DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

AND

DRAFT FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

Proposed Installation of Natural Gas Lines at Joint Base San Antonio, Camp Bullis, Bexar and Comal Counties, Texas

Pursuant to the *National Environmental Policy Act of 1969* (42 United States Code § 4321 et seq.; NEPA) as amended by the *Fiscal Responsibility Act of 2023* (FRA) (Public Law 118-5); the United States (US) Air Force's Environmental Impact Analysis Process (EIAP) implementing regulations (Title 32 *Code of Federal Regulations* [CFR] Part 989) to the extent they are consistent with NEPA, as revised by the FRA, and Executive Order 14154, *Unleashing American Energy*, the Air Force prepared the attached Draft Environmental Assessment (EA) to address the potential environmental consequences associated with the proposed construction and operation of a natural gas distribution system with connectivity to the Joint Base San Antonio, Camp Bullis (JBSA-BUL) cantonment area in Bexar County, Texas.

Purpose and Need

The purpose of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. The Proposed Action would install a below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment. From its terminus in the central portion of the cantonment, distribution lines would then be installed that branch out and connect with facilities located therein. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, cost-effective, and less-polluting energy source. Under the Proposed Action, the military members and civilians working or training at JBSA-BUL, and the residents of communities adjacent to the Base, would accrue these benefits starting in approximately 2030.

The Proposed Action is needed to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. Aging propane systems are also more susceptible to damage and corrosion as compared to buried natural gas lines, creating more potential for shutdown or operational disruptions. In a disaster scenario, propane repair or delivery may not be possible, putting the military mission at risk. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders (EOs), federal statutes, and Department of Defense (DoD) and Air Force policies, plans, and directives.

Description of Proposed Action and Alternatives

Dependent on environmental conditions along the selected routes, the Proposed Action would use a combination of trenching and boring to install the pipelines. For example, trenching may occur along routes with established ROW conditions, whereas boring may occur to avoid disturbance of ground-level features such as streams, wetlands, or roads. Construction of the Proposed Action would occur over approximately 5 years from 2025 through 2030. From start to finish, implementation of the Proposed Action would generally maintain the following sequence of steps:

1. Obtain regulatory permits and/or approvals to include completion of any required technical support studies or surveys.
2. Construct a 6-inch-diameter pipeline from the mainline connection point to a central location within the cantonment.
3. Construct a network of 6- and 4-inch-diameter laterals and service lines within the JBSA-BUL cantonment, including regulator/meter equipment.
4. Prepare facility interiors to receive natural gas (e.g., gas lines and boilers) via reuse or modification of legacy equipment or new equipment installation.

5. Excavate, remove, and dispose of, or demolish in place, propane system infrastructure within the cantonment.

No Action Alternative

Under the No Action Alternative, the Air Force would continue to use propane to operate facilities in the JBSA-BUL cantonment. Concerns with respect to the reliability, safety, and security of the propane tank distribution system would continue to pose risks to the military mission. The cost for JBSA to operate and maintain the system, including its environmental impacts, would be likely to increase in the long term.

While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the effects of the Proposed Action, as required under the NEPA and the EIAP. The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

Alternative 1 – Camp Bullis Road (Preferred)
Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from Interstate-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL. The on-Base portion of this route would span 0.8 mile.

Alternative 2 – NW Military Highway
Under Alternative 2, the Air Force would construct a 2-mile-long natural gas pipeline from a point along NW Military Highway, to the south of JBSA-BUL. The on-Base portion of this route would continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

Summary of Findings
Based on the results of internal and external scoping, literature review, and data analysis, the Air Force analyzed the potential for significant adverse effects on human and natural environment resources that could result from implementation of the Proposed Action and Alternatives. The resource areas analyzed in the Draft EA include the following: land use; noise; air quality; earth, water, biological, and cultural resources; socioeconomics; utilities and infrastructure, including transportation; hazardous materials and waste; and health and safety. The findings of the Draft EA are summarized as follows:

Land Use

Alternative 1 would occur entirely within an existing utility ROW; no ROW acquisition would be required. Easement(s) would set forth conditions for the future management and maintenance of the proposed natural gas pipeline conveyance. JBSA would prepare easement documentation for the portion of Alternative 1 on the Base and coordinate with external stakeholders regarding the easement conditions formalized for the off-Base extent of the ROW, as appropriate. As such, Alternative 1 would be consistent with applicable land use plans and policies for the ROI. This alternative would not discontinue or change existing land use within the ROI.

Potential effects on land use under **Alternative 2** would be the same as Alternative 1.

Noise

Alternative 1 could affect noise-sensitive receptors on and around JBSA-BUL. However, adherence to standard Air Force Occupational Safety and Health regulations that require hearing protection along with other personal protective equipment (PPE) and safety training would minimize the risk of hearing loss to construction workers. Potential adverse effects on noise-sensitive receptors (e.g., the general public or military personnel) would be addressed by site-specific noise reduction measures to ensure noise remains below a Day-Night Average Sound Level of 65 A-weighted decibels during construction.

Potential effects from noise under **Alternative 2** would be the same as Alternative 1.

Air Quality

Emissions of criteria pollutants in tons per year under **Alternative 1** would not exceed the *Clean Air Act* (CAA) regulatory thresholds set by the National Ambient Air Quality Standards. Therefore, Alternative 1

does not require a CAA General Conformity analysis. Over the long term, minor beneficial effects on air quality would result from Alternative 1 due to the conversion from propane to natural gas as an energy source for facilities in the JBSA-BUL cantonment.

Potential effects on air quality under **Alternative 2** would be the same as Alternative 1.

Earth Resources

Excavation under **Alternative 1** would be limited to the upper limit of soils. Therefore, potential effects on geology and topography would be short term and negligible. The construction of Alternative 1 would comply with Texas Pollutant Discharge Elimination System (TPDES) General Permit No. TXR150000, including preparation and implementation of a Stormwater Pollution Prevention Plan (SWP3) approved by the Texas Commission on Environmental Quality (TCEQ). The SWP3 would include required best management practices for structural and non-structural erosion, sediment, and waste control associated with Alternative 1. With these measures in place, soil erosion, loss, and contamination under Alternative 1 would be short term and minor. No impacts on prime farmland or farmland of statewide importance would be anticipated to result from Alternative 1.

Potential effects on earth resources under **Alternative 2** would be the same as Alternative 1.

Water Resources

Surface Waters and Water Quality

As described above, the construction of **Alternative 1** would comply with TPDES General Permit No. TXR150000, including required measures to prevent and minimize erosion and sedimentation of surface waters. These measures would also prevent and minimize contamination of surface waters via surface runoff. Therefore, water quality effects would be short term and minor under Alternative 1.

Potential effects on surface water quality under **Alternative 2** would be the same as Alternative 1.

Waters of the US, including Wetlands

The main line portion of **Alternative 1** would bisect two intermittent streams: Leon Creek and one of its tributaries. Approximately 408 linear feet of these streams would be affected under Alternative 1. To address potential effects from dredge or fill activities within jurisdictional streams, the Air Force would comply with applicable requirements under Sections 404 and 401 of the *Clean Water Act* (CWA). Pursuant to Section 438 of the *Energy Independence and Security Act* (EISA), the Air Force would also incorporate low-impact development measures under Alternative 1, to the maximum extent technically feasible. These design measures would help to maintain or restore pre-construction environmental conditions, minimizing any downstream effects on jurisdictional waters of the US. With regulatory compliance measures in place, potential effects on jurisdictional streams would be short term and minor. No impacts on wetlands would occur under Alternative 1.

Potential effects on surface water quality under **Alternative 2** would be the same as Alternative 1. Portions of Alternative 2 would bisect three intermittent streams that drain to Salado Creek. Approximately 805 linear feet of these streams would be affected under Alternative 2. As described for Alternative 1, Alternative 2 would comply with the applicable provisions of the CWA and EISA. With regulatory compliance measures in place, potential effects on jurisdictional streams under Alternative 2 would be short term and minor. Within the JBSA-BUL cantonment, Alternative 2 would bypass the wastewater treatment storage ponds, which are classified as wetlands under the CWA. With erosion and sedimentation controls in place during the construction of Alternative 2, potential effects on these wetlands would be short term and negligible. No other wetlands would be affected under Alternative 2.

Floodplains

Alternative 1 would affect approximately 4 acres of 100-year floodplains; however, potential effects on the function and capacity of these floodplains would be limited to the construction phase. Construction activities would conclude with revegetation of disturbed areas within 100-year floodplains with native species of grasses and plants. Post construction, no permanent structures would impede surface water flows within

these floodplains. As Alternative 1 would preserve the natural function benefits of 100-year floodplains in the long term, potential effects would be short term and moderate.

Alternative 2 would affect approximately 2 acres of 100-year floodplains. As described for Alternative 1, potential effects would be temporary and, in the long term, the natural function benefits of these floodplains would be preserved. Potential effects on 100-year floodplains under Alternative 2 would be short term and minor.

Groundwater and Water Quality

Alternative 1 would overlie approximately 53 acres of the Edwards Aquifer drainage zone; however, no impacts on the Edwards Aquifer recharge zone would occur under this alternative. With measures in place to minimize potential leaching or discharge of contaminants during the construction of Alternative 1, potential effects on groundwater would be short term and minor.

Alternative 2 would overlie approximately 27 acres of the Edwards Aquifer drainage zone and 25 acres of the recharge zone. As a portion of Alternative 2 would overlie the recharge zone, there would be an increased potential for contaminants to leach or discharge into groundwater. To ensure protection of groundwater resources during construction, the Air Force would comply with the Edwards Aquifer Rules in coordination with TCEQ (e.g., enhanced erosion and sedimentation controls). Pre-construction meetings would be held to ensure contractors are in receipt of an approved Edwards Aquifer Protection Plan (EAPP).

The EAPP would be incorporated into the SWP3, maintained at project areas during construction, and documented as part of JBSA's municipal separate storm sewer system permit. Under Alternative 2, the Air Force would also be required to install: (1) temporary erosion and sediment controls and protective barriers around sensitive features, such as caves, sinkholes, and wells; and (2) detention ponds with approved linings as outlet structures for any water discharges generated during construction. Should groundwater be encountered during construction, excavations would be de-watered and subject to filtering to remove sediments in the water. The Air Force would notify the TCEQ in advance of construction start dates, as these measures would be subject to their approval. JBSA also would conduct regular project site inspections to ensure erosion and sedimentation controls are in place, meet specifications, and remain functionally adequate.

Biological Resources

Vegetation

Alternative 1 would require vegetation removal along the utility ROW. Any vegetation removal to include trees and ground clearing would be avoided during nesting season (approximately September 15 through February 28) to ensure no incidental impacts to migratory birds. Although areas subject to vegetation removal would be replanted with native grasses post construction, the long-term maintenance of the ROW would not allow a full return to current vegetative conditions. This would change or alter the structure of vegetation community along the ROW in some areas; however, because Alternative 1 would use an existing ROW, overall vegetation removal would be minimized. Therefore, Alternative 1 would result in short-term and minor effects on vegetation. No appreciable effects on vegetative communities at JBSA-BUL or the region would occur.

Potential effects on vegetation under Alternative 2 would be the same as Alternative 1.

Wildlife

Alternative 1 would remove existing, vegetated wildlife habitat along the utility ROW. Since the long-term maintenance of the ROW would be required under Alternative 1, these areas would not provide equivalent wildlife habitat post construction; however, because Alternative 1 would use an existing ROW, the overall reduction in and fragmentation of wildlife habitat would be minimized. Construction activities under Alternative 1 would disturb or pose risk to local wildlife on or in the vicinity of project sites. These operations would generate noise, and vehicle/equipment use could injure or kill various wildlife species; however, most would likely relocate to other areas on JBSA-BUL or the region. The probability of disturbance or possible injury or death would increase for less mobile species under Alternative 1. As overall wildlife habitat loss

and fragmentation would be minimized under Alternative 1, and most species would avoid project sites, potential effects on wildlife would be short term and minor.

Potential effects on wildlife under **Alternative 2** would be the same as Alternative 1.

Threatened and Endangered Species

The Air Force has determined that, due to a lack of observed presence or suitable habitat, **Alternative 1** would have "no effect" to the piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), San Marcos salamander (*Eurycea nana*), fountain darter (*Etheostoma fonicola*), Comal Springs riffle beetle (*Heterelmis comalensis*), Helotes mold beetle (*Batrisodes venyivi*), monarch butterfly (*Danaus plexippus*), Cokendolpher Cave harvestman (*Texella cokendolpheri*), Government Canyon bat cave meshweaver (*Cicurina vespera*), Government Canyon bat cave spider (*Tayshaneta microps*), Robber Baron Cave meshweaver (*Cicurina baronia*), Peck's Cave amphipod (*Stygobromus pecki*), and Texas wild-rice (*Zizania texana*).

All construction activities would occur during hibernation season—from September to December; therefore, no impact to the tricolored bat would be anticipated to occur. Since vegetation clearing will be conducted outside their birthing and hibernation seasons, **Alternative 1** may affect, but is not likely to adversely affect, this species.

Noise from construction may move foraging golden-cheeked warbler (GCWA) away from the Proposed Action area, but there is nearby, protected, high-quality, contiguous nesting habitat on the Installation on either side of the Proposed Action area. GCWA have the ability to fly to quiet areas to avoid construction noise. With seasonal restrictions and other protection measures in place at JBSA-BUL, **Alternative 1** may affect, but is not likely to adversely affect, GCWA.

Construction of the main line portion of **Alternative 1** from the cantonment to a natural gas connection point along I-10 would occur within Bexar County karst zones 1 and 4. Karst species present in the Proposed Action area and exposed to construction may be killed or injured by proposed activities, particularly during trenching within karst zone 1. However, the effects would be limited to very small numbers of individuals of each species due to previous efforts to locate features on the Installation and the distance from known occupied features. JBSA would implement both general and species-specific conservation measures with the intent to avoid and minimize adverse effects of the project on the endangered karst invertebrates. **Alternative 1** may affect, and is likely to adversely affect, *Rhadine exilis, Rhadine infernalis,* and Madla Cave meshweaver (*Cicurina madla*).

Ground disturbance from the Proposed Action, such as vegetation removal, heavy machinery, trenching, boring, fill piles, and construction staging areas, could have detrimental effects on the bracted twistflower (*Streptanthus bracteatus*) plant and its seeds if present. Alternative 1 may affect, but is not likely to adversely affect, the bracted twistflower.

Potential effects on threatened and endangered species under **Alternative 2** would be the same as Alternative 1.

Concurrence with these determinations has not yet been received, and Section 7 consultation between USFWS and JBSA is currently ongoing.

Migratory Birds

Site disturbance and noise associated with construction activities under **Alternative 1** could affect migratory birds that use the region for stop-over during migration, foraging, or breeding. However, many such species have ample foraging or stop over elsewhere on JBSA-BUL or in the region. The migratory birds that do breed in central Texas have breeding seasons that generally overlap that of the GCWA. As such, construction scheduling and phasing would account for and avoid any known habitat areas where migratory birds would likely be present. Under Alternative 1, most migratory birds would likely avoid construction sites by relocation. Vegetation or structures containing nests of migratory birds would be left in place until

abandonment. Therefore, potential effects on migratory birds under Alternative 1 would be short term and minor. No long-term, appreciable effects on populations of migratory birds would occur.

Potential effects on migratory birds under **Alternative 2** would be the same as Alternative 1.

Cultural Resources

Archaeological Resources, including Traditional Cultural Properties

There are no recorded archaeological sites, including traditional cultural properties (TCPs) found within the archaeological area of potential effects (APE) for **Alternative 1**. No impacts on archaeological resources would be anticipated to occur under Alternative 1.

The portion of Alternative 1 not contained by JBSA-BUL would occur within 0.5 mile of two cemeteries; however, the existing natural and built environment limits line of sight between these cemeteries and Camp Bullis Road.

There are no recorded archaeological sites or TCPs found within the archaeological APE for **Alternative 2**. Therefore, no impacts on archaeological resources would be anticipated to occur under Alternative 2.

Architectural Resources

A portion of **Alternative 1** would occur within the indirect APE of the proposed historic district on JBSA-BUL. No other historic properties eligible or potentially eligible for listing on the NRHP would occur within the direct or indirect architectural APEs for Alternative 1.

A portion of **Alternative 2** would occur within direct and indirect architectural APEs of the proposed historic district on JBSA-BUL. No other historic properties eligible or potentially eligible for listing on the NRHP would occur within the direct or indirect architectural APEs for Alternative 2.

Concurrence with these determinations has not yet been received, and Section 106 consultation between SHPO and JBSA is currently ongoing.

Socioeconomics

Alternative 1 would not result in a permanent increase to the population on or around JBSA-BUL. Temporary construction workers under Alternative 1 would likely be procured from within Bexar County, Texas. No appreciable change in the population, demand for housing, or public and social services would be likely to occur under Alternative 1. Potential socioeconomic effects under Alternative 1 would be negligible. Short-term, minor beneficial effects on local economic conditions would likely result from Alternative 1 in the form of increased expenditures (e.g., procurement of construction materials and temporary jobs) and incidental spending.

Potential socioeconomic effects under **Alternative 2** would be the same as Alternative 1.

Utilities and Infrastructure, including Transportation

Transportation

Under **Alternative 1**, roadways in the ROI would generally remain accessible to military and civilian users. Localized increases in traffic on JBSA-BUL and along the utility ROW west of the Base would be likely to result from the delivery of equipment and construction materials, removal of debris, and daily commuting of construction workers. Some delays and road closures would be likely in areas along the ROW during construction. However, increases of traffic under Alternative 1 would be a small fraction of existing levels of traffic, and traffic measures would be in place to minimize delays. Therefore, potential effects on transportation under Alternative 1 would be short term and negligible.

Potential effects on transportation under **Alternative 2** would be the same as Alternative 1.

Propane and Natural Gas

Alternative 1 would replace existing propane infrastructure on JBSA-BUL with a pipeline for natural gas. Because propane is a more polluting fuel source as compared to natural gas, Alternative 1 would result in minor, beneficial effects on the environment. Alternative 1 would also result in minor, beneficial effects on safety and security at JBSA-BUL by eliminating the explosive potential of propane use and minimizing commercial access to the Base for propane deliveries.

Potential effects on propane and gas under **Alternative 2** would be the same as Alternative 1.

Sanitary Sewers

No effects on existing sanitary sewer systems would occur under **Alternative 1**; however, Alternative 1 would occur within the same anticipated timeframe as that of a proposed wastewater line conveyance from JBSA-BUL to a discharge connection point located outside the Base. The locational considerations and anticipated timeframes for these projects are the same. Potential effects could occur if the ROW does not provide adequate space to meet the siting and design requirements of both projects.

Potential effects on sanitary sewers under **Alternative 2** would be the same as Alternative 1.

Other Utilities

Electricity, potable water, communications systems, and solid waste management are readily available and sufficient to support the construction and operation of **Alternative 1**.

Potential effects on electricity, potable water, communications systems, and solid waste management under **Alternative 2** would be the same as Alternative 1.

Hazardous Materials and Waste

Hazardous Materials

Alternative 1 would involve the use and management of hazardous substances such as oils, lubricants, and paints. Quantities would be limited to those required, and all such materials would be used, handled, transported, stored, and disposed of in accordance with applicable federal, state, and local laws and regulations. Adherence to standards and implementation of best practices would prevent and minimize releases to the environment. The Air Force would also perform daily inspections of equipment, maintain appropriate spill-containment materials on site, and store all fuels and other materials in appropriate containers. Four petroleum underground storage tanks (USTs) were identified within or immediately adjacent to the utility ROW under Alternative 1. The Air Force would coordinate with the applicable UST operators to either manage or avoid any potential conflicts or adverse effects with respect to these USTs. With these measures in place, potential effects from hazardous materials under Alternative 1 would be negligible.

Potential effects from hazardous materials under **Alternative 2** would be the same as Alternative 1.

Hazardous Waste

Alternative 1 would generate small quantities of hazardous waste that would be managed and disposed of in accordance with applicable federal, state, and local laws and regulations. During construction, all project-related hazardous waste would be segregated from non-hazardous waste, stored in appropriate containers, and transported by licensed contractors for disposal at a permitted facility. Should any excavation or earthwork be required in soils with contaminants detected above applicable regulatory criteria, soils would be categorized as hazardous waste and removed for transportation to a permitted disposal facility. Soils characterized as non-hazardous, if not stockpiled on site for reuse as backfill, would be transported off Base for disposal at a suitable location. All workers involved and the general public in the vicinity of the site would be protected by engineering or administrative controls, as appropriate. With these measures in place, potential effects from hazardous waste would be minor.

Potential effects from hazardous waste under **Alternative 2** would be the same as Alternative 1.

Health and Safety

Human and environmental health impacts under **Alternative 1** would include the potential for a physical injury or fatality, an exposure to a hazardous substance, and fire or explosion from a rapid oxidation process during construction and operation of Alternative 1. However, through adherence to project- and Base-specific health and safety plans, procedures, and protocols, potential effects on human and environmental health and safety under Alternative 1 would short term and minor.

Potential effects on human and environmental health and safety under **Alternative 2** would be the same as those described for Alternative 1.

Cumulative Effects

The Draft EA considered cumulative effects that could result from the incremental effects of the Proposed Action and Alternatives when added to other past, present, or reasonably foreseeable environmental trends and planned actions on and around JBSA-BUL. Reasonably foreseeable environmental trends and planned actions for the San Antonio metropolitan area were characterized in the Draft EA for this purpose. No significant adverse cumulative effects were identified for the resources and resource areas analyzed in the Draft EA.

Mitigation

JBSA or the contractors involved would implement the following BMPs to reduce potential effects on or from biological resources:

- Cease construction work and notify JBSA's Natural Resources staff if migratory birds (or nests of migratory birds) identified by the USFWS as a species of conservation concern are observed on or around construction sites.
- Comply with JBSA environmental specifications during construction activities.
- Revegetate disturbed areas with native species; TPWD recommends incorporating pollinator conservations and management into revegetation and landscaping plans.
- Design, construct, and maintain project-specific stormwater management features to the benefit of wildlife habitat, when applicable and possible.
- Do not conduct vegetation removal and construction within nesting GCWA habitat or in KPA.
- Conduct vegetation removal between 16 September and 28 February to avoid bird nesting season, when GCWA are present; tricolor bat birthing; bracted twistflower flowering; disturbing Monarch butterfly life-cycle stages, which include the egg, the larvae (caterpillar), and the pupa (chrysalis) stages; and the majority of oak wilt season.
- Notify the TCEQ immediately upon encountering a void larger than 6 inches in any direction during trenching activates and complete a void mitigation plan using TCEQ-10256, *Solution Feature Discovery Notification Form*.
- Identify all oak species within the construction footprint prior to initiating vegetation removal. Immediately paint all oaks that are trimmed or accidentally wounded during the action with pruning paint. Sterilize equipment between individual trees to prevent the spread of oak wilt.
- Avoid mature trees when possible to keep canopy intact.
- Survey the construction footprint in April or May, i.e., prior to initiating vegetation clearing, to identify any bracted twistflower in the area. Flag identified plants and protect from construction activities when possible.
- Detail silt fencing placement in the Edwards Aquifer Protection Plan in accordance with all TCEQ requirements as well as safeguards around Cement Cave from sediment and runoff.
- Place fueling points outside Karst Zone 1 or 2 and over containments.

- Once construction is complete, reseed all disturbed areas with regionally native wildflower seed mix to include milkweed species known in the area that are host species for the Monarch butterfly.
- Schedule operations and maintenance activities, to include mowing and brush management, that affect vegetation between 16 September and 28 February to minimize impacts to protected species.
- Thoroughly wash all equipment and machinery used for construction prior to entering the Installation to avoid the introduction of invasive species to the area. Continue monitoring and removal of invasive species.

Conclusion

Finding of No Practicable Alternative. Pursuant to Executive Order 11988, *Floodplain Management*, amended by Executive Order 13690, with consideration of the findings of the Draft EA, the Air Force determined that no practicable alternatives to locate the Proposed Action and Alternatives outside floodplains existed that would meet the purpose and need for the project. Most of the floodplains that would be affected by the Proposed Action and Alternatives occur within previously disturbed areas of an existing utility ROW. Additionally, increases to imperviousness from the Proposed Action and Alternatives would be minimal and effects on the function and use of floodplains would be negligible over the long term. The resultant land use is consistent with the status quo and generally compatible with the future use of the floodplains. Therefore, the Air Force determined that a finding of no practicable alternative would be suitable for the Proposed Action and Alternatives. Pursuant to Executive Order 11990, *Protection of Wetlands*, no direct effects on wetlands would occur and potential indirect effects on wetlands would manageable under the Proposed Action and Alternatives.

Finding of No Significant Impact. After review of the EA prepared in accordance with the requirements of NEPA and 32 CFR Part 989*,* hereby incorporated by reference, I have determined that the Proposed Action and Alternatives would not have a significant adverse impact on the quality of the human or natural environment. Accordingly, preparation of an Environmental Impact Statement would not be required. Given these findings, and with consideration of any substantive comments received during this 30-day public comment period, the Air Force considers its environmental impact analysis process to be sufficient to comply with NEPA and carry out the selection and implementation of the Proposed Action and Alternatives considered by analysis in the Draft EA.

