# Section 1

## 1.0 PURPOSE, BACKGROUND, AND SCOPE

### 1.1 Purpose and Need

This programmatic environmental impact statement (PEIS), prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, assesses the potential environmental impacts associated with executing the Department of Defense (DoD) Chemical and Biological Defense Program (CBDP). The DoD CBDP is designed to protect our soldiers, sailors, marines, and airmen from the evolving chemical and biological (CB) threats they may encounter on the battlefield. This vital component of the overall defense posture of the United States comprises research, development, and acquisition (RDA) activities conducted by the military services and DoD agencies for defensive measures and materiel required to meet potential CB warfare (CBW) threats.

These threats exist and will continue through the foreseeable future, even though many nations have signed and ratified the Biological Weapons Convention (BWC) of 1972 and the Chemical Weapons Convention (CWC) of 1997. Several nations are not parties to one or both of these treaties. Difficulties of verification and the relatively small resource base required to produce CB weapons leave open the possibility that signatory nations could violate the articles of these conventions or that nonsignatory nations or terrorists could ignore them completely. CB weapons constitute a potential component of an offensive arsenal that could be used by hostile parties, either overtly or covertly.

Generally, passive CB defense capabilities cover products that detect, decontaminate, or provide protection from CB warfare agents. Some RDA activities conducted under the CBDP necessarily involve use of hazardous chemicals or infectious disease agents for research, development, and production purposes. The controls on—and the potential environmental consequences of—such activities are a primary focus of this PEIS.

CBW threats also include chemical and/or biological terrorism. While the principal focus of the CBDP remains on the threats to the warfighter, the program vision recognizes the increasing role that DoD personnel and assets will play in support of missions that have not been the traditional domain of the military, namely, homeland security. Congress has been concerned about possible CB terrorist acts against civilians since the mid-1990s, following the subway chemical weapons incident in Japan. The preamble of the Defense Against Weapons of Mass Destruction Act of 1996 (Public Law 104-201, 1996) expresses congressional intent for the DoD CBDP to have a supporting role in homeland security:

> *Sharing of the expertise and capabilities of the Department of Defense, which traditionally has provided assistance to federal, state, and local officials in neutralizing, dismantling, and disposing of explosive ordnance, as well as… biological and chemical materials, can be a vital contribution to the development and deployment of countermeasures against biological and chemical weapons of mass destruction.*

In the wake of the terrorist attacks of September 11, 2001 and the anthrax-contaminated letters, the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense reiterated DoD's commitment to continue coordination of efforts with lead federal agencies and to assist civilian agencies through technology sharing and materiel support (Johnson-Winegar 2001). A key aspect of DoD's role in homeland security is a recognition that it will support and rely on other federal agencies, as well as state and local emergency responders and private organizations, in response to terrorist and other threats to the U.S homeland (U.S. DoD 2003).

## 1.2 Background

The proposed action consists of executing an integrated CBDP designed to protect our soldiers, sailors, marines, and airmen from the evolving CB threats they may encounter on the battlefield. Numerous environmental documents—environmental impact statements (EISs) and environmental assessments—have been prepared by DoD components and the military services to analyze and assess the potential impacts associated with different segments of the CBDP. With few exceptions, these environmental documents have been site specific, focusing on the potential environmental impacts of the activities at a particular location or facility. Despite this rather extensive portfolio of NEPA documents analyzing the potential environmental consequences of various CBDP elements, no single document analyzes the potential environmental impacts of the full range of CBDP activities. In keeping with NEPA purposes, DoD has now determined to prepare such a document. This EIS is programmatic because the proposed action is national in scope and involves a number of separate but related activities. In accordance with Council on Environmental Quality (CEQ) regulations (40 *Code of Federal Regulations* [CFR] 1502.4(c), 1502.20, and 1508.23), a programmatic environmental analysis such as this can be used to facilitate future related analyses, thereby eliminating repetitive discussions of similar matters. This *Chemical and Biological Defense Program Programmatic Environmental Impact Statement* (*CBDP PEIS*) will provide an overarching framework to facilitate future government decision making within the program. When subsequent NEPA analyses are required under the CBDP, this PEIS will enable such analyses to focus on the key issues. It will also provide a single, up-to-date information resource for the public.

