ENVIRONMENTAL ASSESSMENT
OBSCURANT MUNITIONS TRAINING

FORT BLISS, TEXAS AND NEW MEXICO

Prepared by:

Fort Bliss
Directorate of Public Works
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May 2010

FINDING OF NO SIGNIFICANT IMPACT

OBSCURANT MUNITIONS TRAINING
AT
FORT BLISS, TEXAS AND NEW MEXICO

1.0 Introduction: To ensure Soldiers' preparedness, Army doctrine calls for the utilization of smokes and obscurants in military training areas. Due to recent Army stationing and growth decisions, Fort Bliss needs to provide capabilities in obscurant munitions (OM) training within the Fort Bliss Training Complex (FBTC). An Environmental Assessment (EA) was generated to assess the impacts of OM training on the human and natural environment.

2.0 Proposed Action and Alternative Actions: The EA evaluated a proposed action and three alternatives. The **Proposed Action** is the training with OM within existing unexploded ordinance impact areas of the Doña Ana Range, the Digital Air/Ground Integration Range (DAGIR, Range 88) and after firebreaks are constructed on the east side, within the Digital Multi Purpose Range Complex (DMPRC, Range 83). **Alternative A** would include obscurant training only on Doña Ana Range. **Alternative B** would exclude obscurant training at the DMPRC because of the firebreak requirement. Under the **No Action Alternative,** OM training would not be conducted within the FBTC and Soldiers at Fort Bliss would not complete training to Army doctrine.

3.0 Environmental Consequences: The EA provides an analysis of potential environmental impacts of the proposed action within the region of influence. Potential major effects identified were the initiation of wild land fires by obscurant munitions that could then affect cultural and natural resources. Human health risks could occur if obscurant compounds exceed short-term exposure guidelines to persons (troops or commuters on War Highway) outside of the impact areas. These impacts would be managed and reduced via operations planning and monitoring to less than significant. Existing impact areas with minimum vegetation cover would be designated for OM use and lessen the chance of wild land fires. Impact areas are also remote and thus exposure to Soldiers and the public would be minimized. Standard Army obscurant safety and health restrictions and/or requirements used at other installations would be enacted and officially incorporated into the Fort Bliss Regulation 350-1, Training Safety. Requirements would include no firing of obscurants under high danger fire conditions (New Mexico State Forestry fire ratings FIRECON 3 (High Danger) or FIRECON 4 (Very High Danger)), road closures if required, safety equipment issue and use, and construction/maintenance of necessary fire fighting lanes/breaks. The wild lands fire management plan, under coordination with the Bureau of Land Management, would be amended to address the increased risk of fire due to OM use.

4.0 Conclusion: I have reviewed the EA and have determined the Proposed Action, with the indicated safety, health and environmental protection measures would not have a significant impact on the natural or human environment and no further environmental review is required. It is my decision to implement the proposed action with those indicated mitigation measures.

Dana J. H. Pittard
Major General, US Army
Commanding

13 SEP 10
Date

ENVIRONMENTAL ASSESSMENT
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FORT BLISS, TEXAS AND NEW MEXICO

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EXECUTIVE SUMMARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

