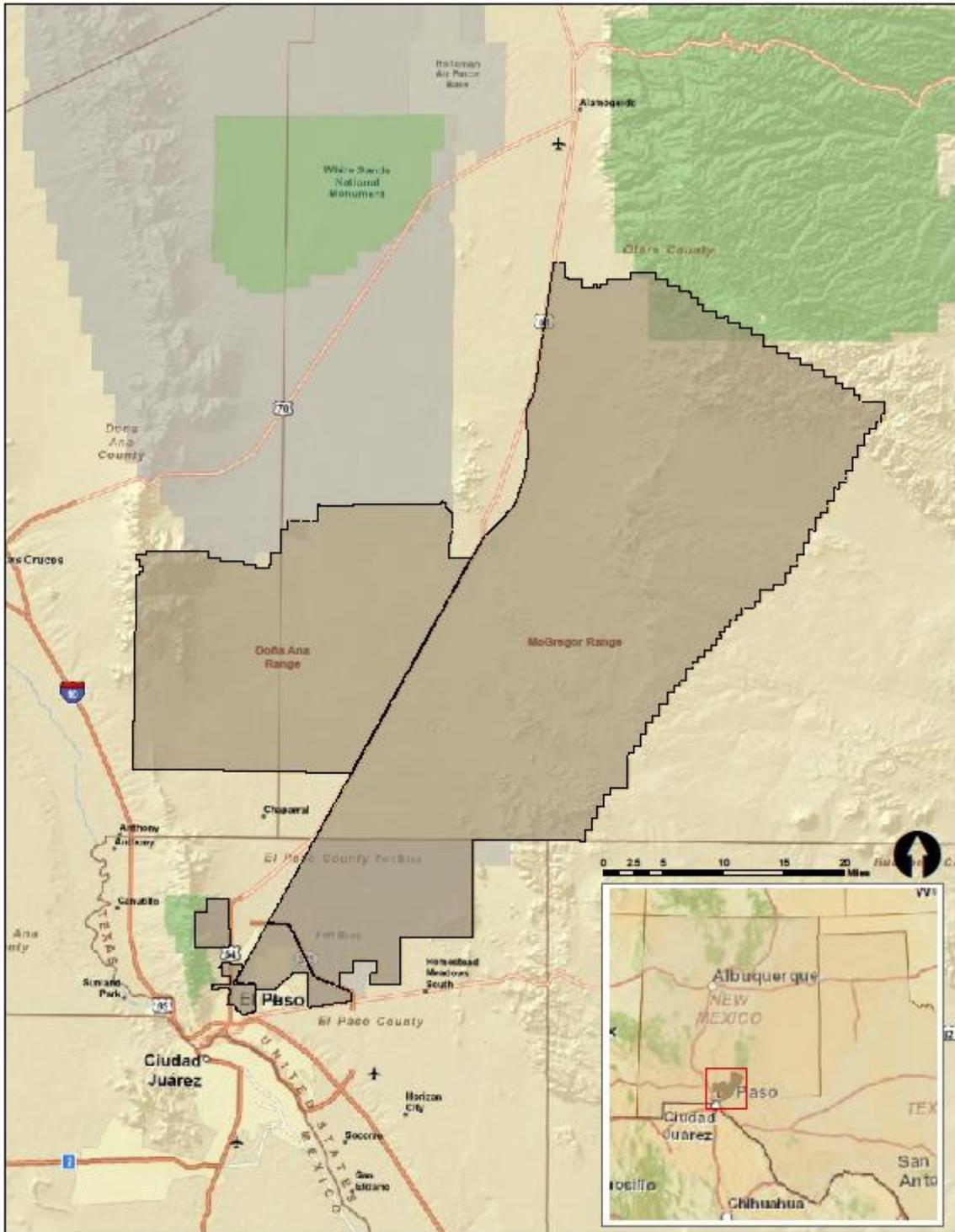


Figure 1. Location of Fort Bliss

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1 Obscurant munitions training requires ranges so soldiers can qualify semi-annually with their individual
2 and crew-served weapons, and meet the requirements for combined arms live-fire training exercises.
3 These exercises provide varied and realistic training that ensures a force is capable of conducting real
4 world full spectrum operations. In providing this type of training, the commander enhances his unit's
5 effectiveness and improves the soldier's survivability on the modern day battlefield.
6

7 Military obscurants are deployed from generators, smoke pots, field artillery, grenades, and mortars.
8 Presently, smoke generators and smoke pots are fielded at Fort Bliss under earlier environmental analyses
9 (U.S. Army 2000). These systems for the most part use mineral oils to generate smoke. Obscurants
10 deployed from field artillery, grenades, and mortars (obscurant munitions), generally use white
11 phosphorus (WP), red phosphorus (RP), or hexachloroethane (HC). To attain training in full spectrum
12 operations, the use of WP, RP and HC obscurant munitions by Soldiers in a field setting is needed at Fort
13 Bliss.
14

15 The purpose of the proposed action is to meet this need and enhance the soldiers' confidence in how to
16 employ the various obscurants, how obscurants would affect their mission, and how obscurants can be
17 used to their advantage in the operational environment. The Army's doctrine calls for such training, and
18 Fort Bliss has received FORSCOM directives requiring this training be conducted within the FBTC.
19

20 **1.3 SCOPE AND CONTENT OF THE ENVIRONMENTAL ASSESSMENT**

21 This Environmental Assessment (EA) has been prepared in accordance with the requirements of the
22 National Environmental Policy Act of 1969 (NEPA) (Public Law 91-190) with regulations published at
23 40 Code of Federal Regulations (CFR) 1500 as amended and at 32 CFR 651 – Environmental Analysis of
24 Army Actions. NEPA is a federal environmental law establishing a national policy of procedural
25 requirements for all federal government agencies, including the preparation of EAs for proposed agency
26 actions. NEPA directs the Army to disclose the effects of its proposed activities at Fort Bliss to the public
27 and officials who must make decisions concerning the proposal.
28

29 Under NEPA, the analysis of environmental conditions only addresses those areas, or Region of Influence
30 (ROI), and environmental resources with the potential to be affected by the Proposed Action or
31 alternatives. Locations and resources with no potential to be affected need not be analyzed. The ROI
32 includes all areas and lands that might be affected and may change depending on how the natural,
33 cultural, and socioeconomic resources they contain or support are affected.
34
35

36 The purpose of this EA is to develop and evaluate alternatives for siting, and evaluate potential impacts of
37 obscurant training alternatives on pertinent resources on the FBTC and adjacent environs. Resources that
38 could potentially be affected as a result of obscurant training and evaluated in this EA include; soils, air
39 quality, surface and groundwater resources, biological resources, cultural resources, health and safety, and
40 hazardous materials.
41

1 **1.4 DECISION(S) TO BE MADE**

2 The 1st Armored Division is the lead agency responsible for the completion of the EA, assisted by U.S.
3 Army Installation Management Command Headquarters, U.S. Army Garrison,. If no significant
4 environmental impacts are determined based on the evaluation of impacts in the EA, a Finding of No
5 Significant Impact (FNSI) will be signed by the Commanding General. If it is determined that the
6 Proposed Action will have significant environmental impacts, the action will be dropped or a Notice of
7 Intent will then be published leading to the preparation of an Environmental Impact Statement (EIS).

8
9 The EA, the FNSI, and all other appropriate planning documents will be provided to the Installation and
10 Garrison Commanders for review and consideration. The signature page for the EA and FNSI package
11 will be signed by both Commanders to indicate approval.
12

13 **1.5 PUBLIC PARTICIPATION**

14 Environmental agencies, the proponent, and the public will be involved to the extent practical in the
15 preparation of the EA. The EA and draft FNSI (if applicable) would be made available to the public prior
16 to initiation of the Proposed Action. The distribution of the EA would occur at least 15 days prior to
17 initiation of any proposed action and would include any agencies, organizations, and individuals who
18 have expressed interest in the project. The public would be allowed to review the EA and provide
19 comments prior to signing of the FNSI and initiation of any proposed action.

1 **2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES**

2 In accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14) and 32 CFR
3 Part 651, the EA must identify and describe all reasonable alternatives to the proposed action, including
4 the No Action alternative. This EA analyzes three action alternatives and the no action alternative.

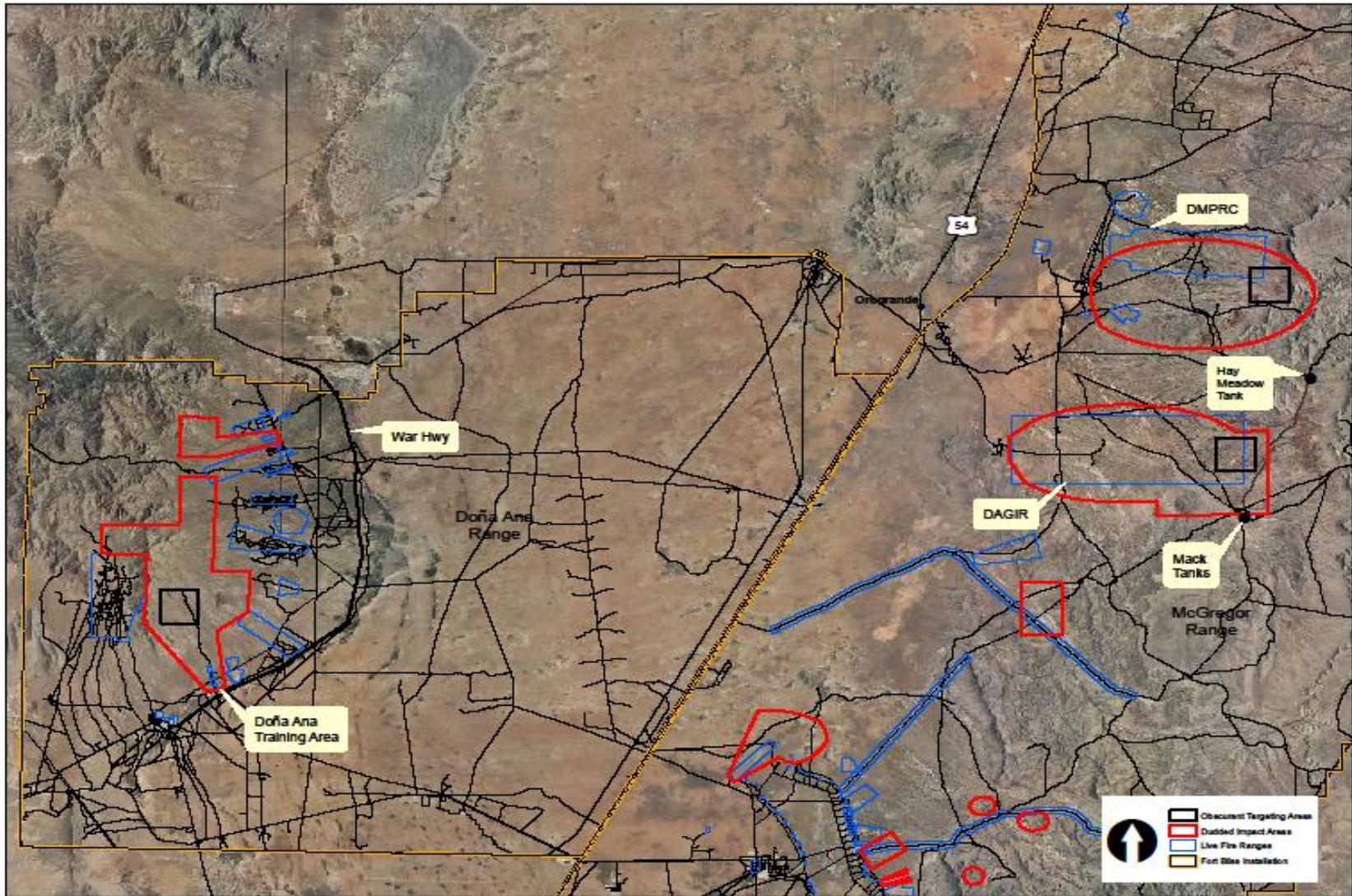
5 **2.1 PROPOSED ACTION**

6 The Proposed Action is the designating of discrete areas for, and the use of, obscurant munitions by
7 military units within the FBTC. The FBTC is managed by the U.S. Army Combined Arms Support
8 (USACAS) battalion (hereon referred to as Range Control). The impact areas of the FBTC have had a
9 history of use with ordnance including HE munitions, but not obscurant munitions. As part of the
10 Proposed Action, obscurant munitions training would be conducted within three Range Control approved
11 areas: the Doña Ana Range firing and impact area, the Digital Air/Ground Integration Range (DAGIR,
12 Range 88), and potentially the Digital Multi-Purpose Range Complex (DMPRC, Range 83) (Figure 2).
13 The DMPRC would only be used in this alternative if firebreaks and equipment access roads are built at
14 the eastern portion of the range.

15 Obscurant munitions using phosphorus burn very hot and pose a fire hazard and would therefore only be
16 fired from designated firing points into designated 2 x 2 kilometer (km) (400 hectare) “obscurant target
17 boxes” with serviceable firebreaks. All obscurant target areas would be within previously duded (with
18 HE) impact areas. These specific locations and boxes would be approved by Range Control within the
19 black line ovals seen at each of the target areas in Figure 2. Within the Doña Ana Impact Area, the target
20 box would be designated the Deer Hill Obscurant Impact Area (Appendix). This area has minimal
21 vegetation cover and would pose a low risk of fire. Likewise within the DAGIR and DMPRC, specific
22 areas within “target boxes” to be called the DAGIR Obscurant Impact Area and the DMPRC Obscurant
23 Impact Area would be delineated by Range Control within the ovals seen in Figure 2. The DAGIR and
24 DMPRC Ranges would be utilized for company live-fire exercises that include firing while under
25 movement. The Doña Ana Range duded impact area would be utilized only for indirect (not within a
26 line-of-sight, or target seen by forward observers only) and stationary firing of obscurant munitions.
27 Some munitions burst upon impact while others contain a timed fuze and burst in the air. Indirect firing
28 to the Deer Hill Impact Area from artillery firing points east of War Highway would require closure of the
29 roadway and affected firing ranges as munitions with air bursting fuzes are not authorized for overhead
30 fire.

31
32 Obscurant munitions included under the Proposed Action include artillery fired from canons (howitzers)
33 and mortars. The advantage of using projected obscurant munitions is the ability to place a smoke screen
34 directly on a distant or close combat target without becoming decisively engaged. Projected obscuration
35 can support short through long-duration missions based on the availability of resources (such as
36 ammunition and required cannon and/or tube systems) and respective rates of fire. Ideal military
37 applications for projected obscuration systems are protection effects by obscuring threat forces at distant
38 locations and marking distant targets for destruction by lethal fires (Army 2008a).