### 1.2.1 Contents of Programmatic Environmental Impact Statement

This introductory section includes a brief description of the CBDP in Section 1.2.2 and a detailed discussion of the scope of the environmental review in Section 1.3. The proposed action is detailed in Section 2. CEQ regulations implementing NEPA require consideration of the No Action and other reasonable alternatives. The No Action Alternative is discussed in Section 3 and compared to the proposed action. The selection of the proposed action as the Preferred Alternative in Section 3 is supported by descriptions of the existing environments in Section 4 and by analyses of health and environmental consequences of the proposed action and the No Action Alternative in Section 5. The conclusions of this PEIS are stated in Section 6.

### 1.2.2 Description of the Chemical and Biological Defense Program

#### *1.2.2.1 Mission Objectives and Program Management*

Prior to 2003, the mission of the DoD CBDP was to provide world-class CB defense capabilities to allow U.S. military forces to survive and successfully complete their operational missions in

battlespace environments contaminated with CBW agents. In 2003, however, this mission expanded to cover military capability to operate in the face of threats in homeland security missions, as well as warfighter missions. If our military forces are not fully prepared to meet these threats, the consequences could be devastating. Over the next year, DoD will review this mission and the supporting operational goals to address its evolving role in combating terrorism and homeland security.

The Army, Navy, Air Force, Marine Corps, Joint Program Executive Office for Chemical and Biological Defense (JPEO CBD), and Defense Advanced Research Projects Agency (DARPA) all conduct RDA activities under the CBDP. Congress has mandated the coordination and integration of all DoD CB defense programs (Public Law 103-160, 1993). A separate CBW Defense Program was created under Public Law 104-201. As required by Congress, DARPA coordinates its CBDP with those of the military departments and other DoD agencies to avoid unnecessary duplication of activities.

The CBDP is limited to RDA of passive defensive measures and materiel, as indicated above. Ratified treaty commitments of the United States, as a signatory of the BWC and CWC, prohibit the development, production, acquisition, and stockpiling of CB weapons. The CBDP is separate from the Chemical Demilitarization Program, which has been disabling and destroying former chemical weapon stockpiles. The Chemical Demilitarization Program is covered by its own EISs (Office of the Program Executive Officer, Chemical Demilitarization 1988; Project Manager, Non-Stockpile Chemical Warfare Materiel 2001).

In DoD Directive 5160.5, 1 May 1985, DoD designated the Department of the Army as the Executive Agent for its CBDP, an action that was subsequently required by Congress (Public Law 103-160, 1993). The program is coordinated among the armed services, JPEO CBD, and DARPA. The CBDP is also coordinated with the Department of Homeland Security CB Nonproliferation Program, the Biodefense Research Program of the National Institute of Allergy and Infectious Diseases within the National Institutes of Health, an agency of the Department of Health and Human Services, and other federal agencies whose primary focus is developing a defensive program to protect the U.S. civilian population from the threat of exposure to CB agents.

The annual DoD budget submission to Congress specifically identifies funds requested for the CBDP. DARPA's CBDP is set forth as a separate program element in that agency's budget. A report on the CBDP is submitted annually to Congress. The most recent report (U.S. DoD April 2003) may be downloaded from the DoD website (http://www.acq.osd.mil/cp/reports.html).

#### *1.2.2.2 Commodity Areas*

The DoD CBDP,[1] which consists of RDA activities at numerous military installations and contractor facilities throughout the United States, is organized into six operationally oriented commodity areas. Each commodity area is managed by one of the military services and has an activity focus as follows:

[1] DARPA's CBDP, although organized in a somewhat different structure than described here, follows a general approach to addressing environmental impacts consistent with that of the DoD CBDP.

### *1.2.2.2.a Contamination Avoidance*

Contamination avoidance includes CB reconnaissance, detection, identification, warning, and reporting. Earliest possible warning is fundamental to avoiding CB agent contamination. RDA activities under Contamination Avoidance focus on pursuit of technological advances in CB standoff detection, remote/early warning detection, sensor miniaturization, and improved detection sensitivity. The Army manages this commodity area.

If early warning is not possible or units are required to occupy or traverse CB-contaminated environments, collective and individual protection systems provide our warfighters with life-sustaining and continued operational capabilities (see Sections 1.2.2.2.b and 1.2.2.2.c).