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

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

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

1.2 PURPOSE AND NEED

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

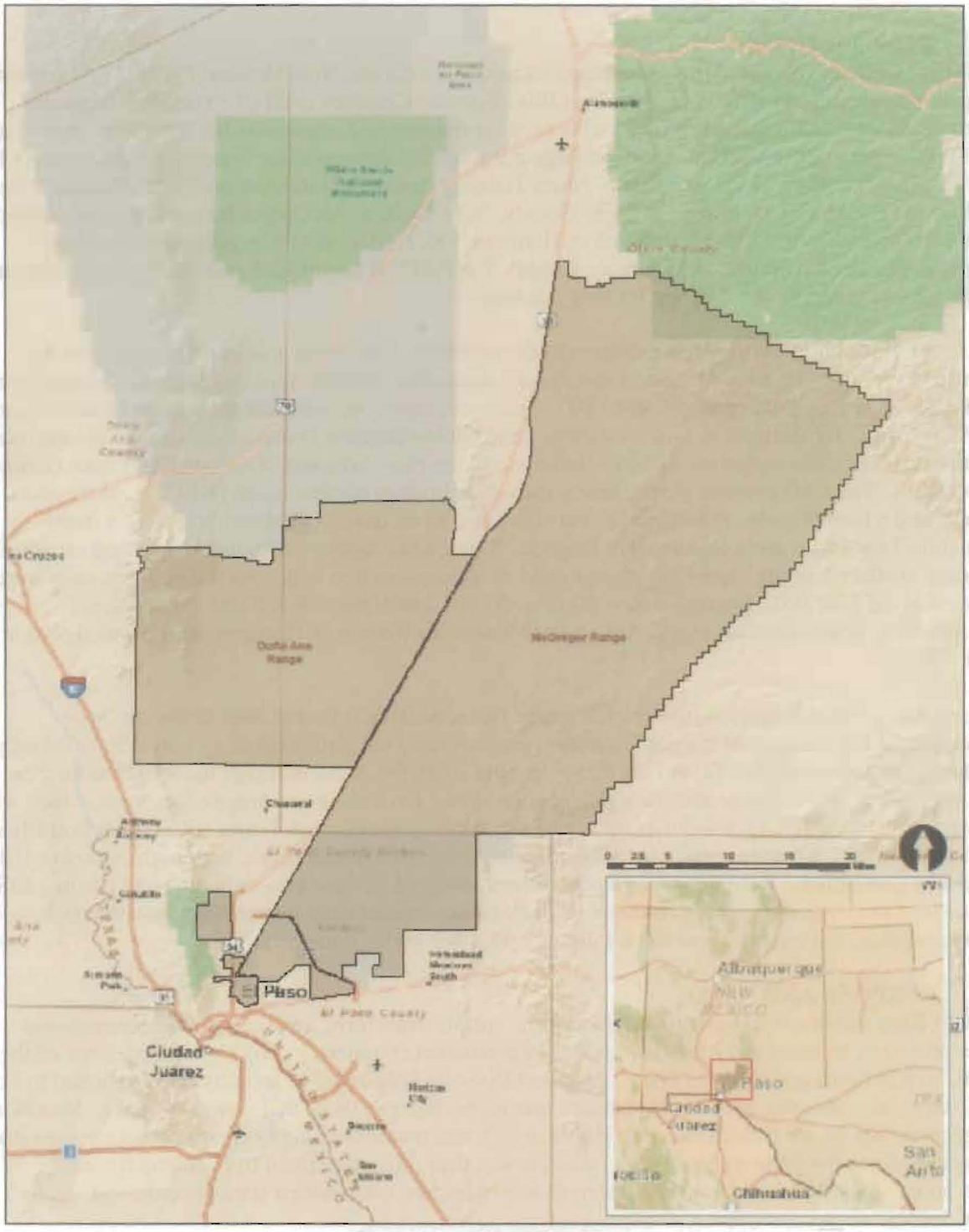

Figure 1. Location of Fort Bliss

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

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

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

1.3 SCOPE AND CONTENT OF THE ENVIRONMENTAL ASSESSMENT

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

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

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

1.4 DECISION(S) TO BE MADE

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

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

1.5 PUBLIC PARTICIPATION

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

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

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

2.1 PROPOSED ACTION

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

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

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

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

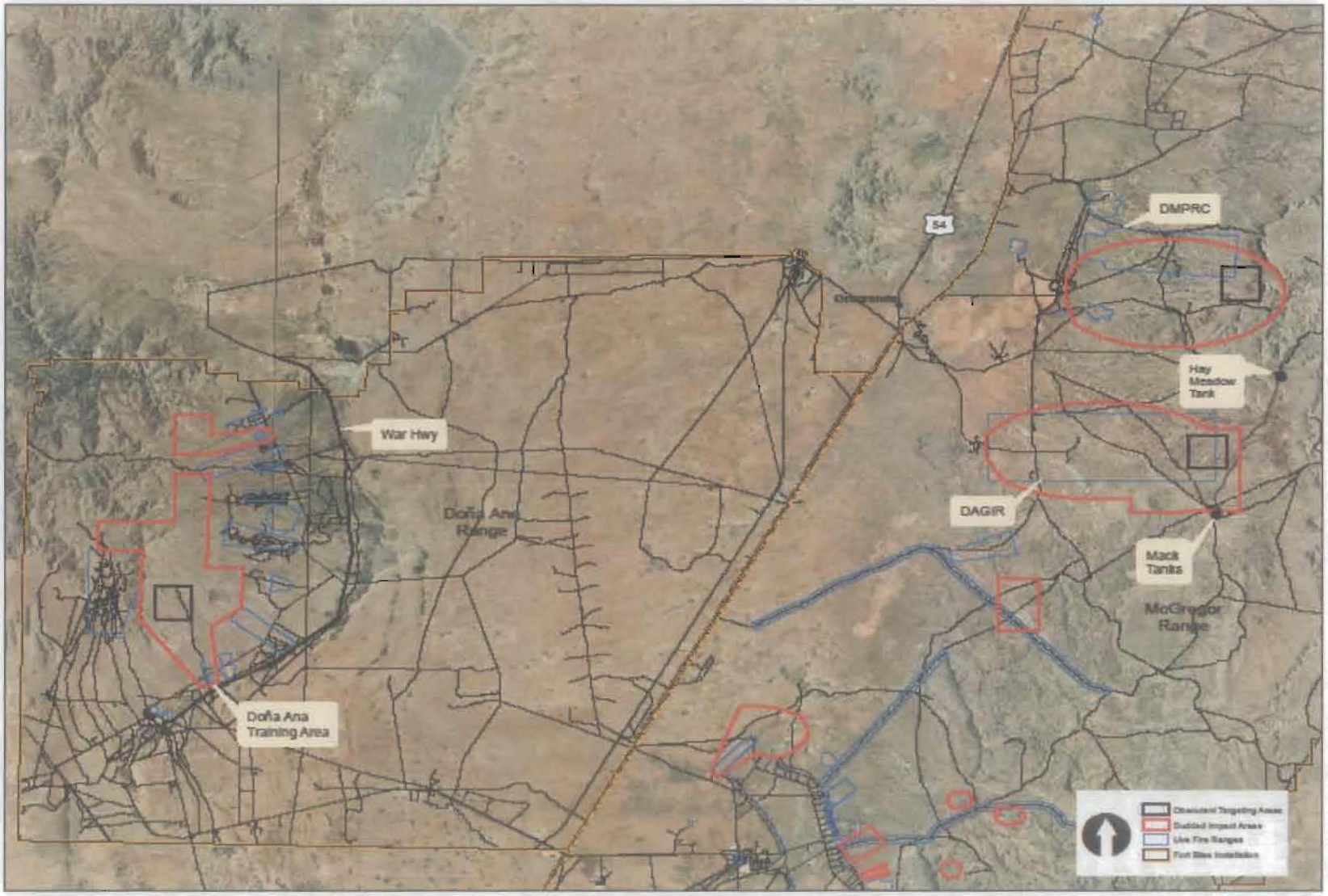

Figure 2. Proposed Obscurant Targeting Areas on Fort Bliss

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

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

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

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

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

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

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

2.2 ALTERNATIVES CONSIDERED

2.2.1 Alternative A

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

2.2.2 Alternative B

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

2.2.3 No Action Alternative

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

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

2.2.4 Alternatives Eliminated from Further Consideration

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

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

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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

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

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

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

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

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

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

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

Source: U.S. Army 2001

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

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

3.1.2 Environmental Consequences

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

Proposed Action

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

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

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

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

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

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

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

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

Alternative B
The environmental consequences would be the same or similar to the Proposed Action.

No Action Alternative
The dudded impact areas would continue to be utilized for munitions training by Army forces, but WP, RP, and HC obscurant munitions would not be used.

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

3.2 Air Quality

3.2.1 Existing Conditions

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

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

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

NAAQS are established by the U.S Environmental Protection Agency (USEPA) for criteria pollutants, including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in diameter (PM-10), particulate matter equal to or less than 2.5 microns (PM-2.5), and lead (Pb). NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare.

