SECTION 4
AFFECTED ENVIRONMENT

4.1 INTRODUCTION

This section describes the existing environment of CSSA where the Proposed Action would be performed. This information provides the baseline, or existing conditions, from which environmental effects of the Proposed Action are identified. Only those environmental resources and resource parameters that could potentially be affected by the action, or are of public concern, are included. The level of detail applied to each particular resource area is commensurate with the level of importance and concern for that resource and the issues it presents. Descriptions of the infrastructure at and in the vicinity of the installation are not provided because the action has no potential to affect this resource area.

4.2 INSTALLATION LOCATION AND MILITARY MISSION

The location of CSSA is shown in Figure 4.1. CSSA consists of approximately 4,000 acres located in Bexar County in south-central Texas. The installation is nearest to the towns of Boerne and Fair Oaks Ranch. The site is primarily accessed from Ralph Fair Road, although there are several access points along the installation boundary. Camp Bullis forms the majority of the installation's eastern boundary. The primary mission of CSSA is to provide support receipt, storage, and issuance of ordnance materiel, as well as quality assurance testing and maintenance of military weapons and ammunition.

4.3 LAND USE

Land use surrounding CSSA is largely rural with military, agricultural, residential, and open space being the most significant current uses. The northern portion of San Antonio, including the CSSA area of influence, has experienced significant residential growth over the past decade, resulting in a greater proportion of residential land use in the vicinity. Commercial development is predominantly located along the Interstate Highway (IH)-10 corridor.

The eastern boundary of CSSA and some of its northern and southern boundaries are shared with Camp Bullis. Directly south of CSSA is the Leon Springs community. It is triangulated between CSSA, Camp Bullis, and State Highway (SH) 3551. The City of Fair Oaks Ranch is located west of the installation and consists of large-lot single-family residences. Its boundaries extend into three counties: Bexar, Comal, and Kendall. The Dominion subdivision lies to the southeast of CSSA. The Dominion is a planned unit development with many different subsections, a golf course and clubhouse, and building requirements for each housing subsection. Hidden Springs subdivision is located south of CSSA.

4.4 AIR QUALITY

CSSA has a modified subtropical climate, predominantly marine in the summer and continental in the winter. The weather is characterized by hot summers and mild winters. The first occurrence of freezing temperatures (32 degrees Fahrenheit [°F]) is in late November, and the average last occurrence is in early March. Average annual temperature is 69°F.

CSSA lies between a semi-arid region to the west and the coastal area of heavy precipitation to the east. Average annual rainfall is about 37 inches. Precipitation is well distributed throughout the year, with the heaviest amounts falling in May and September. Sixty-one percent of the rainfall occurs from April through September and is primarily due to thunderstorms. CSSA is 140 miles from the Gulf of Mexico and tropical storms occasionally affect the installation. Measurable snowfall occurs only once every 3 or 4 years.

4.4.1 Air Pollutants and Regulations

Air quality in any given region is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Air quality is not only determined by the types and quantities of atmospheric pollutants, but also by surface topography, the size of the air basin, and by the prevailing meteorological conditions.

The Clean Air Act (CAA) Amendments of 1990 directed the U.S. Environmental Protection Agency (USEPA) to develop, implement, and enforce strong environmental regulations that would ensure cleaner air for all Americans. The promulgation of the CAA was driven by the failure of nearly 100 U.S. cities to meet the national ambient air quality standards (NAAQS) for ozone (O_3) and carbon monoxide (CO) and by the inherent limitations in previous regulations to effectively deal with these and other air quality problems.

The USEPA established both primary and secondary NAAQS under the provisions of the CAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (*e.g.,* soil, vegetation, and wildlife) from any known or anticipated adverse effects from a criteria air pollutant. The CAA also set emission limits for certain air pollutants for new or modified major sources based on best demonstrated technologies, and established health-based national emissions standards for hazardous air pollutants.

NAAQS are currently established for six air pollutants (known as "criteria air pollutants") including CO, nitrogen oxides (NO_X, measured as nitrogen dioxide, NO_2), O_3, sulfur oxides (SO_X, measured as sulfur dioxide, SO_2), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 microns, collectively referred to as total suspended particulates (TSP).