### *1.2.2.2.b Collective Protection*

Collective protection equipment includes both stand-alone shelters and integrated systems that provide contamination-free, environmentally controlled surroundings for warfighters to perform their missions. Collective protection in the form of overpressure can be applied to mobile and fixed command posts, medical facilities, rest and relief shelters, buildings, fixed sites, vehicles, aircraft, and ships. RDA activities under Collective Protection concentrate on pursuing technological advances that improve generic CB protective filters and fans. Advances that reduce the weight, volume, cost, logistics, and manpower requirements associated with providing collective protection are also objectives. The Navy manages this commodity area.

### *1.2.2.2.c Individual Protection*

Individual protection equipment includes protective masks, suits, boots, and gloves. RDA activities under Individual Protection seek technological advances that provide an individual with improved vision and voice capabilities, increased protection levels, and reduced heat stress. Advances that reduce the weight, volume, cost, logistics, and manpower requirements associated with providing individual protection also are objectives. The Marine Corps manages this commodity area.

### *1.2.2.2.d Restoration*

If contamination cannot be avoided, personnel and equipment must be decontaminated to reduce and/or eliminate hazards after CB agent exposure. Decontamination systems provide a regeneration capability for contaminated units. Modular decontamination systems are being produced to provide decontamination units with the capability to tailor their equipment to support specific missions. RDA activities under Restoration focus on pursuing technological advances in sorbents, coatings, and physical removal, which will reduce logistics burden, manpower requirements, and lost operational capability associated with decontamination operations. The Air Force manages this commodity area.

### *1.2.2.2.e Medical Systems*

Medical systems include pharmaceuticals, biologics, and devices that preserve combat effectiveness by timely provision of medical countermeasures in response to CB agent threats. RDA activities under Medical Systems include development of vaccines and pharmaceuticals that prevent the lethal and/or incapacitating effects of CB agents; development of therapeutic

drugs and other life support equipment that improve survival and lessen time for return to duty; and development of rapid portable diagnostics that enable quick medical response for exposed warfighters. The Army manages this commodity area.

#### *1.2.2.2.f Battlespace Management*

Battlespace Management is a tool used to track and maintain battlespace situational awareness, to provide hazard warning and prediction, and for planning or modification of operations. Also, Battlespace Management is intended to provide a capability for the warfighter to train in a realistic manner without the use of live CB agents. RDA activities under Battlespace Management include meteorological models; transport and dispersion models; hazard and casualty assessment; computational fluid dynamics; hydrocodes; and constructive, live, and virtual simulation. The Navy manages this commodity area.

### *1.2.2.3 CBDP Research, Development, and Acquisition Activities*

RDA activities under the CBDP are conducted in the context of numerous operational, safety, security, and regulatory controls. These controls, in essence, define "normal" conditions for CBDP activities. This PEIS has evaluated CBDP activities and their associated controls via detailed analyses of how controls on potential environmental impacts have worked in practice at selected "example sites," focusing particularly on programmatic concerns (see Section 1.3.3).

For purposes of this environmental impact analysis, RDA activities under the CBDP have been subdivided into discrete, functional components that can be evaluated individually. These components are categorized as Research, Development, Test, and Evaluation (RDT&E); Operations, Maintenance, and Waste Management (OMWM); and Administration. Details of each component and its underlying activities are presented in Section 2.2.1.

#### *1.2.2.3.a Research, Development, Test, and Evaluation*

RDT&E activities under the CBDP comprise the following:

- Prototype development of materials for various commodity area purposes
- Testing of CBDP prototype materials
- All other use and handling of CBDP-specific chemical surety materiel (CSM), toxic industrial chemicals, or hazardous biological materials
- Maintenance of safety equipment required for CBDP-specific hazardous materials
- Laboratory animal care and use
- Use of human subjects
- Other support work for RDT&E activities

#### *1.2.2.3.b Operations, Maintenance, and Waste Management*

OMWM activities under the CBDP comprise the following:

- Operation of the utility systems that serve RDT&E activities under the CBDP, including water, steam, electrical, drainage, heating, ventilating, and air conditioning

- Routine structural repairs and maintenance of the buildings and grounds used for RDT&E activities under the CBDP
- Handling, storage, treatment, monitoring, and disposal of waste streams resulting from RDT&E activities, including exhaust air emissions, solid waste, wastewater streams, hazardous waste, and medical waste