_____ _____

NAME DATE
Rank, US Air Force
Position

Draft
Environmental Assessment of Proposed Installation of Natural Gas Lines at Joint Base San Antonio, Camp Bullis, Bexar and Comal Counties, Texas

March 2025

Prepared for:
United States Air Force
502d Air Base Wing

PRIVACY ADVISORY

This Environmental Assessment (EA) is provided for public comment in accordance with the *National Environmental Policy Act* (NEPA) as amended by the *Fiscal Responsibility Act of 2023* (Public Law 118-5), and Title 32 *Code of Federal Regulations* Part 989, *Environmental Impact Analysis Process (EIAP)*, whichprovides an opportunity for public input on Air Force decision-making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

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TABLE OF CONTENTS

Appendices

List of Figures

List of Tables

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ABBREVIATIONS AND ACRONYMS

502 ABW	502d Air Base Wing
ACAM	Air Conformity Applicability Model
ACM	asbestos-containing material
AFB	Air Force Base
AFFF	aqueous film forming foam
Air Force	United States Air Force
APE	Area of Potential Effect
AST	aboveground storage tank
BA	Biological Assessment
BMP	best management practice
BO	Biological Opinion
BUL	Camp Bullis
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CZP	contributing zone plan
DAFI	Department of the Air Force Instruction
dB	decibel
dBA	A-weighted decibel
DNL	Day-Night Average Sound Level
DoD	United States Department of Defense
EA	Environmental Assessment
EAPP	Edwards Aquifer Protection Plan
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	*Energy Independence and Security Act*
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ETJ	extraterritorial jurisdiction
FEMA	Federal Emergency Management Agency
FFRMS	Federal Flood Risk Management Standard
FONPA	Finding of No Practical Alternative
FONSI	Finding of No Significant Impact
FRA	Fiscal Responsibility Act of 2023
ft^2	square feet/foot
GCWA	golden-cheeked warbler
HWMP	hazardous waste management plan
I-10	Interstate 10
ICRMP	Integrated Cultural Resources Management Plan
INRMP	integrated natural resources management plan
IPaC	Information for Planning and Coordination
JBSA	Joint Base San Antonio
KPA	karst preserve area
MIA	military influence area
MMRP	Military Munitions Response Program
MS4	municipal separate storm sewer system
MSA	metropolitan statistical area
NAAQS	National Ambient Air Quality Standards
NAGPRA	*Native American Graves Protection and Repatriation Act*
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent

NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSH	occupational safety and health
OSHA	*Occupational Safety and Health Act*
PA	Programmatic Agreement
PFAS	Per- and Polyfluoroalkyl substances
PIPES Act of 2020	*Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2020*
PM_x	particulate matter equal to or less than x microns in diameter
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RIFA	red imported fire ant
ROI	Region of Influence
ROW	right-of-way
SARA	San Antonio River Authority
SHPO	State Historic Preservation Office
SIP	state implementation plan
SPCC	spill prevention, control and countermeasures
SWP3	stormwater pollution prevention plan
TCEQ	Texas Commission on Environmental Quality
TCP	Traditional Cultural Property
THC	Texas Historical Commission
TMDL	total maximum daily load
TPDES	Texas Pollutant Discharge Elimination System
tpy	ton per year
TWDB	Texas Water Development Board
US	United States
UST	underground storage tank
USC	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	unexploded ordinance

CHAPTER 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

Joint Base San Antonio (JBSA), Camp Bullis (BUL) is a military training base under United States (US) Air Force (Air Force) management located to the north of the city of San Antonio in Bexar and Comal counties, Texas (**Figure 1-1**). JBSA-BUL is used to train soldiers in preparation for combat across the diverse missions of the Air Force and US Department of Defense (DoD). Most of the mission support functions and facilities that enable training at JBSA-BUL are in the southwest portion of the Base, an area referred to as the "cantonment." The cantonment houses various administrative, industrial, and community support functions for the military members and civilians that train or work at JBSA-BUL. Currently, these facilities are powered, in part, by propane gas delivered via an antiquated system of above-ground storage tanks.

The Air Force 502d Air Base Wing (502 ABW) at JBSA proposes to modernize the cantonment by conversion from propane to natural gas energy. As compared to propane, natural gas is a less-polluting source of energy, and a new distribution system would result in more efficient operations. The Air Force plans to procure a third party to design, construct, operate, and maintain the proposed natural gas distribution system. This proposal would first seek to route and install a new natural gas pipeline that provides connectivity to the cantonment from a privately operated main line proximate to the Base. A secondary network of pipelines would then be installed for distribution to facilities within the cantonment. This Environmental Assessment (EA) evaluates the potential environmental, cultural, and socioeconomic effects of the Air Force's proposal to modernize the JBSA-BUL cantonment by conversion from propane to natural gas energy. This project, hereinafter referred to as the "Proposed Action," would be implemented over approximately 5 years from 2025 to 2030. **Chapter 2** of this EA describes the Proposed Action in more detail.

This EA was prepared in accordance with the *National Environmental Policy Act of 1969* (42 USC § 4321 et seq.; NEPA) as amended by the *Fiscal Responsibility Act of 2023* (FRA) (Public Law 118-5); the Air Force's *Environmental Impact Analysis Process* (EIAP) implementing regulations (Title 32 *Code of Federal Regulations* [CFR] Part 989) to the extent they are consistent with NEPA, as revised by the FRA; and Executive Order (EO) 14154, *Unleashing American Energy*. The EIAP informs decision-makers, regulatory agencies, and the public about an Air Force proposed action before any decision is made on whether to implement the action. During the EIAP, if analyses in the EA determine that potential, significant adverse effects would be likely to occur, the Air Force would publish a Notice of Intent (NOI) in the *Federal Register* to prepare an Environmental Impact Statement (EIS).

To render this document more concise, links are provided to online data sources to which the reader can refer for more information. Should the reader not have internet access, please contact the Air Force point of contact listed on the **Cover Sheet** of this EA and accommodations will be made to provide printed copies of relevant information requested.

1.2 BACKGROUND

The DoD is authorized to enter into agreements with private sector gas or electric providers "to design and implement cost-effective demand and conservation incentive programs," including for the installation and maintenance of energy services and infrastructure (10 USC § 2913(d)(1)). These agreements reduce the administrative time and cost associated with DoD energy development projects and allow DoD to leverage third-party funds to invest in energy efficiency and conservation. Under such terms, the third-party provider recuperates the cost via privatization of the utility; incentives for energy efficiency and conservation are then linked to the operation and maintenance of the utility system. The Air Force intends to use its authority under 10 USC § 2913 to convert from propane to natural gas services within the cantonment area of JBSA-BUL under the Proposed Action as part of its Utilities Privatization Initiative.

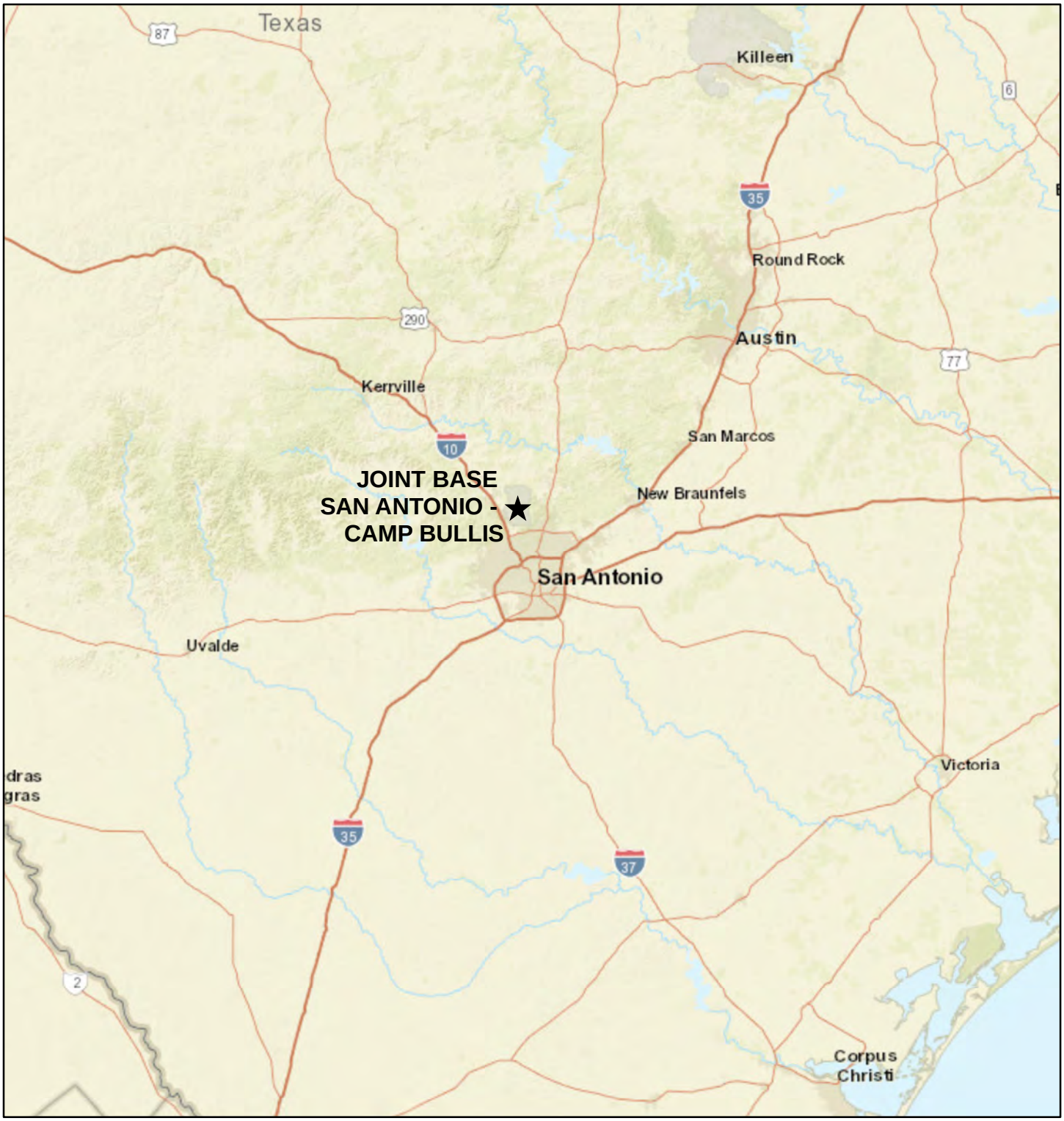

FIGURE 1-1
Regional Location

★ JBSA-BUL

N

0 40 Mile

Imagery: ESRI, 2022.
Coordinate System: WGS 1984 UTM Zone 11N

1.3 JOINT BASE SAN ANTONIO, CAMP BULLIS

A main objective of the DoD joint basing program is to combine the support functions of two or more DoD installations that are in close proximity to one another. JBSA was formed in 2010, merging the support functions of three geographically separate installations in and around the city of San Antonio. This joint basing action brought Lackland Air Force Base (AFB), Randolph AFB, and Fort Sam Houston (formerly an Army base) under the management of the 502 ABW. Camp Bullis, an Army training camp under Fort Sam Houston, also became part of the Joint Base. JBSA is currently the single largest entity in the DoD, accomplishing diverse missions that include training, flying, medical, cyber, and intelligence.

The 27,994-acre JBSA-BUL is the largest property under the management of the 502 ABW. It is primarily used as a training base and maneuvering grounds for Army, Air Force, and Marine Corps combat units. JBSA-BUL is also a key asset for expeditionary medical training at JBSA. Most of the approximately 300 buildings on JBSA-BUL are concentrated in the cantonment. Training lands generally surround the cantonment and occupy all other portions of the Base (**Figure 1-2**). These include field training areas, live-fire ranges, navigation lands, physical fitness courses, and helicopter landing and drop zones. Camp Bullis has historically been used as an impact area. Approximately 1,500 personnel are stationed at JBSA-BUL, not including the visitor population on temporary training assignments.

1.4 PURPOSE OF THE ACTION

The **purpose** of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. Pursuant to 10 USC § 2913, the Proposed Action would install a below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment. From its terminus in the central portion of the cantonment, distribution lines would be installed that branch out and connect with facilities located therein. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, cost-effective, and less-polluting energy source. Under the Proposed Action, the military members and civilians working or training at JBSA-BUL, and the residents of communities adjacent to the Base, would accrue these benefits starting in approximately 2030.

1.5 NEED FOR THE ACTION

The Proposed Action is **needed** to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. Propane is pressurized into a liquid state for storage and transportation. Therefore, even a minor discharge creates a hazard of ignition or explosion. When used to power a building or facility, large quantities of propane must be stored in a nearby outdoor storage tank. Because of these factors, propane use increases the probability of an accidental fire or explosion in the cantonment.

Propane use in the cantonment also represents a security and operational risk to the military mission of JBSA-BUL. As propane requires regular delivery to replenish storage tanks (rather than by buried line), it increases the probability of a security breach where tanks or vehicles could be weaponized. Because propane tank and distribution systems are often subject to dysfunction or failure due to age, damage, or corrosion, there is more potential for operational disruptions. In a disaster scenario, where propane could not be delivered to JBSA-BUL, an operational shutdown could occur.

As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various EOs, federal statutes, and DoD and Air Force policies, plans, and directives (see **Section 2.4.1**).

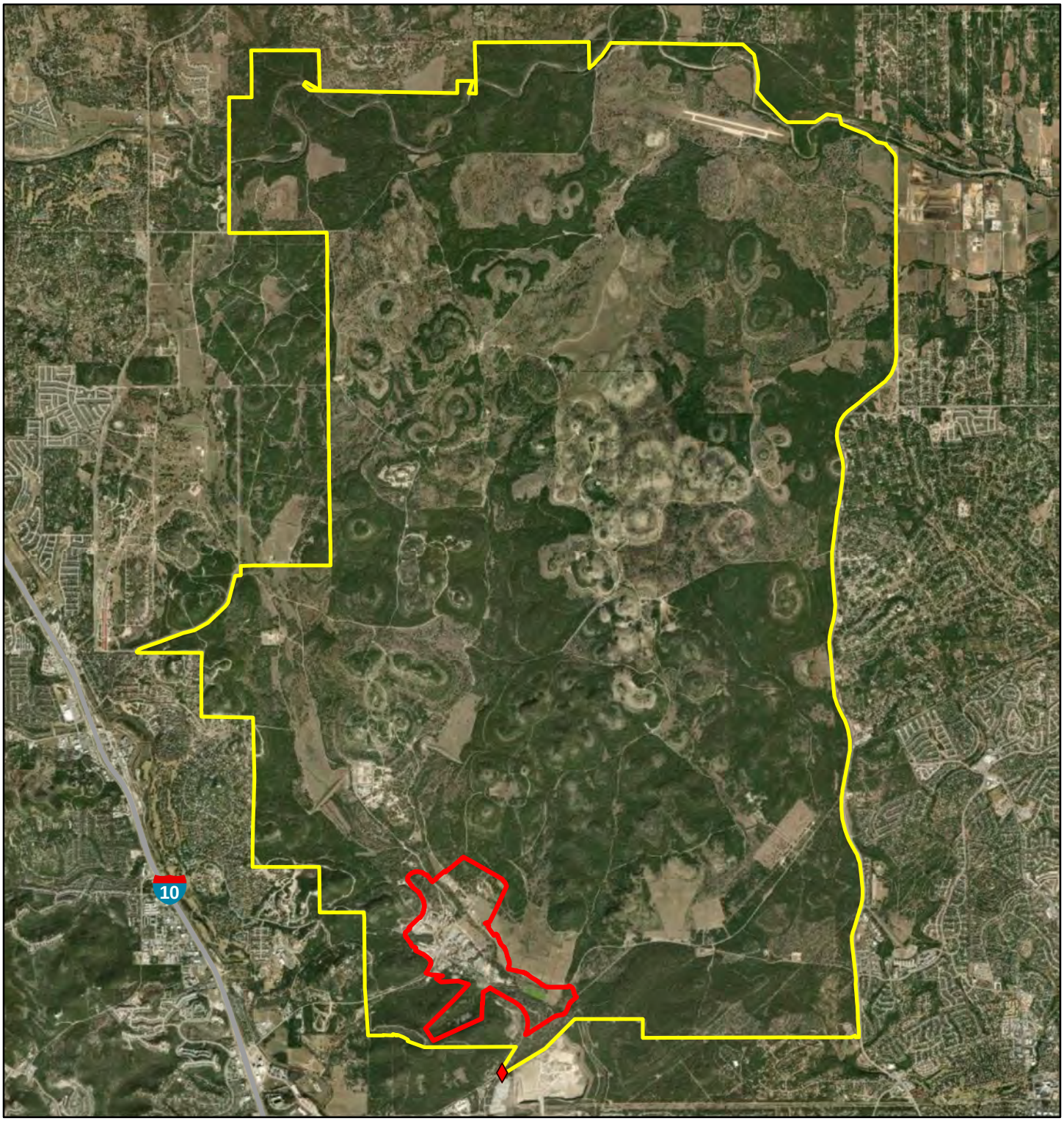

FIGURE 1-2
Joint Base San Antonio - Camp Bullis

Entry Control Point

Cantonment Area

Installation Boundary

N

0 1 2 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N

1.6 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

An EA is a concise public document that briefly discusses the purpose and need, alternatives, and potential environmental impacts of a proposed federal action. It aids in agency planning and decision-making, or facilitates the preparation of an EIS, as necessary (40 CFR § 1501.5). In accordance with 40 CFR § 1501.3, the Air Force determined the appropriate level for analysis for the Proposed Action was an EA.

This EA evaluates the potential environmental consequences of implementing the Proposed Action and Alternatives at JBSA-BUL. It serves as a basis for the Air Force to determine whether the Proposed Action and Alternatives—individually or cumulatively—would result in a significant impact on the human environment.

If the EA determines that potential impacts would be less than significant, the Air Force would select an Alternative to implement and document its decision by issuance of a Finding of No Significant Impact (FONSI). If the EA determines that potential impacts could or likely would be significant, the Air Force would announce its intent to prepare an EIS or choose to take no action. In lieu of preparing an EIS, the Air Force may also "mitigate" potentially significant environmental impacts found during preparation of an EA to less-than-significant levels. Any required, agreed upon mitigation for this purpose would be documented in the FONSI. Should the Proposed Action and Alternatives affect floodplains or wetlands subject to EO 11988, *Floodplain Management*; EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, as reinstated by EO 14030; or EO 11990, *Protection of Wetlands* (see **Section 1.7.1**), the Air Force would also prepare a Finding of No Practicable Alternative (FONPA).

The scope of this EA is generally limited to the routing, construction, and operation of a natural gas distribution system with connectivity to the facilities in the JBSA-BUL cantonment. The Proposed Action also includes such related actions as interior equipment modifications, removal and disposal of the existing propane system infrastructure, and post-construction site restoration. However, because implementing the Proposed Action would be subject to agreement between the Air Force and a third-party provider, the scope of this EA does not include the solicitation or selection of a qualified provider of natural gas services. This EA assumes the provisions of such an agreement are applicable and could be leveraged to implement the Proposed Action.

This EA addresses the potential effects of the Proposed Action and Alternatives on resource areas subject to potential impacts. **Chapter 3** presents information on the existing conditions of each resource area, includes the environmental impacts analysis, and, when appropriate, recommends best practices and mitigation measures. **Chapter 3** also describes reasonably foreseeable environmental effects in the area(s) that could be affected by the Proposed Action and Alternatives, now or in the future. Accordingly, the impact analyses in **Chapter 3** evaluates future actions that support the Air Force's decision-making process or have a reasonably close causal connection to the Proposed Action and Alternatives. To document and account for such potential effects, a region of influence (ROI) is defined for each resource or resource area subject to analysis in this EA. Resource areas eliminated from further, more detailed analysis, as well as the rationale for eliminating those resource areas, are defined in **Section 3.1**.

1.7 DECISION TO BE MADE

The decision to be made is whether to implement the Proposed Action. Should the Air Force choose to implement the Proposed Action, this EA will assist in determining an appropriate scope of action to minimize potential adverse environmental impacts or allow for additional, project-specific environmental review in compliance with NEPA. The decision-making framework for this EA (see also **Section 3.1**) is described as follows:

- Do not implement the Proposed Action.
- Implement the Proposed Action as documented in a FONSI for this EA.

- Publish a NOI in the *Federal Register* to prepare an EIS for the Proposed Action.

Should the Air Force decide to implement the Proposed Action, this EA will identify any actions the Air Force will commit to undertake to minimize environmental effects and comply with NEPA.

1.8 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

NEPA requires federal agencies to consider the potential environmental impacts of their proposed actions on the human and natural environment. The EIAP implements Air Force compliance with NEPA in accordance with the applicable regulations and guidance.

1.8.1 Interagency and Intergovernmental Coordination and Consultation

Interagency and intergovernmental coordination for environmental planning is a federally mandated process for informing and coordinating with other governmental agencies regarding a federal proposed action. The Air Force complies with this mandate through scoping[1] and by inviting public participation (see **Section 1.8.2** of this EA).

In April 2022, the Air Force sent scoping letters concerning the Proposed Action and Alternatives to 14 government agencies. Agency responses to the scoping letters were reviewed and incorporated into the Draft EA, as appropriate. A list of agencies that received scoping letters and copies of the correspondence are provided in **Appendix A**.

1.8.2 Public and Agency Review

The intent of this EA is to inform decision-makers and the public of the potential environmental effects of the Proposed Action and Alternatives prior to making a federal decision to move forward with any Alternative. This allows the Air Force to make a fully informed decision, aware of any potential environmental effects. Overall, this EA

- documents the NEPA process or EIAP;
- provides an opportunity for the public, regulatory agencies, and federally recognized Native American Tribes to participate in the Air Force's decision-making process; and
- considers input on the possible environmental effects of the Proposed Action and Alternatives, including methods to reduce such effects.

The Air Force invites the public and other interested stakeholders to review and comment on this EA. Accordingly, a Notice of Availability of the Draft EA and Preliminary Draft FONSI (hereafter, Draft EA and FONSI) was published in the following local newspapers to commence a 30-day public comment period:

- *The San Antonio Express News*
- *San Antonio Business Journal*

During the public comment period, the Draft EA and FONSI are available for view or download online. Additionally, printed copies of these documents are available by request and placed at the following local library for review:

- San Antonio Public Library, 600 Soledad Street, San Antonio

[1] Scoping is a process for determining the scope of issues to be addressed and analyzed in a NEPA document.

The Final EA will address all substantive comments received on the Draft EA and FONSI; written comments will be included as an appendix to the Final EA. Following issuance of the Final EA and Final Draft FONSI, the Air Force would then issue a Final (signed) FONSI to comply with NEPA, as appropriate.

1.9 INTEGRATION OF OTHER ENVIRONMENTAL STATUTES AND REGULATIONS

This EA organizes separate, but related, environmental compliance requirements associated with the Proposed Action and Alternatives in a single compliance document. In accordance with NEPA, the Air Force addresses these requirements concurrently with the EIAP to the extent possible.

The Air Force is working closely with relevant federal, state, local agencies, and Native American Tribes with purview over the Proposed Action. **Sections 1.9.1–1.9.4** summarize relevant environmental compliance requirements and their concurrency with this EA. Copies of relevant correspondence concerning these requirements are provided in **Appendix A**. These and other applicable environmental statutes and regulations are further described in **Chapter 3**.

1.9.1 Floodplain Management and Protection of Wetlands

EO 11988 directs federal agencies to determine whether a proposed action would occur within a floodplain and to avoid or minimize adverse impacts on floodplains. If an agency considers avoiding adverse impacts on a floodplain and determines that no practicable alternative to undertaking the action is feasible, EO 11988 requires minimizing impacts by design or modification. In such cases, agencies must also prepare and circulate a notice to explain how avoidance was not practicable and describe minimization measures. The planning and evaluation steps required by EO 11988 also apply to EO 11990 a similar directive requiring federal agencies to avoid or minimize adverse impacts on wetlands.

To implement EO 11988, processes for evaluating the impacts of federal actions in or affecting floodplains (and wetlands) are in place. EO 13690 creates a new flood risk reduction standard for federally funded projects, the Federal Flood Risk Management Standard (FFRMS). The FFRMS is a flexible framework for increasing resilience against flooding and preserving the natural-function benefits of floodplains. The incorporation of the FFRMS will expand federal management of actions that affect floodplains from the current base flood level to a higher vertical elevation and corresponding horizontal extent. EO 13690 also sets forth a process for further solicitation and consideration of public input.

As applicable, this EA documents Air Force compliance with EOs 11988, 11990, and 13690.

1.9.2 State Historic Preservation Office

Section 106 of the *National Historic Preservation Act* (54 USC § 300101 et seq.) (NHPA) requires that federal agencies consider the potential effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation an opportunity to comment on the undertaking. This EA assists the Air Force in identifying relevant or interested consulting parties and initiates the Section 106 process for the proposed undertaking concurrent with the NEPA process.

In accordance with 36 CFR Part 800, the Air Force maintains a Programmatic Agreement (PA) with the Texas SHPO under NHPA Section 106 for the operation, maintenance, and development of JBSA. Under the Proposed Action, the Air Force would adhere to the project review process as stipulated in the PA. This process outlines the agreed upon procedures for monitoring, recording, qualifying, and mitigating for potential adverse effects on cultural resources under JBSA's management, including those associated with JBSA-BUL. The PA also identifies development program activities that are "exempted" from Section 106 requirements.

The Air Force uses scoping to determine an appropriate level of analysis for potential effects on cultural resources, including historic properties. This EA is also used to document the Air Force's compliance with Section 106, as follows:

1. Determine if the Proposed Action and Alternatives would potentially affect historic properties;

2. Define the Area of Potential Effects (APE) for any potentially affected historic properties; and
3. Consult with the SHPO and other relevant or interested parties to establish an appropriate level of effort for gathering additional information by inventory or investigation within the APE.