39
40 There are three types of artillery-projected obscuration missions that units would need to train for: quick,
41 immediate, and special. Quick obscuration missions build a smoke screen 100 to 1,500 meters (m) in
42 length (depending on the munitions selected); and is built with artillery (specifically howitzers) firing
43 either HC or WP. The screen can persist from 5 to 15 minutes. An immediate mission creates a small
44 screen of 150 m or less that persists for 30 seconds to 5 minutes. Special obscuration missions are fired to
45 conceal a large area to protect or conceal maneuver forces for an extended period of time. This type of
46 screen can vary from 400 to 2,400 m in length. It takes between 0.5 minutes and 1.5 minutes to build an
47 effective obscuration screen depending on the munitions, the obscurant compound, and the size and



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Figure 2. Proposed Obscured Targeting Areas on Fort Bliss

1 duration of the screen desired. Depending on wind speeds and directions, munitions, and desired screen,
2 between 5 and 15 artillery shells, and between 7 and 180 mortars may be required to build an effective
3 screen. Artillery may be fired at rates between 1 round/minute to 1 round/20 seconds (Army 2008a,
4 Tables A-12 through A-15).

5
6 Phosphorus is highly reactive with oxygen, and once exposed to the air, burns very hot. Consequently,
7 obscurant munitions typically are consumed almost entirely after detonation. However, some byproducts
8 of the reaction do remain and include phosphoric acid that can irritate the skin and mucous membranes of
9 persons exposed to high concentrations of the smoke. HC burning can also give off dangerous by-
10 products. The health risk to persons drops off dramatically as the distance to the point source increases.
11 Typically, 5 km from point source the concentration of smoke is minimal and no risk is involved to
12 personnel per EPA guidelines.

13
14 To protect Soldiers and the general public, no obscurant firing would be conducted when wind speeds are
15 higher than 25 knots (~30 miles per hour). At the Dona Firing Range, training would cease if the OIC
16 observes smoke moving onto War Highway and would close the road until the smoke dissipates. Range
17 Control would not, as a general policy, schedule obscurant firing on Doña Ana during the morning and
18 evening commuting hours. Unit OICs would observe all applicable safety and health requirements as
19 outlined in the training regulations, such as the Range SOP, Fort Bliss Regulations (FB Reg) 350-1 and
20 385-63 and any other field manuals pertaining to obscurant smoke training and safety (*e.g.* FM 3-11.5).
21 To comply with FM 3-11.5 (Army 2008a), unprotected individuals would not be exposed to any
22 concentration of obscurant smoke from WP, RP or HC. The field manual states, “Soldiers and
23 noncombatants located within/passing through obscuration effects are required to wear respiratory
24 protection.” FM 3-11.5 also states, “Soldiers will don protective masks before exposure to any
25 concentration of obscurant produced by smoke hand grenades, pots, or munitions that contain HC, TA
26 (terephthalic acid), or phosphorous filler (WP or RP).” FB Reg 385-63 would be amended to specifically
27 address the obscurant training on Fort Bliss. The number of munition rounds fired at any one time would
28 be limited to the minimum training requirement. Unit OICs would coordinate with Range Control as well
29 as brigade weather officers regarding weather conditions prior to commencement of any training exercise.
30 Positive controls, (*e.g.*, observation, control points, communications, safety equipment availability) would
31 be established to prevent exposure of unprotected personnel. Periodic inspections of units in the field are
32 conducted by range management and safety personnel to monitor for compliance with site restrictions and
33 other environmental requirements and to identify any adverse effects from training. These inspections
34 would continue under the proposed action.

35
36 To protect the public traveling on War Road, if the potential exists for a smoke screen to reach the road,
37 then the road would be closed and not used or reoccupied by unprotected people until the obscurant
38 cannot be detected.

39
40 Tracers, pyrotechnics and illumination projectiles are subject to restriction/suspension during dry periods
41 in accordance with New Mexico State Forestry laws and regulations. Under the Fire Conditions
42 (FIRECON) Rating System established by the New Mexico State Forestry, no firing of obscurants would
43 be allowed under FIRECON 3 (High Danger) or FIRECON 4 (Very High Danger) (Army 2010b). As
44 there is always a potential for fires to occur within the FBTC, with or without obscurant munitions use,
45 fire risks cannot totally be eliminated. In general, fires that have occurred at the FBTC tend to be small
46 and remain contained within the target impact areas, which generally have low fuel loads or are
47 surrounded by firebreaks and access roads. In addition to on-site fire spotting and fire suppression
48 capabilities, fire risk on the range can be managed by controlled burning, development of a Wild Lands
49 Fire Management Plan under cooperation with the Bureau of Land Management (BLM), and development
50 and maintenance of fire breaks to disrupt fuel continuity between impact areas and slopes of the Organ
51 Mountains and below Otero Mesa.

Fort Bliss would be responsible for monitoring and suppressing all fires caused by military activities on McGregor Range and Army fee-owned land. Fort Bliss would serve as lead agency for managing all fires in the impact and military use areas and would seek assistance from the BLM when fires have the potential to leave these areas. Units causing range fires report to Range Control, and all units would furnish a stand-by firefighting team as outlined in FB Reg 385-63, Safety - Fort Bliss Training Complex Range Operations (Army 2010b). Following fire suppression, an After Action Report would be completed to evaluate the cause of the fire, fire damage, and injuries, and to make any necessary recommendations regards changes to the fire plan.

An assessment of wild land fire risk at the impact areas was conducted. The analysis was based on the use of fuel models derived from vegetation mapping on Fort Bliss. The fuel models are based on the National Fire Danger Rating System described in U.S. Department of Agriculture General Technical Report INT-39. Fuel models describe the risk of fire occurrence as well as the expected fire intensity when fire occurs. The obscurant impact areas would be located within those areas that have the least fuel loads and therefore the least risk of fire.

Obscurant munitions to be used for training are determined by the Standards in Training Commission (STRAC). The current STRAC standards authorize the following munitions be used for training missions (Table 2-1).

Table 2-1. STRAC Munitions’ Descriptions, Fiscal Years 2010 and 2011

DODIC #	Nomenclature	Type
B630	CTG 60MM SMK WP M302A1	Mortar
C454	CTG 105MM SMK WP M60A2 W/PD FUZE	Artillery
C870	CTG 81MM SMK RP M819	Mortar
CA03	XM929 120MM WP SMOKE ROUND	Mortar
D550	PROJ 155MM SMK WP M110	Artillery
D528	PROJ 155MM SMK WP M825	Artillery
C479	CTG 105MM SMK HC M84A1	Artillery
BA14	CTG 60MM SMK WP M722E1 W/FUZE M783	Mortar

STRAC standards also recommend the quantities of training munitions to be used by each type of brigade stationed at Fort Bliss under the *Fort Bliss Army Growth and Force Structure Realignment Final Environmental Impact Statement*, March 2010 (Table 2-2). These recommendations are flexible and could change in the future. Each brigade would usually conduct their training over separate 7 day intervals. It is assumed that the brigades would apportion their munitions use relatively evenly over the 7 day training period as listed in Table 2-3.

Current 155-millimeter (mm) artillery systems project obscuration artillery shells 800 m (0.5 miles) to 18.2 km (11.3 miles). Current 105-mm artillery systems project obscuration artillery 600 m (0.4 miles) to 11.5 km (7 miles). Current obscuration artillery shells contain HC, providing visual effects, or WP, providing visual and infrared effects (Army 2008a). Current 120-mm mortar systems project obscuration mortar rounds 200 m (0.1 miles) to 7.2 km (4.5 miles). Current 60-mm mortar systems project obscuration mortar rounds 34 m to 3.5 km (2.2 miles). Current obscuration mortar rounds contain WP or

1 RP providing visual obscuration effects (Army 2008a). The 81 mm mortar is currently the only munition
 2 that uses RP to produce smoke that would be utilized in field training. The fuze in the cartridge expels
 3 and ignites RP pellets and upon hitting the ground the burning pellets produce a smoke cloud.
 4
 5

Table 2-2. Brigades' Projected Annual Training Utilization

DODIC	Obscurant	Brigade	STRAC Recommendations	No. Brigades	Projected Annual Munitions Use	Weapon System
CA03	WP	HBCT	490	6	2,940	120 mm Mortar
D528	WP	HBCT	52	6	312	155 mm Howitzer
D550	WP	HBCT	102	6	612	155 mm Howitzer
C479	HC	IBCT	176	2	352	105 mm Howitzer
C870	RP	IBCT	144	2	288	81 mm Mortar
BA14	WP	IBCT	252	2	504	60 mm Mortar
C454	WP	IBCT	99	2	198	105 mm Howitzer
CA03	WP	IBCT	420	2	840	120 mm Mortar
C870	RP	SBCT	240	2	480	81 mm Mortar
BA14	WP	SBCT	360	2	720	60 mm Mortar
CA03	WP	SBCT	660	2	1,320	120 mm Mortar
D528	WP	SBCT	48	2	96	155 mm Howitzer
D550	WP	SBCT	76	2	152	155 mm Howitzer

Table 2-3. Brigades' Projected Daily Training Utilization

DODIC	Obscurant	Brigade	STRAC Recommendations	Average Daily Use/7 Day Exercise
CA03	WP	HBCT	490	70
D528	WP	HBCT	52	7
D550	WP	HBCT	102	15
C479	HC	IBCT	176	25
C870	RP	IBCT	144	21
BA14	WP	IBCT	252	36
C454	WP	IBCT	99	14
CA03	WP	IBCT	420	60
C870	RP	SBCT	240	34
BA14	WP	SBCT	360	51
CA03	WP	SBCT	660	94
D528	WP	SBCT	48	7
D550	WP	SBCT	76	11

1 **2.2 ALTERNATIVES CONSIDERED**

2 **2.2.1 Alternative A**

3 Alternative A would allow obscurant training only on the Doña Ana Range Deer Hill Obscurant Impact
4 Area. The DAGIR or the DMPCRC would not be used for obscurant training. Keeping the training at
5 Doña Ana firing range would preclude the risk of fire getting out of control and spreading to Otero Mesa.
6 Doña Ana is currently available for training and an active range with duded impact area, and relatively
7 low fire potential (see Section 3.6.4). However, Doña Ana is heavily used and scheduling would be a
8 problem if units were restricted to only this area, and the types of ranges located there do not support
9 training in firing while moving.

10
11 **2.2.2 Alternative B**

12 Alternative B would include the obscurant training as described for the Proposed Action, except that both
13 the Doña Ana impact area and the DAGIR would be used for fielding of the obscurant munitions. The
14 DMPCRC would not be utilized for obscurant training because this range does not have a system of roads
15 on the eastern boundary. This lack of a road system would prohibit fire-fighting equipment access to the
16 east side of the range; and the potential would exist for fire to spread to the Otero Mesa grasslands.
17 Current fire-fighting access points would not be capable of staying ahead of a fire to contain it from
18 spreading east to the Otero Mesa. Fire-fighting routes for the DAGIR, in comparison, are well
19 established from Hay Meadow to Mack tanks, which would allow equipment in to protect from
20 movement of fires onto Otero Mesa.

21
22 **2.2.3 No Action Alternative**

23 NEPA and the Army implementing regulations require the analysis of all reasonable alternatives
24 including the No Action alternative. The No Action alternative provides a benchmark enabling decision
25 makers to compare the magnitude of environmental effects of the action alternatives.

26
27 Under the No Action alternative the training with obscurant munitions would not be conducted within the
28 FBTC. The No Action alternative would consequently not provide the brigades with the necessary full
29 spectrum training, not implement the Army's doctrine for such training, and not implement Fort Bliss's
30 directives requiring that such training be conducted within the FBTC. Units that require training in the
31 use of these munitions would need to deploy to other installations that allow this type of training. No
32 Action would therefore result in training delays, expenditure of scarce training funds, and possibly
33 shortened training not to Army standards. This alternative would leave intact the environmental analyses
34 conducted in the two EISs incorporated by reference regarding the training areas of Fort Bliss.

35
36 **2.2.4 Alternatives Eliminated from Further Consideration**

37 The Cane Cholla range was initially considered for use in obscurant munitions training. Cane Cholla was
38 eliminated from further consideration because the range is relatively small, only 3,076 acres, and is
39 utilized as a helicopter gunnery range. Although this area has vegetation that presents a low risk of fire
40 (except in dry periods following abundant growth of annual grasses and forbs), fire has the potential to
41 spread to the northeast and impact other developed ranges. Additionally, obscurant smokes would have
42 the potential to impact nearby training ranges.

43
44 The northern Doña Ana ranges were eliminated from further consideration because of the high fire
45 potential. This area is highly vegetated and was considered a risk prone area. Fuel Model A (grasslands)
46 abut with brushy Fuel Model C areas in the Organ Mountains foothills, creating a potential for rapidly
47 spreading grass fires to ignite brushy areas. A potential for moderate to high fire intensity in extremely
48 rugged terrain would be created. Fires in this area would be difficult and expensive to fight and would
49 endanger Bureau of Land Management (BLM) recreation areas in the Organ Mountains. Smoke resulting
50 from these fires would also have the potential to impact White Sands Missile Range (WSMR)
51 headquarters.

1 **3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

2
3 This chapter presents information on environmental conditions for resources potentially affected by the
4 alternatives described in Chapter 2. NEPA analysis of environmental conditions only addresses those
5 areas and environmental resources with the potential to be affected by the Proposed Action or alternative
6 actions. Locations and resources with no potential to be affected need not be analyzed.
7

8 The purpose of this EA is to evaluate potential impacts of obscurant training alternatives on resources of
9 the FBTC and adjacent environs determined to be potentially affected by the action alternatives. This is
10 determined by screening the action against a table of Valued Environmental Components (VEC).
11 Resources that could potentially be affected as a result of obscurant training and evaluated in this EA
12 include soils, air quality, surface and groundwater resources, biological resources, cultural resources,
13 health and safety, and hazardous materials. Valued Environmental Component analysis ratings are
14 contained in Table 3-1.
15

16 **Table 3-1. Environmental Components Considered as Potentially Affected by Action Alternatives**

17 VL = very low, L = low, M = medium, H =high

VEC ANALYSIS RATING	VL	L	M	H	COMMENTS
Land Use					
Land Use	X				Land use is military use, covered in EIS
Noise	X				Land use is military use, covered in EIS
Visual Resources	X				Although obscurant clouds could be visible until dispersed by air currents/wind, Targeting areas are remote military ranges and not highly visible and not within any important visual designation.
Earth Resources					
Geology & Soils		X			Potential for un-oxidized WP to absorb to soils, little potential for alteration of soil pH as soils are alkaline.
Mineral Resources	X				No mineral resources would be affected.
Natural Resources					
Threatened & Endangered Species	X				None known to be present
Federal Wetlands	X				None present
Locally Important Resources	X				None identified
Habitat			X		Depending on WP training area, potential habitat could potentially be burned. Wild Fire Management Plan would mitigate fire potential.
Cultural Resources					
Archaeological		X			Potential impacts to surface artifacts from wildfire
Historical Structures		X			Potential impacts from wildfire
Native American Consultation		X			Consultation required
Air Quality					

Table 3-1, continued

VEC ANALYSIS RATING	VL	L	M	H	COMMENTS
Air Quality			X		Short-term but localized degradation of air quality from obscurants smoke. Potential for inhalation of obscurant smoke by wildlife and human receptors.
Green-house gases (GHG)	X				GHG are released in only minor amounts.
Water Resources					
Water Demand & Infrastructure	X				No additional required
Wastewater Demand & Infrastructure	X				No additional required
Surface Water Quantity / Quality		X			Potential for transport of phosphorus compounds in surface water runoff, but into closed basin.
Groundwater Quantity / Quality		X			Groundwater is 100 to 600 feet below ground level.
Transportation					
Traffic & Infrastructure		X			Potential temporary closures of War Highway
Air Space	X				No effect
Radio Frequency / Spectrum Use	X				No effect
Solid Waste / Hazardous Materials					
Solid Waste	X				No per Military Munitions Rule
Hazardous Materials / Waste	X				No per Military Munitions Rule
Socioeconomics					
Population & Housing	X				None
Business, Employment, & Income	X				None
Public Services	X				None
Environmental Justice	X				None
Facilities					
Land / Easement Acquisition	X				None
Construction	X				None
Operations					
Safety	X				Safety regulations would be observed at all times.
Internal Encroachment	X				No encroachment issues
External Encroachment	X				No encroachment issues

VL = very low, L = low, M = medium, H =high.