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

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

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

3.2.2 Environmental Consequences

Air quality impacts would be a concern if they:

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

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

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

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

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

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**

Source: Army 2007, VOC = volatile organic compound

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

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

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

Since WP, RP, and HC smoke compounds absorb moisture from the atmosphere, as relative humidity increases, the amount of screening material available for target obscuration increases. For example, the HC compound is considered to be only about 70 percent efficient; that is, for every 100 grams of HC in a munition, only 70 grams are available for screening. Phosphorous compounds are considered to be better screening agents than HC. This is because WP and RP have large yield factors for various relative humidities. The smoke from a WP munition typically forms a pillar, creating an excellent vertical screen, 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
	NOx	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
	NOx	0.015
	PM-2.5	3.5
	PM-10	3.5
	SO_2	0.0015
	TSP	3.6

Source: USEPA 2009, CO_2 = 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

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

Emission reports are not available for all projected munitions. Assuming all projected munitions released contain 0.64 pounds of CO_2, annual release of approximately 2.8 tons of greenhouse gases (CO_2) could occur. These amounts would be minimal when compared to overall transportation and electrical generation emissions of greenhouse gases.

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

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

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

3.3 Surface Water Resources

3.3.1 Existing Conditions

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

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

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

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

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

3.3.2 Environmental Consequences

Proposed Action

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

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

Alternative A

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

Alternative B

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

No Action Alternative

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

3.4 Groundwater

3.4.1 Existing Conditions

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

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

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

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

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

3.4.2 Environmental Consequences

Proposed Action

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

Alternative A

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

Alternative B

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

No Action Alternative

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

3.5 Biological Resources

3.5.1 Vegetation

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

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

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

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

3.5.2 Wildlife

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

3.5.3 Sensitive Species

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

Three categories of protection status are included in this section:
Federally Listed Threatened and Endangered Species - the ESA provides protection to species federally listed as endangered or threatened. Endangered species are those species that are at risk of extinction in all or a significant portion of their range. Threatened species are those that could be listed as endangered in the near future.

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

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

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

3.5.4 Environmental Consequences

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

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

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

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

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

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

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

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

An assessment of wild land fire risk that would result from the use of obscurant munitions 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.

Proposed Action

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

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

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

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

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

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

Shinn *et al.* (1985) conducted an initial screening of smokes and obscurants and estimated that WP, RP, and HC obscurant smokes could be potentially toxic to animals that forage on foliage on which obscurant smokes have been deposited. The foliage ingestion quotient used the calculated value of 6.5 grams per kilogram (g/kg) as an estimate of the amount of smoke products consumed by a rat when the foliage received deposition from smoke at an air concentration of 1000 milligrams per cubic meter (mg/m^3) for one-hour with a wind speed of approximately 1 mph. The foliage ingestion quotient was the ratio of rat ingestion to the oral 50 percent lethal dose for rats as determined from laboratory toxicity studies.

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

Wildlife foraging on vegetation within the impact areas would be less than significant because; no threatened or endangered wildlife species are known to inhabit the impact areas, the impact areas are not leased as grazing land, wildlife that might inhabit the impact areas are regionally common and although a potential exists that an individual may experience some toxic effects from foraging on vegetation coated with obscurant munitions by-products, the use of the impact areas for training discourages use of these areas by big game animals. Potential effects related to animal foraging would be limited to a minimal area (the obscurant impact areas) in relation to the entire FBTC. HC diffusing (howitzers) and WP bursting devices (mortars, guns, rockets, and howitzers) have a closely defined impact area with highest smoke concentrations estimated to cover an area of 100 square meters (m^2, 0.03 acres) to 12,000 m^2 (3 acres) (Shinn *et al.* 1985). With the requirements outlined in the Description of the Proposed Action, Fort Bliss anticipates the risk of fires to be manageable to acceptable levels.

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

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

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

3.6 Cultural Resources

3.6.1 Existing Conditions

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

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

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

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

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

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

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

3.6.2 Environmental Consequences

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

Proposed Action

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

Alternative A

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

Alternative B

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

No Action Alternative

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

Mitigation

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

3.7 Health and Safety

3.7.1 Existing Conditions

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

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

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

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

Source: National Research Council 1997, 1999

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

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

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

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

Source: USACHPPM 2003, Table C-2.