If no historic properties are identified, or those present would not be adversely affected under the Proposed Action and Alternatives, the Air Force would seek the review and concurrence of the SHPO on its no adverse effects determination. Historic properties potentially subject to adverse effects under the Proposed Action and Alternatives would be subject to further consultation under Section 106 of the NHPA, including any required mitigation measures.

1.9.3 Federally Recognized Tribal Governments

Numerous federal laws, regulations, policies, and directives protect the rights of indigenous communities and resources that preserve their heritage, culture, or religious beliefs. These include the NHPA, NEPA, *Native American Graves Protection and Repatriation Act* (25 USC § 3001 et seq.) (NAGPRA), and more recent federal policy directives.[2] DoD Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes*, describes and implements the DoD policy for engaging with tribal governments.

In accordance with Department of the Air Force Instruction (DAFI) 90-2002, *Interactions with Federally Recognized Tribes*, the Air Force engages with federally recognized Native American Tribes that have potential historic or cultural affiliations to installation lands or lands under managed airspace. As part of the scoping process for this EA, the Air Force identified federally recognized Native American Tribes with a potential interest in the Proposed Action and Alternatives. Those tribes that expressed an interest in the Proposed Action were invited to participate in this EIAP and as consulting parties under Section 106 of the NHPA.

The Air Force sent scoping letters concerning the Proposed Action and Alternatives to three federally recognized Native American Tribes. [To date, none of the tribes has commented on the Proposed Action and Alternatives]. A list of tribes that received scoping letters is provided in **Appendix A**.

1.9.4 Endangered Species Act

Section 7 of the *Endangered Species Act* (16 USC § 1531 et seq.) (ESA) requires federal agencies to consider the potential impacts of their proposed actions on ESA-listed threatened and endangered species or habitat considered essential to their recovery, defined and designated as "critical habitat" under the ESA. Federal agencies are required to consult with the US Fish and Wildlife Service (USFWS) for actions that may affect federally listed threatened and endangered species or their critical habitat. On 10 March 2025, the Air Force initiated Section 7 consultation under the ESA for the Proposed Action using the USFWS's Information for Planning and Consultation (IPaC) tool to obtain an official species list from the USFWS. The list identifies threatened and endangered species and other protected species (e.g., migratory birds) with potential to be affected by the Proposed Action. This information is included in **Appendix A** and incorporated into this EA where applicable.

1.10 Applicable Laws and Environmental Regulations

Other laws and regulations applicable to the Proposed Action include, but are not limited to:

- *Endangered Species Act* (16 USC § 1531 et seq.) (ESA)
- *Edwards Aquifer Rules* (Texas Administrative Code, Title 30,Chapter 213-A et seq.)
- *Clean Air Act of 1963* (42 USC § 7401 et seq.) (CAA)

[2] For example, Presidential Memorandums on *Tribal Consultation and Strengthening Nation-to-Nation Relationships* (26 January 2021) and *Indigenous Traditional Ecological Knowledge and Federal Decision Making* (15 November 2021).

- *Clean Water Act* (33 USC § 1251 et seq.) (CWA)
- Resource Conservation and Recovery Act (42 USC § 6901 et seq.) (RCRA)
- Section 438 of the *Energy Independence and Security Act* (Public Law 110-140)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 et seq.) (CERCLA)
- *Federal Clean Air Act* (42 USC § 7401 et seq., as amended)
- Migratory Bird Treaty Act (16 USC §§ 703–712)
- Toxic Substances Control Act (15 USC § 2601 et seq.)
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994)

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CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The following sections describe the Proposed Action, alternatives screening process, and alternatives dismissed and retained for analysis in this EA.

2.1 INTRODUCTION

Most natural gas distribution systems are installed underground as a network of linear pipelines. Much like an assembly-line process, the construction or installation of natural gas pipelines involves a sequence of repetitive steps and substantial upfront planning to ensure the safety and integrity of the system. Before construction begins, a route must be evaluated and selected, have an approved right-of-way (ROW),[3] and have obtained associated regulatory permits or approvals. The design of the system must also be completed prior to construction, as a variety of soil conditions and other characteristics of the route determine requirements for pipe size, strength, and thickness, among other system components.

Pipeline systems owned and operated by private sector companies are subject to numerous federal and state laws and regulations. In general, interstate systems are regulated at a federal level, while intrastate regulatory oversight is carried out by delegated state authorities. The overarching federal law for pipeline transportation and safety is the *Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2020* (Senate Bill 116-2299) (PIPES Act of 2020). Pursuant to the PIPES Act of 2020, the Office of Pipeline Safety, Pipeline and Hazardous Materials Safety Administration within the US Department of Transportation, is granted authority to enforce the federal minimum pipeline safety standards at 49 CFR Parts 190–199. Title I of the PIPES Act of 2020 addresses pipeline transportation and safety with respect to natural gas systems. In Texas, as certified by the Office of Pipeline Safety, the Pipeline Safety Department of the Texas Railroad Commission enforces pipeline safety regulations.

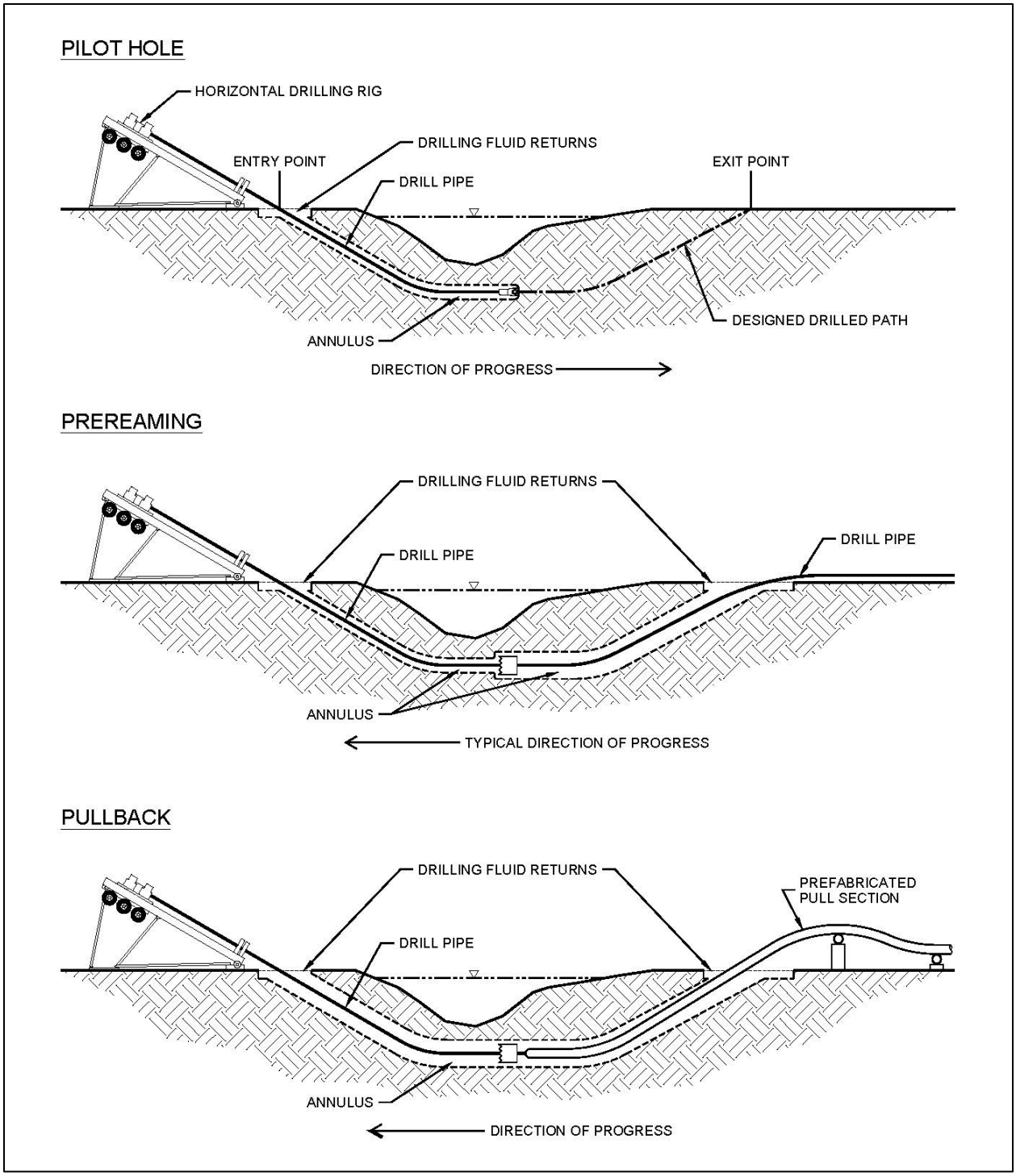
2.2 DESCRIPTION OF THE PROPOSED ACTION

Upon selecting a viable route and obtaining ROW approval, the Proposed Action would be constructed over approximately 5 years from 2025 to 2030. From start to finish, implementation of the Proposed Action would generally maintain the following sequence of steps:

1. Obtain regulatory permits and/or approvals to include completion of any required technical support studies or surveys.
2. Construct a 6-inch-diameter pipeline from a main line connection point to a central location within the cantonment.
3. Construct a network of 6- and 4-inch-diameter laterals and service lines within the JBSA-BUL cantonment, including regulator/meter equipment.
4. Prepare facility interiors to receive natural gas (e.g., gas lines and boilers) via reuse or modification of legacy equipment or new equipment installation.
5. Excavate, remove, and dispose of, or demolish in place, propane system infrastructure within the cantonment.

Under the Proposed Action, the pipeline would be constructed of plastic. Dependent on environmental conditions along the utility ROW, the Proposed Action would use a combination of trenching and boring to install the pipelines. For example, trenching may occur along routes where an established ROW is in place, whereas boring may occur to avoid disturbance of ground-level features such as streams, wetlands, or roads. **Figure 2-1** illustrates boring using horizontal directional drilling.

[3] Temporary ROWs for staging and operating equipment during construction are also required.



Source: USFWS, 2010

Figure 2-1 Illustration of Horizontal Directional Drilling

Table 2-1 characterizes the component of the Proposed Action that would occur once the main line extension reaches the JBSA-BUL cantonment. This portion of the Proposed Action would be the same under the action alternatives, as described in **Sections 2.4.2** and **2.4.3**.

Table 2-1
Pipeline Installation Within the Cantonment[a]

Proposed Method	Pipeline Diameter (inches)	Length of Installation (linear feet)	Associated Erosion Control (acres)	Associated Silt Fence (linear feet)
Trenching	6	2,535	2.1	1,270
	4	2,410		
Boring	6	5,580		
	4	1,025		

Note:
a. The data shown are preliminary estimates only.

The regulatory framework for pipeline transportation and safety (see **Section 2.1**) covers wide-ranging disciplines, processes, procedures, and guidance documents. Some of these are outlined below as examples of those that would be incorporated into the Proposed Action by design.

- **National Consensus Standards:** Technical standards for pipeline industry practices, methods, and procedures relating to the safe design, construction, operation, maintenance, and repair of pipelines codified into the CFR by reference.
- **American Gas Association:** *Plastic Pipe Manual for Gas Service* (2006)
- **American National Standard Institute:** *National Fuel Gas Code*
- **American Petroleum Institute:** Standard 1104, *Welding of Pipelines and Related Facilities* (2021)
- **Common Ground Alliance:** *Best Practices Guide: The Definitive Guide for Underground Safety and Damage Protection*, Version 18.0 (2021)
- **Federal Energy Regulatory Commission:** Environmental Guidelines

Section 2.3 describes the basic steps that would be involved in the construction of the Proposed Action.

2.3 CONSTRUCTION STEPS INVOLVED IN THE PROPOSED ACTION

Source: PHMSA, 2020

There are three basic types of natural gas pipelines. Gathering and transmission pipelines are used to collect and transport natural gas from its source and across jurisdictions in large quantities. Distribution pipelines convey natural gas to end users through a network of smaller mains and service lines. While gathering and transmission pipelines are constructed from steel, distribution pipelines may consist of other materials such as cast iron, copper, or plastic.

The basic steps involved in the construction of a natural gas pipeline system are briefly summarized below.

- **Site Preparation:** Clearance, grading, and earthwork is performed within the temporary (construction) ROW, an area that encompasses the utility ROW, to provide temporary workspace. Silt fencing is installed along edges of streams or wetlands to minimize erosion of disturbed soils.
- **Pipe Laydown:** Referred to as "stringing," sections of pipe are laid out along the ROW in accordance with design plans.
- **Trenching and Boring:** Trenching involves excavating an area to place the pipeline below ground. Excavated soils are typically stockpiled on the non-working side of the trench for reuse as backfill. Boring involves horizontal directional drilling (see **Figure 2-1**) along a pre-determined path below ground surface. The bore hole is used to house all or segments of the pipeline in lieu of a trench by pulling the pipeline through the bore.


Source: PHMSA, 2020

- **Bending, Welding, and Coating:** These steps involve bending individual sections of pipe to account for route changes or topography (may occur on or off site); welding pipe ends into one continuous length; and coating the welded areas to prevent corrosion (other segments are pre-treated).
- **Lowering and Backfilling:** The pipeline is lowered into the trench supported by equipment called "side-booms" to prevent damage. With the pipe in place, the trench is backfilled with fill materials required by design, used soils stockpiled on site, and/or clean fill soils transported to the site.


Source: PHMSA, 2020

- **Testing:** Hydrostatic testing[4] of the pipeline system identifies and eliminates any defects.
- **Site Restoration:** Restoration of the construction ROW to original conditions, to the extent possible, involves grading, soil amendments, infrastructure repair (e.g., irrigation systems), erosion control measures (e.g., placing stone or wood "riprap" along streams and wetlands), and planting and seeding to promote revegetation.


Source: PHMSA, 2020

2.4 ALTERNATIVES SCREENING PROCESS

NEPA requires federal agencies to objectively explore and evaluate reasonable alternatives to a proposed action. Alternatives not found to be reasonable can be eliminated from evaluation provided the EA includes a brief rationale for their elimination.

2.4.1 Selection Standards for Alternatives Screening

Consistent with 32 CFR § 989.8(c), the following selection standards meet the purpose of and need for the Proposed Action (see **Sections 1.4** and **1.5**) and were used to identify reasonable alternatives for analysis in the EA.

- **Location and Capacity:** The main line connection point shall be in the vicinity of JBSA-BUL and have sufficient operational capacity to support the Proposed Action.

[4] Natural gas pipelines are designed to support a specific operating pressure. Hydrostatic pressure testing fills the pipeline with water to test the internal pressure level above the intended operating pressure.

- **Land Use, including ROWs:** The pipeline route to the cantonment shall be compatible with existing land use on and around JBSA-BUL, as well as be supported by an existing and/or reasonably obtainable ROW.
- **Security:** The Proposed Action shall improve and safeguard the security of the military mission at JBSA-BUL.
- **Safety:** The design, construction, operation, and maintenance of the Proposed Action shall comply with applicable federal and state laws and regulations pertaining to natural gas transportation and pipeline safety.
- **Energy Use and Management:** The Proposed Action shall support the goals and objectives for energy efficiency and conservation in accordance with applicable EOs; federal statutes; and DoD and Air Force policies, plans, and directives.[5]
- **Cultural Resources:** The Proposed Action shall avoid, to the maximum extent practicable, adverse effects on cultural resources such as archaeological sites, historic buildings or structures, cemeteries, and traditional cultural properties such as Native American sites of cultural importance.
- **Natural Resources:** The Proposed Action shall avoid, to the maximum extent practicable, adverse effects on sensitive or protected natural resources such as threatened and endangered species and their habitat, floodplains, and groundwater.

Section 2.4.2 describes the alternatives considered but eliminated from detailed analysis, including a brief rationale for their elimination. **Section 2.4.3** describes the alternatives retained for more detailed analysis, including the No Action Alternative.

2.4.2 Alternatives Considered but Eliminated from Detailed Analysis

The Air Force considered multiple options for siting and constructing a natural gas distribution system with service to the JBSA-BUL cantonment. The use of other energy resources such as renewable technologies were also considered. Scenario planning was used to evaluate varying factors such as those described above in **Section 2.4.1**. Ultimately, only two alternatives were determined to meet the purpose of and need for the Proposed Action (see **Sections 1.4** and **1.5**) and could be implemented within the needed timeframe. Representative alternatives the Air Force considered but eliminated from further, more detailed analysis in this EA are briefly described below and depicted in **Figure 2-2**.

2.4.2.1 Wilderness Road

Under this alternative, the Air Force would construct a 4.5-mile-long natural gas pipeline from a point along Blanco Road, immediately east of the JBSA-BUL boundary. The on-Base portion of this route would parallel Wilderness Trail Road for 2.3 miles before connecting to the cantonment via Wilderness Road (1.6 miles) and NW Military Highway (0.5 mile). The Air Force determined that construction of this alternative would result in substantial disturbance of threatened and endangered species habitat areas on JBSA-BUL. It was further determined that the extent of this alternative was largely coterminous with the recharge zone of the Edwards Aquifer. Therefore, the Air Force considered but eliminated this alternative from more detailed analysis in this EA.

2.4.2.2 Wilderness Trail

Under this alternative, the Air Force would construct a 4.8-mile-long natural gas pipeline from a point along Blanco Road, immediately east of the JBSA-BUL boundary. The on-Base portion of this route would parallel Wilderness Trail Road for 3.6 miles before connecting to the cantonment via Wilkerson Road (0.4 mile) and NW Military Highway (0.5 mile). As described above in **Section 2.4.2.1**, the Air Force determined this alternative would also disturb substantial threatened and endangered species habitat areas on JBSA-BUL,

[5] For example, DoD's *Supplemental Guidance for the Utilities Privatization Program* (2019); *Air Force Installation Energy Strategic Plan* (2021); Air Force Policy Directive 90-17, *Energy and Water Management* (2024); and JBSA's *Environmental Policy Statement* (2018).

and its extent was also largely coterminous with the recharge zone of the Edwards Aquifer. Therefore, the Air Force considered but eliminated this alternative from more detailed analysis in this EA.

2.4.3 Alternatives Retained for Detailed Analysis

As described in **Sections 2.1–2.3,** two of the considered alternatives (**Figure 2-2**) were determined to satisfy the purpose of and need for the Proposed Action (see **Sections 1.4** and **1.5**) and could be implemented within the needed timeframe. These alternatives, described below, are carried forward for detailed analysis in this EA, along with the No Action Alternative.

2.4.3.1 No Action Alternative

Under the No Action Alternative, the Air Force would continue to use propane to operate facilities in the JBSA-BUL cantonment. Concerns with respect to the reliability, safety, and security of the propane tank and distribution system would continue to pose risks to the military mission. The cost for JBSA to operate and maintain the system, including its environmental impacts, would be likely to increase in the long term.

While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the effects of the Proposed Action. The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

2.4.3.2 Alternative 1 – Camp Bullis Road (Preferred)

Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from Interstate-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL, where an existing utility line easement is in place. The on-Base portion of this route would span 0.8 mile.

2.4.3.3 Alternative 2 – NW Military Highway

Under Alternative 2, the Air Force would construct a 2-mile-long natural gas pipeline from a point along NW Military Highway, to the south of JBSA-BUL. The on-Base portion of this route would continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

2.1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-2 summarizes potential impacts associated with the Proposed Action and No Action Alternative. The summary is based on the information and analyses detailed in **Chapter 3** of this EA.

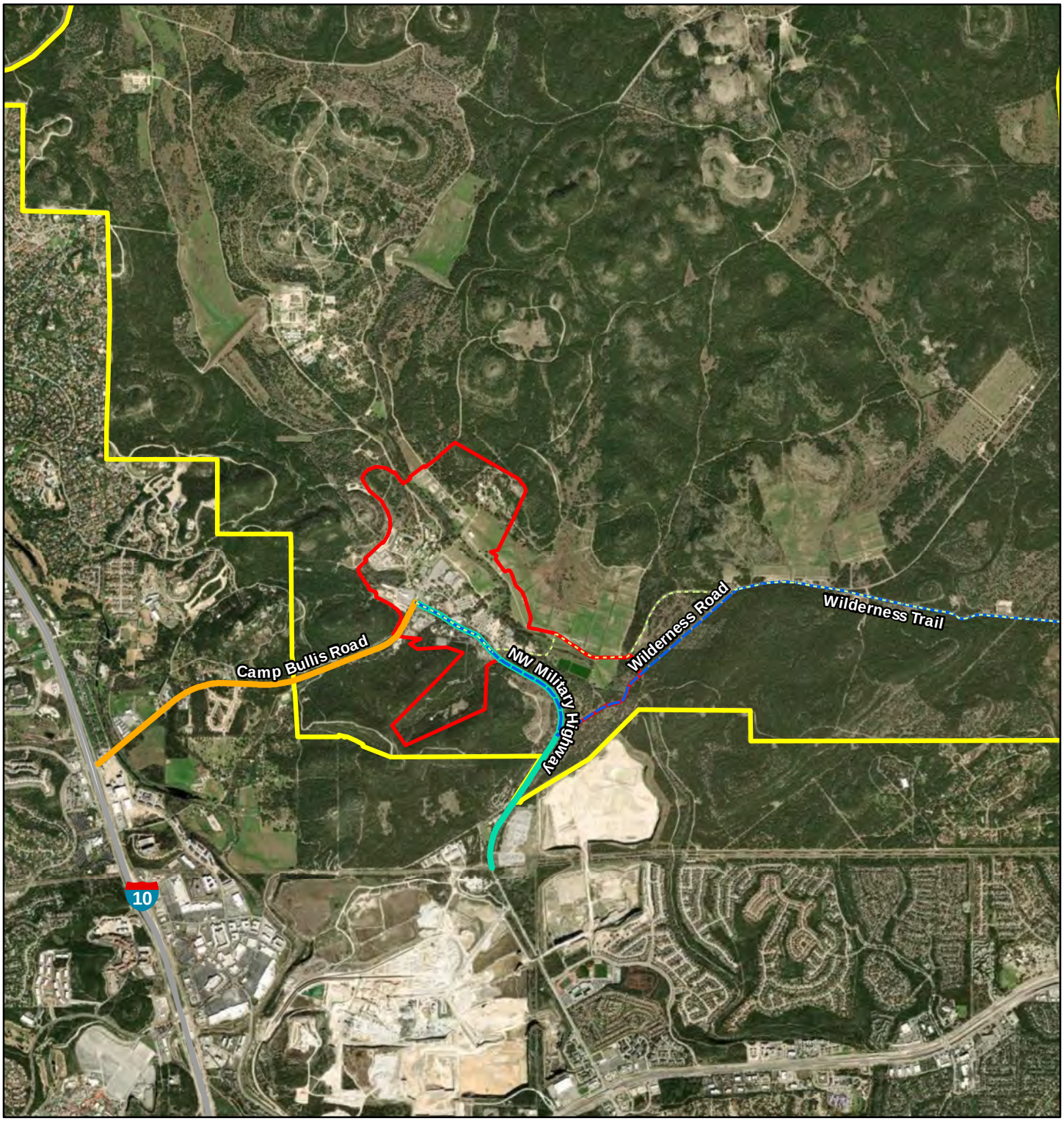


FIGURE 2-2
Route Alternatives for the Proposed Action

- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N

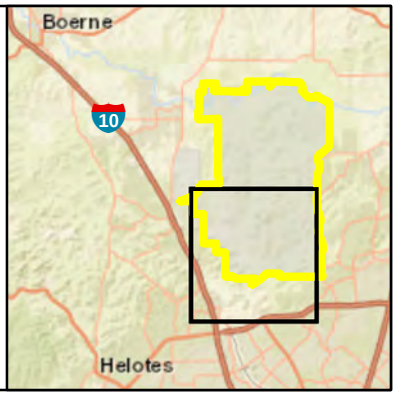


Table 2-2
Summary of Potential Environmental Consequences

Resource Area	Alternative 1 (Preferred)	Alternative 2	No Action Alternative
Land Use	No effects on land use due to consistency with applicable plans and policies. Short-term, negligible effects on aesthetics during construction. Minor, beneficial effects on aesthetics post construction.	Same as Alternative 1.	Minor adverse effects on aesthetics of the JBSA-BUL cantonment from continued propane use.
Noise	Short-term, minor effects during construction.	Same as Alternative 1.	No effects or change in status quo.
Air Quality	Short-term, negligible effects during construction. Minor, beneficial effects from use of a less-polluting source of energy.	Same as Alternative 1.	Short- and long-term, minor, adverse effects with continued propane use.
Earth Resources	Short-term, negligible effects on geology and topography. Short-term, minor effects on soils during construction due to increased potential for erosion, contamination, and loss of structure or function.	Same as Alternative 1.	No effects or change in status quo.
	Potential to affect prime farmland and farmland of statewide importance along portions of the ROW outside of JBSA-BUL.	No potential to affect prime farmland or farmland of statewide importance.	
Water Resources	Short-term, minor effects on surface-water quality during construction due to increased stormwater runoff potential. Potential effects on 408 linear feet of intermittent stream. No effects on wetlands.	Short-term, minor effects on surface-water quality during construction due to increased stormwater runoff potential. Potential effects on 805 linear feet of intermittent stream. Short-term, negligible effects on wetlands (i.e., wastewater effluent storage ponds on JBSA-BUL).	No effects or change in status quo.
	Short-term, moderate effects from construction in 4 acres of 100-year floodplains.	Short-term, minor effects from construction in 2 acres of 100-year floodplains.	
	Short--term, minor effects on groundwater quality due to construction in the Edwards Aquifer drainage zone (53 acres); no effects on Edwards Aquifer recharge zone.	Short-term, moderate effects on groundwater quality due to construction in the Edwards Aquifer recharge (25 acres) and drainage (27 acres) zones.	
Biological Resources	Short-term, minor effects on vegetation and wildlife from required ROW clearance and continual maintenance.	Same as Alternative 1.	No effects or change in status quo.
	No effects to.the piping plover, red knot, San Marcos salamander, fountain darter,	No effects to.the piping plover, red knot, San Marcos salamander, fountain darter,	

Resource Area	Alternative 1 (Preferred)	Alternative 2	No Action Alternative
	Comal Springs riffle beetle, Helotes mold beetle, monarch butterfly, Cokendolpher Cave harvestman, Government Canyon bat cave meshweaver, Government Canyon bat cave spider, Robber Baron Cave meshweaver, Peck's Cave amphipod, and Texas wild-rice.	Comal Springs riffle beetle, Helotes mold beetle, Monarch butterfly, Cokendolpher Cave harvestman, Government Canyon bat cave meshweaver, Government Canyon bat cave spider, Robber Baron Cave meshweaver, Peck's Cave amphipod, and Texas wild-rice.	
	May affect, but is not likely to adversely affect, the golden-cheeked warbler.	May affect, but is not likely to adversely affect, the golden-cheeked warbler.	
	May affect, and is likely to adversely affect, the *Rhadine exilis*, *Rhadine infernalis*, Madla Cave Meshweaver..	May affect, and is likely to adversely affect, the *Rhadine exilis*, *Rhadine* infernalis, Madla Cave Meshweaver.	
	May affect, but is not likely to adversely affect, the tricolored bat.	May affect but is not likely to adversely affect the tricolored bat.	
	Short-term, minor effects on migratory birds during construction. Impacts minimized by activities taking place outside of nesting season. No long-term, appreciable effects on populations of migratory birds.	Same as Alternative 1.	
Cultural Resources	No adverse effects on archaeological sites, including traditional cultural properties, anticipated.	Same as Alternative 1.	No effects or change in status quo.
	No adverse effects on historic properties on and around JBSA-BUL anticipated.	Same as Alternative 1.	
Socioeconomics	Short-term, negligible effects on population, housing, labor and employment, and community services. Short-term, minor, beneficial effects on local economic conditions.	Same as Alternative 1.	No effects or change in status quo, including minor, beneficial effects.
Utilities & Infrastructure, including Transportation	Short-term, minor effects on transportation and traffic on and around JBSA-BUL.	Same as Alternative 1.	No effects or change in status quo, including minor, beneficial effects.
	Moderate, beneficial effects on infrastructure and utilities at JBSA-BUL.	Same as Alternative 1.	
Hazardous Materials & Waste	Negligible effects from the use and generation of hazardous materials and waste during and after construction.	Same as Alternative 1.	No effects or change in status quo.
	Short-term, minor effects during construction due to possible disturbance of or	Same as Alternative 1.	