3.1 Soils

3.1.1 Existing Conditions

Fort Bliss’s soils can be separated into two general categories based upon physiographic positions: (1) valleys and basin floors; (2) and mountains, mountain foot slopes, and escarpments. Wind and water erosion are the major processes affecting soils on Fort Bliss. Soils unprotected by vegetation are susceptible to erosion from wind and water runoff. Gullying is the most prevalent form of erosion, but

1 sheet and rill erosion from water, and wind erosion are processes that can also affect soil movement.
 2 Stony or gravelly soils and rock outcrops are not generally subject to erosion, although during periods of
 3 severe thunderstorm activity, large volumes of runoff can build up rapidly, causing flash floods that can
 4 produce large gullies.

5
 6 Except for the Paleozoic limestone and Precambrian granite of Rattlesnake Ridge, the Organ Mountains
 7 south of Soledad Canyon have more of a plateau like aspect (Seager 1981). Deer Hill lies approximately
 8 0.7 miles east of Rattlesnake Ridge. The proposed 400 hectare obscurant targeting area lies adjacent to
 9 and southeast of Deer Hill. Approximately 6 percent of the soils are mapped as Brewster very gravelly
 10 loam with slopes of 35 to 65. Approximately 60 percent of the surface area is covered with stones and
 11 boulders, and depth to bedrock is 4 to 20 inches. The soil is naturally well drained, and there is no zone
 12 of water saturation within a depth of 72 inches. Soil pH, to a depth of 8 inches, ranges from 6.1 to 7.3
 13 (NRCS 2007). The remainder of the soils are mapped as Missile very gravelly fine sandy loam, which
 14 occurs on piedmont slopes up to 15 percent and is derived from igneous rock. Approximately 40 percent
 15 of the surface area is covered with stones and boulders. This soil is well drained and there is no zone of
 16 water saturation within a depth of 72 inches. Organic matter content is less than 1 percent and soil pH
 17 ranges from 7.9 to 8.4 down to 8 inches (NRCS 2007).

18
 19 The DMPRC obscurant targeting area also encompasses approximately 400 hectares (Table 3-2).
 20 Gravelly and lithic soils comprise nearly 100 percent of the targeting areas' soil types. The soils are
 21 alkaline; pH ranges up to 8.4, and calcareous, having developed from the weathering of gypsum,
 22 sandstone, limestone, and igneous and metamorphic rocks. The soils are generally well drained, and have
 23 no zone of water saturation within a depth of 72 inches. The Infantry-Sonic complex, the dominant soil
 24 type, has a surface covered with up to 50 percent stones and boulders and is typically very gravelly to 10
 25 inches, with cemented material at a depth of 10 to 14 inches. The Bissett-Rock outcrop occurs on the
 26 steeper slopes up to 65 percent and consists of very gravelly loam with bedrock at 13 to 80 inches.

27
 28 **Table 3-2. Soils of the DMPRC Obscurant Targeting Area**

Soils	Herrick Group	Percentage
Infantry-Sonic complex, 3 to 10 percent slopes	Gravelly	0.59
Mariola fine sandy loam, 1 to 3 percent slopes	Gravelly	<0.001
Allamore very gravelly loam, 10 to 35 percent slopes	Gravelly	0.20
Sonic very gravelly fine sandy loam, 1 to 8 percent slopes	Gravelly	0.04
Bankston extremely channery loam, 15 to 35 percent slopes	Lithic	0.10
Bissett-Rock outcrop complex, 5 to 15 percent slopes	Lithic	0.03
Bissett-Rock outcrop complex, 35 to 65 percent slopes	Lithic	0.04
Bissett-Rock outcrop complex, 15 to 35 percent slopes	Lithic	0.003
Reyab silt loam, 1 to 3 percent slopes	Loam	0.005

29 Source: U.S. Army 2001

30
 31 The DAGIR obscurant targeting area also encompasses approximately 400 hectares (Table 3-3). This
 32 area contains a greater percentage of soils mapped as loam than does the DMPRC. Gravelly and lithic
 33 soils comprise 47 percent of the targeting area's soil types; loam accounts for 53 percent of the range's
 34 soils. The soils are alkaline, pH ranges up to 8.4, and calcareous, having developed from the weathering
 35 of gypsum, sandstone, limestone, and igneous and metamorphic rocks. The soils are generally well
 36 drained, and have no zone of water saturation within a depth of 72 inches. The Crossen and Tinney soils
 37 occur on Piedmont slopes and fans, have high pH (range from 7.9 to 8.4), are well drained, and have no
 38 zone of water saturation within a depth of 72 inches. The Crossen soil typically consists of gravelly fine

sandy loam to a depth of 15 inches with cemented material at depths of 15 to 28 inches. Tinney soils consist of loam to 80 inches. The Reyab silt loam typically consists of silt loam to 80 inches and is found along inset fans and fan aprons. On DAGIR, the Reyab silt loam occurs along riparian areas within the range.

Table 3-3. Soils of the DAGIR Obscurant Targeting Area

Soils	Herrick Group	Percentage
Infantry-Sonic complex, 3 to 10 percent slopes	Gravelly	0.01
Crossen gravelly fine sandy loam, 2 to 5 percent slopes	Gravelly	0.13
Crossen-Tinney complex, 1 to 3 percent slopes	Gravelly	0.04
Bissett-Rock outcrop complex, 15 to 35 percent slopes	Lithic	0.002
Bissett-Rock outcrop complex, 5 to 15 percent slopes	Lithic	0.29
Reyab silt loam, 1 to 3 percent slopes	Loam	0.52
Reyab silt loam, 0 to 1 percent slopes	Loam	0.01

Source: U.S. Army 2001

Erodibility of soils varies considerably across McGregor Range. In general, soil erodibility is a function of soil type, slope, and vegetative cover. Sandy soils are extremely susceptible to wind erosion; loamy sands are highly erodible and capable of supporting a productive vegetative cover. Soils with large amounts of clay are moderately erodible and capable of supporting vegetation. Loamy soils with less than 35 percent clay are slightly erodible, and stony or gravelly soils and rock outcrops are not generally subject to erosion.

In general, Fort Bliss's soils are well drained to excessively drained with depth to bedrock ranging from shallow to very deep. In geothermal exploration wells in the vicinity of the McGregor Range Camp (relatively near the DAGIR and DMPC), depth to bedrock was highly variable and thickness of basin fill deposits ranged from 30 to 710 feet (Finger and Jacobsen 1997).

Pennington *et al.* (2003) sampled soils from randomly selected grids of the Doña Ana Range. They also collected discrete and composite samples from other areas of the range where they observed various surface anomalies that they suspected might result in deposition or release of residues of energetic compounds. These included samples collected near artillery targets, in areas where chunks of explosives or propellants were observed on the surface, from the firing line at a light antitank weapon rocket range, from areas where low-order detonation debris was observed, from several craters including a demolition crater, and from areas with unexploded ordnance. In general, very little residue of energetic materials was found in the surface soils from seven randomly selected firing point mini-grids. Concentrations of explosive residues were detected sporadically and at low concentrations in 12 randomly selected stratified mini-grids from the impact area. Concentrations of energetics and their transformation products in samples collected near surface anomalies were higher than concentrations from random grid samples. Although Pennington *et al.* (2003) did not include obscurants in their analyses, it is logical that the potential distribution of obscurant compounds on ranges would be similar to the distribution of the energetic compounds studied.

Walsh and Collins (1993) conducted tests at Fort Drum, New York to determine the spatial distribution and short-term persistence of WP residue following the detonation of 81-mm mortar WP smoke rounds. At the point of impact, WP was driven into the soil matrix to a depth of 20 centimeters, resulting in a WP soil concentration on the order of 100 micrograms/gram ($\mu\text{g/g}$). Away from the point of detonation, the amount of WP residue deposited from the exploding shell decreased exponentially, with most of the WP found within a 10 m radius. The WP was deposited in the form of particles approximately 1 mm in

1 length. Samples taken from craters four months after impact had WP concentrations around 20 µg/g ,
2 indicating that WP did not rapidly oxidize in the soil matrix.
3 The condition of the soil influences the effectiveness of artillery-delivered and mortar-delivered smoke.
4 An impacting smoke munition bursting in soft soil loses effectiveness since part of the filling compound
5 is driven into the dirt (Army 1986).
6

7 **3.1.2 Environmental Consequences**

8 Potential impacts to soils' resources stem from the release and breakdown of principal and residual
9 components associated with the obscurant munitions and can include impacts to soil resources. Impacts
10 to soil resources would be considered major if the chemical breakdown products of the obscurants alter
11 soil chemistry. WP is normally imbedded in a felt matrix within the munition which when exploded, is
12 dispersed thereby exposing the WP to air.
13

14 **Proposed Action**

15 The combustion of WP would produce smoke made up of various oxides of phosphorus. WP produces a
16 hot, dense, white smoke composed of particles of phosphorous pentoxide, which are converted by moist
17 air into phosphoric acid. The smoke contains some unburnt phosphorus and particles in the air that may
18 have a protective coating that makes them unreactive for a longer time, but it mainly has various burned
19 phosphorus products (Spanggord *et al.* 1985, ATSDR 1997a). These oxides react rapidly with moisture
20 to form a number of transformation products. Organic compounds (concentrations in parts per billion)
21 and some inorganic gases might be present, but only at trace levels. Because WP is not likely to persist
22 long in air, a majority of phosphorus compounds released and dispersed in air during military use of
23 smokes are likely to be deposited as phosphoric acid or phosphates on land and water (USEPA 1990,
24 Chemical Research & Development Center 1983). The phosphorus combustion products which are
25 deposited on soils would be rapidly complexed and immobilized by metals such as aluminum, adsorbed
26 by soil particles, or absorbed by biota (Chemical Research & Development Center 1983).
27

28 Laboratory combustion studies indicated that the upper limit of conversion of WP/felt is about 92 percent.
29 Thus, in the burning of WP/felt in the environment, some amount of unreacted elemental phosphorus
30 could remain in the burned felt matrix (Spanggord *et al.* 1985). The fate of WP/felt or RP/butyl rubber
31 buried in soil would be controlled by the diffusion of oxygen through the soil, the diffusion of oxygen
32 through surface-oxide layers that build up on phosphorus, the surface area of the phosphorus, and the
33 depth at which the phosphorus is buried. Longer life-times are projected at deeper depths and the buildup
34 of surface oxide layers would add to the persistence (Spanggord *et al.* 1985). WP binds moderately to
35 soil and typically doesn't move deep in soil with oxygen-depleted rainwater (ATSDR 1997a).
36

37 Soils of the range impact areas are alkaline and the deposition products of phosphorus smokes are not
38 anticipated to measurably alter soil pH values. There may be some lowering of pH in surface soils,
39 depending on soil type, but the buffering capacity of most soils would counteract small or diluted acid
40 additions (Van Voris *et al.* 1987). In neutral, calcareous, and limed soil, WP is quickly oxidized to
41 phosphate that can be used effectively by plants (references cited in Rivera *et al.* 1996), and phosphorus
42 depositions may actually be beneficial to nutrient-poor surface soils (Van Voris *et al.* 1987). Soils of the
43 Doña Ana impact area are gravelly and rocky; neither duded munitions, nor WP/felt or RP/butyl rubber
44 would be expected to become buried to any appreciable depth or reach an anaerobic or saturated soil
45 horizon. Since WP is not very soluble in water, its mobility in soil systems is low (Rivera *et al.* 1996).
46 With respect to the Doña Ana impact area Pennington *et al.* (2003) stated, "A large amount of rock
47 fragments was observed on surfaces subject to wind scour, and the surface is highly compacted. Rounds
48 that impact this "armored" surface do not penetrate deeply into the soil. Thus, rounds that do not result in
49 a high-order detonation remain at the surface as either unexploded ordnance items or low-order
50 detonation debris. The extremely arid conditions in southern New Mexico provide little moisture to
51 dissolve and leach residues and hence small pieces of explosive that were distributed by low order

1 detonations can remain at the surface for long periods.” Minor impacts to soils’ physico-chemical
2 properties would be anticipated from the deposition of obscurant smoke transformation products or the
3 deposition of WP or RP on the soil surface.
4

5 Within the DMPRC and DAGIR, neither duded munitions, nor WP/felt or RP/butyl rubber would be
6 expected to become buried to any appreciable depth; or reach an anaerobic or saturated soil horizon in the
7 gravelly and rocky soils found there. Minimal impacts to soils’ physico-chemical properties would be
8 anticipated from the obscurant compounds or the deposition of obscurant smoke transformation products
9 in these areas.
10

11 Within the loamy and sandy soils of the DMPRC and DAGIR, WP/felt, and RP/butyl rubber could
12 potentially become buried by wind transport of soils or the munitions’ impact. As soils are very alkaline,
13 alterations of pH would not be expected. WP is poorly soluble and because of the high reactivity of WP,
14 it usually is not found far from the source of contamination (ATSDR 1997a, National Research Council
15 1997). These soils generally have no saturated zone to 72 inches and therefore little dissolution and
16 transport of obscurant products would be expected.
17

18 Small amounts of HC found in soils would evaporate into the air while some would undergo anaerobic
19 biodegradation by microscopic organisms. It takes approximately 4 days for 99 percent of the HC in the
20 soil to break down anaerobically while it can take 4 weeks or more aerobically (ATSDR 1997b). This
21 would constitute a minimal impact to local soils.
22

23 **Alternative A**

24 The environmental consequences would be the same as the Proposed Action described for the Doña Ana
25 targeted impact area except the intensity would increase due to the use of Doña Ana for all obscurant
26 training.
27

28 **Alternative B**

29 The environmental consequences would be the same or similar to the Proposed Action.
30

31 **No Action Alternative**

32 The duded impact areas would continue to be utilized for munitions training by Army forces, but WP,
33 RP, and HC obscurant munitions would not be used.
34

35 **Mitigation**

36 No mitigation would be required. Soil resources would not be affected to a level that mitigation of soil
37 impacts is required.
38

39 **3.2 Air Quality**

40 **3.2.1 Existing Conditions**

41 This resource is regulated by the EPA per the Clean Air Act (CAA) of 1963, as amended, and is
42 important because of the status of regional ambient air quality in relation to National Ambient Air Quality
43 Standards (NAAQS). It is also important publicly because of health concerns and the desire for clean air
44 expressed by virtually all citizens.
45

46 Air quality at a given location is a function of several factors, including the quantity and type of pollutants
47 emitted locally and regionally, and the dispersion rates of pollutants in the region. Primary factors
48 affecting pollutant dispersion are; wind speed and direction, atmospheric stability, temperature, presence
49 or absence of inversions, and topography.
50

1 Fort Bliss' climate can be characterized as having low relative humidity, hot summers, and moderate
2 winters. Some higher elevation areas of the installation have semi- and sub-humid climatic zones due to
3 higher precipitation. Springtime is normally moderate in temperature with high winds and blowing dust.
4 In winter, the average temperature is 43.6 degrees Fahrenheit (°F) and in summer, the average
5 temperature is 78.9 °F (NRCS 2000). Average relative humidity ranges from 51 percent at 6 A.M. to 26
6 percent at 6 P.M. local standard time. Evaporation rates are very high, averaging a 97-inch precipitation
7 deficit each year. Annual precipitation at Fort Bliss averages from 8 inches in the valley to 20 inches in
8 the mountains. The majority of rainfall occurs from July to September, resulting from intense
9 thunderstorm activity, with a dry season typically occurring from winter to early summer. Wind speeds at
10 Fort Bliss average 9 to 12 miles per hour (mph) with gusts over 60 mph in March and April. Dust and
11 sandstorms occur in March and April due to these stronger winds and lack of precipitation. Spring winds
12 are typically from the west while summer and winter usually bring a more southerly and northerly flow,
13 respectively (Army 2001).