The CAA does not make the NAAQS directly enforceable, but requires each state to promulgate regulatory requirements necessary to implement the NAAQS. The CAA also

allows states to adopt air quality standards that are more stringent than the federal standards. In Texas, air quality regulations are enforced by the Texas Commission on Environmental Quality (TCEQ) pursuant to the Texas Administrative Code (TAC). As promulgated in TAC, Title 30, Chapter 101.21 as amended, the state of Texas has adopted the NAAQS as the Texas standards. The NAAQS are shown on Table 4.1.

Federal activities are required to comply with the USEPA Final General Conformity Rule as promulgated in 40 CFR 93, Subpart B, which establishes criteria for emissions of non-attainment criteria pollutants. The rule requires that total direct and indirect emissions of these pollutants be considered in determining conformity. The rule does not apply to actions where the total direct and indirect emissions of pollutants do not exceed *de minimis* threshold levels set forth in 40 CFR 93.153(b). The applicable *de minimis* threshold level is 100 tons per year (tpy) for O_3 precursors. In addition, the federal action must not be considered regionally significant (*i.e.*, emissions equal to or exceeding 10 percent of the area's emissions inventory for any non-attainment pollutant).

Table 4.1 National Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS[a,b,c]	Secondary NAAQS[a,b,d]
Carbon Monoxide	8-hour	9 ppm (10 µg/m^3)	No standard
	1-hour	35 ppm (40 µg/m^3)	No standard
Lead	Quarterly	1.5 µg/m^3	1.5 µg/m^3
Nitrogen Oxides (measured as NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)
Ozone	8-hour	0.08 ppm (157 µg/m^3)	0.08 ppm (157 µg/m^3)
Particulate Matter (measured as PM_{10})	Annual Arithmetic Mean	50 µg/m^3	50 µg/m^3
	24-hour	150 µg/m^3	150 µg/m^3
Particulate Matter (measured as $PM_{2.5}$)	Annual Arithmetic Mean	15 µg/m^3	15 µg/m^3
	24-hour	65 µg/m^3	65 µg/m^3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour	0.03 ppm (80 µg/m^3) 0.14 ppm (365 µg/m^3) No standard	No standard No standard 0.50 ppm (1,300 µg/m^3)

[a] National and state standards, other than those based on an annual or quarterly arithmetic mean, are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is less than or equal to one.

[b] The NAAQS are based on standard temperature and pressure of 25 degrees Celsius and 760 millimeters of mercury.

[c] National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA.

[d] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.

µg/m^3 micrograms per cubic meter
NAAQS National Ambient Air Quality Standards
NO_2 nitrogen dioxide
PM_{10} particulate matter equal to or less than 10 microns in aerodynamic diameter
$PM_{2.5}$ particulate matter equal to or less than 2.5 microns in aerodynamic diameter
ppm parts per million

4.4.2 Regional Air Quality

The USEPA classifies air quality within an area according to whether or not the concentration of criteria air pollutants in the atmosphere exceeds primary or secondary NAAQS. All areas within each air quality control region (AQCR) is assigned a designation of either attainment or nonattainment for each criteria air pollutant. An attainment designation indicates that air quality within specific areas of an AQCR is either "unclassified" or that the air quality is as good as or better than the NAAQS for individual criteria air pollutants. Unclassified indicates that the air quality within an area cannot be classified and is therefore treated as attainment. Nonattainment indicates that concentration of an individual criterion air pollutant at a specific location exceeds primary or secondary NAAQS. Before a nonattainment area is eligible for reclassification to attainment status, the state must demonstrate compliance with NAAQS in the nonattainment area for 3 consecutive years and, through extensive dispersion modeling, demonstrate that attainment status can be maintained in the future even with community growth.

CSSA is located within the Metropolitan San Antonio Intrastate AQCR (designated AQCR 217). This AQCR includes the Counties of Atascosa, Bexar, Comal, Dimmit, Edwards, Frio, Gillespie, Guadalupe, Karnes, Kendall, Kerr, Kinney, La Salle, Maverick, Medina, Real, Uvalde, Val Verde, Wilson, and Zavala. All counties within this AQCR are classified by the USEPA as attainment or unclassified for all criteria pollutants except for Bexar, Comal, and Guadalupe Counties, which were designated as "basic" non-attainment for 8-hour O_3 when the new regulations became effective April 15, 2004. Unclassified indicates that air quality within the AQCR is better than the NAAQS, or cannot be classified and is, therefore, treated as attainment.