Resource Area	Alternative 1 (Preferred)	Alternative 2	No Action Alternative
	exposure to contaminants in environmental media.		
Health & Safety	Short- and long-term, minor effects on health and safety during construction, operation, and maintenance activities. Minor, beneficial effects from reduced operational safety risk at JBSA-BUL.	Same as Alternative 1.	Short- and long-term, moderate, adverse effects from continued propane use.

Notes:

a. Impact area calculations are approximate and assume a temporary (construction) 100-foot-wide ROW. For the purpose of analysis and for possible siting flexibility under the Alternatives, the temporary ROW was applied to each side of the utility ROW (i.e., road centerline), for a total width of 200 feet.

Color legend: green = preferable; orange = not preferable; clear = same, similar, or no action
ROW = right-of-way

CHAPTER 3 EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

This section describes the baseline resource conditions and environmental consequences of the Preferred Alternative 1 (Camp Bullis Road), Alternative 2 (NW Military Highway), and the No Action Alternative.

The methodology used to analyze potential adverse effects that could result from the Proposed Action and Alternatives is briefly described in **Section 3.1**. Resources considered but dismissed from detailed analysis in this EA, including a brief justification for their dismissal, are discussed in **Section 3.2**. Resources carried forward for analysis are identified in **Section 3.3**. These resources are further described and analyzed in **Sections 3.4** through **3.16**.

3.1 FRAMEWORK FOR ANALYSIS

To provide a framework for analysis, the Air Force defined a study area, or ROI, specific to each resource area. Such ROIs delineate a boundary where possible effects from the considered alternatives would have a reasonable likelihood to occur. Beyond these ROIs, potential adverse effects on resources would not be anticipated. Potential effects are described as follows:

- **Beneficial –** positive effects that improve or enhance resource conditions.
- **Negligible –** adverse effects likely to occur but at levels not readily observable by evaluation.
- **Minor –** observable, measurable, tangible adverse effects qualified as below one or more significance threshold(s).
- **Significant –** obvious, observable, verifiable adverse effects qualified as above one or more significance threshold(s); not mitigable to below significance.

When relevant to the analysis, potential effects are further defined as direct or indirect, short- or long-term, and temporary, intermittent, or permanent. To determine the potential for "significant" effects under the Proposed Action, the Air Force defined impact thresholds to support the analyses in this EA. Based upon the nature of the Proposed Action (see **Section 2.2**) and existing resource conditions, qualitative and quantitative thresholds are used to qualify effects that may require further Air Force management or mitigation.

For purpose of analysis, this EA defines a temporary construction ROW for the main line portion of the Proposed Action (i.e., from central terminus in the JBSA-BUL cantonment area to the connection point) as 100 feet from the utility ROW centerline (i.e., roadway). This area would encompass the limits of disturbance during the construction phase of the Proposed Action. However, to provide flexibility in siting the Proposed Action, this distance was applied to both sides of the utility ROW (i.e., 200 feet in total) when used to quantify the potential effects of the Proposed Action.

An effort was made to identify past, present, and reasonably foreseeable actions that would affect lands included in the Proposed Action and Alternatives as well as in the region. A cumulative effects analysis has been conducted for each resource section. This analysis considers the effects on the environment that result from the incremental effects of the Proposed Action when added to the effects of other past, present, and reasonably foreseeable actions at JBSA-BUL. The past, present, and reasonably foreseeable future major projects anticipated to occur on or near JBSA-BUL are listed in **Table 3-1,** which briefly describes the proposed or planned projects identified for consideration of potential cumulative impacts when combined with the effects of the proposed action at JBSA-BUL and on a regional scale.

Table 3-1
Past, Present, and Reasonably Foreseeable Actions

Name	Description	Timeframe / Duration	Location
US 281 Expansion	Reconstruct and widen from 4 to 6 lanes a divided expressway with two high-occupancy vehicle lanes.	2017–2023	From Loop 1604 to Bexar/Comal County line
New Entry Control Point	Construct Entry Control Point to accommodate future traffic demand for access to JBSA-BUL.	2019	Southern boundary of JBSA-BUL along Military Highway
Panther Springs Creek Restoration	Make improvements to natural channel for increased water flow.	2021–2022	Southeast corner of JBSA-BUL (off Base)
North Rim Corporate Campus	Construct a 550,000-square-foot campus with four office buildings, two multi-level parking garages, and retail space.	Phase 1 (2022) Phase 2 (2023)	Immediately south of the I-10 intersection with Camp Bullis Road
Classen-Steubing Ranch Park	Make improvements to local park.	2022	Approximately 2.5 miles east of the southeast boundary of JBSA-BUL along Huebner Road
Wastewater Line Connection	Install proposed wastewater line connection to the San Antonio Water System.	2025–2027	Alternatives within JBSA-BUL along Camp Bullis Road or to the southeast boundary of the Installation to a San Antonio Water System connection point
Blanco Road Phase III	Expand roadway from 2 to 4 lanes (Borgfeld Drive to County Line).	Planning Stage TBD	Near the eastern boundary of JBSA-BUL
Replace Tactical Equipment Maintenance Facility	Demolish existing facility and construct a new Tactical Equipment Maintenance Facility with vehicle wash facility, parking, storage, and infrastructure improvements.	TBD	JBSA-BUL (cantonment)
Shavano Highlands Subdivision	Construct planned residential subdivision with access Salado Creek Greenway.	TBD	East of Eisenhower Park and south of JBSA-BUL

Sources: City of San Antonio, 2025; Texas Department of Transportation, 2022; Air Force, 2017, 2018a; Pape-Dawson, 2021; Bexar County, 2022

3.2 RESOURCES ELIMINATED FROM DETAILED ANALYSIS

In accordance with NEPA, federal agencies shall identify and eliminate from detailed study the issues not significant or that have been covered by prior environmental review. Accordingly, the Air Force considered but eliminated from further analysis the following resources:

- **Airspace Management –** The Proposed Action would not alter the current airspace configurations associated with JBSA-BUL; the frequency, tempo, and volume of current aircraft training and operations would not change.
- **Coastal Zone Management –** JBSA-BUL lies outside the jurisdiction of the federally approved Texas Coastal Zone Management Program.
- **Radon –** Bexar County is located within Radon Zone 3. This zone has predicted average indoor radon screening levels of less than 2 picocuries per liter. In accordance with United States Environmental Protection Agency (USEPA)-established thresholds, there is low probability of radon occurring in excess of 4 picocuries per liter under the Proposed Action (USEPA, 2019).

3.3 RESOURCES CARRIED FORWARD FOR DETAILED ANALYSIS

Based on the results of internal and external scoping (see **Section 1.8**), the following resources are carried forward for analysis: land use; noise; air quality; earth, water, biological, and cultural resources; socioeconomics; environmental justice and protection of children; utilities and infrastructure, including transportation; hazardous materials and waste (HAZMAT); and health and safety. To provide context for the resource analysis sections, **Section 3.4** briefly describes the environmental setting on and around JBSA-BUL.

3.4 ENVIRONMENTAL SETTING

Part of the larger San Antonio-New Braunfels metropolitan statistical area (MSA), the city of San Antonio is centrally located in Bexar County, Texas. JBSA-BUL is situated north of downtown San Antonio in northern Bexar County. A small portion of the Base overlaps with Comal County to the north. As one of the most urbanized counties in Texas, the population of Bexar County is projected to surpass 2 million in the next decade (Texas Water Development Board [TWDB], 2021). The Base is bound by Farm Road and Market Road to the east, Amman Road to the north, Interstate 10 (I-10) to the west, and the northern part of San Antonio to the south. The incorporated city of Fair Oaks Ranch and Camp Stanley, a National Guard-owned and -operated Base, abut JBSA-BUL to the west and northwest (Air Force, 2017).

3.5 LAND USE

Land use describes the natural or developed condition of a given parcel of land or area and the types of functions and structures it supports. Land use designations vary by jurisdiction, but commonly used terms include residential, commercial, industrial, agricultural, recreation, and open space. Land use is typically guided and regulated by management plans, policies, regulations, and ordinances that determine the type and extent of land use allowable in specific areas, including specially designated or environmental conservation lands.

The ROI for land use includes JBSA-BUL and the potentially affected portions of San Antonio's North Sector Planning Area outside the Base.

3.5.1 Existing Conditions

3.5.1.1 Municipal Land Use

Land use in San Antonio is administered by a collective of plans that together guide and regulate development within the municipality and its extraterritorial jurisdiction (ETJ)[6] in unincorporated Bexar County (refer to **Figure 1-1**). Adopted in 2016, the *2015 SA Tomorrow Comprehensive Plan* defines the framework for land use planning within the city and its ETJ. There are two additional framework plans with a region-level focus, the *Sustainability Plan* and *Multimodal Transportation Plan*. More detailed sub-area plans tier from the framework plans to address city-wide functions (e.g., housing and transportation) or different types of land use (e.g., industry, neighborhood, or community). There are also incorporated jurisdictions within San Antonio and its ETJ with land use planning authority. While the framework plans establish overarching policies at a regional level, they do not alter or negate land use planning at the sub-area or local level. The applicable sub-area plan for the Proposed Action is the *City of San Antonio North Sector Plan* (City of San Antonio [COSA], 2022a).

Land use to the west, southwest, and south of JBSA-BUL includes mixed use development interspersed with public lands (e.g., parks, conservation areas, and road and utility corridors). Residential communities are the predominate land use; commercial, industrial, and open space further characterize these localities. To the south-southwest of JBSA-BUL, an area anchored by the University of Texas at San Antonio is a

[6] The ETJ is a legally designated area of land outside a municipality that can be annexed for land use planning and management purposes (e.g., development regulation, service delivery, economic opportunity, and preservation). In Texas, the size of an ETJ is based on population; San Antonio has a 5-mile ETJ.

designated “regional center” for its various entertainment and retail destinations. Immediately south of and adjacent to the JBSA-BUL boundary lies the 320-acre Eisenhower Park. A new residential development is under construction to the south and southeast of Eisenhower Park. Other areas immediately south of JBSA-BUL include privately held lands, some of which preserve relatively large tracts of woodlands (COSA, 2010).

Both the Comprehensive Plan and the North Sector Plan have incorporated an overlay district for JBSA-BUL into their future land use map. The overlay district encompasses four military influence areas (MIAs), each delineated to address a specific land use compatibility concern (i.e., noise, vertical obstruction, light, and safety). The boundary of the overlay district is defined by the largest MIA, the Light MIA, delineated as a 5-mile area around the Base (COSA, 2016, 2010).

3.5.1.2 Installation Land Use

Land use on JBSA-BUL is generally classified as improved, semi-improved, and unimproved. Improved areas (1,121 acres) are defined as those with buildings and other permanent structures, including maintained or landscaped grounds associated with the built environment. Most improved areas are concentrated in JBSA-BUL’s cantonment area. Land use in the cantonment includes various administrative, housing (temporary), commercial, industrial, and other mission or community support facilities and spaces (**Figure 3-1**).

Semi-improved areas (1,788 acres) include portions of the Base that support the military mission on a somewhat regular basis such as roads and trails used for transit or for training purposes (e.g., vehicle maneuvers). Unimproved areas (25,075 acres) are those generally not subject to development or regular maintenance; rather, these lands support JBSA-BUL’s training mission in their natural state. Unimproved lands also include habitat for federally protected species under Air Force management. Land use on JBSA-BUL is further characterized by 28 training areas that range in size from 338 to 6,405 acres. When compatible with the military mission, some training areas support game hunting for approved military personnel and their dependents (Air Force, 2020).

3.5.2 Environmental Consequences

3.5.2.1 Evaluation Criteria

The Air Force defines a significant effect on or from land use within the ROI as one or both of the following:

- land use that would discontinue or substantially change existing or adjacent land use; and/or
- land use that would be inconsistent with applicable management plans, policies, regulations, and ordinances.

3.5.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Alternative 1 would occur entirely within an existing utility ROW; no ROW acquisition would be required. Easement(s) would set forth conditions for the future management and maintenance of the proposed natural gas pipeline conveyance. JBSA would prepare easement documentation for the portion of Alternative 1 on the Base and coordinate with external stakeholders regarding the easement conditions formalized for the off-Base extent of the ROW, as appropriate. As such, Alternative 1 would be consistent with applicable land use plans and policies for the ROI. This alternative would not discontinue or change existing land use within the ROI. Under Alternative 1, minor beneficial effects on the land use aesthetics of in the JBSA-BUL cantonment would result from replacement and removal of the dilapidated above-ground portions of the propane tank and distribution system.

3.5.2.3 Alternative 2 – NW Military Highway

Potential effects on land use resources under Alternative 2 would be the same as described for Alternative 1.

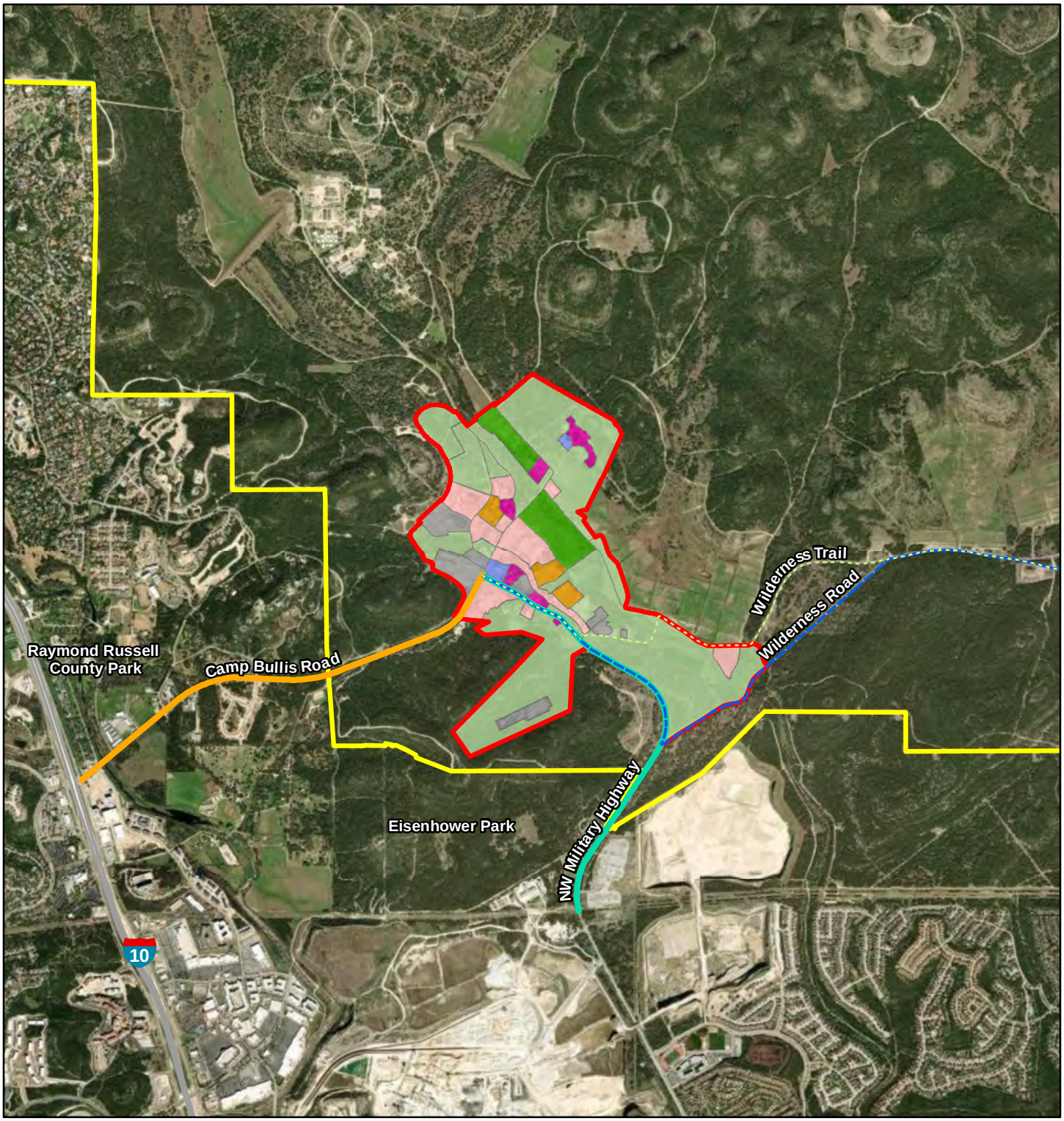


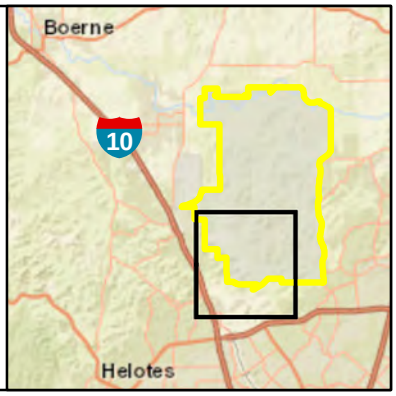
FIGURE 3-1
Land Use

- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Administrative
- Community Service
- Housing Unaccompanied
- Industrial
- Medical
- Open Space
- Outdoor Recreation

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



3.5.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and land use within the ROI would not change from the status quo. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair and potentially constrain future land use plans in the cantonment area of JBSA-BUL.

3.5.2.5 Cumulative Effects

Alternative 1 would be consistent with applicable regional land use plans and policies (COSA, 2016, 2010, 2022a). Therefore, when considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects to land use would be anticipated to occur with implementation of the Proposed Action.

3.5.3 Best Management Practices and Mitigation Measures

No best management practices (BMPs) or mitigation measures for land use were identified by analysis.

3.6 NOISE

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Noise is generally described as unwanted sound. Unwanted sound can be grounded in objectivity (e.g., hearing loss or damage to structures) or subjectivity (e.g., an individual's level of tolerance or annoyance to different sounds). Noise events elicit varying responses within a population or area based on the activity generating noise and its perceived importance and related factors, such as setting, time of day, exposure period or duration, and receptor sensitivity. In addition to humans, noise also aaffects wildlife as indicated by behavioral changes during nesting, foraging, migration, or other life-cycle activities (USEPA, 1978).

Sound is expressed in logarithmic units of decibels (dB). A sound level of 0 dB is approximately the threshold of human hearing (i.e., sound that is barely audible under quiet listening conditions). Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort; sound levels of 130 db or greater are felt as pain. In terms of varying levels of sound, the average human ear can detect changes at approximately 3 dB or higher.

The magnitude of a sound is influenced by its frequency, measured in cycles per second or hertz. To normalize frequency relative to the human ear, environmental noise measurements are usually weighted to replicate human sensitivity to noise. The most commonly used metric is the "A-weighted" scale as indicated by the addition of an "A" to the measurement unit (e.g., dBA). In this EA, the dB unit refers to A-weighted sound levels unless otherwise noted.

Some noise-generating activities produce short-in-duration, impulsive sounds such as explosions or sonic booms. Impulse noise can sometimes be felt and may also result in secondary physical effects on structures from shaking or rattling. Due to the unique nature and characteristics of impulse noise, the "C-weighted" scale is used to approximate the human ear's sensitivity to these higher-intensity sounds (i.e., dBC) (USEPA, 1979).

The *Noise Control Act of 1972* (Public Law 92-574) directs federal agencies to comply with applicable federal, state, and local noise control regulations. In 1974, the USEPA provided information suggesting that continuous and long-term noise levels greater than 65 dBA are normally unacceptable for noise-sensitive receptors such as residences, schools, churches, and hospitals (USEPA, 1974).

The ROI for land use includes JBSA-BUL and the potentially affected portions of San Antonio's North Sector Planning Area outside the Base.

3.6.1 Existing Conditions

The City of San Antonio has a noise ordinance that defines and regulates “noise nuisances.” Construction projects are identified as a noise nuisance if occurring outside of normal weekday work hours or if noise exceeds 80 dBA as measured near the boundary line of where the noise is generated. The City of San Antonio’s noise ordinance also defines two types of “quiet zones” where noise is not to interfere with operations within a distance of 250 feet of the real-property line (COSA, 2001).

JBSA-BUL is situated in the highly urbanized metropolitan area of San Antonio. Higher-density development generally occurs to the southwest and west of the Base along I-10. Some areas to the south of JBSA-BUL are zoned for industrial land use. Additionally, military training operations on JBSA-BUL and portions of the ROI outside the Base are a regular source of noise.

One of the preferred routes for helicopter sorties originating from JBSA-BUL is the airspace immediately south-southwest of the Base. As such, this area defines a portion of the Noise MIA (see **Section 3.5** above) for JBSA-BUL (JBSA, 2015a). Helicopter operations at JBSA-BUL, while not unusual, are not frequent enough to generate a predicted noise exposure above 65 Day-Night Average Sound Level (DNL). Noise-sensitive receptors in the ROI are primarily associated with schools, healthcare facilities, recreation and conservation lands (including wildlife that inhabits these areas), and places of religion. Most agencies have identified a DNL of 65 dB as a criterion that protects those most impacted by noise and that often can be achieved on a practical basis (Federal Interagency Committee on Noise, 1992). Noise-sensitive receptors within 800 feet of the utility ROW, that is, those who could reasonably be expected to hear construction noise under the Proposed Action, include the following:

- Pineapple School (daycare center on JBSA-BUL)
- Grace Church
- Eisenhower Park
- Golden-cheeked warbler (GCWA) habitat (construction noise restrictions within a 300-ft buffer area while birds are present on the Installation in spring)

3.6.2 Environmental Consequences

3.6.2.1 Evaluation Criteria

When evaluating noise effects, several aspects are examined:

- the degree to which noise levels generated by training and operations, as well as construction, demolition, and renovation activities, would be higher than the ambient noise levels;
- the degree to which there would be hearing loss and/or annoyance; and
- the proximity of noise-sensitive receptors (e.g., residences, schools, hospitals, parks) to the noise source.

An environmental analysis of noise includes the potential effects on the local population and estimates the extent and magnitude of the noise generated by the Proposed Action and Alternatives.

3.6.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from I-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL, where an existing utility ROW is in place. The on-Base portion of this route would span 0.8 mile.

Noise associated with the operation of construction equipment is generally short term, intermittent, and localized, with the loudest machinery typically producing peak sound pressure levels ranging from 86 to 95 dBA at a 50-foot distance from the source (**Table 3-2**).