14
15 NAAQS are established by the U.S Environmental Protection Agency (USEPA) for criteria pollutants,
16 including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate
17 matter equal to or less than 10 microns in diameter (PM-10), particulate matter equal to or less than 2.5
18 microns (PM-2.5), and lead (Pb). NAAQS represent maximum levels of background pollution that are
19 considered safe, with an adequate margin of safety, to protect public health and welfare.

20
21 In addition to the criteria pollutants, USEPA also regulates air toxics. These pollutants are not criteria
22 pollutants in that federal and state ambient air quality standards have not been established. However, at
23 the federal level, USEPA regulates hazardous air pollutants (HAPs, air toxics) through the use of
24 maximum achievable control technology (MACT). USEPA has established National Emission Standards
25 for HAPs, as required under the CAA and its amendments of 1977 and 1990, to implement MACT
26 requirements on listed source categories of HAPs.

27
28 White phosphorus and hexachloroethane are regulated by the USEPA as HAPs designated by the CAA.
29 Rather than setting ambient air quality standards for HAPs, the USEPA regulates emissions of toxic air
30 pollutants from a published list of source categories that must meet control technology requirements for
31 these toxic air pollutants. Obscurant munitions are not a listed source category. Major stationary sources
32 of HAPs are defined in 40 CFR 70 as those sources that emit more than 10 tons of a single HAP or 25
33 tons of all HAPs combined.

34
35 Within the ROI of the proposed action, air quality is in attainment for all categories of the NAAQS.

36 37 **3.2.2 Environmental Consequences**

38 Air quality impacts would be a concern if they:

- 39 • increase ambient air pollution concentrations above any NAAQS;
- 40 • contribute to an existing violation of any NAAQS;
- 41 • interfere with or delay timely attainment of NAAQS; or
- 42 • impair visibility within any federally mandated federal Class I area.

43 None of these scenarios would occur as a result of the proposed action as discussed below. Additionally,
44 there are no Class I areas within the region of influence of this action.

45
46 According to USEPA's General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal
47 action that has the potential to cause violations in a NAAQS nonattainment or maintenance area must
48 undergo a conformity analysis. A conformity analysis is not required if the Proposed Action or

1 alternative actions occur within an attainment area. Since the Fort Bliss ranges lie within attainment areas
 2 for all criteria pollutants, a conformity determination is not required and was not performed.

3
 4 Fort Bliss is not considered to be a major source of air emissions by the Air Quality Bureau of the State of
 5 New Mexico, because it is primarily comprised of multiple minor individual emission sources that are
 6 included on the Air Quality Bureau's list of insignificant activities. A baseline air emission inventory for
 7 calendar year 2004 in the New Mexico portion of the installation was developed to determine the status of
 8 Fort Bliss with regard to air emission sources in New Mexico and to address the dynamic activities in the
 9 training ranges. The Air Quality Bureau considers the installation a minor source of emissions.
 10 Consequently, Fort Bliss is not currently required to have any air quality permits for operations in New
 11 Mexico. A summary of the air emission inventory is presented in Table 3-4.

12
 13 **Table 3-4. Baseline Air Emission Inventory for Portions of Fort Bliss in New Mexico (2004)**

Emission Sources	Emissions (tons/year)					
	NO _x	SO ₂	CO	PM	VOC	HAPs
External Combustion Sources	3.81	0.48	1.95	0.47	0.16	0.04
Internal Combustion Sources	25.53	0.48	3.08	1.08	1.27	0.06
Solvents Use Sources	0	0	0	0	0.42	0
Storage Tanks & Fueling Operations	0	0	0	0	1.54	0.12
Miscellaneous Operations	0	0	0	0.36	0	0.4
Surface Coating operations	0	0	0	0.01	0.05	0.01
Total Emissions	29.34	0.96	5.03	1.92	3.44	0.63

14 Source: Army 2007, VOC = volatile organic compound

15
 16 Smoke is an aerosol that owes its ability to conceal or obscure to its composition of many small particles
 17 suspended in the air. These particles scatter or absorb the light, thus reducing visibility. When the
 18 density or amount of smoke material between the observer and the object to be screened exceeds a certain
 19 minimum threshold value, the object cannot be seen. WP, RP, and HC absorb water vapor from the
 20 atmosphere, which increases their diameters and makes them more efficient reflectors and scatterers of
 21 light rays. Diffusion is governed by wind speed, turbulence, stability of the atmosphere, and terrain.

22
 23 Meteorological conditions that have the most effect on smoke screening and munitions expenditures
 24 include wind direction, relative humidity, visibility, and atmospheric stability. Wind direction is critical
 25 for determining the adjustment or aim point for screens deployed by artillery or mortars (Army 1986,
 26 1996).

27
 28 As smoke is released into the atmosphere, it is transported and diffused downwind. The plume is
 29 depleted quite rapidly by atmospheric turbulence. The obscuration power of the plume becomes marginal
 30 at relatively short downwind distances and must be replenished at each point where the attenuation of a
 31 line of sight approaches a minimum. The transport wind speed and direction for a diffusing plume in the
 32 surface boundary layer of the atmosphere occurs at a height of about half of the plume height. Usually,
 33 this would be a height of about 10 m (Army 1986, 1996).

34
 35 Since WP, RP, and HC smoke compounds absorb moisture from the atmosphere, as relative humidity
 36 increases, the amount of screening material available for target obscuration increases. For example, the
 37 HC compound is considered to be only about 70 percent efficient; that is, for every 100 grams of HC in a
 38 munition, only 70 grams are available for screening. Phosphorous compounds are considered to be better
 39 screening agents than HC. This is because WP and RP have large yield factors for various relative
 40 humidities. The smoke from a WP munition typically forms a pillar, creating an excellent vertical screen,
 41 especially with high relative humidity. However, only about 10 percent of the smoke generated from WP

munitions is available for screening near the ground. In general, if the wind speed is less than 3 knots (3.5 mph) or greater than 20 knots (23 mph), smoke can be an unsatisfactory countermeasure on the battlefield. The employment of large smoke is probably most effective if the screen is generated before sunrise when stable conditions and light-to-moderate winds are most likely. Screens generated in these conditions would remain close to the ground with only moderate vertical diffusion. Screens also reduce incoming solar radiation reaching the ground so that convective turbulence is suppressed. A diffusing smoke plume also tends to follow the terrain-influenced surface winds (Army 1986, 1996).

Proposed Action

Particulate matter is the primary pollutant emitted from the use of the XM929 120-mm WP smoke cartridge and the use of the M819 81-mm RP smoke cartridge (Table 3-5). Other criteria pollutants, HAPs, and toxic chemicals (*i.e.*, those chemicals regulated under Section 313 of the Emergency Planning and Community Right to Know Act [EPCRA]) are emitted at low levels. As these munitions are typically used in the field, there are no controls associated with their use (USEPA 2009). No criteria pollutant emission factors reports were located for the additional obscurant munitions recommended for obscurant training, but these would be expected to produce similar emissions when functioned.

Table 3-5. Emissions of Criteria Pollutants and Carbon Dioxide

Munition	Compound	Pounds per Item
XM929 120-mm White Phosphorus Smoke Cartridge (DODIC = CA03)	CO ₂	0.64
	CO	0.012
	Pb	0.0006
	NO _x	0.18
	PM-2.5	12.9
	PM-10	12.3
	SO ₂	0.00084
	TSP	13.9
M819 81-mm Red Phosphorus Smoke Cartridge (DODIC = C870)	CO ₂	0.34
	CO	0.0032
	Pb	0.000085
	NO _x	0.015
	PM-2.5	3.5
	PM-10	3.5
	SO ₂	0.0015
	TSP	3.6

Source: USEPA 2009, CO₂ = carbon dioxide, TSP = total suspended particulates.

As the ranges are in NAAQS attainment areas no major long-term impacts to air quality from criteria pollutants would occur. Particulate matter would be the primary criteria pollutant emitted through obscurant munitions' functioning and could amount to several tons per year, but the release of particulate matter would be intermittent and spread over a wide area within the FBTC. Emissions from the Proposed Action would not exceed the NAAQS. When compared to the particulate matter resulting from wind erosion, the effects of munitions' functioning would be almost unnoticeable. Particulate matter resulting from wind erosion in Doña Ana County was estimated at approximately 60,000 tons for 1996 (New Mexico Environment Department Air Quality Bureau 2004). If one assumed that all obscurant compound was released as PM the amount of annual matter would equal approximately 21 tons. If one assumed that all projected munitions released 13.9 pounds as PM the amount of annual matter would equal approximately 61 tons. 40 CFR 93 § 153 defines *de minimis* levels, the minimum threshold for which a

1 conformity determination must be performed, for various criteria pollutants in various areas. For
2 comparison purposes, the *de minimis* levels for PM-10 are 70 tons per year for serious nonattainment and
3 100 tons per year for moderate nonattainment and maintenance. As previously stated, general conformity
4 does not apply since the proposed action would occur within an attainment area.

5
6 Emission reports are not available for all projected munitions. Assuming all projected munitions released
7 contain 0.64 pounds of CO₂, annual release of approximately 2.8 tons of greenhouse gases (CO₂) could
8 occur. These amounts would be minimal when compared to overall transportation and electrical
9 generation emissions of greenhouse gases.

10
11 **Alternative A**

12 Potential effects to air quality would be similar to the Proposed Action, but limited to the Doña Ana
13 Range area. Since only Doña Ana would be used there would be more incidences of road closures and
14 training interruptions.

15
16 **Alternative B**

17 Potential effects to air quality would be similar to the Proposed Action.

18
19 **No Action Alternative**

20 Under the No Action, air quality effects as described for continued training within the FBTC as described
21 in the *Fort Bliss Texas and New Mexico Mission and Master Plan Final Supplemental Programmatic*
22 *Environmental Impact Statement* (Army 2007a), and *Fort Bliss Army Growth and Force Structure*
23 *Realignment Final Environmental Impact Statement* (Army 2010a) would continue.

24
25 **3.3 Surface Water Resources**

26 **3.3.1 Existing Conditions**

27 Water quality in New Mexico is regulated by the New Mexico Environment Department per the Clean
28 Water Act (CWA) of 1977, as amended. The only significant surface water body near Fort Bliss is the
29 Rio Grande in Texas and is not within the ROI of the proposed action (Army 1998). No perennial
30 streams or natural surface-water bodies are present within or adjacent to the proposed obscurant training
31 areas.

32
33 The Doña Ana and McGregor ranges are located in two basins, the Tularosa Valley and the Salt Basin.
34 The Salt Basin includes the western part of Otero Mesa and the southern slopes of the Sacramento
35 Mountains' foothills. The Tularosa Valley and the Salt Basin are characterized by small ephemeral
36 streams that discharge toward the central areas of the closed basins. Under natural conditions, small
37 playas develop in low-lying areas during periods of high runoff. Some streams that originate in the
38 mountains are perennial in their upper reaches (Army 2000).

39
40 Very few of the arroyo-riparian drainages and none of the playa lakes on Fort Bliss are regulated as
41 jurisdictional wetlands as defined by the Army Corps of Engineers. The only known Waters of the U.S.
42 are on the west side of the Organ Mountains (part of the Rio Grande drainage), and some arroyos on
43 McGregor Range that originate in New Mexico and cross into Texas and the Rio Grande drainage.
44 Whether federally regulated or not, Fort Bliss recognizes all arroyo-riparian drainages and playa lakes as
45 locally important natural resources.