On December 9, 2002, elected officials representing four city and four county governments within the San Antonio Metropolitan Statistical Area (MSA) signed a document known as the Early Action Compact (EAC). The EAC, an agreement among the governments of the four-county San Antonio MSA, the Texas Commission on Environmental Quality (TCEQ), and the USEPA, commits the region to evaluation and implementation of a Clean Air Plan containing O_3 pollution control strategies designed to reduce O_3 pollution to comply with federal health-based standards.

In exchange for going forward with the EAC and the resulting Clean Air Plan, the USEPA defers the penalties the MSA would incur when declared in "non-attainment" of the CAA. The MSA includes Bexar, Comal, Guadalupe, and Wilson Counties and the Cities of San Antonio, New Braunfels, Seguin, and Floresville. "Non-attainment" designation penalties could subject the MSA to loss of federal transportation funding as well as burdensome regulations for new or expanding businesses and industry.

On September 21, 2005, USEPA approved revisions to the Texas State Implementation Plan (SIP), which demonstrates attainment of the 8-hour O_3 standard within the San Antonio EAC area, and approved the associated control measures detailed in the Clean Air Plan. These actions result in emissions reductions needed to achieve attainment of and maintain the 8-hour NAAQS for O_3.

An accurate regional emissions inventory is needed to assess the potential contribution of a source or group of sources to regional air quality. An emissions inventory is an estimate of total mass emissions of pollutants generated from a source or sources over a period, typically 1 year. Emissions from all counties in the AQCR are used for comparison purposes in this EA. Quantities of air pollutants are generally measured in pounds (lbs) per year or tpy. Stationary emission sources may include boilers, generators, fueling operations, industrial processes, and burning activities, among others. Mobile emission sources typically include vehicle operations.

Current emission quantities for AQCR 217 are presented in Table 4.2. These emission quantities only include stationary, significant, and grandfathered point sources. Emissions from mobile sources and insignificant or trivial area and volume sources have not been determined for AQCR 217.

Table 4.2 Emissions Inventory, AQCR 217

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR 217 Emissions[a]	8,307	2,058	40,615	56,512	6,786	4,364

Note: CO – carbon monoxide; VOC - Volatile organic compounds; NO_X – nitrogen oxide; SO_x – sulfur oxides are measured as SO_2, sulfur dioxide; PM_{10} – particulate matter equal to or less than 10 microns in aerodynamic diameter. VOC is not a criterion pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. The criteria pollutant lead, Pb, is not included in the table because its use in fuels for internal combustible engines is prohibited by federal regulations; Pb emissions from vehicles and construction equipment used during the proposed project would not occur.

a Summarized from USEPA AirData Emissions for counties within AQCR 217. Information comes from an extract of EPA's National Emission Inventory (NEI) database. Data were extracted in August 2005 from the Final 1999 NEI Version 3. (AirData 2006).

4.5 NOISE

Noise is defined as unwanted sound, or more specifically, any sound that interferes with communication, is intense enough to damage hearing, or is otherwise perceived as annoying. Primary sources of noise at and in the vicinity of CSSA include vehicular traffic on public roads, military vehicle operation, heavy equipment operation, and munitions testing. Other noise sources include infrequent detonation of explosives at the designated firing range. Portions of the installation have been designated as noise abatement areas to minimize on-post and off-post noise. Noise monitoring or modeling data are not available for CSSA. Noise sensitive areas in the vicinity of the installation include residences located adjacent to the installation boundary. An Installation Environmental Noise Management Plan (IENMP) that includes education, complaint management, noise and vibration mitigation, noise abatement procedures, and noise assessment was implemented by CSSA (Parsons 2005c).