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

Maloney *et al.* (1992) measured fog-oil concentrations under stable conditions, to generate data for dispersion models, up to 4 kilometers (2.5 miles) from smoke pots. Maximum measured concentrations at 2 km (1.2 miles) were 2.5 and 2.1 mg/m^3 at 2 m and 8 m above the ground surface respectively. At 4 km, maximum concentrations were 0.5 and 0.2 mg/m^3 at 2 m and 8 m above the ground surface, respectively. Although these data are not directly translatable to HC, WP, and RP smokes' dispersion characteristics on the FBTC, they do indicate the potential for measurable quantities of smoke components to be transported some distance from an area of deployment.

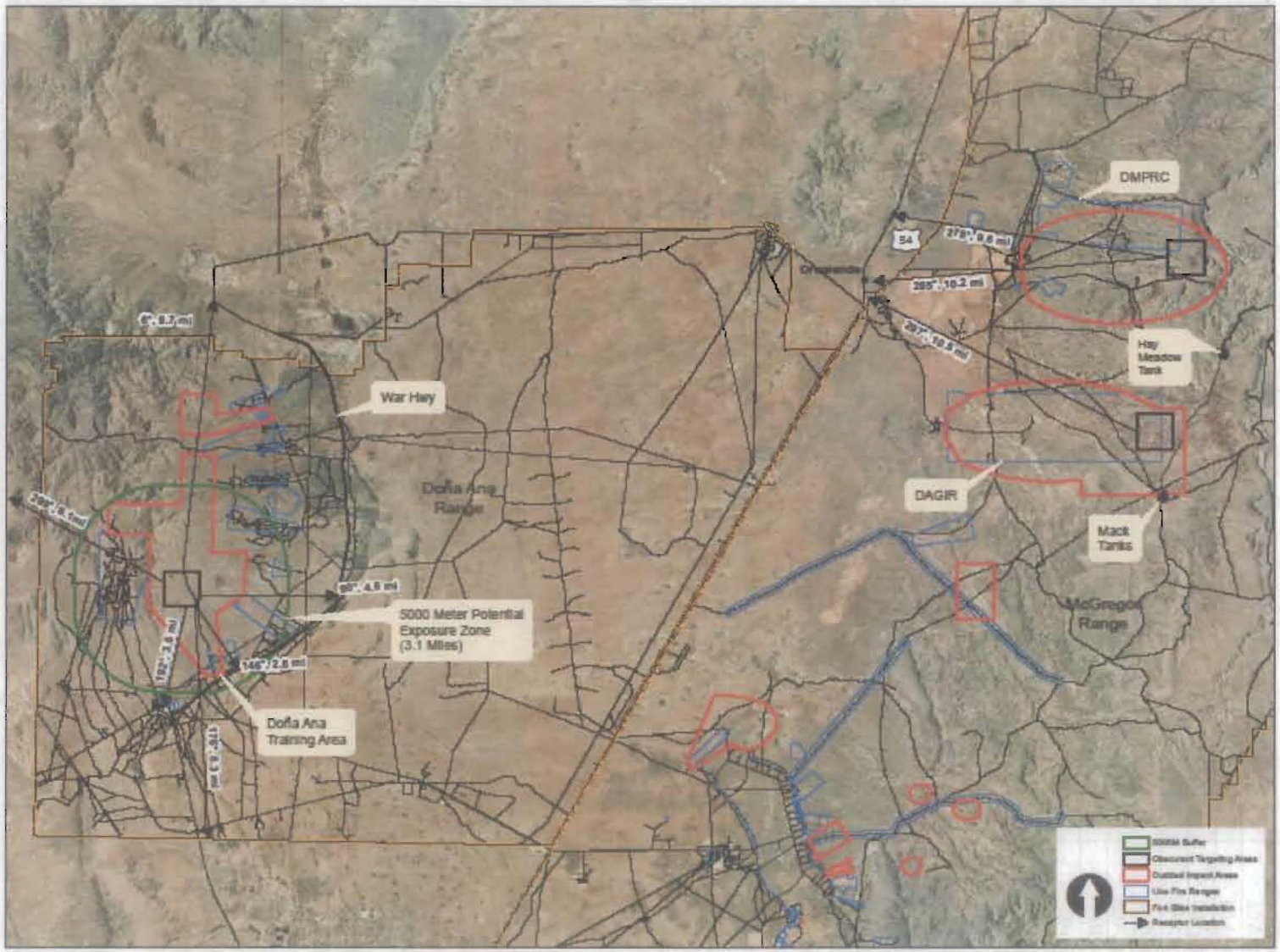

Figure 3. Potential Receptor Locations.