*1.2.2.3.c Administration*

Administrative activities under the CBDP include the following:

- Management, accountability, and projection of the CBDP budget
- Administration of personnel, contracts, and program activities
- Preparation of RDT&E test methods
- Publication of CBDP accomplishments in open, referenced, scientific literature
- Review, analysis, and planning of projects to achieve CBDP mission objectives

## 1.3 Scope of Environmental Review

### 1.3.1 Public Participation

On 4 June 2001, the U.S. Army announced its intention to prepare a PEIS that would assess the potential environmental impacts associated with executing the DoD CBDP. To identify concerns germane to this PEIS and to afford the affected public and government agencies opportunities for meaningful input, the Army conducted scoping activities, including: disseminating information packages to the public and government activities; publishing notices in local newspapers; coordinating with public-interest groups; and establishing a public *CBDP PEIS* website (http://chembioeis.detrick.army.mil). A copy of the Stakeholder and Public Involvement Plan documenting the various outreach activities appears in Appendix A.

Subsequent to the scoping activities and data collection, the U.S. Army prepared the Draft PEIS (DPEIS) and announced its availability in the *Federal Register* on May 5, 2003. Concurrent with the *Federal Register* notice, the DPEIS was announced to example site representatives, to identified potential stakeholder organizations, and in newspapers of major circulation in and around example sites. Further, the DPEIS was posted on the *CBDP PEIS* website, sent to local libraries, and submitted to federal and state agencies, potentially impacted Indian tribal groups, citizen advisory groups, and individuals upon request for review and comment. Written comments were received from federal and state agencies through August 13, 2003. All comments were addressed and changes were made to the DPEIS in preparation of the Final PEIS. Details of the comments received during the DPEIS public review period and the resolution thereof are provided in Appendix B.

This Final PEIS was distributed along the same lines as noted for the DPEIS. Details of the DPEIS public review plan and the Final PEIS distribution plan appear in Appendix A.

### 1.3.2 Identification of Significant Issues

The CBDP and its potential impacts on the environment were analyzed in the context of past occurrences, the types of activities conducted, existing control measures, and the extent of what

can reasonably be expected to happen under specific circumstances or can be predicted, given existing knowledge and application of scientific methodology.

CBDP activities were also analyzed in relationship to similar RDA activities occurring in the private sector, where many universities and research institutions routinely work with hazardous CB substances outside of the CBDP. Comparisons were made to the nature of hazardous CB substances used and to the impacts seen on human health and the environment.

A preliminary list of health and safety issues related to the CBDP was developed primarily from existing programmatic NEPA documents (U.S. Army Medical Research and Development Command [USAMRDC], April 1989, and Joint Vaccine Acquisition Program [JVAP], September 1997). Subsequent site-specific NEPA documentation was also examined. No additional concerns were identified, nor were any proposed during public scoping. The current list includes the following concerns for RDA activities under the CBDP:

- High-hazard biological materials—naturally occurring infectious agents for diseases that may have serious or lethal consequences (for the purposes of this document, those materials requiring biosafety level-3 and -4 containment facilities and procedures)
- CSM—high-hazard substances (not including industrial chemicals, riot-control agents, chemical herbicides, smoke, or flame) intended for use in military operations through their physiological properties: chemical surety comprises a system of safety and control measures for protection of workers, public health, and the environment
- Outdoor aerosol testing with simulants—dispersion in the air of very small liquid droplets or solid particles, less than 0.01 millimeters in diameter, of biological organisms and chemicals that are substituted for their more hazardous counterparts
- Genetically engineered microorganisms (GEMs)—microorganisms (e.g., bacteria) that have been intentionally modified by alteration of genetic information
- Outdoor testing with lasers—devices that emit highly amplified and coherent radiation of one or more discrete frequencies, with potential hazards for accidentally exposed persons ranging from interference with vision to permanent retinal damage
- Vaccines and drug therapy—preparations intended to provide immunity to infectious diseases and treatments for chemical exposure, respectively
- Security—intentional unauthorized removal of highly hazardous CB materials for purposes of terrorism

### 1.3.3 Technical Approach

As noted previously, the sites for executing CBDP activities are located at numerous military installations and private facilities throughout the United States and in other countries. The CBDP is a dynamic program; each year, new short- and long-term RDA activities are initiated in both existing and new locations while others are terminated.