4.6 GEOLOGICAL RESOURCES

The oldest and deepest known rocks at the CSSA area are Paleozoic age (225 to 570 million years ago), schists of the Ouachita structural belt, which underlie the predominant carbonate lithology of the Edwards Plateau. Cretaceous age sediments were deposited as

onlapping sequences on a submerged marine plain and, according to well logs and outcrop observations, thicken to the southeast. These sediments represent the Trinity Group Travis Peak Formation shallow marine deposits. The Travis Peak Formation attains a maximum thickness of about 940 feet and is divided into five members, in ascending order: the Hosston Sand, the Sligo Limestone, the Hammett Shale, the Cow Creek Limestone, and the Hensell Sand. Overlying the Travis Peak Formation, but still a part of the Cretaceous age Trinity Group, is the Glen Rose Limestone. Subsection 2.6.1 of the INRMP presents a more detailed discussion of the geologic formations at CSSA.

Sinkholes and caverns are present on the surface and in the subsurface at CSSA, primarily in areas where porous and fractured limestone formations are exposed. The sinkholes and caves result from dissolution of limestone and gypsum by infiltrating surface water. There is evidence of karst development along some of the streams on post. These karst features provide a direct pathway for stream flow to recharge the shallow groundwater and can contribute to the rapid recharge response observed in the on-post wells.

In general, soil at CSSA is thin, dark-colored, gravely clay and loam. The soil types are strongly influenced by topography and the underlying limestone. Soil types for CSSA include Brackett, Tarrant, Brackett-Tarrant Association, Crawford and Bexar Stony, Trinity and Frio, Krum Complex, and Lewisville Silty Clay.

4.7 WATER RESOURCES

Subsection 2.7 of the INRMP provides a more detailed description and discussion of the waters resources of CSSA.

4.7.1 Surface Water

Salado, Leon, and Cibolo Creeks drain surface water from CSSA. Approximately 75 percent of CSSA is in the Salado Creek watershed, 15 percent in the Cibolo Creek watershed, and 10 percent in the Leon Creek watershed. Most of the active-use areas of CSSA are in the Leon Creek watershed, including a wastewater treatment plant which drains into a tributary of Leon Creek at the southern boundary. These streams are intermittent at CSSA. In the developed areas of CSSA, rainfall runoff is conveyed to the natural stream flow channels by ditches and sheet flow. Natural stream channels on CSSA generally have broad floodplains, and portions of CSSA are in the 100-year floodplain. In the undeveloped areas, runoff flows overland to natural channels.

Storm drainage across CSSA roadways is inadequate. Culverts, or openings allowing drainage underneath the roads, are currently too restrictive of flow to prevent pooling of water during a major storm event. Culverts underneath bridges and throughout the roadways need to be widened to allow increased flow. CSSA is currently preparing an EA to assess the adequacy of the roadways in the inner cantonment and other portions of the installation, including storm drainage.

4.7.2 Groundwater

There are three aquifers in the area of CSSA: the upper, middle, and lower Trinity. At CSSA, the lower Trinity aquifer is not used because of its low production and the high cost of well completion. The primary source of water in the wells at CSSA is the middle Trinity aquifer. Discharge from the upper Trinity aquifer is predominantly from natural rejection through seeps and springs and from pumping. Fluctuations in water levels in the upper Trinity are predominantly a result of seasonal rainfall and pumpage from domestic and pumping wells.

4.7.3 Groundwater Quality

In the CSSA area, the lower Trinity aquifer yields fresh to slightly saline water throughout the area, with total dissolved solids (TDS) content ranging from 900 to 1,500 milligrams per liter (mg/L). Water from the upper Trinity aquifer is generally of poor quality. The existence of evaporite beds in the upper Trinity causes excessive sulfate in the water.

4.8 BIOLOGICAL RESOURCES

4.8.1 Vegetation

CSSA is located within the Balcones Canyonlands subregion of the Edwards Plateau natural region. Evergreen woodlands and deciduous forests dominate this subregion of steep slopes and high-gradient streams. Grasslands are restricted primarily to drainage divides, usually in the context of open woodlands or savannas. Some of the woodlands and a majority of the native grasslands on the Edwards Plateau have been destroyed by historic human settlement of this region. Overall, vegetation at CSSA is similar to that of the region. Past land uses at CSSA resulted in a patchwork of open grassland/disturbed savanna delineated by stands of Ashe juniper-oak (*Juniperus ashei-Quercus sp.*) woodlands.