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 m^2, the estimated maximum ambient WP and phosphine concentrations were estimated to be 7 micrograms per cubic meter ($\mu g/m^3$) and 7 $\mu g/m^3$, 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/m^3 and 0.12 $\mu g/m^3$ (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 m^2, the estimated environmental concentration of smoke would be 5 to 25 mg/m^3 (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 m^2, may produce an environmental concentration of 1,800 to 3,500 mg/m^3 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/m^3 as phosphorus pentoxide (202 mg/m^3 as orthophosphoric acid) 100 m downwind from deployment and about 1.0 mg/m^3 as phosphorus pentoxide (1.4 mg/m^3 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

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

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

Alternative A

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

Alternative B

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

No Action Alternative

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

3.8 Hazardous Materials

3.8.1 Existing Conditions

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

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

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

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

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

3.8.2 Environmental Consequences

Proposed Action

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

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

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**

Alternative A
The environmental consequences would be similar to the Proposed Action.

Alternative B
The environmental consequences would be similar to the Proposed Action.

No Action Alternative
Under the No Action alternative, range impact areas would continue to receive a variety of munitions utilized in training Army forces. The Military Munitions Rule applies to all active ranges and munitions' impact areas. Similar to the Proposed Action, munitions landing off range could be subject to RCRA corrective action. At Fort Bliss, ordnance is expended using a variety of small arms, grenades, mortars, howitzers, artillery, rockets, and missiles during training exercises and testing activities.

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4.0 Cumulative Impacts

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

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

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

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

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5.0 Acronyms and Abbreviations

1AD	First Armored Division
BCT	Brigade Combat Team
BLM	Bureau of Land Management
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CWA	Clean Water Act
DAGIR	Digital Air/Ground Integration Range
DMPRC	Digital Multi Purpose Range Complex
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPCRA	Emergency Planning and Community Right to Know Act
ESA	Endangered Species Act
^0F	Degrees Fahrenheit
FBTC	Fort Bliss Training Complex
FIRECON	Fire Conditions
FNSI	Finding of No Significant Impact
FORSCOM	Forces Command
g/kg	Grams per Kilogram
HAP	Hazardous Air Pollutant
HBCT	Heavy Brigade Combat Team
HC	Hexachloroethane
HE	High Explosive
IBCT	Infantry Brigade Combat Teams
ICRMP	Integrated Cultural Resource Management Plan
INRMP	Integrated Natural Resource Management Plan
Km	Kilometer
MACT	Maximum Achievable Control Technology
m	Meters
m^2	Square Meter
MEG	Military Exposure Guideline
mg/m^3	Milligrams per Cubic Meter
mm	Millimeter
mph	Miles Per Hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
O_3	Ozone
OIC	Officers in Charge
Pb	Lead
PM-10	Particulate Matter Equal to or Less than 10 Microns in Diameter
PM-2.5	Particulate Matter Equal to or Less than 2.5 Microns in Diameter
PPEGL	Permissible Public Exposure Guidance Levels
RCRA	Resource Conservation and Recovery Act

ROD	Record of Decision
ROI	Region of Influence
RP	Red Phosphorus
SBCT	Stryker Brigade Combat Team
SPEGL	Short-term Emergency Guidance Levels
SO_2	Sulphur Dioxide
SOP	Standard Operating Procedures
STRAC	Standards in Training Commission
TRIDDS	Toxic Release Inventory Data Delivery System
µg/g	Micrograms per Gram
$\mu g/m^3$	Micrograms per Cubic Meter
U.S.	United States
USACAS	U.S. Army Combined Arms Support
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic Compound
WP	White Phosphorus
WSMR	White Sands Missile Range