It was not necessary, however, to examine all CBDP activities at all of these sites in detail for this PEIS. The technical approach to gauge the environmental impact of the CBDP was to demonstrate how the environmental compliance programs within the CBDP are actually working, via detailed analyses for selected example sites. This approach, which was proven in

previous programmatic NEPA documents (USAMRDC, April 1989, and JVAP, September 1997), was applied to this PEIS using an iterative three-pronged process, as follows:

- The first prong entailed the identification of programmatic issues by evaluating CBDP component activities for possible impacts on environmental attributes, as described in Sections 1.3.3.2 and 4.1. Existing environmental attributes at the example sites are discussed in Sections 4.2 through 4.7.
- The second prong involved evaluating how the environmental compliance programs of the military services, JPEO CBD, and DARPA deal with these possible environmental impacts. This was accomplished via identification and review of benchmark guidelines and regulations for animal care and use, human subjects, CSM, and special mitigation measures for waste management and safety, health, and security, as discussed in Section 2.3, and discussion of the example sites with respect to CBDP activities and associated mitigation measures in Section 2.4.
- In the third prong, the performance of the various compliance programs was demonstrated via detailed environmental analyses for each of the selected example sites in Sections 5.2 through 5.12 and programmatic evaluation of the analyses in Sections 5.13 and 5.14.

To ensure that the CBDP was subjected to a thorough analysis, the program components at the selected example sites were examined carefully and probed for potential adverse environmental impacts using a systematic, interdisciplinary approach. In addition, information and insight were sought during the public scoping process from the public and the government communities (see Appendix A).

#### *1.3.3.1 Example Sites*

Nine facilities were chosen as example sites for detailed environmental analysis of CBDP activity in this PEIS (see **Figure 1-1)**. These sites were deemed representative of the full breadth of CBDP activities, and specifically covering the most significant activities, based on the following criteria:

- Both biological defense and chemical defense activities
- Both medical and nonmedical CBDP activities
- RDA activities within each CBDP commodity area
- At least one site operated by each military service
- At least one site that may perform contracts funded in whole or in part by DARPA and PEO CBD
- Both military and nonmilitary sites
- Sites of continuing or potential public interest
- Recognized issues