The vegetation communities at CSSA consist of grasslands, woodlands, and savannas. Each vegetation community can be further divided into community types. Eight vegetation community types were mapped as part of the black-capped vireo and golden-cheeked warbler surveys conducted in 2005 (Parsons 2005b). Table 2.1 of the INRMP lists each vegetation community type with calculated areas. Definitions of vegetation communities are based on classification schemes provided by the USFWS (Underwood 2005), which are derived from the NRCS and Diamond, *et al.* (1988). Vegetation community types at CSSA include:

- **Juniper-Live Oak Woodlands** Composed of woody species ranging between 3-10 meters tall, with a canopy closure of 71-100 percent. Ashe juniper dominates with a large Live oak component.
- **Juniper Woodlands** Composed of woody species ranging between 3-10 meters tall, with a canopy closure of 71-100 percent. Ashe juniper dominates, few other woody species are present.
- **Live Oak-Juniper Woodlands** Composed of woody species ranging between 3-10 meters tall, with a canopy closure of 71-100 percent. Live oaks (*Quercus fusiformis*) dominate with a large Ashe juniper component. Other oak species

persist in lower abundance, such as Spanish oak (*Quercus buckleyi*) and shin oak (*Quercus sinuata*).

- **Juniper Dominant Shrublands** Ashe juniper dominates and is under 3 meters tall, few other woody species are present.
- **Live Oak Dominant Shrublands** Live oaks and shin oaks under 3 meters tall, with other shrubs and shorter statured tree species such as flame-leaf sumac (*Rhus lanceolata*), Texas persimmon (*Diospyros Texana*), and agarita (*Berberis trifoliolata*).
- **Herbaceous Bluestem and Short Grass Prairie** Woody species compose less than 25 percent of ground cover, dominated by herbaceous vegetation, including grasses of different heights.
- **Mixed Oak Savanna** Woody species composed primarily of live oak, shin oak, Texas persimmon, and Ashe juniper, form 25-50 percent cover.

4.8.2 Wetlands

Wetlands are areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (hydrophytes), including swamps, marshes, bogs, and similar areas (33 CFR, Section 328.3(b); 40 CFR section 230.3(t)). Wetlands and waters of the U.S. delineation field surveys were conducted at CSSA in November/December 1995 and April 1996 (SAIC 1997a). In November 1996, a wetlands specialist from the U.S. Army Corps of Engineers visited the site to verify the findings of the delineation (SAIC 1997a). Based on the survey results, four jurisdictional wetlands totaling 1.1 acres and seven non-jurisdictional wetlands totaling 3.2 acres occur on CSSA. The non-jurisdictional wetlands are all man-made impoundments. However, two impoundments are classified as jurisdictional because they intercept flows from defined channels, springs, or seeps. The other jurisdictional wetlands appear to be associated with either springs or seeps. In addition, approximately 32,250 linear feet of stream drainages on CSSA have defined channels and can be classified as jurisdictional waters of the U.S. (SAIC 1997a).

4.8.3 Wildlife

Bird surveys conducted at CSSA between mid-March and early June 2005 documented 92 bird species at the installation (Parsons 2005b). Although definitive surveys have not been conducted for other wildlife at CSSA, the installation is expected to support a variety of wildlife similar to the surrounding region. Several game species are known to occur at the installation, including: white-tailed deer (*Odocoileus virginianus*), axis deer (*Axis axis*), wild turkey (*Meleagris gallopavo*), dove (*Zenaida macroura*), ducks, quail, rabbits (*Lepus californicus* and *Sylvilagus floridanus*), squirrel (*Sciurus niger*), raccoon (*Procyon lotor*), and coyotes (*Canis latrans*). Other species likely to be found at CSSA include skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), ring-tailed cat (*Bassariscus astutus*), bobcat (*Lynx rufus*), and a variety of rodent species (SAIC 1997b).