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APPENDIX

LOCATION of OBSCURANT MUNITIONS TARGET BOXES

on DOÑA ANA, DAGIR, and DMPRC FIRING RANGES

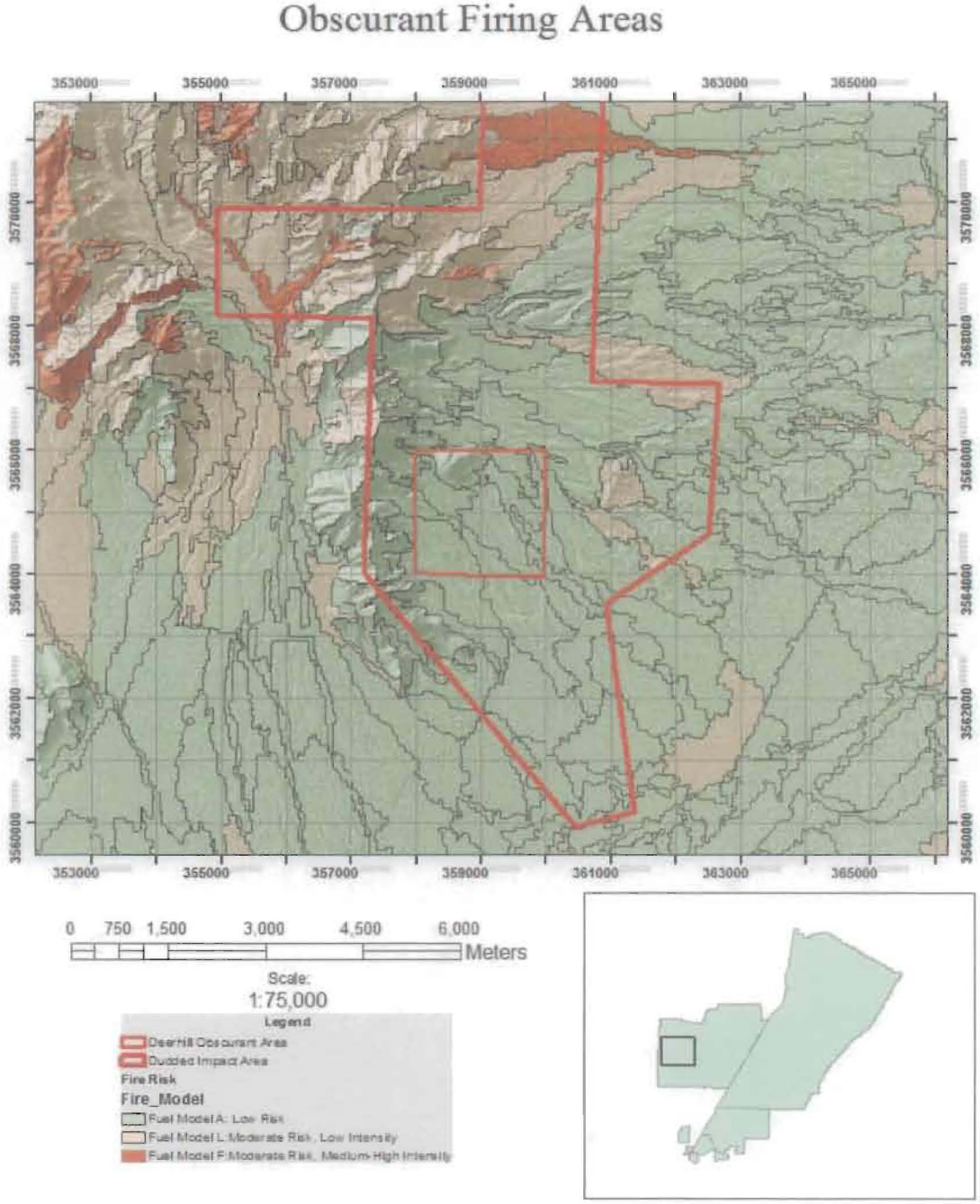

Figure A-1. Location of the 400 Hectare Doña Ana Obscurant Target Box at Grid 13, CS 66 58; 66 60; 64 58; 64 60; for the NW, NE; SW, & SE corners of the 2 x 2 km box.