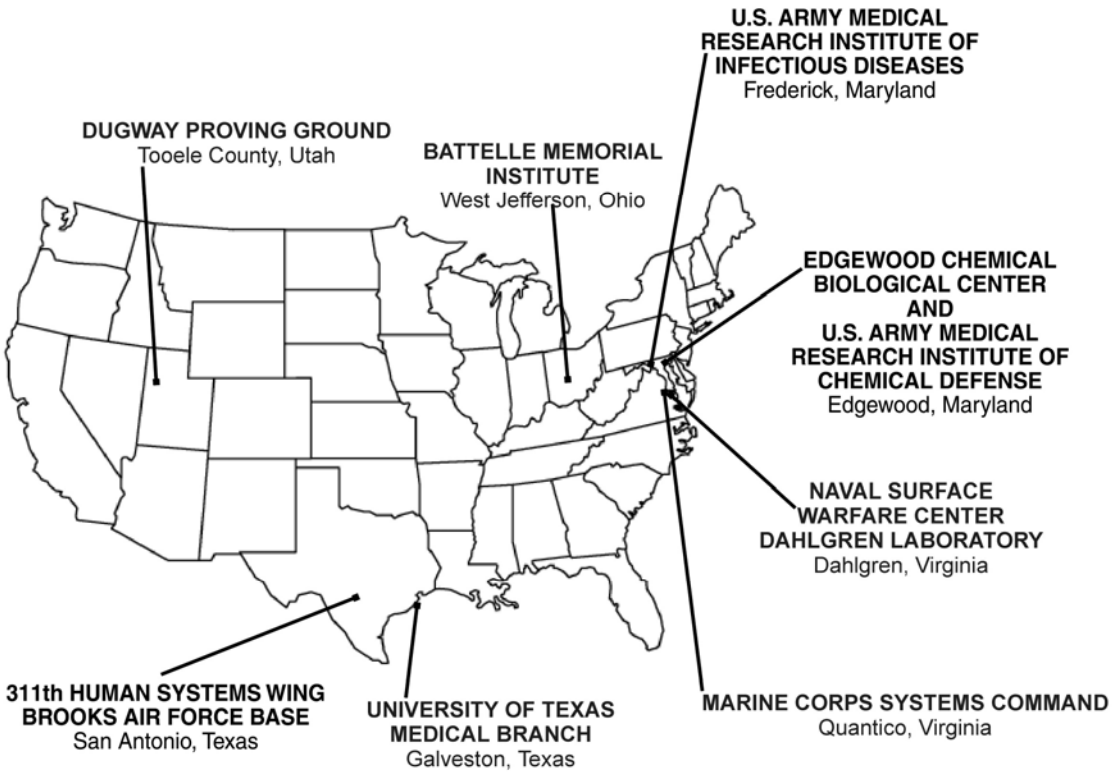


**Figure 1-1. Map of the Example Site Locations**

The selected example sites are as follows:

*1.3.3.1.a Edgewood Chemical Biological Center*

The Edgewood Chemical Biological Center (ECBC) is located at the Edgewood Area of Aberdeen Proving Ground, Maryland. The ECBC is an activity under the Soldier and Biological Chemical Command,[2] the principal Army command for nonmedical CBDP activities. Research and development activities are conducted at—or administered from—this site, for both biological defense and chemical defense. Contamination Avoidance is the principal commodity area, but this site also serves activities under Collective Protection, Individual Protection, and Restoration. Known issues for this site include CSM and high-hazard biological materials. A more detailed description of this site, including discussion of the existing environment, appears in Section 4.2. CBDP activities at this site are presented in Section 2.4.1 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

*1.3.3.1.b U.S. Army Medical Research Institute of Chemical Defense*

The U.S. Army Medical Research Institute of Chemical Defense (USAMRICD), located at the Edgewood Area of Aberdeen Proving Ground, Maryland, is the principal DoD research site for medical chemical defense. USAMRICD is under the U.S. Army Medical Research and Materiel

[2] The Soldier and Biological Chemical Command (SBCCOM) is referred to throughout this Programmatic EIS; however, it was deactivated in October 2003. The research and development functions of SBCCOM were incorporated into the Research Development and Engineering Command (RDECOM). The Edgewood Chemical and Biological Center (ECBC) is also now a part of RDECOM.

Command (USAMRMC). Medical Systems is the principal commodity area. There is ongoing public interest in this site, and CSM is known to be of concern. A more detailed description of this site, including discussion of the existing environment, appears in Section 4.2. CBDP activities at this site are presented in Section 2.4.2 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.c Naval Surface Warfare Center Dahlgren Laboratory*

The Naval Surface Warfare Center Dahlgren Laboratory (NSWCDL), located near Dahlgren, Virginia, is the principal Navy site for nonmedical activities under the CBDP. Testing activities are conducted at—or administered from—this site, for both biological defense and chemical defense. The principal Commodity Areas are Collective Protection and Battlespace Management. A more detailed description of this site, including discussion of the existing environment, appears in Section 4.3. CBDP activities at NSWCDL are presented in Section 2.4.3 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.d U.S. Army Medical Research Institute of Infectious Diseases*

The U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), located on Fort Detrick in Frederick, Maryland, is the principal DoD research site for medical biological defense. USAMRIID is under the command of USAMRMC. Medical Systems is the principal commodity area. Known issues for this site include aerosol testing, GEMs, and high-hazard biological materials. There is also ongoing public interest in this site. A more detailed description of this site, including discussion of the existing environment, appears in Section 4.4. CBDP activities at this site are presented in Section 2.4.4 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.e Dugway Proving Ground*

Dugway Proving Ground, under the U.S. Army Test and Evaluation Command, is located near Tooele, Utah, and is a site for nonmedical testing activities for both biological defense and chemical defense. Contamination Avoidance is the principal commodity area. There is ongoing public interest in this site, which has known concerns about aerosol testing, CSM, and high-hazard biological materials. A more detailed description of this site, including discussion of the existing environment, appears in Section 4.5. CBDP activities at this site are presented in Section 2.4.5 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.f University of Texas Medical Branch*