4.8.4 Rare Species

The Endangered Species Act (ESA) and AR 200-3 require the Army to protect animal and plant species that are federally listed as endangered or threatened. The ESA specifically requires agencies not to "take" without authorization or "jeopardize" the continued existence of any listed species, or to destroy or adversely modify habitat critical to any listed species. In addition, the TPWD maintains a list of state endangered and threatened species. CSSA is currently in consultation with USFWS Austin Ecological Services Field Office and the USFWS Region 2 office for the development of a 10-year programmatic Biological Opinion (PBO). The PBO will establish annual thresholds of "take" in concert with INRMP projects that are designed to benefit listed species.

Limited surveys have been conducted at CSSA for endangered and threatened species. A general habitat evaluation was conducted in December 1992, and detailed bird surveys were conducted in the spring of 1993 (Stewardship Services 1993). More recently, presence-absence surveys for black-capped vireos (*Vireo atricapillus*) and golden-cheeked warblers (*Dendroica chrysoparia*) were conducted between mid-March and early June 2005 (Parsons 2005b). In addition, a Phase 1 karst hydrogeologic investigation was conducted at CSSA in 2002 (Veni 2002). Although the karst investigation did not include specific endangered species surveys, it provided a general evaluation of potential habitat for subterranean species. Table 4.3 provides a summary of federal and state-listed species with potential to occur in Bexar County, Texas, based on information obtained from the USFWS (2004) and TPWD (2005).

Of the species listed in Table 4.3, the Black-capped vireo and Golden-cheeked warbler have been documented at CSSA. The following subsections provide additional information for each species and discuss their potential to occur at CSSA. Federally listed species are discussed first, followed by state-listed species.

Karst Invertebrates

The nine invertebrates (arachnids and insects) listed in Table 4.3 are obligate (capable of surviving in only one environment) karst or cave-dwelling species (troglobites) of local distribution in karst terrain in Bexar County. Habitat required by these invertebrates consists of underground, honeycomb limestone that maintains high humidity and stable temperatures. As of early 2003, 74 caves in Bexar County were known to contain one or more of the listed invertebrates (USFWS 2004). None of these known caves are located on CSSA. Critical habitat has been designated under the ESA for seven of the nine listed invertebrates. Lands designated as critical habitat include 22 separate units, with a total area of 1,063 acres (USFWS 2003). Critical habitat for these species has not been designated on the installation. Two caves and 94 potential karst features were found during the Phase 1 karst hydrogeologic investigation conducted at CSSA in 2002. However, the draft report indicates that none of the caves or karst features are likely to contain endangered karst invertebrates due to CSSA's probable location outside of the zones where they occur (Veni 2002). This finding is also supported by previous work conducted by Veni (1994) and Veni and Reddell (1999).

Black-capped Vireo

Black-capped vireos nest in Texas from April through July, and winter along the western coast of Mexico. In general, nesting habitat for this species includes a patchy arrangement of well-developed shrubs and mid-successional overstory irregularly interspersed with bare or grassy openings. The vegetation component should be complete to the ground to provide suitable nest sites. The species composition of the vegetation tends to be less important than its structure, but broad-leaved species are more favorable than others, and juniper may be underrepresented in occupied habitat. Suitable habitat development for this species is strongly associated with the rocky soils of the Lower Cretaceous limestones of the Fredericksburg Group.

Black-capped vireos are known to nest in Bexar County, including at Camp Bullis, located east of and adjacent to CSSA. One pair of Black-capped vireos was documented in the northeastern portion of CSSA in the spring of 1993 (Stewardship Services 1993). A single detection of Black-capped vireos was recorded during the 2005 surveys in the East Pasture (Parsons 2005b).

Golden-cheeked Warbler

Golden-cheeked warblers nest only in central Texas mixed Ashe-juniper and oak woodlands, typically in ravines and canyons. During breeding, this species inhabits dense forests and woodlands containing Ashe juniper and a variety of deciduous species, including various oaks. Although the species composition of woody vegetation varies greatly within suitable breeding habitat, Ashe juniper is typically the dominant species and occurs at all sites inhabited by nesting golden-cheeked warblers. This species constructs nests from strips of bark found on relatively mature Ashe junipers. They come to Texas in March to nest and raise their young, and leave in July to spend the winter in Mexico and Central America (USFWS 1992).