Table 3-2
Peak Sound Pressure Level of Construction Equipment from 50 Feet

Equipment	Sound Pressure Level (dBA)
Bulldozer	95
Scraper	94
Front Loader	94
Backhoe	92
Grader	91
Crane	86

Source: Reagan and Grant, 1977
dBA = A-weighted decibel

Alternative 1 could affect noise-sensitive receptors on and around JBSA-BUL. Pineapple School is situated approximately 150 feet from the utility ROW on the Base. Grace Church is approximately 100 feet north of the utility ROW along Camp Bullis Road, between the JBSA-BUL boundary and I-10.

However, construction noise does not typically generate a predicted noise exposure of 65 dBA DNL or greater even at extremely high rates of operation because the equipment itself does not generate noise that would produce a 65-dBA DNL when averaged over a year. Additionally, adherence to standard Air Force Occupational Safety and Health regulations that require hearing protection along with other personal protective equipment (PPE) and safety training would minimize the risk of hearing loss to construction workers. Potential adverse effects on other noise-sensitive receptors in the ROI would be further reduced by site-specific noise reduction measures to ensure noise remains below 65 dBA DNL during construction. Therefore, noise associated with the construction of Alternative 1 would be short term and minor. In the long term, no appreciable change to the existing noise environment would result from the operation of Alternative 1.

3.6.2.3 Alternative 2 – NW Military Highway

Under Alternative 2, the Air Force would construct a 1.5-mile-long natural gas pipeline from a point along NW Military Highway, approximately 0.4 mile to the south of JBSA-BUL. The on-Base portion of this route would continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

The route for the pipeline would parallel the boundary of Eisenhower Park to the south of JBSA-BUL. As described under Alternative 1, construction-related noise under Alternative 2 would not be likely to generate noise above 65 dBA DNL, even at extremely high rates of operation. Therefore, noise associated with the construction of Alternative 2 would be short term and minor.

3.6.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Noise on JBSA-BUL and surrounding areas would not change from the status quo.

3.6.2.5 Cumulative Effects

Construction and operation activities would combine with other sources of noise locally and regionally; however, no appreciable increase in noise generated concurrently with Alternative 1 would be anticipated. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects to the noise environment would be anticipated to occur with implementation of the Proposed Action.

3.6.3 Best Management Practices and Mitigation Measures

No additional project-specific BMPs or mitigation measures for noise were identified by analysis.

3.7 AIR QUALITY

Air pollution is a threat to human health and damages trees, crops, other plants, lakes, and animals. It creates haze or smog that reduces visibility in national parks and cities and interferes with aviation. To improve air quality and reduce air pollution, Congress passed the CAA and its amendments in 1970 and 1990, which set regulatory limits on air pollutants and help to ensure basic health and environmental protection from air pollution.

This section describes regional air quality conditions and analyzes potential effects on air quality the Proposed Action and Alternatives. The ROI for air quality is defined as the San Antonio-New Braunfels MSA which includes Bexar County, designated by the USEPA as being in "marginal nonattainment" for ozone, a criteria pollutant.

3.7.1 Existing Conditions

3.7.1.1 Criteria Pollutants

In accordance with CAA requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. Measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter.

The CAA directed the USEPA to develop, implement, and enforce environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed the National Ambient Air Quality Standards (NAAQS), which are numerical concentration-based standards for pollutants that have been determined to impact human health and the environment. Under the CAA, there are primary and secondary NAAQS. The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources in addition to maintaining visibility standards. NAAQS are currently established for the criteria air pollutants ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead.

Ozone is not usually emitted directly into the air but is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants, or "ozone precursors." These ozone precursors consist primarily of nitrogen oxides and volatile organic compounds that are directly emitted from a wide range of emission sources. For this reason, regulatory agencies limit atmospheric ozone concentrations by controlling volatile organic compound pollutants (also identified as reactive organic gases) and nitrogen oxides.

3.7.1.2 General Conformity and Attainment

When a region or area meets NAAQS for a criteria pollutant, it is classified as "in attainment" for that pollutant. When a region or area fails to meet NAAQS for a criteria pollutant, it is classified as "nonattainment" for that pollutant. In cases of nonattainment, the affected state, territory, or local agency must develop a state implementation plan (SIP) for USEPA review and approval. The SIP is an enforceable plan developed at the state level that lays out a pathway for how the state will comply with air quality standards. If air quality improves in a region that is classified as nonattainment, and the improvement results in the region meeting the criteria for classification as attainment, then that region is classified as a "maintenance" area.

Under the CAA, the General Conformity Rule requires proposed federal agency activities in designated nonattainment or maintenance areas to demonstrate conformity with the SIP for attainment of NAAQS. Agencies are required to show that the net change in emissions from a federal proposed action would be below applicable *de minimis* threshold levels. The thresholds are more restrictive as the severity of the nonattainment status of the region increases (see 40 CFR § 93.153(b)(1) and (b)(2) for nonattainment areas and maintenance areas, respectively).

3.7.1.3 New Source Review

Per the CAA, the USEPA's Prevention of Significant Deterioration (PSD) New Source Review permit program regulates criteria, and certain non-criteria, air pollutants for air quality control regions designated unclassified or in attainment. In such areas, a PSD review is required for new "major source" or "major modification of existing source" emissions that exceed 100 or 250 tons per year (tpy) of a regulated CAA pollutant, dependent on the type of major stationary source.[7] For "minor source" emissions, a PSD review is required if a project increases a "major source" threshold by itself.

3.7.1.4 Operating Permits

The State of Texas has adopted the federal NAAQS. Pursuant to Title 30 of the *Texas Administrative Code*, Chapter 122 (30 TAC 122), the Texas Commission on Environmental Quality (TCEQ) administers a permit program for stationary source emissions generated at federal facilities. Permitting requirements for federal owners and operators are largely based on a "potential to emit," defined as the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design or configuration. Potential-to-emit calculations determine whether a federal facility is defined as a "major source" under the CAA, thus requiring a Title V operating permit; however, some "non-major" or "minor" source federal owners or operators are subject to permit-by-rule requirements (30 TAC 106). Such requirements authorize stationary source emissions for individual or specific operations.

TCEQ's delegated authority under the CAA extends to mobile emissions generated in Texas. Pursuant to 30 TAC 111.145, fugitive dust generated by construction or demolition involving 1 acre or more of land requires, at a minimum, two dust-control measures, including the use of water (or other suitable oil or chemical application) for dust suppression and measures to prevent airborne particulate matter during sandblasting or similar operations.

3.7.1.5 Region of Influence

JBSA-BUL is located in Bexar County within the Metropolitan San Antonio Intrastate Air Quality Control Region (40 CFR § 81.40); the ROI for air quality. Bexar County is located in an area currently designated as "marginal nonattainment" for ozone. The county is designated in attainment for all other criteria air pollutants.

The USEPA's reclassification of Bexar County to nonattainment with a marginal classification was conditioned on 2015–2017 data recorded at 0.073 ppm from two monitoring stations, one at JBSA-BUL and one in northwest Bexar County. The change from attainment to marginal nonattainment for Bexar County required a revision to the Texas SIP for attainment of the ozone NAAQS based on 2018–2020 monitoring data. In January 2020, TCEQ adopted a SIP revision and requested USEPA's approval by demonstration that Bexar County would attain the 2015 8-hour ozone NAAQS by its statutory attainment deadline of 21 September 2021 "but for" anthropogenic emissions emanating from outside the US (TCEQ, 2020a). Most recently, the USEPA announced its intent to move Bexar County from marginal to moderate nonattainment for ozone. Should the proposal be finalized, Bexar County would be required to meet the ozone standard of 70 ppm by 24 September 2024 (COSA, 2022b).

JBSA-BUL is defined as a "minor source" and operates under a permit-by-rule issued by the state of Texas. Facilities operating under a permit-by-rule are required to monitor emissions and report the findings.

3.7.1.6 Regional Meteorology

The ROI is typified by warm, temperate weather conditions. On average, temperatures range from 62 to 95 degrees Fahrenheit in the summer, and 39 to 74 degrees Fahrenheit in the winter. Average annual precipitation is approximately 33 inches but can vary from 10 to 51 inches from year to year. Common

[7] There are two types of "major stationary source" emissions: named and un-named. A named stationary source is listed in 40 CFR § 51.166(b)(1) and has a potential to emit of 100 tpy (includes fugitive emissions). An un-named stationary source is one that is ***not*** listed in 40 CFR § 551.166(b)(1) and has a potential to emit of 250 tpy.

weather conditions for San Antonio and the surrounding region include clear, sunny skies, and low wind speeds. On average, annual evaporation is 69 inches or 1.3 inches per week (Air Force, 2020b).

3.7.2 Environmental Consequences

3.7.2.1 Evaluation Criteria

The environmental impact methodology for air quality impacts presented in this EA is derived from Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention* (February 2020). The proposed action is broken down into basic units. For example, a basic development project that consists of replacing a building with a new building could be broken down into demolition (ft^2), grading (ft^2), building construction (ft^2 and height), architectural coatings (ft^2), and paving (ft^2). These data are then input into the Air Force's Air Conformity Applicability Model (ACAM), which models emissions based on the inputs and estimates air emissions for each specific criteria and precursor pollutant, as defined in the NAAQS. The calculated emissions are then compared against the applicable threshold based on the attainment status of the ROI. If the annual net increase in emissions from the project are below the applicable thresholds, then the Proposed Action and Alternatives are not considered significant and would not be subject to any further conformity determination. Assumptions of the model, methods, and detailed summary results are provided in **Appendix B** of this EA.

As previously stated, the ROI for this project is in marginal nonattainment for ozone; therefore, the *de minimis* value in 40 CFR § 93.153(b)(1) is used as the threshold for ozone precursors. The ROI is in attainment for all other NAAQS; therefore the PSD value is used as a threshold for all other criteria pollutants other than lead. Due to the toxicity of lead, the use of the PSD threshold as an indicator of potential air quality impact insignificance is not protective of human health or the environment. Therefore, the *de minimis* value is used instead. The following thresholds are applicable for the Proposed Action and Alternatives:

- 100 tpy *de minimis* value for ozone precursors (volatile organic compounds and nitrogen oxides);
- 250 tpy PSD value for carbon monoxide, sulfur dioxide, PM_{10}, $PM_{2.5}$ precursor ammonia; and
- 25 tpy *de minimis* value for lead.

3.7.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Under Alternative 1, the Air Force would construct an approximately 2-mile-long natural gas main line from I-10 via Camp Bullis Road. Within the JBSA-BUL cantonment, approximately 14,075 lf of secondary pipelines would branch out to connect with facilities.

There are four ACAM inputs for a project of this type: trenching, grading, backfill, and transportation of excavated material. In order to quantify these inputs, the following assumptions were made:

- The trenches excavated for all pipelines (2-inch, 4-inch, and 6-inch) were assumed to be 2 feet wide and excavated to a depth of 3 feet.
- All the material excavated would be replaced with engineered fill and the excavated material would be transported off site.
- An area approximately 4 feet wide would require grading for the entire length of the 6-inch pipeline. An area 2 feet wide is assumed for the internal distribution lines.
- Construction would occur in five phases from the beginning of calendar year 2025 to the end of calendar year 2030. The duration of each phase is assumed to be 1 year and construction activities would be equally divided over each of the phases.

Table 3-2 summarizes the results of the ACAM analysis for Alternative 1. Because the construction of Alternative 1 would occur in phases over approximately 5 years, the ACAM outputs were identical for each year. As such, the table reflects the emissions in tpy for each year-long phase. As shown in **Table 3-3,** the net increase in emissions per year would be short term and negligible when compared to the applicable

thresholds. The annual net increase in emissions projected indefinitely into the future (steady state) would be calculated to be zero because there would no longer be emissions generated by construction activities. Alternative 1 could result in a net decrease in emissions because the current propane supply requires that the fuel be transported to JBSA-BUL. Construction of the natural gas pipeline conveyance would eliminate the need for fuel to be transported on Base and would therefore result in a net reduction in emissions over time. Therefore, Alternative 1 would result in minor, beneficial effects on air quality in the long term.

Table 3-3
Comparison of Air Emissions and Annual PSD Thresholds under Alternative 1 (Preferred) (2025–2030)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
volatile organic compounds	0.458	100	No
nitrogen oxides	4.017	100	No
carbon monoxide	4.836	250	No
sulfur oxides	0.007	250	No
PM_{10}	21.946	250	No
$PM_{2.5}$	0.166	250	No
lead	0.000	25	No
ammonia	0.003	250	No

3.7.2.3 Alternative 2 – NW Military Highway

The linear extent of the main line under Alternative 2 would be approximately the same as Alternative 1. The network of secondary pipelines in the JBSA-BUL cantonment would be identical to that of Alternative 1. Therefore, as demonstrated by the ACAM analysis (**Table 3-3**), the net increase in emissions per year from construction under Alternative 2 would be short term and negligible when compared to the applicable thresholds. Alternative 2 would also result in minor, beneficial effects on air quality in the long term by converting to natural gas from propane.

3.7.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. In the short term, air quality conditions in the ROI would remain consistent with the status quo. In the long term, air quality conditions would be determined by changes in population, land use, energy usage, and other relevant factors that affect the air quality of the San Antonio-New Braunfels MSA and Bexar County, Texas.

3.7.2.5 Cumulative Effects

Bexar County and the City of San Antonio would continue to revise and implement the SIP for attainment of ozone and maintain attainment status for all other criteria pollutants. Enforcement of the General Conformity Rule would also continue within Bexar County, Texas, and the Metropolitan San Antonio Intrastate Air Quality Control Region. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects to air quality would be anticipated to occur with implementation of the Proposed Action.

3.7.3 Best Management Practices and Mitigation Measures

The Air Force would require contractors to implement the following BMPs to reduce the potential air quality effects of the Proposed Action:

- Comply with JBSA environmental specifications during construction activities.
- Minimize vehicle idling by turning off equipment and vehicles when not in use.

- Cover dump truck beds while in transit or not in use to minimize fugitive dust emissions.
- Regularly water stockpiles or unpaved areas to minimize fugitive dust emissions.

No mitigation measures for potential air quality effects were identified by analysis.

3.8 EARTH RESOURCES

Earth resources include geology, topography, and soils. Geology refers to the structure and configuration of surface and subsurface features. Characteristics of geology include geomorphology, subsurface rock types, and structural elements. Topography refers to the shape, height, and position of the land surface. Soil refers to the unconsolidated materials overlying bedrock or other parent material. Soils are defined by their composition, slope, and physical characteristics. Attributes of soil, such as elasticity, load-bearing capacity, shrink-swell potential, and erodibility, determine its suitability to support a particular land use.

The ROI for earth resources is the JBSA-BUL cantonment area and the linear extent of the natural gas main from the cantonment to a connection point off Base.

3.8.1 Existing Conditions

3.8.1.1 Geology and Topography

The Balcones Canyonlands formed from uplift and subsidence along the Balcones Fault Zone. This area is a transition zone between central Texas and the coastal plain, defined by the gradual descent of the ridge and its characteristic stairstep topography. The exposed and underlying limestone is another defining feature of the Balcones Canyonlands. The soluble limestone dissects springs, streams, and rivers working above and below ground to create canyons, sinkholes, and caverns (karst).

The geology underlying JBSA-BUL and northern San Antonio is influenced by the Balcones Fault Escarpment. The escarpment trends northeast to southwest across Texas and bisects the southeast portion of JBSA-BUL and northern San Antonio. In doing so, it separates the Glen Rose Limestone Formation to the northwest from the Edwards Limestone Formation to the southeast. The Glen Rose Limestone Formation consists of alternating layers of limestone, dolomite, and marl that outcrop in the central and northern portions of JBSA-BUL. Except for areas farther north along Cibolo Creek, this formation ranges in thickness from 410 to 450 feet. The Edwards Limestone Formation consists of nodular limestone, mudstone, highly altered crystalline limestone, and chert, and ranges in thickness from 210 to 250 feet.

The topography of JBSA-BUL and northern San Antonio is characterized by karst landforms created by the dissolution of carbonate rocks (e.g., limestone and dolomite) exposed to acidic water. Hydrogeologic features associated with karst landforms include sinkholes, sinking streams, closed depressions, subterranean drainage, mesocaverns (humanly impassable voids in karst limestone) and caves (TSS, 2014). Regionally, elevations range from approximately 700 to 1,500 feet above mean sea level. The steeper topography is found northwest of the Balcones Fault Zone. Surface drainage is generally oriented south to southeast; however, in many areas, the highly permeable limestone minimizes overland flows (USGS, 2021).

3.8.1.2 Soils

The soils in the ROI are depicted in **Figure 3-2** and described in **Table 3-4**.

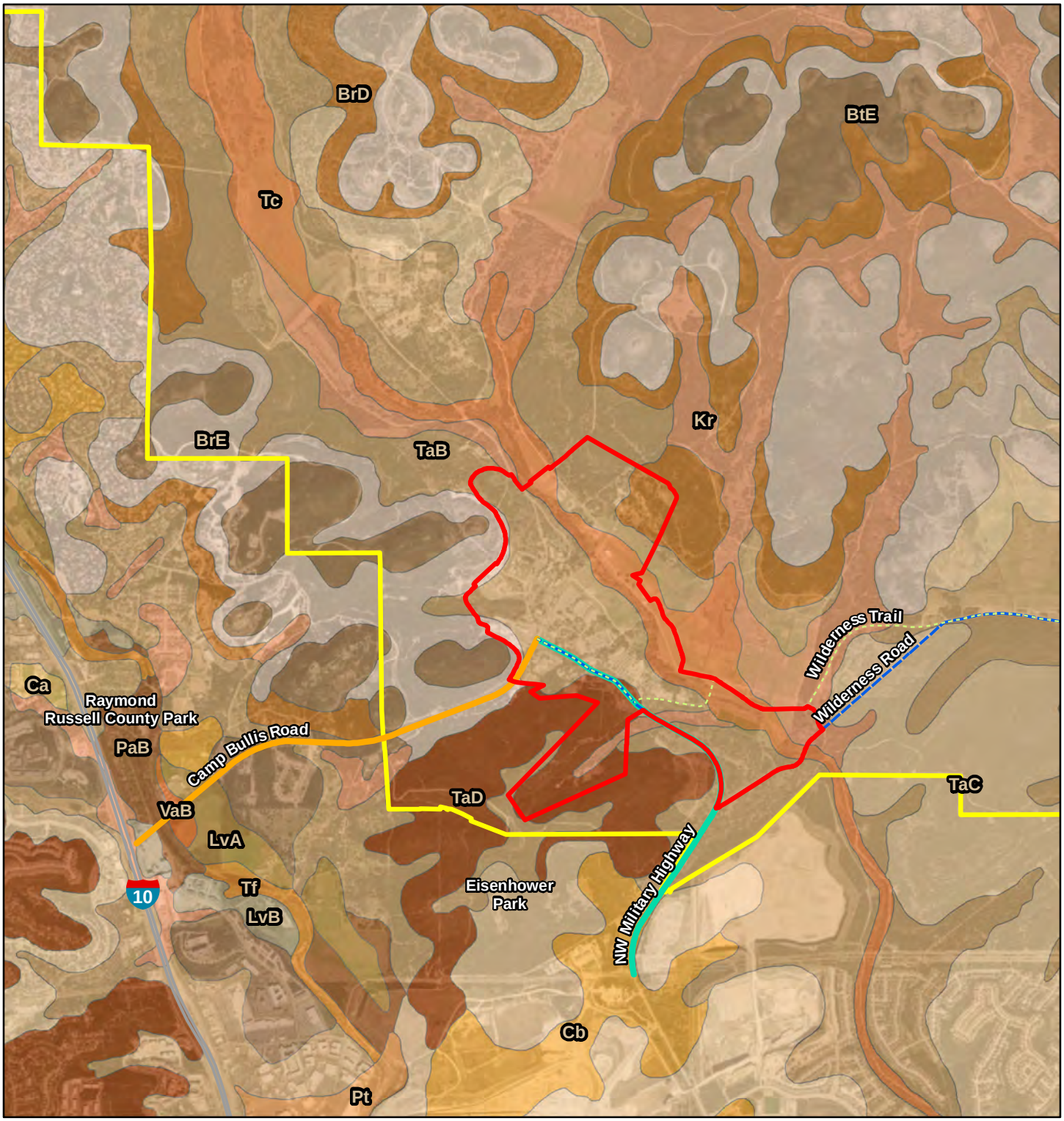


FIGURE 3-2
Soil Types

- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary

BrD	LvA	TaD	
BrE	LvB	TbB	
BtE	PaB	Tc	
Ca	Pt	Tf	
Cb	TaB	VaA	
Kr	TaC	VaB	

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N

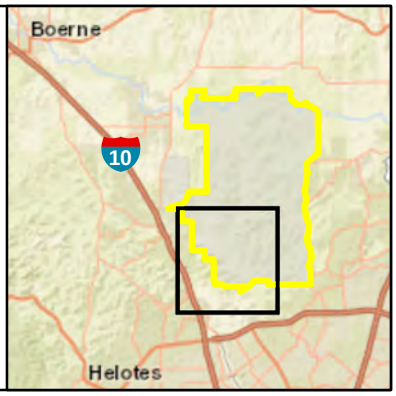


Table 3-4
Soil Types Associated With the Proposed Action

Map Unit	Description	Depth to Bedrock[a] (ft)	Percent of Proposed Action (% of lf)	Erosion Potential[b] (*K*)	Slope Gradient[c] (%)	Plasticity Rating[d] (%)	Farmland Class
BtE	Brackett-Eckrant association, 20 to 60 percent slopes	< 1	19	0.17	40	17	not applicable
BrE	Brackett gravelly clay loam, 12 to 20 percent slopes	< 1	15	0.17	16	17	not applicable
Cb	Crawford, stony and Bexar soils, 0 to 5 percent slopes	2.8	3	0.10	2	36	not applicable
TaB	Eckrant cobbly clay, 1 to 8 percent slopes	< 1	59	0.10	3	32	not applicable
TaD	Eckrant-Rock outcrop association, 8 to 30 percent slopes	< 1	1	0.05	19	32	not applicable
Kr	Krum clay, 1 to 5 percent slopes	> 6.5	< 1	0.15	2	31	prime farmland if irrigated
LvA	Lewisville silty clay, 0 to 1 percent slopes	> 6.5	1	0.20	< 1	27	prime farmland
LvB	Lewisville silty clay, 1 to 3 percent slopes	> 6.5	< 1	0.20	2	27	prime farmland
VaB	Sunev loam, 1 to 3 percent slopes	> 6.5	< 1	0.28	2	14	farmland of statewide importance

Source: NRCS, 2022
Notes:
a Bedrock in soil survey refers to a continuous root and water restrictive layer of rock.
b Erosion factor *K* measures a soil's susceptibility to erosion based on its structure and permeability. Values of *K* range from 0.02 to 0.69; the higher the value, the more susceptible soils are to rill and gully erosion.
c Slope gradient is the difference in elevation between two points, expressed as a percentage of the distance between those points.
d Plasticity is the difference between the liquid and plastic limits of a soil or the range of water content in which a soil exhibits the characteristics of a plastic solid. Soils with a wide range of moisture content, such as clays, perform more as a plastic material.
ft = feet; lf = linear feet

The most predominate soils underlying the Proposed Action include the Brackett and Eckrant series soils. Brackett soils are well-drained, clay and loam soils, typically found on steeper slopes. Eckrant soils are well-drained, shallow, cobbly clay loam soils, with a moderately slow rate of permeability. These soils are found in areas that range from level to very steep (Air Force, 2020b).

None of the soils associated with the Proposed Action are classified as "hydric." The Brackett, Krum, Lewisville, and Sunev soil series are given a compaction rating of "medium," meaning the upper 12 inches of these soils are susceptible to compaction when moist; all other soil series are given a compaction rating of "low." However, none of the soil series listed in **Table 3-4** are rated as having a "high" potential for compaction.

Prime Farmland
As defined by the *Farmland Protection Policy Act* (7 USC §§ 4201–4209), there are two soils associated with the Proposed Action that are classified as "prime farmland"; a third, Krum clay, is considered "prime

farmland if irrigated." Additionally, Sunev loam soils are classified as "farmland of statewide importance" (USDA, 1966).

3.8.2 Environmental Consequences

3.8.2.1 Evaluation Criteria

The Air Force defines a significant effect on earth resources within the ROI as one or more of the following:

- substantial alteration of unique or valued geologic or topographic conditions;
- substantial soil erosion, sedimentation, and/or loss of natural function (e.g., compaction); and
- development on soils with characteristics that do not support the intended land use.

3.8.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Potential effects on geology and topography would be short term and negligible under Alternative 1.

The construction of Alternative 1 would involve earthwork to install pipelines below ground. Earthwork would include trench excavation, subsurface boring, backfill of soils (i.e., reuse and fill) and substrate to meet design specifications, and compaction and grading of topsoil post construction. These activities would expose soils and increase their susceptibility to water and wind erosion. Inclement weather (e.g., rain or wind) would increase the probability and severity of soil erosion, particularly during construction. Alternative 1 could also result in the accidental release of contaminants or unintentional disturbance of contaminated soils that already persist in the environment. For example, construction vehicle and equipment usage could result in accidental spills of petroleum-based constituents into soil media.

Surficial soils would be graded to conform to local topography and achieve positive surface drainage following placement and compaction of reuse or fill soils. The construction of Alternative 1 would conclude with revegetation of the landscape using native plants and trees, as appropriate. JBSA would then conduct post-construction site inspections to ensure any agreed upon management measures remain effective and pre-construction conditions remain the same or improve.