The University of Texas Medical Branch (UTMB) in Galveston, Texas, a nonmilitary site for medical research activities, conducts a current large-award program under the CBDP. The Space and Naval Warfare Systems Command is the primary contracting agency working with UTMB under the CBDP. DARPA is likely to work with UTMB in the future, although they do not have a relationship at this time. The principal commodity areas are Contamination Avoidance and Medical Systems. High-hazard biological materials are a known issue for this site. A more detailed description of this site, including discussion of the existing environment, appears in

Section 4.6. CBDP activities at UTMB are presented in Section 2.4.6 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.g Battelle Memorial Institute, West Jefferson*

The Battelle Memorial Institute operates a unique medical research and evaluation facility in West Jefferson, Ohio, which is a site for research and testing activities under the CBDP, for both biological defense and chemical defense. The CBDP activities at this site are mainly executed under contracts with the JVAP for Joint Program Office for Biological Defense and with USAMRMC for the Army. Medical Systems is the principal commodity area. Known concerns for this site include aerosol testing, GEMs, and high-hazard biological materials. A more detailed description of this site, including discussion of the existing environment, appears in Section 4.7. CBDP activities at this site are presented in Section 2.4.7 and are analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.h 311th Human Systems Wing*

At Brooks Air Force Base, located near San Antonio, Texas, the 311th Human Systems Wing administers contracts and interagency agreements for nonmedical chemical defense development and testing activities for all services. No direct RDT&E or OMWM activities under the CBDP are conducted at this site. Restoration is the principal commodity area, but this site also serves activities under Contamination Avoidance, Collective Protection, and Individual Protection. CBDP activities at this site are presented in Section 2.4.8 and analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.1.i Marine Corps System Command*

The Marine Corps Systems Command, located near Quantico, Virginia, is the principal Marine Corps site for activities under the CBDP. Contracts and interagency agreements for nonmedical development and production activities are administered from this site. No direct RDT&E or OMWM activities under the CBDP are conducted. Individual Protection is the principal commodity area, but this site also serves Collective Protection, Contamination Avoidance, and Restoration. CBDP activities at this site are presented in Section 2.4.9 and analyzed with respect to environmental and health consequences and mitigation measures in Sections 5.2 through 5.14.

### *1.3.3.2 Attribute Areas for Environmental Analysis*

The following sections (1.3.3.2.a through 1.3.3.2.k) enumerate the environmental, health, and socioeconomic attributes used in analyzing impacts of CBDP component activities at the example sites. The existing environments at the example sites are described in terms of these attributes in Sections 4.1 through 4.7. Attribute analysis is applied to environmental and health consequences of CBDP activities and mitigation measures in Sections 5.2 through 5.14.

#### *1.3.3.2.a Air Quality*

The air quality of an area is characterized by the concentrations of various atmospheric pollutants. For purposes of environmental analysis in this PEIS, climate and weather were

considered under this attribute. Emissions of criteria pollutants (carbon monoxide, lead, nitrogen oxides, ozone, particulate matter smaller than 10 microns in diameter, and sulfur dioxide) and 180 hazardous air pollutants are regulated under the Clean Air Act (CAA) and CAA Amendments of 1990. Potential release of chemical agents or biological agents into the atmosphere is an additional concern for CBDP component activities, particularly in connection with aerosol testing.

#### *1.3.3.2.b Biological Resources*

Analyses of biological resources in this PEIS address several categories of plant and animal species habitats including: protected biological resources (federal- and state-listed endangered plant and animal species and critical habitats); regulated biological resources (game animals [birds and mammals], furbearers, hawks, eagles, and waterfowl); sensitive habitats; species of social importance (Bureau of Land Management-designated sensitive species, songbirds, shore birds, and U.S. Fish and Wildlife Service species of special concern); and food-chain organisms. Wetlands, however, are addressed under the Water Resources attribute (see Section 1.3.3.2.j).

#### *1.3.3.2.c Cultural Resources*

A cultural resource is defined as any district, site, building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources are usually classified into three major categories: prehistoric and historic archaeological resources, architectural resources, and traditional cultural resources of groups such as Native Americans. The environmental analyses in this PEIS considered the cultural resources that are eligible or potentially eligible for the National Register of Historic Places.