During the 2005 surveys, 19 Golden-cheeked warblers were detected in habitat areas typical of the species. Of those, 18 Golden-cheeked warblers were detected through both visual sightings and audible calls, while one Golden-cheeked warbler detection was through only

counter singing. Some detections were mated pairs, formulating an estimated total of 16 Golden-cheeked warbler territories. Four fledglings were observed, but were not included in the total count.

Whooping Crane

The only remaining natural breeding population of whooping cranes winters along the Texas Gulf Coast in and around Aransas National Wildlife Refuge, approximately 200 miles southeast of CSSA. The TPWD's rare species list for Bexar County (TPWD 2004) indicates that whooping cranes are potential migrants in Bexar County. During migration they often pause overnight to use wetlands for roosting and agricultural fields for feeding, but seldom remain more than one night (TPWD 1996). The potential for migrating whooping cranes to use CSSA is low based on the lack of suitable foraging and roosting habitat.

Cagle's Map Turtle

Cagle's map turtle is endemic to the Guadalupe River system and requires riverine habitat with permanently flowing water. CSSA is located in the upper San Antonio watershed and outside of the known range for this species. In addition, all the streams at CSSA are intermittent.

State Listed Species

Table 4.3 includes state-listed endangered and threatened species that could potentially occur in Bexar County (TPWD 2004). An analysis of the known distributions, habitat requirements, and habitat present at CSSA suggests that a majority of these state-listed species are not expected to occur at CSSA.

Amphibians

The black-spotted newt is typically found along the Gulf Coastal Plain south of the San Antonio River, and is not expected to occur at CSSA. However, the potential exists for troglobitic salamanders to occur at the installation. During a downhole video camera survey of wells at CSSA, an unidentified salamander was observed in well CS-2 (Parsons 1996). This unidentified salamander could have been a Comal blind salamander (Eurycea tridentifera) or another rare troglobitic salamander. The Comal blind salamander occurs in two caves on Camp Bullis and one cave on private property just north of CSSA's northern boundary (Veni 2002).

Birds

American and Arctic peregrine falcons potentially migrate through Bexar County. Other than transient individuals, these species are not expected to occur at the installation. The white-faced ibis and wood stork require extensive wetland habitats, which are not present on CSSA. Potentially suitable habitat for the zone-tailed hawk could occur at CSSA. The zone-tailed hawk was not observed during bird surveys conducted in 1993 or 2005.

Fish

The toothless blindcat and widemouth blindcat are endemic to the San Antonio Pool of the Edwards Aquifer, located in the southwestern part of San Antonio. Therefore, these troglobitic catfish would not be expected to occur at CSSA.

Mammals

In Texas, the black bear inhabits desert lowlands and high elevation forests and woodlands. This large mammal has not been observed at CSSA and is not expected to be present.

Reptiles

The indigo snake occurs in thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors. It is not likely that the distribution of this species reaches the Balcones Canyonlands in northern Bexar County, where CSSA is located. Therefore, this species is not expected to occur on the installation.

Texas horned lizard habitat consists of open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush, or scrubby trees. Once common throughout most of the state, this species has disappeared from many parts of its former range over the past 30 years. The habitat assessment conducted at CSSA in 1992 indicated that potentially suitable Texas horned lizard habitat exists at the installation (USFWS 2002). However, habitat for this species is very limited at the installation based on the mowing regime.

The Texas tortoise is generally found south of a line connecting Del Rio, San Antonio, and Rockport. Therefore, it is not likely that the distribution of this species reaches the Balcones Canyonlands in northern Bexar County.

4.9 CULTURAL RESOURCES

4.9.1 Historic Architectural Resources

CSSA contains a total of 194 buildings and structures, along with infrastructure that includes roads, railroad sidings, and landscape elements. The buildings are concentrated in a rural setting within the inner cantonment which consists of a variety of building types primarily associated with munitions storage and support buildings that include administration, residences, operations, warehouses, vehicle storage, and utility related structures.

Overall, CSSA retains marginal integrity of architectural resources. While most of CSSA buildings dating to the 1930's and 1940's remain intact, many have been modified. Only a handful of structures possess the classic historic features of the San Antonio area such as limestone facades and tile roofs (i.e., Fort Sam Houston or Randolph Air Force Base).