46
47 Playa lakes are also present on Fort Bliss in the Tularosa Valley. Playas are depressional areas in the
48 central portions of closed drainage basins that receive surface water flow from surrounding areas. Playas
49 are dry for most of the year; however, fine-grained sediments, mostly sand, silt, and clay are deposited in
50 thin horizontal layers after seasonal heavy rains. Since water permeability is slow and shallow, standing
51 water may remain up to a few weeks following heavy rains. Playas have a higher content of silt and clay

1 soils (more stable soils) than surrounding areas. This factor enables them to contain a higher diversity of
2 grasses and shrubs, which increases habitat diversity and increases water holding capacity in the arid
3 environment. Old Coe Lake, a 114 acre playa lake, occurs just east of War Highway.
4

5 **3.3.2 Environmental Consequences**

6 **Proposed Action**

7 The Proposed Action would have minimal effects on water resources. There is a low probability that
8 obscurant munitions would get transported down arroyos and to playa wetlands. Old Coe Lake is about
9 0.5 miles east of War Highway and approximately 6 miles northeast of the proposed obscurant targeting
10 area at Doña Ana. Arroyo-riparian drainages generally run to the southeast from the proposed obscurant
11 targeting area at Doña Ana. Potential small, isolated wetlands occur approximately 1 to 2 miles east of
12 War Highway and there is little potential for pieces of obscurant compounds to be deposited in these
13 areas.
14

15 Arroyo-riparian drainages and alluvial fans occur in both the DMPC and DAGIR and there is some
16 potential that unburnt pieces of obscurant compounds could be transported down gradient from the
17 proposed targeting areas. Such transport and subsequent down gradient deposition would be contained
18 within the range complexes and is therefore not considered a major issue. Additionally, the arroyo-
19 riparian drainages are dry for the majority of the year and no jurisdictional wetlands occur within the
20 range complexes.
21

22 **Alternative A**

23 Potential effects to surface waters would be similar to the Proposed Action as described for Doña Ana
24 except the localized amount of unburned materials would increase in the Doña Ana obscurant impact
25 area.
26

27 **Alternative B**

28 Potential effects to surface waters would be similar to the Proposed Action.
29

30 **No Action Alternative**

31 Under the No Action, surface water effects as described for continued training within the FBTC as
32 described in the *Fort Bliss Texas and New Mexico Mission and Master Plan Final Supplemental*
33 *Programmatic Environmental Impact Statement (Army 2007a)*, and *Fort Bliss Army Growth and Force*
34 *Structure Realignment Final Environmental Impact Statement (Army 2010a)* would continue.
35

36 **3.4 Groundwater**

37 **3.4.1 Existing Conditions**

38 Fort Bliss is located primarily in the Tularosa-Hueco Basin of the Basin and Range Physiographic
39 Province with small portions in the Mesilla Basin and the Salt Basin. The principal aquifers in the
40 Tularosa-Hueco Basin are the Hueco Bolson and the Tularosa aquifer. Hueco Bolson provides
41 groundwater to the City of El Paso, the Fort Bliss Cantonment, and Ciudad Juárez. Tularosa Basin
42 underlies portions of the Doña Ana Range – North Training Areas and McGregor Range, and supplies
43 water for Doña Ana Range Camp, the Main Post at WSMR, and the City of Alamogordo. The Mesilla
44 Basin aquifer is located west of Fort Bliss but represents an important source of water for the Fort Bliss
45 Main Cantonment and the City of El Paso. Salt Basin aquifer underlies the eastern portion of the
46 McGregor Range, but does not represent a source of water for Fort Bliss.
47

48 Water enters the groundwater flow system in the lower Tularosa Basin principally as mountain-front
49 recharge from storm runoff in alluvial fan areas adjacent the mountains. Models used by the U.S.
50 Geological Survey (USGS) in the Franklin and Organ mountains indicate that 3.1 percent of the
51 precipitation falling in the Organ Mountains drainage areas reaches the saturated zone. Surface drainage

1 areas in the Organ Mountains, that contribute water to the lower Tularosa Basin, encompass about 225
2 square miles. Recharge from the Sacramento Mountains to the eastern part of the Tularosa Basin is
3 estimated at 4,500 acre feet per year. Evapotranspiration in the Tularosa Basin is not a significant
4 component of the groundwater flow system because the depth to groundwater generally exceeds 200 feet.
5 Groundwater development in the Tularosa Basin area of McGregor Range, except for a few livestock
6 wells, has not been extensive. Depth to groundwater generally is more than 200 feet in the McGregor
7 Range and is brackish to saline; the aquifer has little potential as a potable water source (Army 1998).

8
9 Groundwater resources are not extensively developed in the Salt Basin, and no significant use of
10 groundwater occurs in the basin within McGregor Range. A few small-capacity stock and domestic wells
11 have been completed on Otero Mesa. However, the possibility of a fresh water aquifer in the alluvium
12 south of the Sacramento Mountains represents a potential resource for nondomestic use in that area of
13 McGregor Range.

14
15 The Doña Ana Ranges occupy most of the Organ Mountains, the alluvial fans on the east and south flanks
16 extend well out into the basins to the east. The groundwater underlying the basin fill deposits is saline.
17 The depth to groundwater in this area varies from about 30.5 m (100 feet) in the central part of the basin
18 to 152 to 183 m (500 to 600 feet) near the heads of the alluvial fans. Most of the potable water in the area
19 is located in the lenses of fresh water along the basin margins and the base of the mountains (Pennington
20 *et al.* 2003).

21 22 **3.4.2 Environmental Consequences**

23 **Proposed Action**

24 Since WP is not very soluble in water, its mobility in soil systems is low (Rivera *et al.* 1996) and
25 obscurant compounds are unlikely to leach to deep groundwater underlying the ranges. For example, WP
26 has not been detected in any groundwater samples at the Massachusetts Military Reservation and the
27 absence of WP is consistent with its fate-and-transport properties (*i.e.*, low solubility, and high
28 degradation potential) (Pennington *et al.* 2004). With the arid climate and depth to groundwater at Fort
29 Bliss leaching of explosives residues to groundwater is very unlikely (Pennington *et al.* 2003). Potential
30 groundwater contamination with obscurant compounds is considered less than significant.

31 32 **Alternative A**

33 Potential effects to groundwater would be similar to the Proposed Action.

34 35 **Alternative B**

36 Potential effects to groundwater would be similar to the Proposed Action.

37 38 **No Action Alternative**

39 No potential effects as a result of the proposed obscurant munitions training would occur.

40 41 **3.5 Biological Resources**

42 **3.5.1 Vegetation**

43 As a result of its large size and varied topography, Fort Bliss exhibits a high degree of biodiversity.
44 About 67 percent of Fort Bliss is desert shrublands, mostly in the Tularosa Basin. About 39 percent of
45 Fort Bliss is covered with mesquite-dominated plant communities most of which are coppice dunes.
46 Creosote dominated plant communities cover about 18 percent of the total land and grassland plant
47 communities cover about 30 percent of the land on Fort Bliss. Within Fort Bliss, Otero Mesa covers
48 about 152,706 acres, most of which is covered by grassland plant communities. The remainder of the
49 grassland plant communities occur in the Tularosa Basin and in the foothills of the Organ Mountains.

1 The Deer Hill area is classified as foothill desert shrublands. The dominant shrubs in the foothill desert
2 shrublands are creosotebush (*Larrea tridentata*) and mimosa (*Mimosa aculeaticarpa*). Surrounding areas
3 include; creosote piedmont shrublands, foothill desert shrublands, and foothill desert scrub (dominants
4 include creosotebush and mariola [*Parthenium incanum*]).

5
6 None of the arroyo-riparian drainages and playa lakes within the ROI are regulated as jurisdictional
7 wetlands as defined by the Army Corps of Engineers. Several arroyo-riparian drainages lead from the
8 Doña Ana impact area but are not connected to a regulated body of water. Based on studies of the
9 ephemeral drainages on McGregor Range and the Doña Ana Range–North Training Areas, the ephemeral
10 drainages have been determined to have: 1) shrub, tree, and forb cover that is more dense along the
11 drainage channels than the surrounding area; 2) greater species richness (for shrubs, trees, grasses, and
12 forbs) than the perennial channel; 3) heights of shrubs along the drainage channels that are nearly twice
13 the height of shrubs in the uplands; 4) riparian species such as desert willow that tended to be taller than
14 non-drainage species; and 5) species normally found in drainages at lower elevations that may be found
15 outside drainages at higher elevations (Army 2007a).

16
17 The DAGIR and DMPRC obscurant target areas consist of creosotebush-dominated plant communities
18 where tarbush (*Flourensia cernua*) and lowland grasslands are associated with loamy soils in the
19 drainages. The eastern part of McGregor Range is dominated by Otero Mesa. Vegetation on Otero Mesa
20 is predominately basin and mesa grasslands dominated by black (*Bouteloua eriopoda*) and blue (*B.*
21 *gracilis*) grama, with tobosa grass (*Hilaria mutica*) and burrograss (*Scleropogon brevifolius*) in the broad
22 drainages.

23 24 **3.5.2 Wildlife**

25 Wildlife resources are important because they are a critical element of many valuable aquatic and
26 terrestrial habitats; are an indicator of the health of various aquatic and terrestrial habitats; and many
27 species are important aesthetic, commercial and recreational resources. Approximately 335 species of
28 birds, 58 species of mammals, 39 species of reptiles, and 8 species of amphibians are known to occur on
29 Fort Bliss. However, very few of these species would be expected within the three proposed obscurant
30 target areas. During the monsoon season an assortment of ephemeral invertebrates (primarily larvae and
31 small shrimp-like crustaceans) may hatch in the playas such as Old Coe Lake, and reproduce before the
32 water dries up. In turn, this invertebrate fauna provides important food for adult and larval toads,
33 salamanders, and some birds (Army 2001 and references cited therein).

34 35 **3.5.3 Sensitive Species**

36 The Endangered Species Act (ESA) [16 U.S.C. 1531 *et. seq.*] of 1973 as amended was enacted to provide
37 a program for the preservation of endangered and threatened species and to provide protection for the
38 ecosystems upon which these species depend for their survival. Federal agencies are required to
39 implement protection programs for designated species and to use their authorities to further the purposes
40 of the act.

41
42 Three categories of protection status are included in this section:

43 Federally Listed Threatened and Endangered Species - the ESA provides protection to species federally
44 listed as endangered or threatened. Endangered species are those species that are at risk of extinction in
45 all or a significant portion of their range. Threatened species are those that could be listed as endangered
46 in the near future.

47
48 State Listed Threatened and Endangered Species - New Mexico maintains their own lists of state
49 endangered and threatened plant and animal species.

50

1 Other Sensitive Species - include federally and state-listed candidates, proposed endangered, proposed
2 threatened, and species of concern. Candidate species are those for which the U.S. Fish and Wildlife
3 Service (USFWS) has sufficient information on biological vulnerability and threats to support proposals
4 to list them as endangered or threatened, but issuance of proposed rules for these species is precluded by
5 higher priority listing actions. Proposed endangered and threatened species are those proposed for listing
6 as endangered and threatened, respectively, and for which formal ruling is in progress. Species of
7 concern are those identified to receive attention for planning purposes. At present, none of those species
8 receive legal protection under the ESA
9

10 Of the federally listed species, only one regularly occurs on Fort Bliss: Sneed pincushion cactus
11 (*Escobaria sneedii* var. *sneedii*) populations exist on specific limestone habitats. The American bald
12 eagle (*Haliaeetus leucocephalus*) roosts on winter slopes in Lincoln National Forest and forages on the
13 Sacramento Mountains' foothills part of McGregor Range. The desert night-blooming cereus
14 (*Peniocereus greggii* var. *greggii*) is a federal species of concern and an endangered species in New
15 Mexico, and is known to occur on desert flats and washes within the Doña Ana Range area where this
16 cactus is monitored by Fort Bliss.
17

18 **3.5.4 Environmental Consequences**

19 New Mexico normally experiences two fire seasons annually that correspond to the two driest times of the
20 year. The most severe of the two seasons is usually in the spring when the area receives almost no rain,
21 vegetation is starved for moisture, and strong dry winds occur. Fires during this season are most often
22 caused by human activity or lightning from dry thunderstorms (thunderstorms with little or no rain). The
23 second fire season usually begins with another dry period during the fall after the monsoonal rains, when
24 many grasses and other small plants begin to die and dry out, providing ready fuel for fire. Atmospheric
25 moisture levels are reduced and dry thunderstorms again become a fire threat.
26

27 Seasonal weather and grazing influence fire potential in deserts. A wet year produces large quantities of
28 grasses and forbs, which provide fuel to carry fire. Grazing reduces these fine fuels, thus reducing
29 potential fire spread. Re-growth following fire depends on the availability of moisture. If burning is
30 followed by a wet season, production of perennial grasses and some forbs may increase. In the most arid
31 desert areas, fires may reduce density of shrubs and cacti for 50 to 100 years. However, studies have
32 shown substantial differences between species and also complex interactions among available moisture,
33 grazing, and plant species (Smith 2000).
34

35 Wildfires, especially during these periods and times of drought, are a direct impact to vegetation and
36 habitats. Wildfires on the FBTC usually result from live weapons firing or pyrotechnics and from human
37 carelessness. Fires generally occur when fine fuel loads are high. Most of the desert scrub and shrubland
38 cover types are not very susceptible to fire, except when unusual weather conditions result in high fuel
39 loads.
40

41 Monasmith (1997) studied the short-term (1 year) effects of fire on a creosotebush dominated community
42 and associated small mammals community. Relative abundance of Merriam's kangaroo rats (*Dipodomys*
43 *merriami*), the most prevalent small mammal, was not affected after 1 month post-burn. However,
44 relative abundance of Merriam's kangaroo rats 1 year post-burn was higher on burned sites. Silky pocket
45 mouse (*Perognathus flavus*) relative abundance immediately increased and remained higher on the burned
46 sites 1 year post-burn. Trends in desert pocket mouse (*Chaetodipus penicillatus*) relative abundance
47 indicated a declining population on burned sites 1 year following the burn.
48

49 Laboratory combustion studies indicated that the upper limit of conversion of WP is about 92 percent.
50 Thus, in the burning of WP/felt in the environment, an amount of unreacted elemental phosphorus might
51 be expected to remain in the burned felt matrix (Spangford *et al.* 1985). Unburned elemental phosphorus

1 and oxidized phosphorus would remain on the surface of the metal parts and in the felt wedges after the
2 munition has functioned (Chemical Research & Development Center 1983).

3
4 As a consequence of both testing of munitions at Pine Bluff Arsenal and deployment of grenades in
5 military training exercises incompletely combusted clumps of oxide coated RP have been observed and
6 are believed to account for fires occurring at training sites. The possible ignition of residual clumps either
7 spontaneously, or by friction or other disturbance presents a potential threat for environmental damage
8 from fires (Mitchell and Burrows 1990).

9
10 Small pieces of WP or RP may crust over when burning and go out. The pieces can re-ignite if the crust
11 is scraped away (by an animal or a person) and could start a fire. In an artillery projectile, WP wedges
12 ignite immediately upon exposure to air and fall to the ground. Up to 15 percent of the WP remains
13 within the charred wedge and can reignite if the felt is crushed and the unburned WP is exposed to the
14 atmosphere (Army 2007b). The fire could spread beyond the impact boundaries and affect lands before
15 being discovered. The risk of such a fire cannot be totally eliminated, but it would be reduced by
16 properly maintaining fire breaks, monitoring or reducing fuel loads, and regularly briefing personnel on
17 the potential for fires and reporting/response requirements.

18
19 An assessment of wild land fire risk that would result from the use of obscurant munitions was conducted.
20 The analysis was based on the use of fuel models derived from vegetation mapping on Fort Bliss. The
21 fuel models are based on the National Fire Danger Rating System described in U.S. Department of
22 Agriculture General Technical Report INT-39. Fuel models describe the risk of fire occurrence as well as
23 the expected fire intensity when fire occurs.

24 25 **Proposed Action**

26 Toxicity symptoms resulting from RP/butyl rubber or WP exposures for five plant species (*i.e.*,
27 ponderosa pine, short needle pine, sagebrush, blando brome [a grass], and bushbean) varied depending on
28 species, smoke concentration, duration of exposure, relative humidity, and wind speed. The primary
29 symptoms appearing included leaf tip burn, leaf curl, leaf abscission and drop, floral abortion, chlorosis,
30 necrotic spotting, wilting, desiccation, and dieback. The grass appeared to be the least sensitive, followed
31 by the sagebrush and pines, with bushbean being the most sensitive. Effects were more pronounced on
32 older plant tissues. Phosphorus smokes deposited onto foliar surfaces were not tightly bound or sorbed
33 and could be readily removed during rainfall (Van Voris *et al.* 1987).