Alternative 1 would expose soils during construction, making them more susceptible to erosion. To minimize potential adverse effects from erosion, JBSA would obtain and comply with Texas Pollutant Discharge Elimination System (TPDES) General Permit No. TXR150000. This construction general permit requires projects that would disturb 5 acres or more of land to prepare and obtain a TCEQ-approved stormwater pollution prevention plan (SWP3) and publish an NOI prior to construction to solicit input on the project. The SWP3 would include required BMPs for structural and non-structural erosion, sediment, and waste control during and after the construction of Alternative 1. The SWP3 may also include planning and operational considerations such as staging construction equipment and materials on existing gravel or paved surfaces and minimizing or restricting vehicle movements within the construction ROW. With these measures in place, the construction of Alternative 1 would minimize soil erosion and loss and reduce the potential for contaminants to enter the soil media.

Alternative 1 would alter soil structure, composition, and function in portions of the ROW. However, the siting and design of Alternative 1 would necessarily consider soil structure and function to ensure the operational integrity and safety of the natural gas pipeline conveyance. The compaction ratings of the involved soils would also be considered by design. Further, existing gravel and paved surfaces within the ROW of Alternative 1 would provide ample space to park or stage construction vehicles and equipment.

The construction of Alternative 1 would result in potential short-term, minor effects on soils; however, effects would be temporary and further reduced by required management measures and best practices. In the long term, potential effects on soils from the operation of Alternative 1 would be negligible.

Prime Farmland
Under Alternative 1, Krum clay is the only soil associated with the portion of the Proposed Action on JBSA-BUL designated prime farmland (if irrigated). Given the historic use of JBSA-BUL for military training and

because these areas of the Base are not subject to irrigation, no impacts to prime farmland soils on JBSA-BUL would occur under Alternative 1.

The off-Base portion of Alternative 1 would potentially affect prime farmland (i.e., Lewisville silty clays) and farmland of statewide importance (i.e., Sunev loam). These soils would be further evaluated in the planning and design phase of Alternative 1 to determine whether such areas qualify for protection under the *Farmland Protection Policy Act*.

3.8.2.3 Alternative 2 – NW Military Highway

Potential effects on earth resources under Alternative 2 would be the same as described for Alternative 1.

Prime Farmland
No soils associated with Alternative 2 are designated as prime farmland or farmland of statewide importance. Therefore, Alternative 2 would have no potential to affect farmland resources.

3.8.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Although earth resources on and in the vicinity of JBSA-BUL would not be affected in the short term, new or planned development projects likely would disturb and alter such resources in the future.

3.8.2.5 Cumulative Effects

Development plans and projects within and around the San Antonio metropolitan area would continue to be regulated under the National Pollution Discharge Elimination System (NPDES) permitting program. Depending on the nature and size of development, regulatory compliance measures would be in place to prevent or minimize potential effects on earth resources. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects on earth resources, including soils, would be anticipated to occur with implementation of the Proposed Action.

3.8.3 Best Management Practices and Mitigation Measures

The Air Force would require contractors to implement the following BMP to reduce potential effects on or from earth resources under the Proposed Action:

- Comply with JBSA environmental specifications during construction activities.
- Prior to construction, obtain an applicable TPDES permit to manage stormwater on a site-specific basis. Prepare a TCEQ-approved SWP3 and submit an NOI as appropriate. Adhere to the permit conditions during construction to minimize soil erosion, sedimentation, and compaction.
- When practicable or in compliance with applicable laws and regulations, incorporate low-impact development[8] features and techniques into the design of the Proposed Action to increase stormwater retention and infiltration on the project sites.
- When practicable, identify and implement BMPs for construction and post-construction stormwater management in accordance with the USEPA's National Menu of Best Management Practices (BMPs) for Stormwater or other technical guidance.

No mitigation measures for potential effects on or from earth resources were identified by analysis.

[8] Low-impact development measures include filtration, infiltration, evaporation, plant transpiration, and rainwater reuse to retain and treat stormwater on site, in contrast to conventional management practices that temporarily store and ultimately discharge stormwater to receiving waterbodies.

3.9 WATER RESOURCES

Water resources include watershed management, surface waters, stormwater management, floodplains, and groundwater, the features and functions of which are valued by or beneficial to humans (e.g., water quality, recreation, and flood protection).

The ROI for water resources includes the surface and subsurface environments at, adjacent to, and downstream of the Proposed Action.

3.9.1 Existing Conditions

3.9.1.1 Watershed Management

Bexar County is part of the 4,180-square-mile San Antonio River Basin, the principal tributaries of which include the Medina River, Leon Creek, Cibolo Creek, and Salado Creek. TWDB administers a program for the long-term planning and development of state water resources. The TWDB divides Texas into 16 distinct regional water planning areas for this purpose. Each regional water planning area is tasked with developing a regional water plan for incorporation into a state water plan prepared by the TWDB. Bexar County, Texas, is part of the Region L regional water planning area.

Most of the southern half of JBSA-BUL is part of the Salado Creek watershed; a small area of land in the southwest corner of the Base lies within the Leon Creek watershed. More specifically, the Proposed Action would take place in portions of the following three sub-watersheds as identified by their principal tributaries (**Figure 3-3**):

- Lewis Creek-Salado Creek (Hydrologic Unit Code [HUC] 121003010101)
- Upper Leon Creek (HUC 121003020402)
- Leon Creek Headwaters (HUC 121003020401)

Water quality concerns primarily relate to increases in urbanization and contaminants generated on the land surface that convey downstream to areas that function to recharge the Edwards Aquifer.

3.9.1.2 Surface Waters and Water Quality

Pursuant to the CWA, TCEQ sets and enforces water quality standards for surface waters in Texas. Discharges to state waters are permitted under the TPDES permit program. TPDES permits are required for different types of pollutant-generating activities such as construction, industrial operations, and public-owned and -operated storm sewers (TCEQ, 2020b, 2021d).

Under Section 303(d) of the CWA, the State of Texas is required to identify and develop a list of waterbodies (or waterbody segments) that are impaired based on their intended use (e.g., swimming or fishing). Impaired waterbodies are those that are not in attainment with water quality standards promulgated by TCEQ. To achieve attainment status, a total maximum daily load (TMDL) is developed for the impairment. TMDLs use science-based criteria to establish a regulatory ceiling for the impaired waterbody to achieve attainment of water quality standards; that is, the maximum pollutant loads a waterbody may receive from all or portions of a basin or sub-basin in attainment of water quality standards. TMDLs target specific pollutants and set enforceable limits to improve or maintain the current conditions of 303(d)-listed waterbodies. TCEQ also implements a statewide water quality sampling program for this purpose and requires sampling through the issuance of TPDES permits (USEPA, 2021).

The water quality of the San Antonio River Basin has improved over historic levels, in large part due to more advanced wastewater treatment within the region. For example, dissolved oxygen concentrations in the surface waters of the basin have increased substantially in the last several decades. However, water quality in portions of the river basin continues to be of management concern for low dissolved oxygen levels and contaminants such as fecal coliform and nutrients.

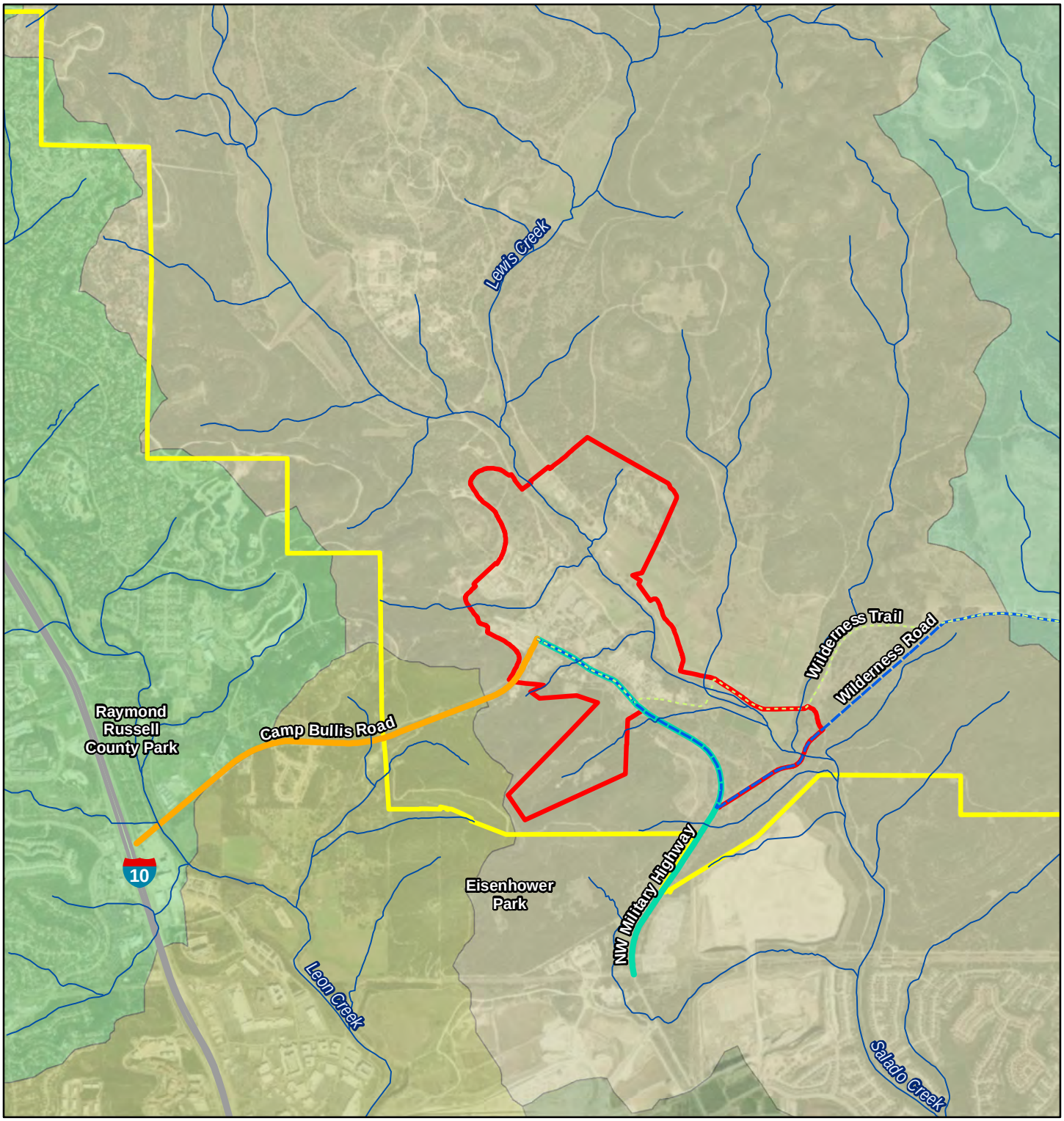


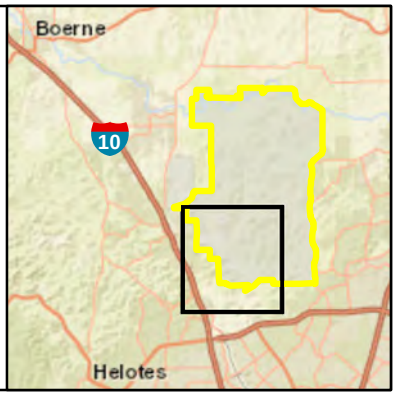
FIGURE 3-3
Drainage Basins

- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Headwaters Leon Creek
- Lewis Creek/Salado Creek
- Olmos Creek/San Antonio River
- Panther Springs/Salado Creek
- Upper Leon Creek

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



The surface waters of JBSA-BUL are characterized by numerous intermittent streams, three large flood structures that regulate surface flow downstream in certain areas of the Base (e.g., the cantonment area), and, to a lesser extent, man-made ponds (**Figure 3-4**). Most streams and ponded areas remain dry throughout the year but are subject to overflow during high-intensity rainfall events.

The ROI for water resources is characterized by the convergence of Salado Creek and Lewis Creek north of the JBSA-BUL cantonment and Leon Creek west of the Base. From its point of convergence with Lewis Creek, Salado Creek flows in a southernly direction through the cantonment and eventually discharges to the San Antonio River; however, surface waters often percolate to groundwater quickly, leaving the stream bed dry for much of the year. Segment 1910 of Salado Creek, from its headwaters in Camp Stanley to its confluence with Lewis Creek on JBSA-BUL, was previously designated "impaired" for low levels of dissolved oxygen. However, recent studies concluded there is now sufficient capacity to assimilate oxygen-demanding materials within this portion of Salado Creek and that an implementation plan for the TMDL is not necessary (TCEQ, 2021a).

Leon Creek is a south-to-southeast-flowing tributary of the Medina River that generally parallels the portion of I-10 to the west of JBSA-BUL. It then flows through western San Antonio before discharging to the Medina River approximately 12 miles south of downtown. Like Salado Creek, segments of Leon Creek within the ROI are often dry due to high rates of percolation into groundwater. To the south-southwest of the ROI, Segment 1906 of Leon Creek from northwest San Antonio south to its confluence with the Medina River was previously designated "impaired" for low levels of dissolved oxygen. However, the impairment was removed by assessment in 2016 (TCEQ, 2021b).

3.9.1.3 Wetlands

The natural-function benefits of wetlands include flood control, groundwater recharge, wildlife habitat, recreational opportunities, and maintenance of water quality. For these reasons, wetlands are regulated as a subset of Waters of the US under Section 404 of the CWA. When a federal action requires a Section 404 wetlands permit, states have authority under Section 401 of the CWA to enforce surface-water quality standards through review of the Section 404 permit application.

Wetlands in the ROI are characterized by relatively small, isolated communities, many of which occur within portions of 100-year floodplains. Wetlands associated with the Proposed Action are limited to the treated wastewater storage ponds in the southeast portion of the JBSA-BUL cantonment (**Figure 3-4**).

3.9.1.4 Stormwater Management

Stormwater management in the ROI is focused on precipitation runoff that occurs as sheet flow during major storm events. For example, on JBSA-BUL, the San Antonio River Authority (SARA) constructed four stormwater impoundments north of the Base cantonment to decrease the rate of stormwater runoff downstream.

Pursuant to the CWA, JBSA-BUL is regulated as a small municipal separate storm sewer system (MS4) operator and maintains an MS4 permit for its stormwater conveyance system. As a requirement of the MS4 permit, JBSA-BUL maintains a Base-wide SWP3, which describes procedures for the management of stormwater on the Base, including stormwater conveyed to four regulated outfalls subject to compliance with JBSA-BUL's multi-sector general permit for industrial facilities (TPDES General Permit No. TXR0550000). Three of these outfalls discharge to Salado Creek; the other discharges to Panther Springs Creek. The Base's multi-sector general permit is associated with vehicle maintenance, refueling, and explosives detonation operations, as well as with several landfill sites contaminated by historical operations. Stormwater discharges within the "contributing zone" of the Edwards Aquifer, the area upstream from the "recharge zone," must comply with 30 TAC 213 (i.e., the Edwards Aquifer Rule) in addition to the provisions set forth in the multi-sector general permit.

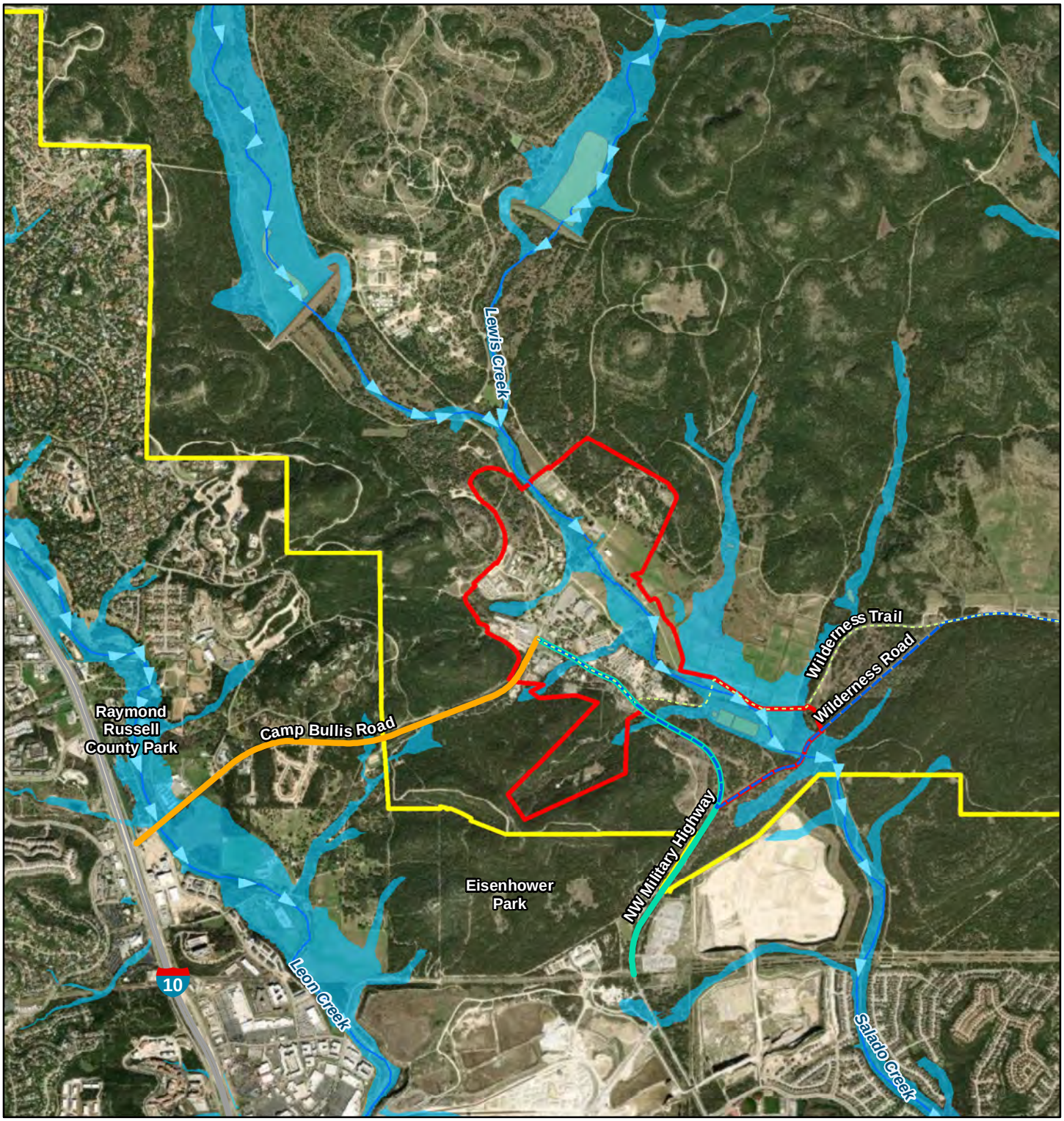


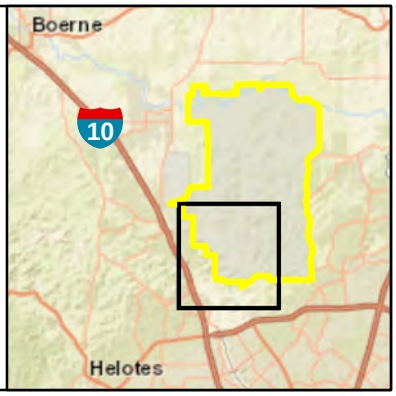
FIGURE 3-4
Surface Waters and Floodplains

- Surface Flow Direction
- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Stream/Creek
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Wetland
- 100-Year Floodplain

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



Stormwater discharges from construction activities on JBSA-BUL are also permitted under the TPDES. The type and extent of a construction activity on the Base determines stormwater management requirements on a case-by-case basis as follows:

- Disturbance of **1 acre** to less than **5 acres** that ***are not*** part of a larger common plan of development requires preparation, implementation, and maintenance of a site-specific SWP3.
- Disturbance of **1 acre** to less than **5 acres** that ***are*** part of a larger common plan of development requires authorization under TPDES General Permit No. TXR150000, including a TCEQ-approved SWP3 and NOI publication prior to construction.
- Disturbance of **5 acres or more** requires authorization under TPDES General Permit No. TXR150000, including a TCEQ-approved SWP3 and NOI publication (i.e., whether part of a larger common plan of development or not) prior to construction.

These construction general permits establish standard measures to prevent or minimize potential soil erosion and sedimentation from construction sites (TCEQ, 2021b).

Section 438 of the *Energy Independence and Security Act* (42 USC § 17094) (EISA) directs federal agencies to incorporate, to the maximum extent technically feasible, low-impact development measures to maintain the pre-development hydrology of a site for projects involving 5,000 ft^2 or more of land disturbance. DoD technical criteria and requirements for compliance with Section 438 of EISA are provided in UFC 3-10-10, Change 1, *Low Impact Development*.

3.9.1.5 Floodplains

Floodplains are areas of low-lying, relatively flat ground adjacent to rivers, streams, large wetlands, or coastal waters with a potential for inundation due to rain or melting snow. In a natural vegetated state, floodplains slow the rate at which incoming overland flows reach the adjacent waterbody. Floodplains also function to recharge groundwater, maintain water quality, provide wildlife habitat, and support recreation.

The Federal Emergency Management Agency (FEMA) defines the 100-year floodplain or base flood as an area that has a 1-percent chance of inundation in any given year; the area with a 0.2-percent chance of inundation in any given year is defined as the 500-year floodplain. FEMA designates 100-year floodplain zones to indicate the severity or type of flooding in an area. Zone A designates portions of 100-year floodplains where depths or base flood elevations are not yet known and require further study. Conversely, Zone AE portions of 100-year floodplains are those with defined base flood elevations. Beyond the 100-year floodplain, areas designated as Zone X are either shaded to indicate the 500-year floodplain or unshaded to indicate a lower risk of flooding outside the 100- and 500-year floodplains (FEMA, 2021).

EO 11988, *Floodplain Management*, requires federal agencies to determine whether proposed development would occur within a floodplain and to avoid floodplains, to the maximum extent possible, when there is a practicable alternative. Where construction within the floodplain is unavoidable, development of a FONPA is required detailing no other alternatives. EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input,* reinforces the tenets of EO 11988 to avoid actions in a floodplain or minimize potential harm if an action must take place in a floodplain. For example, EO 13690 directs federal agencies to use nature-based approaches when developing alternatives for actions under EO 11988.

EO 13690 further directs federal agencies to use higher standards for actions in floodplains by managing beyond the base flood to a higher vertical flood elevation and corresponding horizontal floodplain. The FFRMS describes varying ways to determine a higher flood elevation and extent for federally funded projects; however, the goal is to establish the level to which a structure or facility must be to minimize current and future flood risks. As a resilience standard, the FFRMS provides flexibility to use structural or nonstructural methods to reduce or prevent damage, elevate a structure, or, if appropriate, consider adaptation or recovery by design.

The San Antonio River Basin is part of an area commonly associated with “flash” flooding from high-intensity, short-in-duration rainfall (SARA, 2021). In coordination with FEMA, the SARA regulates floodplain

use in Bexar County. SARA also functions as a technical resource for floodplain management (e.g., the surface-water impoundments on JBSA-BUL). Such flood control structures hold water temporarily after rain events to increase infiltration into groundwater.

Floodplains associated with the ROI are primarily found adjacent to stream channels and within impoundment areas (see **Figure 3-4**).

3.9.1.6 Groundwater and Water Quality

Groundwater is water that collects or flows beneath the land surface. As precipitation occurs, water percolates through the ground and occupies porous space in soil, sediment, and rocks. Groundwater resources are often used for potable water consumption, agricultural irrigation, and industrial applications. An aquifer is a body of porous rock or sediment saturated with groundwater. In Texas, aquifers are a critical source of water, supplying more than 60 percent of annual water use (TWDB, 2021a). As defined by the TWDB, there are two "major" aquifers associated with Bexar County, the Trinity Aquifer and the Edwards (Balcones Fault Zone) Aquifer.

The Trinity Aquifer extends across central and northeastern Texas. This aquifer system occupies 21,308 square miles of subsurface area, underlying all or parts of 61 Texas counties. Because it is composed of several smaller aquifers within the Trinity Group, the Trinity Aquifer is referred to by several different names across the state. For example, in Bexar County, the aquifer is often referred to as the Glen Rose Aquifer. Regardless of nomenclature, the smaller aquifers that comprise the Trinity Aquifer consist of limestones, sands, clays, gravels, and conglomerates. The Trinity Aquifer discharges to numerous springs throughout its reach. There are no major concerns with respect to the water quality of the Trinity Aquifer; however, increased total dissolved solids and concentrations of sulfate and chloride have been detected in portions of the aquifer. The groundwater of the Trinity Aquifer is primarily used as a source of potable water. JBSA-BUL is part of the Trinity Aquifer's outcrop area, the part of an aquifer that lies at the land surface.

The Edwards (Balcones Fault Zone) Aquifer occupies a subsurface area of 2,314 square miles in south-central Texas. The Edwards Aquifer extends across parts of 13 Texas counties, including Bexar County. Because it primarily consists of partially dissolved limestone, the Edwards Aquifer is highly permeable. The Edwards Aquifer discharges to numerous springs throughout its reach. The water quality of the Edwards Aquifer is generally considered to be high. The groundwater of the aquifer is primarily used as a source of potable water and for agricultural irrigation; the City of San Antonio obtains nearly all of its water supply from the Edwards Aquifer. Because of its high rate of permeability, water levels and spring flows in the Edwards Aquifer can fluctuate rapidly in response to rainfall, drought, or pumping. This characteristic also increases the aquifer's susceptibility to pollution from stormwater runoff or spills. Groundwater contamination in the Edwards Aquifer is of particular concern with respect to drinking water and the unique ecology of the aquifer (TWDB, 2021b, 2021c).