#### *1.3.3.2.d Earth Resources*

Earth resources are the natural features that characterize a setting, such as topography, geology, and soils. However, climate and weather are considered under Air Quality in this PEIS. Earth resources also include naturally occurring or human-induced hazards within or at the Earth's surface, such as earthquakes, that could pose threats to public health and safety and to facilities**.**

#### *1.3.3.2.e Land Use*

The land use attribute includes categorization of land by activities, ownership, and jurisdiction, as well as land use planning and zoning. Impacts on the land use attribute are secondary impacts that result when the current, designated, or planned use of land is altered by air quality, noise, utility, or waste management impacts or restricted by regulatory considerations such as wetlands or critical habitat.

#### *1.3.3.2.f Noise*

Noise is defined as unwanted sound. The effects of high sound levels on humans range from speech and hearing interference to permanent threshold shifts in hearing acuity. In addition, high sound levels can modify the behavior of wildlife and domestic animals. Sound levels in some areas are regulated by state or local laws.

### *1.3.3.2.g Socioeconomics and Environmental Justice*

Socioeconomics and environmental justice are grouped together in view of similar data requirements. The socioeconomic attribute includes the size and demographic composition of population, employment, income, and housing, as well as community services. The environmental justice attribute emanates from Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations), which directs federal agencies to identify and address, as appropriate, equitable environmental protection regardless of race, ethnicity, economic status, or community so that no segment of the population bears a disproportionate share of the consequences of environmental pollution attributable to a program or project. Impacts on either of these attributes are considered as secondary impacts that are due to impacts from another attribute area, for example, air quality impacts.

### *1.3.3.2.h Transportation and Airspace*

Transportation and airspace are grouped together in view of similar data requirements. Environmental analysis of the transportation system focused on the network of public and military highways and roads and considered impacts on congestion/traffic flow and safety. This attribute also includes rail service, air transport, and marine transport.

Airspace is a resource for aviation that is defined both vertically and horizontally. Aviation-related airspace is managed by the Federal Aviation Administration, which has established policies, designations, and flight rules designed to protect aircraft and has designated "special use" airspaces specifically for military or other governmental activities.

### *1.3.3.2.i Utilities*

The utilities attribute includes the facilities and infrastructure used for potable water pumping, treatment, storage, and distribution and energy generation and distribution, including providing electricity, natural gas, petroleum-based fuels, and alternative energy sources (e.g., geothermal energy). For purposes of the environmental analysis in this PEIS, the utilities attribute also includes remedial activities for restoration of soil and/or groundwater previously contaminated by non-CBDP activities. However, collection, treatment, and disposal of wastewater are not considered under this attribute; it appears under Waste Management (see Section 1.3.3.3.a).

### *1.3.3.2.j Water Resources*

Water resources include surface waters (natural drainages and waterways) and groundwaters (aquifers) viewed as sources of drinking water supply; habitat for biological resources; settings for recreation; and receptors for disposal of wastewater effluent. Wetland considerations are included under this attribute for purposes of environmental analysis in this PEIS.

### *1.3.3.2.k Cumulative Impacts*

CEQ regulations implementing NEPA define cumulative impacts to the environment as those effects resulting from the impact of the proposed action when combined with past, present, and future actions (40 CFR 1508.7). Thus, cumulative impacts are the sum of all direct and indirect impacts, both adverse and positive, that result from the incremental impacts of the proposed action when added to other past, present, and predictable future actions, regardless of source.

Cumulative impacts may be accrued over time and/or in conjunction with preexisting effects from other activities (40 CFR 1508.25).

### *1.3.3.3 Mitigation Measures*

Mitigation includes minimizing impacts by limiting the degree or magnitude of the action and its implementation and reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action (40 CFR 1508.20). Mitigation measures for this analysis fall in two categories and are set forth in Sections 1.3.3.3.a and 1.3.3.3.b.

#### *1.3.3.3.a Waste Management*

Waste management includes collection, storage, and disposal of wastewater, solid waste, hazardous waste, and medical waste, which are subject to regulatory requirements that have been promulgated by the Environmental Protection Agency and state governments. Collection and disposal of solid waste and management of underground and aboveground storage tanks and air emissions are also considered under this mitigation measure category.

#### *1.3.3.3.b Safety, Health, and Security*

Safety, health, and security measures include both worker and local populations as the proposed action extends to adjoining properties. The environmental analysis in this PEIS addresses the potential risks of CBDP component activities and the capability to manage that risk in both normal operations and emergency situations. This includes industrial hygiene, fire and emergency response, and disaster response planning.