34
35 Vegetation communities on the ranges are regionally common, and, as noted above, the tested grass and
36 sagebrush were the least sensitive to phosphorus smokes. Sagebrush exhibited no adverse effects for 16
37 days following 2 hours of exposure. Exposures of 4-, 6-, and 8-hours showed a rapid onset of leaf edge
38 burn and dieback (Van Voris *et al.* 1987).

39
40 Tests with HC smokes indicated a low to moderate impact to plants following direct foliar deposition, and
41 little residual effects. Indirect soil-plant effects were minimal in most instances, and not expected to be
42 persistent. Indirect effects analysis of HC-contaminated soils on plant growth indicated no major effects
43 on grass growth through two or three harvests. In no case was seed germination affected. Overall,
44 damage intensity was lower than observed for phosphorus smokes. (Cataldo *et al.* 1989)

45
46 Short-term effects to vegetation could include the phytotoxic effects described above. No long-term
47 significant impacts are anticipated to vegetation communities from the deposition of obscurant smokes on
48 foliar surfaces. While the toxic effects of phosphorus smokes appear to be severe, the damage observed
49 to date for the native plant species should be transient (Van Voris *et al.* 1987).

50

1 Based on fuel models, the Doña Ana targeting area's vegetation community presents a low risk of fire
2 except in dry times following abundant growth of annual grasses and forbs. There is a slight risk of fire
3 spread to Rattle Snake Ridge, which is habitat for Sneed's pincushion cactus. However, this cactus
4 population, currently being monitored by Fort Bliss, occurs on the west side of Rattlesnake Ridge
5 approximately 1.7 miles from the targeting area. Additionally, the cactus's general habitat is in areas of
6 bare rock that would not be prone to carry fire. The proposed action would not perceptibly affect the
7 local cactus population. Based on the results of Monasmith (1997) no long-term major fire effects are
8 anticipated to small mammal populations.
9

10 The DMPRC's and DAGIR's vegetation ranges from desert grassland to desert and foothill shrub/grass
11 types. Grassland areas are in Fuel Model L, perennial grass land. This fuel model supports fast moving
12 low intensity fire. The shrub/grass land types are considered to be Fuel Model A, annual grasses and
13 forbs with shrubs, which would support fast moving low intensity fires when sufficient fuels are present.
14 Fuel loading in Fuel Model A is dependent on the abundance of annual vegetation following periods of
15 adequate moisture. Steep slopes east of the obscurant impact zones have the capacity of carrying fire to
16 grasslands on Otero Mesa. The fire-fighting routes for the DAGIR are established from Hay Meadow to
17 Mack tanks, which would aid in protection for movement of fires onto Otero Mesa.
18

19 Shinn *et al.* (1985) conducted an initial screening of smokes and obscurants and estimated that WP, RP,
20 and HC obscurant smokes could be potentially toxic to animals that forage on foliage on which obscurant
21 smokes have been deposited. The foliage ingestion quotient used the calculated value of 6.5 grams per
22 kilogram (g/kg) as an estimate of the amount of smoke products consumed by a rat when the foliage
23 received deposition from smoke at an air concentration of 1000 milligrams per cubic meter (mg/m³) for
24 one-hour with a wind speed of approximately 1 mph. The foliage ingestion quotient was the ratio of rat
25 ingestion to the oral 50 percent lethal dose for rats as determined from laboratory toxicity studies.
26

27 There is sparse forage within the Doña Ana Range impact area and because of the impact of munitions in
28 the area, very few wildlife numbers would be expected. There are no threatened or endangered wildlife
29 species within the impact areas proposed for obscurant training. Additionally, wildlife species anticipated
30 to occur within the ranges' impact areas are regionally common. Creosotebush is largely unpalatable due
31 to toxic resins, but will occasionally be foraged upon by jack rabbits and woodrats to obtain water (Forest
32 Service no date). Mariola is one of the most important components of the diet of grazing animals on a
33 desert shrublands (Villabos 2004).
34

35 Wildlife foraging on vegetation within the impact areas would be less than significant because; no
36 threatened or endangered wildlife species are known to inhabit the impact areas, the impact areas are not
37 leased as grazing land, wildlife that might inhabit the impact areas are regionally common and although a
38 potential exists that an individual may experience some toxic effects from foraging on vegetation coated
39 with obscurant munitions by-products, the use of the impact areas for training discourages use of these
40 areas by big game animals. Potential effects related to animal foraging would be limited to a minimal
41 area (the obscurant impact areas) in relation to the entire FBTC. HC diffusing (howitzers) and WP
42 bursting devices (mortars, guns, rockets, and howitzers) have a closely defined impact area with highest
43 smoke concentrations estimated to cover an area of 100 square meters (m², 0.03 acres) to 12,000 m² (3
44 acres) (Shinn *et al.* 1985). With the requirements outlined in the Description of the Proposed Action, Fort
45 Bliss anticipates the risk of fires to be manageable to acceptable levels.
46
47

1 **Alternative A**

2 Alternative A would limit obscurant use and thus potential fires to the Doña Ana area, which is rated as
3 having a low fire risk. There would be no risk of fire spread to the Otero Mesa grasslands since the
4 nearby DMPRC or DAGIR would not be used.

5
6 **Alternative B**

7 Alternative B would limit the risk of fire spread to Otero Mesa as a result of limiting the obscurant
8 training to the DAGIR in the Tularosa Basin. Fire-fighting routes for the DAGIR are established from
9 Hay Meadow to Mack tanks.

10
11 **No Action Alternative**

12 Risk of wildland fires within the FBTC remains with the No Action alternative. The FBTC will continue
13 to be utilized for Army live fire training. The FBTC has experienced fires in the past, particularly in
14 years with an increased fuel load, and the risk remains for future fires. Fires may result from both FBTC
15 operations and natural causes such as lightning.

16
17 **3.6 Cultural Resources**

18 **3.6.1 Existing Conditions**

19 Cultural resources are regulated at Fort Bliss per the National Historic Preservation Act of 1966, as
20 amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological
21 Resources Protection Act of 1979; as well as other statutes. Cultural resources are important because of:
22 their association or linkage to past events, to historically important persons, and to design and/or
23 construction values; and for their ability to yield important information about prehistory and history.
24 Cultural resources are publicly significant because preservation groups and private individuals support
25 their protection, restoration, enhancement, or recovery.

26
27 Cultural resources at Fort Bliss include prehistoric and historic archaeological sites, traditional cultural
28 properties, sacred sites, buildings, structures, artifacts, cultural landscapes, and historic districts. Cultural
29 resources represent the material manifestations of the knowledge, technologies, beliefs, art, morals, laws,
30 and customs particular to the people who have resided in a region. Fort Bliss manages cultural resources
31 associated with all prehistoric and historic periods recognized in south-central New Mexico and west
32 Texas.

33
34 The Army (2000) describes in detail the cultural history of Native Americans and post-contact inhabitants
35 in the region. The Integrated Cultural Resources Management Plan (ICRMP, Army 2008b) for Fort Bliss
36 also contains detailed information about the prehistory and history of Fort Bliss. Both documents are
37 incorporated herein by reference. Pursuant to Army Regulation AR 200-1, the Garrison Commander at
38 Fort Bliss is responsible for managing the cultural resources on the installation in compliance with federal
39 laws, regulations, and standards.

40
41 Nearly 100 percent of the Doña Ana Range-North Training Areas has been inventoried. While some of
42 that inventory does not meet current standards, much of it has been re-surveyed in the past five years.
43 Less survey has been completed in the Doña Ana Range area (44 percent). However, much of the land
44 within Doña Ana Range is an active impact zone or is very steep terrain. Each of these conditions
45 prohibits survey. Most of the accessible land in Doña Ana Range has been surveyed to current standards.
46 Current efforts in this area of the installation are focused on evaluation and mitigation of sites. Located
47 on the western edge of the Tularosa Basin and alluvial fans of the Organ Mountains, the area contains
48 over 6,300 archaeological sites. The majority are prehistoric Native American sites. They consist of sites
49 that are from all prehistoric eras known in the region, ranging from small hearths with artifact scatters to
50 residential sites with small huts, pit houses, or pueblos. Rock shelters have been recorded in the Organ
51 Mountains, some with residue of human occupation. Properties of cultural and/or religious importance

1 have been identified in these areas of the installation and are managed through consultation with the
2 appropriate tribes.

3
4 Approximately 84 percent of the Tularosa Basin portion of McGregor Range has been surveyed.
5 Currently, over 4,200 sites have been recorded in this portion of the installation. They include 4,072
6 Native American sites and 216 historic-age sites. Sites in this portion of Fort Bliss span the prehistoric
7 era and include short term and longer term residential sites and other activity areas. Sites south of
8 Highway 506 include small sites in the central basin that contain hearths with associated ceramic and
9 lithic artifacts. The alluvial fans near playas and along the east edge of the basin contain many longer-
10 term residential occupations of the late Formative. The piedmont slopes along Otero Mesa and the Hueco
11 Mountains contain sites with large and small roasting pits and associated artifact scatters. Of these, 860
12 Native American and 37 historic-age sites have been determined eligible for the National Register. Two
13 off-limit areas, including one for Escondida pueblo, were recently created in this part of the installation.
14 Architectural properties have also been inventoried in this portion of the installation. Most are related to
15 historic ranching and small settlements near the railroads. Properties of cultural and/or religious
16 importance have been identified in these areas of the installation and are managed through consultation
17 with the appropriate tribes.

18
19 Fifty-four percent of Otero Mesa has been surveyed. Most of the surveys were completed in the 1970s
20 and do not meet current standards. New surveys are underway, concentrating on a 30-meter buffer zone
21 along both sides of all roads on Otero Mesa. At present, just over 500 sites have been recorded in this
22 part of the installation. Of these, 70 Native American sites and five historic-age sites have been
23 determined eligible for listing on the National Register. In general, site density on Otero Mesa is lower
24 than in the alluvial fans or central basin environments. Most Native American sites consist of scatters of
25 the debris from stone-tool making and remains of campfires and roasting pits of varying sizes that contain
26 heated stones used in cooking. Some rock shelters, present on the escarpment that drops down to the
27 Tularosa basin, contain the residue of human use. Most historic sites are related to cattle ranching. No
28 cultural landscapes, sacred sites, or traditional cultural properties have yet been identified in this portion
29 of Fort Bliss.

30 **3.6.2 Environmental Consequences**

31 Activities that occur during or in anticipation of training on the FBTC could impact historic properties or
32 cultural resources. The impacts affect historic and cultural resources by destroying the resource or by
33 damaging the resource's integrity.

34 **Proposed Action**

35
36 Live-fire maneuvers including obscurant munitions could result in fires that adversely affect historic
37 properties. Buildings would be particularly vulnerable to fires, but the probability of fire reaching a
38 building location is low and roads would be available for fire fighting. Fires can also affect archaeological
39 historic properties. Fire can damage archaeological sites by destroying man-made features such as adobe
40 walls or altering deposits such as artifacts or organic food remains or exfoliation of rock art.

41 **Alternative A**

42 Potential impact to cultural resources would be limited to the Doña Ana area.

43 **Alternative B**

44 Potential impacts to cultural resources would be similar as described for the Proposed Action.

45 **No Action Alternative**

46 Under the No Action alternative live-fire maneuvers and natural events could result in fires that adversely
47 affect historic properties and archaeological sites.
48
49
50
51

1 **Mitigation**

2 Mitigation to control fire as described in Section 3.6 would reduce the potential for major impacts to
3 cultural resources. Adverse effects to cultural resources can be mitigated programmatically through the
4 procedures outlined in Standard Operating Procedure #7: Resolution of Adverse Effects in the Fort Bliss
5 Programmatic Agreement. In the event that cultural resources are inadvertently damaged as a result of
6 these training activities, Fort Bliss would follow the procedures outlined in SOP #11: Reporting Damage
7 to Historic Properties.
8

9 **3.7 Health and Safety**

10 **3.7.1 Existing Conditions**

11 Department of the Army Pamphlet 385–64 (Army 1999), Ammunition and Explosives Safety Standards
12 provides procedures to protect military and civilian Army employees, the public, and the environment. It
13 also sets forth procedures for use when transporting ammunition or explosives over the public highway.
14 Range safety policy is outlined in Army Regulation 385–63, Range Safety and Fort Bliss 350-1, Training
15 Safety. Within the framework of the training operations, the Army has a regulatory responsibility to
16 ensure that the use of smokes and obscurants does not adversely affect the health of local residents or the
17 environment, both on and near the training sites.
18

19 Phosphorus smoke aerosols act as irritants because of their high phosphoric acid content. Effects of
20 exposure to HC smoke are considered to arise primarily from inhalation of the zinc chloride component,
21 which comprises almost two thirds of the total mass of HC smoke. Respiratory irritation and
22 inflammation from obscurant smokes have been noted in humans and in animal studies (National
23 Research Council 1997, Von Stackleberg *et al.* 2004). Smoke in field concentrations is usually harmless,
24 but dense concentrations may cause irritation of the eyes, nose, and throat (Department of the Army
25 Pamphlet 385–64 [1999]). USEPA has classified hexachloroethane as Group C, possible human
26 carcinogen; WP is classified as Group D, not classifiable as to human carcinogenicity (USEPA 2000).
27 Army Field Manual No. 3-50 (Army 1996) states that HC is a carcinogen and phosphorus smoke contains
28 phosphoric acid, and that respiratory protection should be worn by troops when exposed to these smokes.
29

30 The National Research Council (1997, 1999) developed short-term emergency guidance levels (SPEGL)
31 and permissible public exposure guidance levels (PPEGL) to ensure the protection of communities living
32 near military facilities (Table 3-6). In developing SPEGLs and PPEGLs, the subcommittee assumed that
33

34 **Table 3-6. SPEGLs and PPEGLs for Smokes at Boundaries of Military-Training Facilities**

Smoke or Obscurant	Exposure Guideline	Exposure Duration	Guidance Level (mg/m ³)
Red phosphorus/butyl rubber smoke	SPEGL	15 minutes	4
		1 hour	1
		6 hour	0.2
	PPEGL	8 hour, 5 day week	0.1
Hexachloroethane smoke	SPEGL	15 minutes	1
		1 hour	0.3
		6 hour	0.04
	PPEGL	8 hour, 5 day week	0.02
White phosphorus smoke	SPEGL	15 minutes	1.9
		1 hour	0.5
		6 hour	0.08
	PPEGL	8 hour, 5 day week	0.009

35 Source: National Research Council 1997, 1999
36

1 the general population includes sensitive subpopulations, such as the elderly, pregnant women, infants,
 2 children, and the chronically ill. In the absence of direct information on the toxicity of the smokes and
 3 obscurants in sensitive subpopulations, the subcommittee recommended that an uncertainty factor of 10
 4 be used to extrapolate from guidance exposure levels derived for a population of healthy adults in the
 5 military to levels protective of more sensitive human subpopulations.