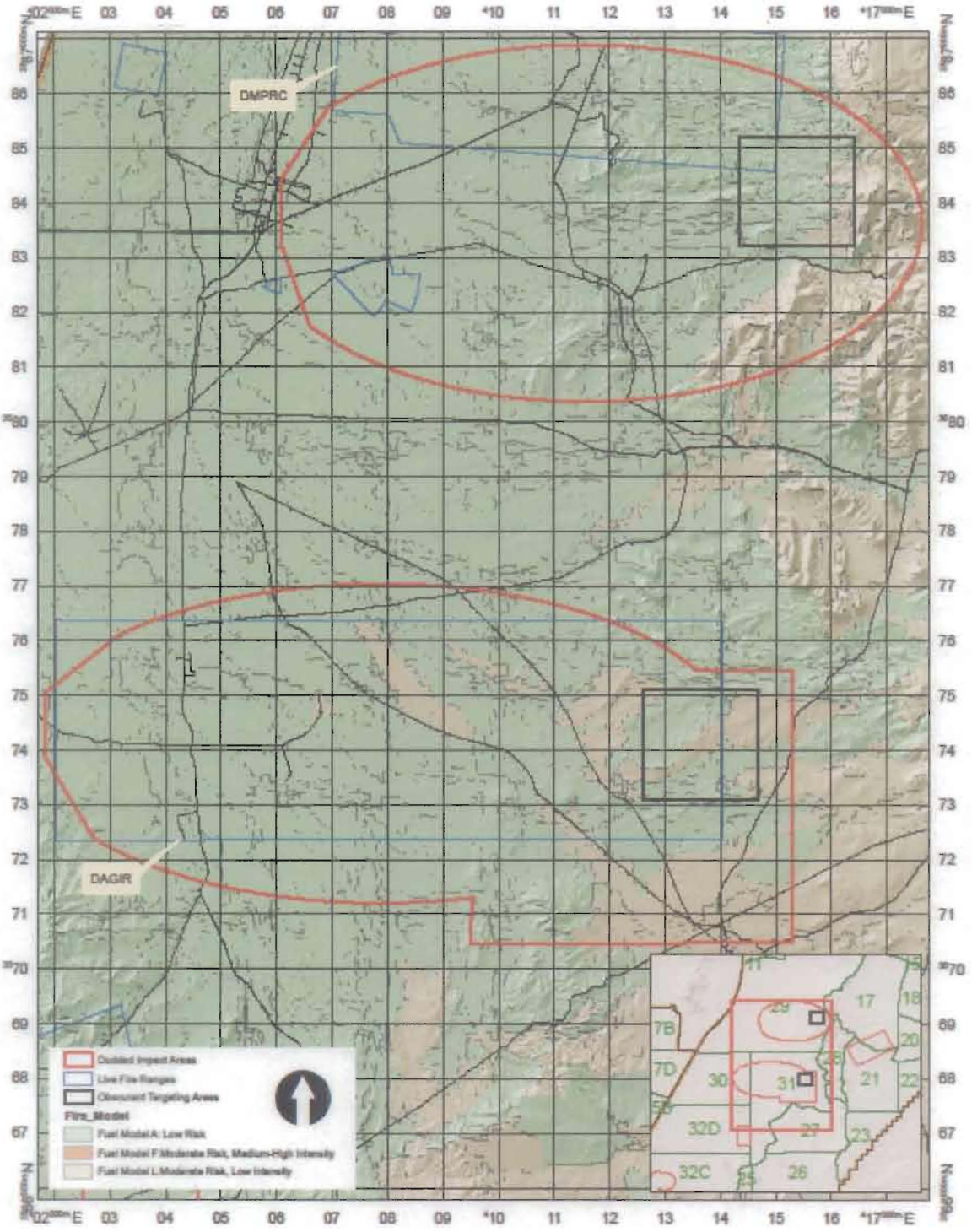

Figure A-2. Location of the 400 Hectare Obscurant Target Boxes at the DAGIR and DMPRC Firing Ranges. Boxes are notional and may move within the impact boundaries per Range Control delineation.