Most of JBSA-BUL overlies a portion of the Edwards Aquifer designated the "contributing zone"; that is, the area that drains to surface waters that are a source of recharge for the aquifer (see **Figure 3-4**). Approximately 4,000 acres in the southeastern portion of the Base are designated an Edwards "recharge zone." In the recharge zone, water recharge occurs directly from surface to groundwater in unconfined portions of the aquifer, such as springs and sinkholes (Edwards Aquifer Authority, 2021). Because of their proximity to one another in the sub-stratum, the Trinity and Edwards aquifers are hydrologically connected at JBSA-BUL. Hydrologic connectivity occurs in areas of combined groundwater where effects on one aquifer may also affect the other.

3.9.2 Environmental Consequences

3.9.2.1 Evaluation Criteria

The Air Force defines a significant effect on water resources within the ROI as one or more of the following:

- substantial, permanent alteration, damming, diversion or redirection of jurisdictional stream segments or hydrological connections to Waters of the US, including wetlands;

- substantial changes to the volume, rate, or quality of stormwater discharges result in non-compliance with applicable water quality regulations or permit conditions;
- development within 100- or 500-floodplains or jurisdictional wetlands without full consideration of other practicable alternatives or methods to avoid and minimize adverse effects;
- release of contaminants to groundwater underlying a project site exceeding applicable regulatory thresholds (i.e., maximum concentration levels); and
- substantially reduced groundwater recharge or volume at or near a project site (e.g., lowering of the water table).

The Air Force has determined that the Proposed Action necessitates development within and proximate to 100-year floodplains. Although alternative routes were considered to avoid or minimize potential adverse effects on floodplain resources, no other routes evaluated were determined feasible to support the project largely due to other associated environmental concerns. Other factors considered included safety, security, and the location and capacity of existing infrastructure, among others. Alternative 1 and Alternative 2 were determined to be the only feasible options available that would meet technical specifications of the Proposed Action with the least environmental impacts. To document planning conducted to avoid and minimize potential adverse effects of the Proposed Action on 100-year floodplains, the Air Force prepared a FONPA.

3.9.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Surface Waters and Water Quality
Alternative 1 would occur in parts of both the Salado Creek and Leon Creek watersheds. Project areas under Alternative 1 would be drained by one or more unnamed, intermittent tributaries of Salado Creek or Leon Creek. Alternative 1 would involve earthwork to install pipelines below ground, including excavation, boring, grading, and site restoration. These activities could result in erosion and sedimentation or release of contaminants with potential to degrade surface-water quality in the ROI.

As described in **Section 3.8.2.1**, Alternative 1 would be subject to the conditions of TPDES Construction General Permit TXR150000, which would require the preparation of a TCEQ-approved SWP3 prior to the start of the Proposed Action. The contractor would be required to complete an NOI to secure a general permit and provide a copy of the acquired permit to the JBSA Water Quality Manager within two days prior to starting construction activities. The contractor would then be required to post a copy of the permit in a location that would be visible to the public.

SWP3s contain project-specific measures to minimize potential adverse effects from erosion and contaminant releases into the environment that could enter surface waters via stormwater runoff. With these measures in place, sedimentation and pollution of surface waters would be unlikely to occur. The contractor would be responsible for ensuring that the SWP3 was maintained on site throughout the duration of construction. The construction of Alternative 1 would bisect two intermittent streams in the ROI. Approximately 408 lf of intermittent streams would be subject to potential effects during the construction of Alternative 1, including segments of Leon Creek and one of its tributaries. JBSA would comply with applicable requirements for impacts on jurisdictional streams pursuant to Sections 404 and 401 of the CWA. With regulatory compliance measures in place, potential adverse effects from dredge or fill activities within jurisdictional streams would be short term and minor.

To comply with Section 438 of the EISA, low-impact development measures would be incorporated into Alternative 1, to the maximum extent technically feasible. These design measures would help to maintain or restore stormwater runoff to pre-construction conditions in terms of temperature, rate, volume, and duration of surface flow. Under Alternative 1, the Air Force would conduct an analysis of pre-development hydrology to establish a baseline condition and set design objectives for stormwater management. If design objectives could not be met on one or more project sites, low-impact development measures would be considered for application in areas downstream thereof (i.e., either on or in the vicinity of the ROI). These compliance measures would further reduce potential erosion and sedimentation downstream of project sites associated with Alternative 1.

Wetlands
No impacts on wetlands would occur under Alternative 1.

Floodplains
Alternative 1 would occur within and directly impact approximately 4 acres of 100-year floodplains. However, potential effects on the function and capacity of these floodplains would be limited to the construction phase. This phase would conclude with site restoration to include revegetation of disturbed areas with native species of plants and trees. Because Alternative 1 would place the pipeline underground, no permanent structures would impede surface-water flows within these floodplains over the long term. Under Alternative 1, the ROW and resultant land use would preserve the natural-function benefits of the 100-year floodplains following construction. However, because construction would occur within 4 acres of floodplains, potential effects on floodplains under Alternative 1 would be short term and moderate.

Groundwater and Water Quality
Alternative 1 would overlie approximately 53 acres of the Edwards Aquifer drainage zone; however, no impacts to the Edwards Aquifer recharge zone would be anticipated. Therefore, with BMPs and construction standards in place to minimize potential leaching or discharge of contaminants into groundwater, potential effects on groundwater under Alternative 1 would be short term and minor.

3.9.2.3 Alternative 2 – NW Military Highway

Surface Waters and Water Quality
Potential effects on surface-water quality during the construction of Alternative 2 from increased stormwater runoff would be the same as described for Alternative 1.

Alternative 2 would bisect three intermittent streams that drain to Salado Creek. Approximately 805 lf of these intermittent streams would be subject to potential effects during the construction of Alternative 2. As described for Alternative 1, Alternative 2 would comply with the applicable provisions of the CWA, including management measures to reduce potential adverse effects on jurisdictional streams. However, given the extent of streams affected under Alternative 2, potential effects from dredge or fill activities would be short term and moderate.

Wetlands
Alternative 2 would bypass the wastewater treatment storage ponds within the JBSA-BUL cantonment. However, no direct adverse effects to these wetlands would result from Alternative 2. As the required construction site erosion and sedimentation controls would further regulate discharge into these wetlands, potential effects on wetlands under Alternative 2 would be short term and negligible.

Floodplains
Alternative 2 would occur within and directly impact approximately 2 acres of 100-year floodplains. As described for Alternative 1, potential effects would be temporary and, in the long term, the natural-function benefits of these floodplains would be preserved. However, the construction of Alternative 2 would occur within 100-year floodplains. Therefore, potential effects would be short term and minor.

Groundwater and Water Quality
Alternative 2 would overlie approximately 27 acres within the drainage zone, including approximately 25 acres of Edwards Aquifer recharge zone. As such, Alternative 2 would increase the potential for contaminants to leach or discharge to groundwater of the Edwards Aquifer. Due to its hydrologic connectivity with the Trinity Aquifer, this potential extends to groundwater in this aquifer. To ensure protection of these groundwater resources during and after construction activities, Alternative 2 would comply with the applicable Edwards Aquifer Rules in coordination with TCEQ (e.g., enhanced erosion and sedimentation controls).

Edwards Aquifer Protection Zones
TCEQ regulates activities in the Edwards Aquifer Authority-designated Edwards Aquifer protection zones, including during and after construction. Rules are different depending on the type of activity and zone in which it would occur. However, any activity with a potential to pollute the aquifer and surface streams that recharge it is subject to regulation. All activities, regardless of zone, must install erosion and sedimentation

controls that meet specific requirements before any work begins. These controls must be maintained during construction and remain in place post construction until vegetation is established.

With some exceptions, activities that occur over an Edwards Aquifer protection zone require the preparation of an Edwards Aquifer Protection Plan (EAPP) for TCEQ review and approval. In the contributing zone, an EAPP is required for disturbance of 5 acres or more of land, either individually or as a part of a larger plan of development. An EAPP outlines the BMPs that would be implemented and maintained before and after construction, to prevent contaminants in stormwater from reaching the groundwater of the aquifer. Additionally, an Edwards Aquifer Contributing Zone Plan (CZP) that serves a similar purpose is required for any regulated activity therein (i.e., disturbance of more than 5 acres). The CZP must be developed and approved by the TCEQ and Edwards Aquifer Authority prior to commencing onsite construction activities. Once final stabilization is complete, the contractor must submit a TCEQ TPDES Notice of Termination and provide a copy to the JBSA Water Quality Program Manager.

On the recharge and transition zones, specific requirements are in place for the installation of underground storage tanks (USTs) and aboveground storage tanks (ASTs) or piping that store hazardous substances or fuels. Further, a water pollution abatement plan is required for any regulated activity proposed to occur on the recharge zone. WRAPs are identify BMPs to ensure protection of the aquifer's water quality. Like EAPPs and CZPs, WRAPs require TCEQ review and approval in advance of any work on the recharge zone.

During construction on the recharge or transitions zones, if sensitive features (as defined in 30 TAC 213.3(29)) are encountered where a potential exists for hydrologic connectivity between the surface and subsurface portions of the Edwards Aquifer, work must stop immediately, and workers must adhere to additional rules for the activity. In such cases, a Texas-certified professional engineer or geoscientist must conduct a geologic assessment, including recommendations to protect the groundwater resources of the aquifer (TCEQ, 2008).

Pre-construction meetings would be held to ensure contractors are in receipt of all approved, project-specific EAPPs or CZPs. These plans would be incorporated into the SWP3 and maintained at project areas during construction. The EAPP or CZP would be documented as part of JBSA's MS4 permit and TCEQ would be notified in advance of all construction start dates.

Under Alternative 2, construction contractors would be required to install temporary erosion and sediment controls and protective barriers around sensitive features, such as caves, sinkholes, and wells, as approved by TCEQ. Temporary detention ponds with approved linings would be installed as an outlet structure for any water discharges generated during construction. All work would occur within the delineated construction limits of disturbance; any changes would be subject to TCEQ review and approval. JBSA also would conduct regular project site inspections to ensure erosion and sedimentation controls are in place, meet specifications, and remain functionally adequate.

Under Alternative 2, any spills or accidental releases of hazardous substances would be reported immediately to TCEQ and be subject to JBSA-BUL's spill prevention, control and countermeasures (SPCC) plan and any EAPP or CZP codified response measures. Should groundwater be encountered during construction, excavations would be de-watered and subject to filtering to remove sediments in the water.

All activities associated with Alternative 2 that would occur on the recharge zone would be conducted in accordance with 30 TAC 213, as approved by the TCEQ. Compliance with the Edwards Aquifer Rules would prevent and minimize potential adverse effects on groundwater resources that could result from Alternative 2. Therefore, potential adverse effects on groundwater resources under Alternative 2 would be short term and moderate.

3.9.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Water resources and hydrology would not change substantially on JBSA-BUL or regionally. However, the

beneficial impact on water quality associated with the Proposed Action would also not occur under the No Action Alternative.

3.9.2.5 Cumulative Effects

Under Alternative 1, development plans and projects within and around the San Antonio metropolitan area would continue to be regulated under the NPDES permitting program. Depending on the location, nature, and size of a regulated activity, enforcement of the Edwards Aquifer Rules would also continue. These regulatory compliance measures would serve to prevent or minimize potential effects on water resources from development on a regional scale. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects on water resources would be anticipated to occur with implementation of the Proposed Action.

3.9.3 Best Management Practices and Mitigation Measures

The Air Force would require contractors to implement the following BMPs to reduce potential effects on water resources under the Proposed Action:

- Comply with JBSA environmental specifications during construction activities.
- Comply with Sections 404/401 of the CWA including any site-specific BMPs established through the permitting process.
- Prior to construction, obtain an applicable TPDES permit to manage stormwater on a site-specific basis; prepare a State-approved SWP3 and submit an NOI as appropriate; adhere to permit conditions during construction to minimize soil erosion, sedimentation, and compaction under the Proposed Action.
- When practicable, identify and implement BMPs for construction and post-construction stormwater management in accordance with the USEPA's National Menu of Best Management Practices (BMPs) for Stormwater or other technical guidance.
- Comply with Section 438 of the EISA to maintain the pre-development hydrology where project activities would occur to the maximum extent technically feasible; incorporate low-impact development[9] measures and techniques into the design of the Proposed Action to increase on-Base infiltration of stormwater.
- When possible, establish construction staging areas on existing hardscape and at least 100 feet away from surface-water resources.
- Should any excavation encounter the water table, minimize potential effects through measures such as dewatering that would prevent discharge of contaminated water during construction or demolition.

No mitigation measures for potential effects on water resources were identified by analysis.

3.10 Biological Resources

Biological resources include plants, animals, and the habitats upon which they rely for sustenance and survival. These resources include terrestrial and aquatic species; game and non-game species; special status species (i.e., state or federally listed species and species of concern such as migratory birds); and environmentally sensitive habitats or natural areas that have functional or intrinsic value to humans. Pursuant to the *Sikes Act* (16 USC § 670a), JBSA maintains the Integrated Natural Resources Management Plan (INRMP) to guide the use and management of natural resources within the Joint Region, including JBSA-BUL (Air Force, 2020a).

[9] Low-impact development measures include filtration, infiltration, evaporation, plant transpiration, and rainwater reuse to retain and treat stormwater on Base, in contrast to conventional management practices that temporarily store and ultimately discharge stormwater to receiving waterbodies.

The ROI for biological resources includes JBSA-BUL and the northern extent of the San Antonio metropolitan area that contains or supports sensitive or beneficial natural resources.

3.10.1 Existing Conditions

3.10.1.1 Vegetation

Bexar County, Texas, includes parts of three different ecoregions; two of these ecoregions, the Balcones Canyonlands and Northern Blackland Prairies, help to characterize the ecology of JBSA-BUL. Expansive tallgrass prairie vegetation once typified the Northern Blackland Prairies ecoregion of Texas. The regional ecology was further characterized by irregular plains and low-to-moderate gradient streams with silt, clay, and sand substrates. However, urbanization and conversion to cropland and pasture have since altered the original vegetation and landscape associated with the Northern Blackland Prairies; less than 1 percent now exists in small, scattered areas regionally.

Vegetation on JBSA-BUL is indicative of the Balcones Canyonlands and Northern Blackland Prairies ecoregions. However, due to fragmentation of the landscape, the dominant plant communities consist of woodlands, forests,[10] and grasslands. Riparian, deciduous, and evergreen forests and woodlands, interspersed with grasses and shrubs, are organized along soil and moisture gradients. Higher-density trees and shrubs are generally concentrated within canyons and riparian areas. In areas of high relief, slope orientation determines the duration of light exposure and influences the type and density of vegetation. Typical woody species found in upland areas of JBSA-BUL include Ashe juniper (*Juniperus ashei*), Texas oak (*Quercus buckleyi*), live oak (*Quercus fusiformis*), escarpment black cherry (*Prunus serotina var.eximia*), Texas persimmon (*Diospyros texana*), and agarito (*Mahonia trifoliolata*) (TCEQ, 2007). Some of these woodlands also support habitats for endangered and other protected species (see **Sections 3.10.1.3** and **3.10.1.4**, respectively).

Vegetation communities in other areas of JBSA-BUL include managed grasses, herbaceous grasslands, and shrublands. Native and non-native grasses are managed to support military operations or provide recreation for authorized personnel and their dependents. These include grasslands or savannah within and outside the cantonment area. Native grassland species found on JBSA-BUL include little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), big bluestem (*Andropogen gerardii*), switchgrass (*Panicum virgatum*), sideoats gramma (*Bouteloua curtipendula*), plains lovegrass (*Eragrostis intermedia*), vine-mesquite (*Panicum obtusum*), Lindheimer muhly (*Muhlenbergia lindheimeri*), silver bluestem (*Bothriochloa laguroides*), green sprangletop (*Leptochloa dubia*), tall dropseed (*Sporobolus asper*), and Texas cupgrass (*Eriochloa sericea*).

Herbaceous grasslands consist of forbs, grasses, and scattered trees. These areas are not regularly maintained but some are managed to minimize or prevent hardwood encroachment. Shrublands or areas in which shrubs are the predominate plant community are also not subject to regular maintenance; however, prescribed fire or mechanical treatment is used to control density in some areas (Air Force, 2017).

In areas outside of JBSA-BUL, to the west, southwest, and south of the cantonment area, vegetation is generally limited by development. However, in some cases, public and private conservation lands are interspersed with development. For example, Eisenhower Park abuts the southern boundary of JBSA-BUL to the west of NW Military Highway, portions of which provide habitat for threatened and endangered species (see **Section 3.10.1.3**) (USFWS, 2021b).

3.10.1.2 Wildlife

The unique ecology preserved by JBSA-BUL provides habitat for diverse wildlife species. Over several decades, surveys have documented more than 350 different wildlife species on the Base. JBSA administers a hunting program at JBSA-BUL for certain native and non-native wildlife species. Game species managed

[10] Forests are differentiated from woodlands as having more extensive canopies that limit light penetration to understory vegetation; that is, shrubs, bushes, and younger trees are commonly the understory of forests whereas grasses and shrubs typify the understory of woodlands.

as part of the hunting program include Aoudad sheep (*Ammotragus lervia*), coyote (*Canis latrans*), feral hog (*Sus scrofa*), axis deer (*Axis axis*), Rio Grande turkey (*Meleagris gallopavo*), black-tailed jackrabbit (*Lepus californicus*), catalina goat (*Capra hircus*), and white-tailed deer (*Odocoileus virginianus*), among other small mammals and birds (Air Force, 2020b).

3.10.1.3 Threatened and Endangered Species

Threatened and endangered species include plants and animals that receive protection under federal or state laws, regulations, or policy directives. Under the Proposed Action, these primarily include the ESA (16 USC § 1531 et seq.), the *Migratory Bird Treaty Act* (16 USC §§ 703–712), *Bald and Golden Eagle Protection Act* (16 USC §§ 668–668d), EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, and the Texas Parks and Wildlife Code (Title 5, Chapters 67 and 68).

JBSA maintains an INRMP to manage the natural resources of JBSA-BUL, including threatened and endangered species and their habitat. Pursuant to Section 7 of the ESA, JBSA also consults with the USFWS on actions with a potential to adversely affect or jeopardize the continued existence of such species or their habitat on Base. There is one Section 7 consultation that resulted in USFWS issuance of a Biological Opinion (BO) of relevance to the Proposed Action, the *Final Biological Opinion on the Joint Base San Antonio-Camp Bullis Training Site Military Land Management Practices for Fiscal Years 2015–2025 in Bexar and Comal Counties, Texas* (*Consultation No. 02ETAU00-2015-I-0216*) (hereafter, the 2015 BO).

Pursuant to Section 7 of the ESA, JBSA engaged in informal consultation with the USFWS for military activities and trainings at JBSA-BUL with a potential to adversely affect listed species or their habitat (JBSA, 2015b). The informal consultation covered construction and maintenance activities and requested the following conservation measures:

- Avoid sensitive areas (sensitive areas include but are not limited to GCWA habitat and karst preserve areas [KPAs]) for new construction projects on JBSA-BUL. Additionally, all work will be reviewed by and coordinated with the Natural Resources Office prior to planning. If a project must occur in GCWA habitat or KPAs, JBSA-BUL would seek consultation with USFWS.
- Conduct structure, sign, and utility maintenance under the guidelines of the seasonal training restrictions.
- Limit road, trail, firebreak, culvert, fence, and easement maintenance within the 300-foot buffer zone of GCWA habitat to outside the nesting season (from approximately 15 August to 28 February). Do not exceed 8 feet from either side of existing road, trail, culvert, firebreak, fence, or easement for clearing activities. Restrict tree trimming to branches below 6 feet and paint all oak cuts with pruning paint no later than 30 minutes after the cut. Confine tree removal to re-growth juniper of less than 12 feet in height.
- Inform all personnel responsible for construction activities about the need to follow design plans, stay within demarcated construction boundaries, and minimize impacts to wildlife and other environmental concerns via scopes of works, contracts, and other written means.
- Consult with USFWS in the event new projects must be planned within GCWA habitat or KPAs.

Any activities not included in this informal consultation, or that would come into conflict with the established measures, would be subject to separate Section 7 consultation requirements.

The ESA, as amended by the *National Defense Authorization Act for Fiscal Year 2004* (Public Law 108-136), exempts military installations from "critical habitat" designations in cases where a *Sikes Act*-compliant INRMP provides a demonstrable benefit to one or more ESA-listed species. As such, no ESA-designated critical habitat is present on JBSA-BUL. On 10 March 2025, the Air Force used the USFWS IPaC tool to obtain an official species list from the USFWS. The list identifies threatened and endangered species and other protected species (e.g., migratory birds) with potential to be affected by the Proposed Action. This information is included in **Appendix A** and incorporated into this EA where applicable. **Table 3-5** identifies federal- and state-listed threatened and endangered species known or with potential to occur in the ROI.

Table 3-5
Federal- and State-Listed Species Known or with Potential to Occur at JBSA-BUL

Common Name	Scientific Name	Federal Status	State Status	Documented at JBSA-BUL
Plants				
Bracted twistflower	*Streptanthus bracteatus*	PT	-	Yes
Texas wild-rice	*Zizania texana*	E	-	No
Mammals				
Black bear	*Ursus americanus*	-	T	No
White-nosed coati	*Nasua narica*	-	T	No
Tricolored bat	*Perimyotis subflavus*	PE	-	Yes
Birds				
Golden-cheeked warbler	*Setophaga chrysoparia*	E	E	Yes
Piping plover	*Charadrius melodus*	T	T	No
Red knot	*Calidris canutus rufa*	T	-	No
Whooping crane	*Grus americana*	-	E	No
White-faced ibis	*Plegadis chihi*	-	T	Yes
Tropical parula	*Setophaga pitiayumi*	-	T	No
Wood stork	*Mycteria americana*	-	T	No
Zone-tailed hawk	*Buteo albonotatus*	-	T	Yes
Amphibians				
San Marcos salamander	*Eurycea nana*	T	-	No
Texas blind salamander	*Eurycea rathbuni*	E	-	No
Cascade Caverns salamander	*Eurycea latitans*	-	T	Yes
Texas salamander	*Eurycea neotenes*	-	T	No
Reptiles				
Texas tortoise	*Gopherus berlandieri*	-	T	Yes
Texas horned lizard	*Phrynosoma cornutum*	-	T	Yes
Cagle's map turtle	*Graptemys caglei*	-	T	Yes
Crustaceans / Mollusks				
Peck's Cave Amphipod	*Stygobromus (=Stygonectes) pecki*	E	-	No
False spike	*Fusconaia mitchelli*	-	T	No
Fish				
Fountain Darter	*Etheostoma fonticol*	E	-	No
Widemouth Blindcat	*Satan eurystomus*	-	T	No
Toothless Blindcat	*Trogloglanis pattersoni*	-	T	No
Insects				
Ground beetle [unnamed]	*Rhadine exilis*	E	-	Yes
Ground beetle [unnamed]	*Rhadine infernalis*	E	-	Yes
Comal Springs Dryopid Beetle	*Stygoparnus comalensis*	E	-	No
Comal Springs Riffle Beetle	*Heterelmis comalensis*	E	-	No
Helotes Mold Beetle	*Batrisodes venyivi*	E	-	No
Monarch Buttery	*Danaus plexippus*	PT	-	Yes
Arachnids				
Bracken Bat Cave Meshweaver	*Cicurina venii*	-	-	No
Cokendolpher Cave Harvestman	*Texella cokendolpheri*	E	-	No
Government Canyon Bat Cave Meshweaver	*Cicurina vespera*	E	-	No
Government Canyon Bat Cave Spider	*Neoleptoneta microps*	E	-	No
Madla's Cave Meshweaver	*Cicurina madla*	E	-	Yes
Robber Baron Cave Meshweaver	*Cicurina baronia*	E	-	No

Source: USFWS, 2022;; JBSA 2020a; JBSA 2024
C = Candidate; E = Endangered; PE = Proposed Endangered; PT = Proposed Threatened; T = Threatened

The following sections describe federal- and state-listed species and their habitat potentially affected by the Proposed Action in more detail.

Golden-Cheeked Warbler
The GCWA is a federal- and state-listed migratory bird species that breeds exclusively in central Texas. During the winter, the GCWA inhabits the highlands of Central America from southern Mexico to Nicaragua. Known for its distinct yellow cheek feathers and vocalization, the GCWA's range in Texas coincides closely with that of the Ashe juniper tree. Dense forests and woodlands with closed canopies dominated by mature Ashe juniper and interspersed with other mostly deciduous trees such as walnuts, oaks, and elms are preferred habitat for nesting GCWAs. The fall migration of the GCWA starts in early July and continues through August. As an early breeder, these birds return to central Texas by mid-March, with most eggs reported between 1 April and 27 June. Overall, the breeding season occurs from 1 March to 15 August each year. To date, no "critical habitat" has been designated for the GCWA under the ESA (USFWS, 2021a).

GCWAs have been observed on and around JBSA-BUL since the late nineteenth century. JBSA currently manages and monitors the GCWA population on the Base by conducting annual territory and point counts (Air Force, 2020b). Data collected over a 3-year period informs habitat protection measures in place for the GCWA at JBSA-BUL as the configuration of woodlands likely determines habitat use (i.e., nesting or foraging). In general, suitable habitat for establishment of a GCWA territory in the ROI consists of large, contiguous tracts of oak-juniper woodlands with tree canopy cover in excess of 60 percent; adjacent, less dense woodlands with tree canopy in the range of 35 to 40 percent may be used for GCWA foraging (USFWS, 2015).