6
 7 Technical Guide 230 provides military exposure guidelines (MEGs) for chemicals in air, water, and soil
 8 for use during deployments (U.S. Army Center for Health Promotion and Preventive Medicine
 9 [USACHPPM] 2003). The military population, for which these guidelines were developed, is assumed to
 10 be “healthy and fit” and often believed to be less susceptible to the adverse health effects caused by
 11 chemical exposures than the general (civilian) population. The purpose of the MEGs is to provide
 12 protection to military personnel from chemical exposures during deployments. Table 3-7 lists the short-
 13 term exposure MEGs for air. The 1-hour Air-MEGs were developed to delineate three major levels of
 14 health effects: minimum, significant, and severe. These guidelines are defined as follows:

- 15
- 16 • 1-hour Minimal Effects Air-MEG: The airborne concentration above which continuous exposure
 17 for 1 hour could begin to produce mild, non-disabling, transient, reversible effects, if any. Such
 18 effects should not impair performance. Increasing concentration and/or duration could result in
 19 performance degradation, especially for tasks requiring extreme mental/visual acuity or physical
 20 dexterity/strength.
- 21 • 1-hour Significant Effects Air-MEG: The airborne concentration above which continuous
 22 exposure for 1 hour could begin to produce irreversible, permanent, or serious health effects that
 23 may result in performance degradation and incapacitate a small portion of individuals. Increasing
 24 concentrations and/or duration of exposure will increase incidence and severity of effects.
- 25 • 1-hour Severe Effects Air-MEG: The airborne concentration above which continuous exposure
 26 for 1 hour could begin to produce life-threatening or lethal effects in a small portion of
 27 individuals. Increasing concentrations and/or duration of exposure would increase incidence of
 28 lethality and severity of non-lethal severe effects.
- 29

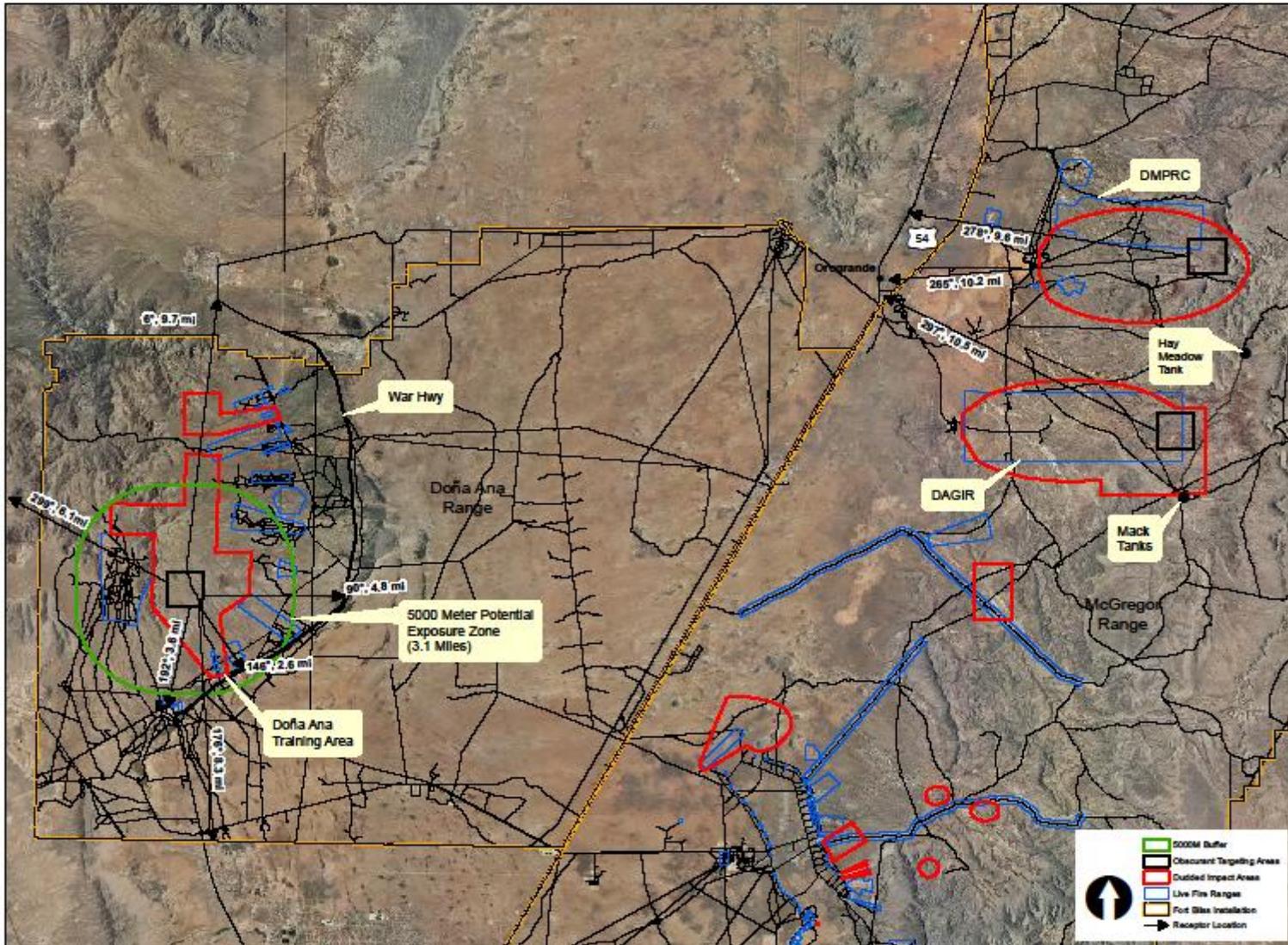
30 Table 3-7. Short-Term Air Military Exposure Guidelines

1-HOUR AIR-MEG MG/M ³			
Compound	Health Effect Level		
	Minimal	Significant	Severe
Hexachloroethane (smoke)	0.3	3	
White phosphorus	0.3	3	5
Red phosphorus (smoke)	1	10	1,000

31 Source: USACHPPM 2003, Table C-2.

32
 33 Table 3-8 lists estimates of the distance and direction of the training ranges to the nearest potential human
 34 receptors. Figure 3 depicts the locations of the potential receptors listed in Table 3-8.

35
 36 Maloney *et al.* (1992) measured fog-oil concentrations under stable conditions, to generate data for
 37 dispersion models, up to 4 kilometers (2.5 miles) from smoke pots. Maximum measured concentrations
 38 at 2 km (1.2 miles) were 2.5 and 2.1 mg/m³ at 2 m and 8 m above the ground surface respectively. At 4
 39 km, maximum concentrations were 0.5 and 0.2 mg/m³ at 2 m and 8 m above the ground surface,
 40 respectively. Although these data are not directly translatable to HC, WP, and RP smokes’ dispersion
 41 characteristics on the FBTC, they do indicate the potential for measurable quantities of smoke
 42 components to be transported some distance from an area of deployment.



43
44

Figure 3. Potential Receptor Locations.

Table 3-8. Approximate Distance and Direction of the Training Ranges to the Nearest Potential Human Receptors

Range	Receptor	Distance (km/mi)	Azimuth (degrees)
Doña Ana	Soledad Canyon Housing Development	9.8/6.1	299
Doña Ana	Range Camp	5.8/3.6	192
Doña Ana	War Road (closest point)	4.2/2.6	146
Doña Ana	War Road (east of range)	7.7/4.8	90
Doña Ana	Chaparral, NM	13.4 /8.3	176
Doña Ana	WSMR HQ	15.6/9.7	6
DMPRC	Orogrande, NM	16.4 /10.2	270
DMPRC	Highway 54 (closest point)	15.4/9.6	278
DAGIR	Orogrande, NM	17.1/10.6	297

Notes: Distances measured from closest boundary of proposed oval obscurant targeting area.

During field use of a single 155 mm WP shell over an area of 100 m², the estimated maximum ambient WP and phosphine concentrations were estimated to be 7 micrograms per cubic meter (µg/m³) and 7 µg/m³, respectively (Berkowitz *et al.* 1981, cited in ATSDR 1997a). If 72 shells were used over the same area for a continuous screen, the maximum ambient WP and phosphine concentrations would be 0.12 mg/m³ and 0.12 µg/m³ (Berkowitz *et al.* 1981, cited in ATSDR 1997a). During deployment of WP/felt bursting rockets and howitzers where the smoke covered an estimated minimum ground area of 9,500-12,000 m², the estimated environmental concentration of smoke would be 5 to 25 mg/m³ (Shinn *et al.* 1985, cited in ATSDR 1997a). The deployment of WP-based mortars, guns, rockets, and howitzers covering an estimated minimum smoke area of 100 to 800 m², may produce an environmental concentration of 1,800 to 3,500 mg/m³ smoke (Shinn *et al.* 1985, cited in ATSDR 1997a). The concentration of WP in air from the smoke would be only a small fraction of the smoke concentration. Artillery produced smokes (mortars, guns, rockets, and howitzers) were determined to be toxic when the smoke and obscurant was HC and WP (Shinn *et al.* 1985).

Community exposure as a result of deployment of WP/felt and RP/butyl rubber could reach 146 mg/m³ as phosphorus pentoxide (202 mg/m³ as orthophosphoric acid) 100 m downwind from deployment and about 1.0 mg/m³ as phosphorus pentoxide (1.4 mg/m³ as orthophosphoric acid) 5,000 m downwind (Berkowitz *et al.* 1981, cited in USEPA 1990). USEPA does not expect community exposures to be severe at a distance of greater than 300 m (0.2 miles). However, particularly susceptible individuals might experience respiratory irritation even at a distance of 5,000 m (3.1 miles) (USEPA 1990).

3.7.2 Environmental Consequences

The downwind concentrations of obscurant smokes and their transformation products that might result from the Proposed Action and alternative actions is unknown for all possible scenarios of munitions functioning in conjunction with wind speed, wind direction, humidity and other environmental variables that might occur within the complex terrain of the FBTC. Based on the literature cited previously, the recommended NRC public exposure guidelines, and the short-term air MEGs, the potential exists, at least under certain circumstances, that obscurant smokes could impact human receptors within the ROI of the Proposed Action and alternative actions.

Proposed Action

Spring winds are typically from the west, while summer and winter usually bring a more southerly and northerly flow, respectively. Under inversion conditions, deployment of obscurants on the Doña Ana impact area could potentially result in the exposure of sensitive receptors to smoke chemical constituents. The greatest potential for exposure would be at War Highway, the firing ranges west of War Highway, and the Doña Ana range camp. War Highway is the main connecting highway between Fort Bliss and

1 WSMR cantonments. This road is used by approximately one third of the WSMR civilians, and
2 approximately one quarter of all commercial vehicles servicing WSMR. The proposed action would
3 follow FB 350-1 guidelines that pertain to closure of War Highway and the ceasing of obscurant use if
4 conditions warrant.

5
6 Deployment of obscurants on the DMPRC and DAGIR ranges would unlikely result in the exposure of
7 sensitive receptors to obscurant smokes. Orogrande, New Mexico and Highway 54 represent the potential
8 sensitive receptor location for these two ranges. However, these are approximately 10 miles away and
9 prevailing winds generally would carry smoke away from these receptors.

11 **Alternative A**

12 Potential effects of obscurant use would be as described for Doña Ana under the Proposed Alternative.
13 Fort Bliss Regulation 350-1 guidelines would be followed to assure receptors would not be exposed.
14 Because the intensity of use at Doña Ana would increase under this alternative, road closures and other
15 safety measures would increase as well.

17 **Alternative B**

18 Potential effects of obscurant use would be as described for Doña Ana and the DAGIR under the
19 Proposed Alternative.

21 **No Action Alternative**

22 Under the No Action, no potential effects of obscurant smokes exceeding exposure guidelines on
23 receptors could occur.

25 **3.8 Hazardous Materials**

26 **3.8.1 Existing Conditions**

27 Independent of federal regulation, DoD has maintained its commitment to handle and store military
28 munitions responsibly in order to minimize the potential for harm to human health and the environment.
29 The Federal Facilities Compliance Act of 1992, which amended the Resource Conservation and Recovery
30 Act (RCRA), required the USEPA, in consultation with DoD and the states, to publish regulations that
31 specify when conventional and chemical military munitions become hazardous waste subject to Subtitle C
32 of RCRA, and provide for the safe storage and transportation of such waste. As a result, in 1997, USEPA
33 issued the final version of the Military Munitions Rule: Hazardous Waste Identification and
34 Management; Explosives Emergencies; Manifest Exemption for Transport of Hazardous Waste on Right-
35 of-Ways on Contiguous Properties (6622 *Federal Register* Vol. 62, No. 29, February 12, 1997). The rule
36 identifies when conventional and chemical military munitions become a hazardous waste under RCRA.
37 New Mexico has adopted the federal rule.

38
39 The term “military munitions” is defined to include all types of both conventional and chemical
40 ammunition products and their components, produced by or for the military for national defense and
41 security. Military munitions are not a solid waste for regulatory purposes: (1) when a munition is being
42 used for its intended purpose, which includes when a munition is being used for the training of military
43 personnel; when a munition is being used for research, development, testing, and evaluation; and when a
44 munition is destroyed during range clearance operations at active and inactive ranges; and (2) when a
45 munition that has not been used or discharged, including components thereof, is repaired, reused,
46 recycled, reclaimed, disassembled, reconfigured, or otherwise subjected to materials recovery activities.

47
48 Used or fired munitions are solid waste when they are removed from their landing spot and then either:
49 (1) managed off-range (*i.e.*, when transported off-range and stored, reclaimed, treated, or disposed of; or
50 (2) disposed of (*i.e.*, buried or landfilled) on-range. In both cases, when the used or fired munition is a

1 solid waste, it is potentially subject to regulation as a hazardous waste. Also, munitions that land off-
 2 range, and that are not promptly retrieved, are statutory solid waste.

3
 4 EPCRA requires facilities to report when the facility has manufactured, processed, or otherwise used a
 5 toxic chemical in excess of an applicable threshold quantity of that chemical. The DoD has developed the
 6 Toxic Release Inventory Data Delivery System (TRIDDS) program to calculate toxic emissions from
 7 munitions use. Range operations fall into the “otherwise used” category. Exceeding a threshold quantity
 8 does not restrict the use of the chemical; it only has to be reported. The threshold quantity for WP is
 9 10,000 pounds per year.

10
 11 **3.8.2 Environmental Consequences**

12 **Proposed Action**

13 Implementation of the Proposed Action would increase the amount of toxic chemicals used on the ranges.
 14 The USEPA requires that spills or accidental releases into the environment of one pound or more of a
 15 HAP be reported to the USEPA. When used on the designated ranges, the release of obscurants would
 16 not be considered a “spill,” because they would be used for their intended purposes. If obscurant
 17 munitions were to land off range, the materials would be handled as a hazardous waste requiring
 18 immediate proper treatment and/or disposal. If the off-range munition is not promptly rendered safe
 19 and/or retrieved, it would potentially be subject to RCRA corrective action. If the remedial action were
 20 infeasible, the range operator would maintain a record of the event for as long as any threat remains. The
 21 record would include the type of munition and its location (to the extent the location is known).