4.9.2 Historic and Prehistoric Archeological Resources

There are 40 known archeological sites at CSSA, seven of which are eligible for listing in the National Register (Kibler and Gardner 1998; Scott, *et al.* 1997; Parsons 2005a). Of these sites, 19 are considered historic sites and 21 are considered prehistoric sites. A total of seven sites were identified with potential eligibility for the National Register of Historic Places; however, none are eligible. The prehistoric sites were interpreted as open campsites or lithic scatters. Historic sites were either classified as pre-military (before 1906) or military (1906-1945). Military components represented World War I training trenches, utilities, and infrastructure, facility plans, housing properties, service/support properties, and unidentified

property types. The pre-military sites included a 19th Century homestead, 20th century ranches, and a possible 20th-century saloon (Parsons 2005a).

4.9.3 Native American Consultation

Three federally recognized Native American tribes used the CSSA area in historic times, including the Comanche, the Mescalero Apache, and the Tonkawa, although the Comanche and Mescalero Apache may not have had permanent settlements in the area. Two additional tribes claim descent from Native Americans that once lived in the CSSA area, the Lipan Apache Band of Texas, and the Tap Pilam Coahuiltecans. Both of these groups claim descent from missionized Native Americans who converted to Catholicism, and both have petitioned for federal recognition. No Native American burial sites have been located during previous archeological surveys at CSSA, and there is low potential for their presence (Parsons 2005a).

4.10 SOCIOECONOMICS

Socioeconomic resources include the basic attributes and resources associated with the human environment, including population, economic activity, and issues such as housing availability and public service provision. Economic activity typically encompasses employment, personal income, and industrial/commercial growth.

Socioeconomic resources also specifically include sensitive populations, such as children, minorities, and low-income communities, as mandated by Executive Orders (EO) 13045 and 12898. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that federal agencies shall identify and address environmental health and safety risks from their activities, policies, or programs that may disproportionately affect children. EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, serves to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations. Adverse is defined by the Federal Interagency Working Group on environmental justice as "...having a deleterious effect on human health or the environment that is significant, unacceptable, or above generally accepted norms."

4.10.1 Regional

CSSA is located in Bexar County. The nearest communities to CSSA include Boerne and Fair Oaks Ranch City. Boerne is located in neighboring Kendall County. General socioeconomic data for Boerne, Fair Oaks Ranch, and Bexar County are summarized in Table 4.4.

Table 4.4 General Socioeconomic Data for Boerne, Fair Oaks Ranch, and Bexar County

Statistic	Boerne (2000)	Fair Oaks Ranch City (2000)	Bexar County (2004)
Population	6,178	4,695	1,459,296
Race/Ethnicity			
White	94.8%	96.4%	68.7%
Black	0.4%	0.4%	7.0%
Asian Pacific	0.2%	0.6%	1.8%
Native American	0.4%	0.4%	0.5%
Other	3.3%	1.0%	19.9%
Hispanic	19.4%	7.9%	56.9%
Median Age	39.2	45.9	32.8
Per Capita Income	$23,251	$45,293	$20,483

Source: USCB 2006.

In 2002, Bexar County had 542,103 housing units (United States Census Bureau [USCB] 2004a). In 2000, the home ownership rate for Bexar County was 61.2 percent and the median value of owner-occupied housing units was $74,100 (USCB 2004a). Bexar County had 212,204 rental units in 2003. The number of vacant rentals during this time was 12,521, equating to a 5.9 percent vacancy rate. The average rent for all rental units was approximately $630 (USCB 2004b). There are 19 school districts in Bexar County with an estimated enrollment in 2003 of 413,450 students 3 years of age and older (USCB 2004b).

4.11 HAZARDOUS AND TOXIC MATERIALS/WASTES

The only INRMP activity with potential to affect hazardous and toxic materials/waste at the installation is the selective use of pesticides to control fire ants. Limited quantities of pesticides would be used at the installations to control fire ants when mound density exceeds 20 mounds per acre. Pesticides are applied according to guidelines presented in the CSSA Pest Management Plan, and are used outside established karst buffer zones.