22
 23 In Table 3-9 is listed the projected annual use of obscurant compounds based on current STRAC
 24 recommendations. The number of munitions has been projected forward to the full training complement
 25 of combat teams as described in the *Fort Bliss Army Growth and Force Structure Realignment Final*
 26 *Environmental Impact Statement* March 2010. Based upon this projection, the release of WP is
 27 anticipated to annually exceed the TRI reporting threshold. Fort Bliss would therefore annually report the
 28 quantities of WP used during the previous year. Note that future STRAC authorizations could change
 29 from those listed.

30
 31 **Table 3-9. Projected Annual Use of Obscurant Compounds**

Compound	Brigade	DODIC	No.	Number of Brigades	Total Munitions	Pounds per Munition	Total Pounds
HC	IBCT	C479	176	2	352	1.4	493
Total							493
RP	IBCT	C870	144	2	288	2.11	608
RP	SBCT	C870	240	2	480	2.11	1,013
Total							1,621
WP	HBCT	CA03	490	6	2940	5.28	15,523
WP	HBCT	D528	52	6	312	12.8	3,978
WP	HBCT	D550	102	6	612	15.6	9,547
WP	IBCT	BA14	252	2	504	0.76	383
WP	IBCT	C454	99	2	198	3.26	645
WP	IBCT	CA03	420	2	840	5.28	4,435
WP	SBCT	BA14	360	2	720	0.76	547
WP	SBCT	CA03	660	2	1320	2.3	3,036
WP	SBCT	D528	48	2	96	12.8	1,224
WP	SBCT	D550	76	2	152	15.6	2,371
Total							41,689

32

1 **Alternative A**

2 The environmental consequences would be similar to the Proposed Action.

3

4 **Alternative B**

5 The environmental consequences would be similar to the Proposed Action.

6

7 **No Action Alternative**

8 Under the No Action alternative, range impact areas would continue to receive a variety of munitions

9 utilized in training Army forces. The Military Munitions Rule applies to all active ranges and munitions'

10 impact areas. Similar to the Proposed Action, munitions landing off range could be subject to RCRA

11 corrective action. At Fort Bliss, ordnance is expended using a variety of small arms, grenades, mortars,

12 howitzers, artillery, rockets, and missiles during training exercises and testing activities.

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1 **4.0 Cumulative Impacts**
2

3 Cumulative impacts are defined as the impacts on the environment that result from the incremental impact
4 of the action when added to other past, present, and reasonably foreseeable future actions.
5

6 An increase in military training with obscurant munitions could cumulatively increase the chance of
7 wildfires. The fire hazards associated with proposed increases in live-fire training of obscurant munitions
8 on Fort Bliss are generally expected to be contained within discrete areas. Fort Bliss and the BLM have
9 cooperating agreements to fight fires. Fort Bliss is currently actively working on fuel reduction and fire
10 breaks on Forest Service land within the FBTC. Increased threats of fire would be met with increased
11 management planning and resource allocation to limit the incidences of uncontrolled wild lands fires.
12

13 An increase in military training with obscurant munitions would cumulatively increase the quantities of
14 TRI chemicals reported annually by Fort Bliss under EPRCA. Obscurant munitions use would
15 cumulatively add to the amount of particulate matter generated from training exercises. However, since
16 most of the increase of WP, RP and HC used would be completely consumed during combustion, the
17 cumulative increase is not significant.
18

19 Because used munitions are not removed from the dudded impact areas, mortar and artillery shells that
20 are left behind may continue to release phosphorus residues into the soil. However, more than 90 percent
21 of the obscurant mixture would be used during combustion. WP is not regarded as persistent in the
22 presence of oxygen, but could remain for at least 4 months (Walsh and Collins 1993). Obscurant
23 munitions' residues would be in addition to energetic compounds and transformation products, and other
24 inorganics resulting from the live firing of a variety of munitions within the FBTC. Since the area has
25 been set aside as an impact area under previous analyses, cumulative increases in munitions by-products
26 have been planned, expected, and contained within these areas.

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1	5.0	Acronyms and Abbreviations
2		
3	1AD	First Armored Division
4	BCT	Brigade Combat Team
5	BLM	Bureau of Land Management
6	BMP	Best Management Practice
7	BRAC	Base Realignment and Closure
8	CAA	Clean Air Act
9	CEQ	Council on Environmental Quality
10	CFR	Code of Federal Regulations
11	CO	Carbon Monoxide
12	CO ₂	Carbon Dioxide
13	CWA	Clean Water Act
14	DAGIR	Digital Air/Ground Integration Range
15	DMPRC	Digital Multi Purpose Range Complex
16	DoD	Department of Defense
17	EA	Environmental Assessment
18	EIS	Environmental Impact Statement
19	EPCRA	Emergency Planning and Community Right to Know Act
20	ESA	Endangered Species Act
21	°F	Degrees Fahrenheit
22	FBTC	Fort Bliss Training Complex
23	FIRECON	Fire Conditions
24	FNSI	Finding of No Significant Impact
25	FORSCOM	Forces Command
26	g/kg	Grams per Kilogram
27	HAP	Hazardous Air Pollutant
28	HBCT	Heavy Brigade Combat Team
29	HC	Hexachloroethane
30	HE	High Explosive
31	IBCT	Infantry Brigade Combat Teams
32	ICRMP	Integrated Cultural Resource Management Plan
33	INRMP	Integrated Natural Resource Management Plan
34	Km	Kilometer
35	MACT	Maximum Achievable Control Technology
36	m	Meters
37	m ²	Square Meter
38	MEG	Military Exposure Guideline
39	mg/m ³	Milligrams per Cubic Meter
40	mm	Millimeter
41	mph	Miles Per Hour
42	NAAQS	National Ambient Air Quality Standards
43	NEPA	National Environmental Policy Act
44	NO ₂	Nitrogen Dioxide
45	O ₃	Ozone
46	OIC	Officers in Charge
47	Pb	Lead
48	PM-10	Particulate Matter Equal to or Less than 10 Microns in Diameter
49	PM-2.5	Particulate Matter Equal to or Less than 2.5 Microns in Diameter
50	PPEGL	Permissible Public Exposure Guidance Levels
51	RCRA	Resource Conservation and Recovery Act

1	ROD	Record of Decision
2	ROI	Region of Influence
3	RP	Red Phosphorus
4	SBCT	Stryker Brigade Combat Team
5	SPEGL	Short-term Emergency Guidance Levels
6	SO ₂	Sulphur Dioxide
7	SOP	Standard Operating Procedures
8	STRAC	Standards in Training Commission
9	TRIDDS	Toxic Release Inventory Data Delivery System
10	µg/g	Micrograms per Gram
11	µg/m ³	Micrograms per Cubic Meter
12	U.S.	United States
13	USACAS	U.S. Army Combined Arms Support
14	USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
15	U.S.C.	United States Code
16	USEPA	United States Environmental Protection Agency
17	USGS	U.S. Geological Survey
18	USFWS	U.S. Fish and Wildlife Service
19	VOC	Volatile organic Compound
20	WP	White Phosphorus
21	WSMR	White Sands Missile Range

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APPENDIX

**LOCATION of OBSCURANT MUNITIONS TARGET BOXES
on DOÑA ANA, DAGIR, and DMPRC FIRING RANGES**

Obscurant Firing Areas

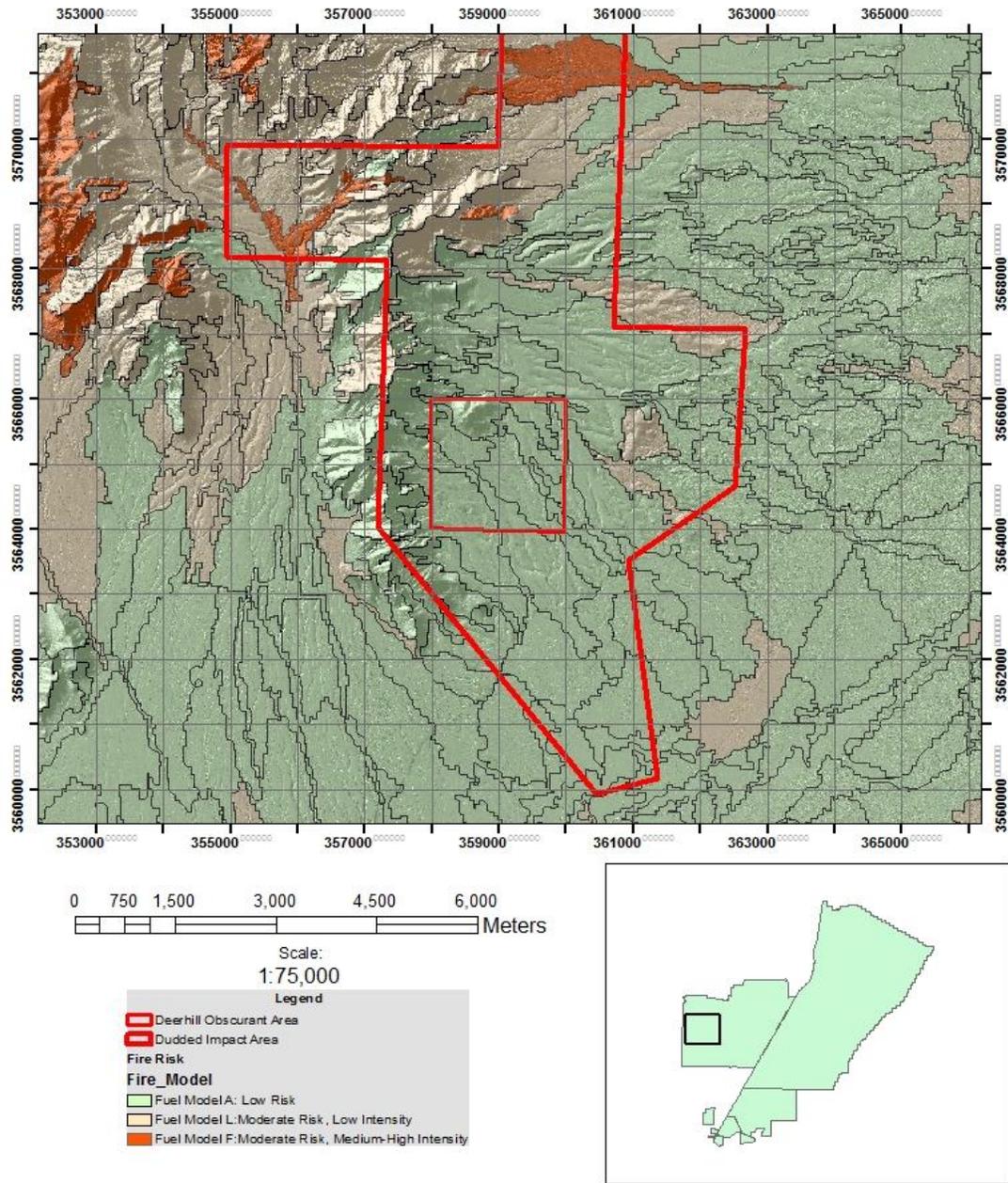


Figure A-1. Location of the 400 Hectare Doña Ana Obscurant Target Box at Grid 13, CS 66 58; 66 60; 64 58; 64 60; for the NW, NE; SW, & SE corners of the 2 x 2 km box.

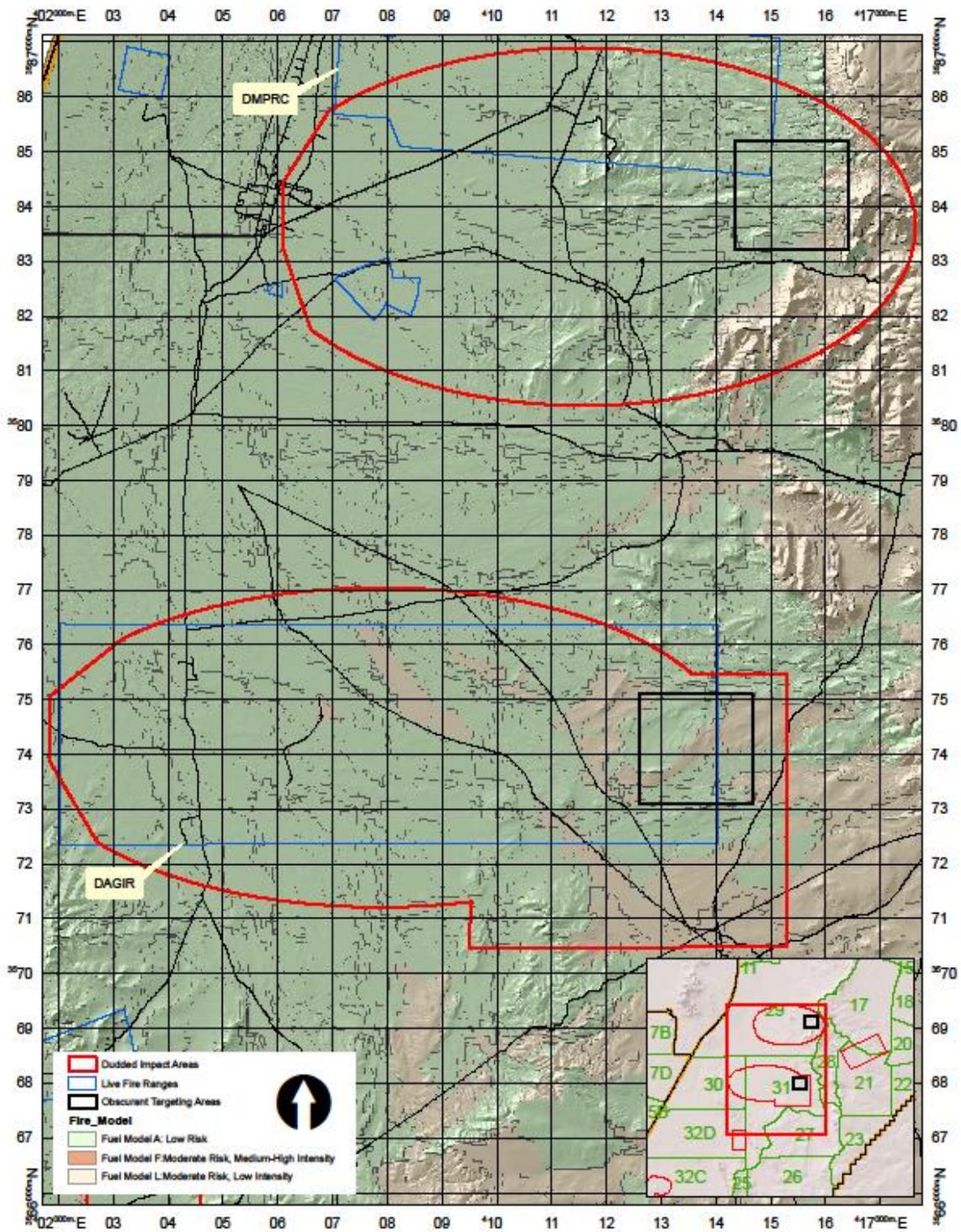


Figure A-2. Location of the 400 Hectare Obscurant Target Boxes at the DAGIR and DMPRC Firing Ranges. Boxes are notional and may move within the impact boundaries per Range Control delineation.