On JBSA-BUL, there are 9,303 acres of designated GCWA habitat (i.e., habitat known to support breeding pairs of GCWA). Buffer areas of 300 feet around the GCWA habitat total 14,884 acres on the Base where military training and operational restrictions apply (Air Force, 2020b). **Figure 3-5** depicts the GCWA habitat management areas for the Base portion of the ROI.

Karst Invertebrates
The unique ecology underlying JBSA-BUL and the larger ROI is characterized by the close connection between surface-water flows and groundwater in a karstic region. As surface water infiltrates the ground, it dissects the soluble bedrock (e.g., limestone) in the subsurface, and karst features such as sinkholes and caves are formed. These formations provide habitat for numerous species of troglobites, invertebrates that spend all or most of their lives underground. Characterized by small or absent eyes and pale coloration, these species rely on the high humidity, stable temperatures, and suitable substrates found below ground; however, such ecosystems are uniquely dependent on surface-derived nutrients from sources that include leaf litter and animal eggs (e.g., cave cricket), feces, and carcasses (USGS, 2021; USFWS, 2019)

There are three federally listed endangered invertebrates documented to occur on and around JBSA-BUL: Madla's Cave meshweaver, a small cave-adapted spider, and *Rhadine exilis* and *Rhadine infernalis*, two species of small, cave-adapted ground beetles with no common name. In 2012, the USFWS designated critical habitat under the ESA for nine karst invertebrates in Bexar County, Texas (77 FR 8450, 14 February 2012), including all three federally listed species. In total, 28 habitat units surrounding 57 caves were designated for the nine species. Three of the critical habitat units for *Rhadine exilis* and *Rhadine infernalis* were designated within 500 meters of JBSA-BUL on private property (USFWS, 2021b, 2019).

In cooperation with the USFWS, Bexar County delineated five karst zones based upon the probable presence of a rare or endemic karst invertebrate species (**Figure 3-6**). Bexar County karst zones 1 through 5 are defined as follows(USFWS, 2008):

- **Zone 1 –** areas known to contain listed invertebrate karst species
- **Zone 2 –** areas having a high probability of containing suitable habitat for listed invertebrate karst species
- **Zone 3 –** areas that probably do not contain listed invertebrate karst species
- **Zone 4 –** areas that require further research but are generally equivalent to Zone 3, although they may include sections which could be classified as Zone 2 or Zone 5 as more information becomes available
- **Zone 5 –** areas that do not contain listed invertebrate karst species.

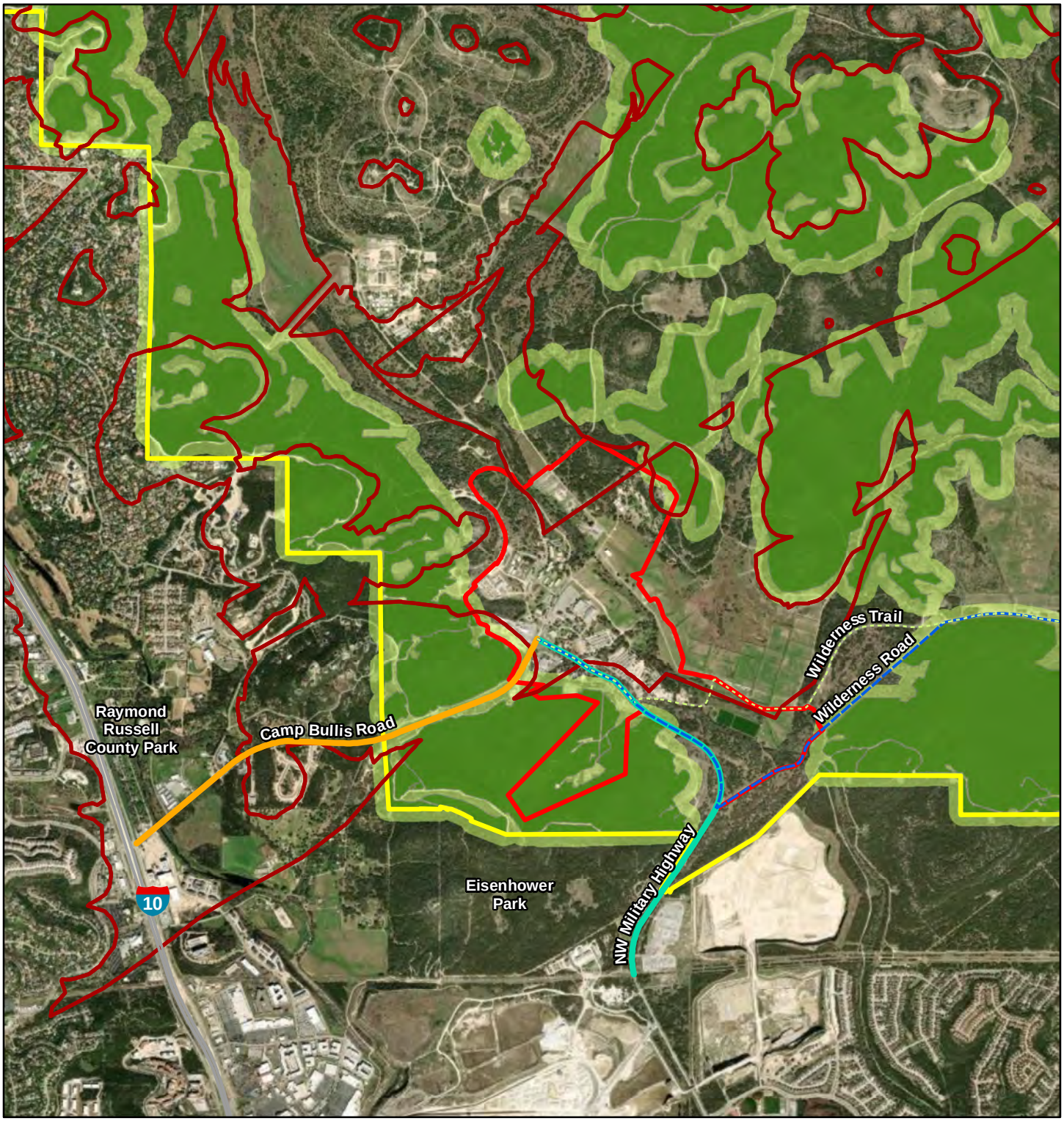


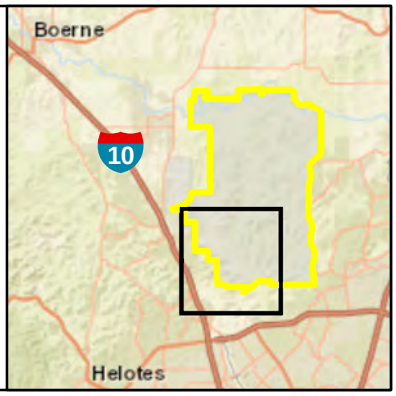
FIGURE 3-5
Habitat Management Areas

- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Karst Preserve Area
- GCW Buffer (300 ft)
- GCW Habitat

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



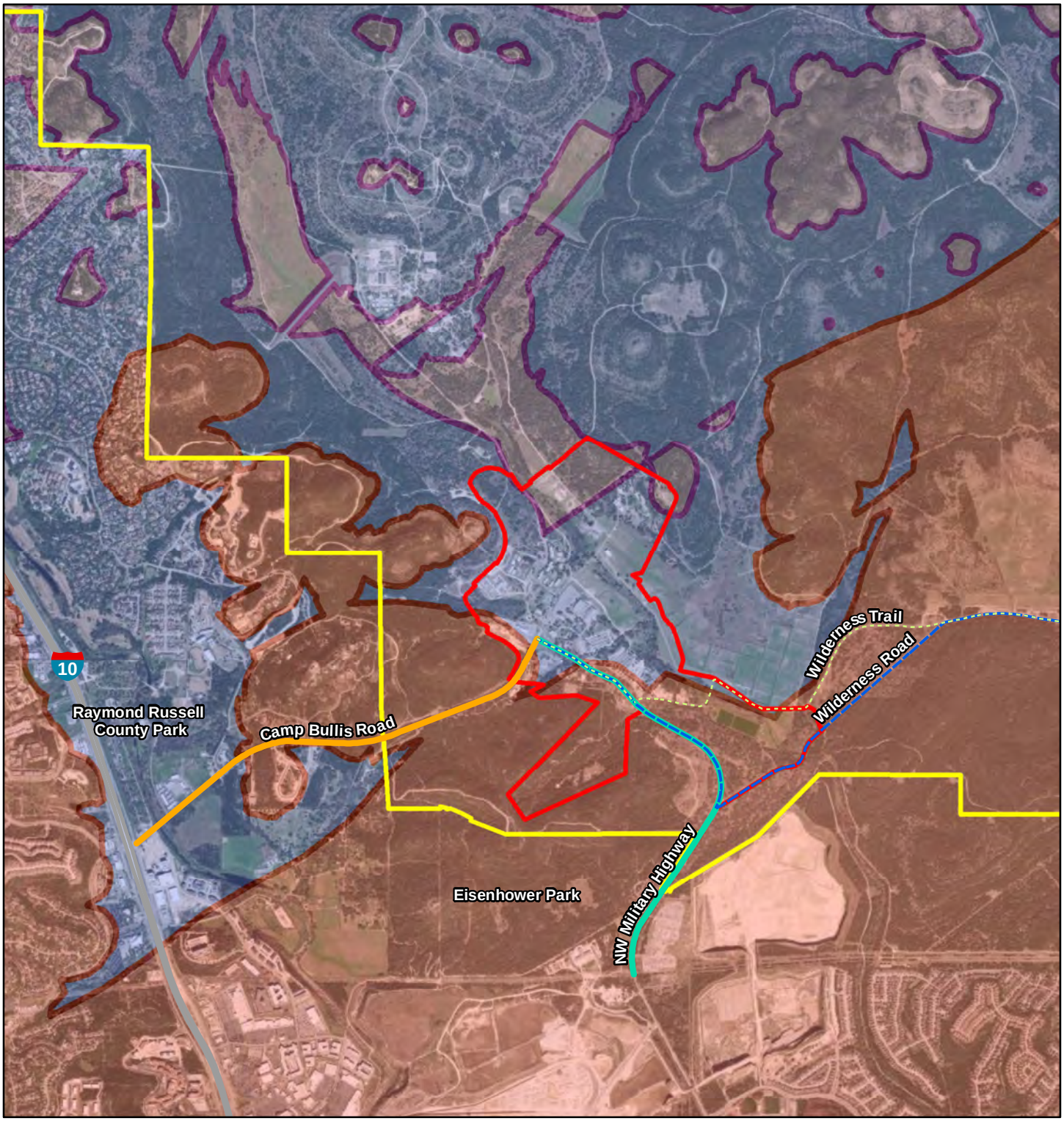


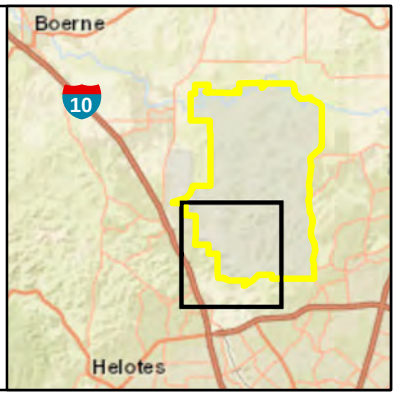
FIGURE 3-6
Karst Zones

- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Karst Zone 1
- Karst Zone 3
- Karst Zone 4

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



JBSA-BUL includes approximately 3,194 acres of karst zone 1 and 1,464 acres of karst zone 2; the remaining portions of the Base are part of either karst zone 3 or 5. There are 29 caves on Base known to contain one or more federally listed karst invertebrates. To further protect karst habitat on JBSA-BUL, ground disturbance is prohibited within karst zones 1 and 2 except in areas that are previously disturbed (USFWS, 2015).

In accordance with the USFWS' *Karst Preserve Managing and Monitoring Recommendations* (USFWS, 2014), JBSA-BUL maintains KPAs around caves known to contain one or more federally listed karst species. KPAs are delineated as buffer zones around each cave where military training and operational restrictions apply. Approximately 2,757 acres of habitat area are associated with the KPAs on JBSA-BUL, most of which are found in the southernmost part of the Base (see **Figure 3-6**) and within karst zone 1. KPAs also function to protect other endemic karst species known to occur on JBSA-BUL but that are not federally or state-protected (**Table 3-6**) (Air Force, 2020b).

Table 3-6
Endemic Species Associated with Karst Habitat on JBSA-BUL

Common Name	Scientific Name
Ground beetle (unnamed)	*Rhadine bullis*
Ground beetle (unnamed)	*Rhadine ivyi*
Ground beetle (unnamed)	*Rhadine sprousei*
Millipede (unnamed)	*Speodesmus ivyi*
Millipede (unnamed)	*Speodesmus falcatus*
Cave meshweaver (unnamed)	*Cicurina brunsi*
Cave meshweaver (unnamed)	*Cicurina bullis*
Cave meshweaver (unnamed)	*Cicurina platypus*
Armored harvestmen (unnamed)	*Texalla elliotti*
Armored harvestmen (unnamed)	*Texalla hilgerensis*
Dipluran (undescribed)	*Myxojapyx* sp.
Pseudoscorpion (unnamed)	*Tarttartogreagis reyesi*
Seed shrimp	*Ostracoda podocopida*

The portions of the Proposed Action that lie beyond the boundary of JBSA-BUL are also subject to karst regulations associated with the nine Bexar County karst species subject to the 2012 USFWS critical habitat designation, and surveys of the areas in which those portions are located would be required. Prior to construction, properties in karst zones 1 through 4 may require a karst survey by a qualified professional biologist or geologist. Should the survey involve activities with a potential to "take" federally listed species, the surveyor would also be advised by the USFWS to obtain a Section 10(a)(1)(A) permit issued pursuant to the ESA prior to conducting such activities (USFWS, 2006). When necessary, the following two primary steps are required in making a presence/absence determination for karst species (USFWS, 2006):

1. **Initial Karst Feature Survey** – Prior to survey, submit a formal data request to the Texas Speleological Survey to obtain locations for known caves and karst features and review available data from applicable prior surveys or assessments (i.e., those on file at TCEQ's regional office in San Antonio). Conduct a visual inspection for signs of karst features in accordance with applicable TCEQ procedural guidelines.
2. **Suitable Habitat Assessment** – Karst features identified by the initial survey are further assessed by a qualified biologist or geologist with relevant experience in identifying cave-adapted invertebrate species. An assessment of potential suitable habitat for federally listed karst species is conducted, with or without excavation, and survey results are prepared and submitted to the USFWS for review.

3.10.1.4 Migratory Birds

In the US, migratory birds are protected by the *Migratory Bird Treaty Act* (see **Section 3.10.1.3**). EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, further directs federal agencies to protect migratory birds.

JBSA-BUL is located in the Central Flyway, a migratory bird corridor that extends from northern Alaska, south through Canada and the central US, and into northern Mexico. More than 200 migratory birds have been documented to occur at the Base. **Table 3-7** lists migratory birds in Bexar County, Texas, that are of conservation concern across their range or regionally (USFWS, 2020). Nine such species are also identified by the USFWS' *Birds of Conservation Concern 2021* as species associated with the Edwards Plateau or Oaks and Prairie regions of the US.

Table 3-7
Migratory Birds with Potential to Occur on JBSA-BUL

Common Name	Scientific Name	Observed on JBSA-BUL	Potential Use of JBSA-BUL
American golden-plover[a]	*Pluvialis dominica*	No	foraging or rest over
Chestnut-collared Longspur[a]	*Calcarius ornatus*	Yes	foraging or rest over
Kentucky warbler[a]	*Oporornis formosus*	Yes	foraging and nesting; breeds 20 April to 20 August
Lesser yellowlegs[a]	*Tringa flavipes*	Yes	foraging or rest over
Long-billed curlew[a]	*Numenius americanus*	No	foraging or rest over
Mccown's longspur	*Calcarius mccownii*	No	foraging or rest over
Mountain plover[a]	*Charadrius montanus*	No	foraging or rest over
Orchard oriole	*Icterus spurius*	No	foraging and nesting; breeds 10 June to 15 August
Prothonotary warbler[a]	*Protonotaria citrea*	No	foraging and nesting; breeds 1 April to 31 July
Red-headed woodpecker[a]	*Melanerpes erythrocephalus*	No	foraging and nesting; breeds 10 May to 10 September
Sprague's pipit[a]	*Anthus spragueii*	Yes	foraging or rest over
Chimney swift	*Chaetura pelagica*	Yes	foraging and nesting; breeds 21 April to 5 July
Buff-breasted sandpiper	*Calidris subruficollis*	No	foraging or rest over
Pectoral sandpiper	*Calidris melanotos*	No	foraging or rest over
Black-capped vireo	*Vireo atricapillus*	Yes	foraging and nesting; breeds 20 April to 8 July
Thick-billed longspur	*Rhynchophanes mccownii*	No	foraging and nesting
Grasshopper sparrow (northern)	*Ammodramus savannarum*	Yes	foraging and nesting; breeds 20 April to 24 July
Field sparrow	*Spizella pusilla*	Yes	foraging and nesting; breeds 6 April to 10 July
Rufous-crowned sparrow (rock)	*Aimophila ruficeps*	Yes	foraging and nesting; breeds 3 April to 9 August
Pyrrhuloxia	*Cardinalis sinuatus*	Yes	foraging and nesting; breeds March to August
Eastern meadowlark	*Sturnella magna*	Yes	foraging and nesting; breeds mid-March to 8 August
Painted bunting	*Passerina ciris*	Yes	foraging and nesting; breeds 27 April to 19 August

Source: USFWS, 2022; Texas A&M AgriLife Research, 2022
Note:
a. Also identified as a USFWS Birds of Conservation Concern species, defined as migratory [or non-migratory] bird species, beyond those designated as federally threatened and endangered species, that represent the highest conservation priorities (USFWS, 2021).

3.10.1.5 Invasive Species

Invasive plant and animal species on JBSA-BUL are managed in accordance with JBSA's *Integrated Pest Management Plan* and INRMP. Invasive species of management concern at the Base primarily include feral hog (*Sus scrofa Linnaeus*) tawny crazy ant (*Nylanderia fulva*), and red imported fire ant (RIFA; *Solenopsis invicta* sp.). Feral hogs cause soil erosion (e.g., rooting), contaminate surface waters, and prey on smaller mammals and the eggs of ground nesting birds. The feral hog population on the Base is

managed via an extensive trapping program administered by the Natural Resources Office through a cooperative agreement and the JBSA hunting program (Air Force, 2020b).

Tawny crazy ants and RIFAs tend to populate disturbed areas on JBSA-BUL and may feed on karst invertebrates, including cave crickets (*Orthoptera: Rhaphidophoridae*), the eggs of which are an important source of food for karst invertebrates (Air Force, 2020b). JBSA conducts monitoring at 75 caves and karst features across the Base to inform management and control measures, including biannual high-pressure hot water and soap treatments to deter ants from populating karst habitat. RIFA concerns were also considered in defining buffer distances around KPAs on JBSA-BUL. Additionally, tawny crazy ants and RIFAs are known to depredate GCWA nests (Air Force, 2020b).

3.10.2 Environmental Consequences

3.10.2.1 Evaluation Criteria

Whether or not a potential effect on plant or animal species is considered adverse depends on many factors. These include the range and abundance of a species across a particular geography or jurisdiction, and how vulnerable or sensitive a species is relative to a particular activity considering variables such as distance from source and exposure duration.

The Air Force defines a significant effect on biological resources within the ROI as one or more of the following:

- mortality or diminishment of regionally or locally important plant or animal species;
- substantial vegetation removal, particularly in riparian habitat areas;
- direct loss or substantial degradation of terrestrial (e.g., fragmentation) or aquatic (e.g., wetlands) habitats; and
- “take” of a federally listed threatened or endangered species in the form of harm, harassment, wounding, and/or killing.

In April 2024, JBSA prepared a Biological Assessment (BA) which evaluated the potential effects to endangered species from the privatization of wastewater and natural gas services at Camp Bullis, which resulted in a BO from USFWS dated 24 September 2024. The natural gas project alternative analyzed in the BA was not carried forward for analysis in this EA. Due to the proximity of the evaluated alternative to Alternative 1 (Preferred) and Alternative 2, and the similarity in the proposed construction approach, the 2024 BA has been used as the basis for the following effects determinations. Consultation with USFWS is ongoing for the Proposed Action.

3.10.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Vegetation
The construction of Alternative 1 would remove existing vegetation along the utility ROW. Under Alternative 1, areas subject to vegetation removal would be replanted with native grass species post construction. The long-term maintenance of the utility ROW would not allow a full return to current vegetative conditions. This would change or alter the structure of vegetation community along the ROW in some areas. However, because Alternative 1 would occur within an existing ROW, the removal or alteration of vegetation would be minimized. Vegetation clearing would be done outside of nesting season to further minimize impacts to protected migratory birds. Short- and long-term, minor effects on vegetation would occur under Alternative 1.

Wildlife
The construction of Alternative 1 would remove existing, vegetated wildlife habitat in the ROI. Since ROW maintenance would limit re-establishment of natural vegetation communities, some areas along ROWs would not provide equivalent wildlife habitat post construction. However, because Alternative 1 would occur within an existing ROW, habitat fragmentation would be minimized.

Under Alternative 1, construction activities would generate noise and increase risk to wildlife from the use of heavy equipment and vehicles on project sites. In the short term, wildlife species would be displaced from areas along the ROW. Although most wildlife would be expected to relocate elsewhere in the ROI, possibly returning to such areas post construction, less mobile species could be killed by construction vehicles or equipment.

Because most wildlife would relocate from project sites during the construction of Alternative 1, no appreciable decline in common wildlife species that inhabit the ROI would be anticipated. Therefore, potential adverse effects on wildlife under Alternative 1 would be short term and minor.

Federally Listed Species
The Air Force has determined that, due to a lack of observed presence or suitable habitat, Alternative 1 would have "no effect" to the piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), San Marcos salamander (*Eurycea nana*), fountain darter (*Etheostoma fonicola*), Comal Springs riffle beetle (*Heterelmis comalensis*), Helotes mold beetle (*Batrisodes venyivi*), monarch butterfly (*Danaus plexippus*), Cokendolpher Cave harvestman (*Texella cokendolpheri*), Government Canyon bat cave meshweaver (*Cicurina vespera*), Government Canyon bat cave spider (*Tayshaneta microps*), Robber Baron Cave meshweaver (*Cicurina baronia*), Peck's Cave amphipod (*Stygobromus pecki*), and Texas wild-rice (*Zizania texana*).

Tricolored Bat
The nearest identified tricolored bat (*Perimyotis subflavus*)-inhabited cave is located outside of the project area. Construction noise may have negative effects on tricolored bats in the Proposed Action area during the spring and summer months. Some studies indicate traffic noise and road construction may decrease bat activities and cause acute acoustic trauma, disturbance and displacement from important food and shelter resources, and signal masking. All construction activities would occur during hibernation season from September to December; therefore, no impacts to the tricolored bat would be anticipated to occur. Since vegetation clearing would be conducted outside the birthing and hibernation seasons, Alternative 1 may affect, but is not likely to adversely affect, this species.

JBSA would conduct a tricolored bat habitat assessment and determine BMPs and monitoring through an interagency agreement with USFWS. The habitat assessment would be reviewed after completion and JBSA would reengage with USFWS if the effects determination for tricolored bats changes.

Golden-Cheeked Warbler
On JBSA-BUL, the construction of Alternative 1 would affect the 300 ft buffer surrounding GCWA habitat. Potential effects on GCWA habitat under Alternative 1 would be avoided by design. Potentially suitable habitat for the GCWA also exists elsewhere in the ROI, some of which has connectivity to designated habitat on JBSA-BUL. Some areas of known or potential GCWA habitat outside the boundary of JBSA-BUL could also be affected, either directly or indirectly, by the construction of Alternative 1.

The on-Base portion of Alternative 1 would affect approximately 19 acres of GCWA habitat buffer where training and operational restrictions apply. As these areas typically support GCWA foraging activities around established territories, Alternative 1 would reduce foraging opportunity for GCWAs that nest in nearby habitat areas of JBSA-BUL. However, construction under Alternative 1 within or near areas of designated GCWA buffer habitat would occur outside of the GCWA breeding season of 1 March to 15 August. These avoidance measures would minimize the potential to adversely affect populations of GCWAs; however, short- and long-term, moderate effects on GCWAs would result from Alternative 1 due to construction impacts within 19 acres of designated GCWA habitat buffer.

GCWA on JBSA-BUL are known to forage outside nesting habitat. Noise from construction may move foraging GCWA away from the Proposed Action area, but some construction noise studies found no evidence to suggest that GCWA respond negatively to road construction noise and activity. Since there is nearby, protected, high-quality, contiguous nesting habitat on the Installation on either side of the Proposed Action area, GCWA have the ability to fly to quiet areas to avoid construction noise (JBSA, 2024).

Overall, with seasonal restrictions and other protection measures in place at JBSA-BUL, Alternative 1 may affect, but is not likely to adversely affect, GCWA.

Karst Invertebrates
Construction of the main line portion of Alternative 1 from the cantonment to a natural gas connection point along I-10 would occur within Bexar County karst zones 1 and 4 (see **Section 3.10.1.3)**. Assuming a 50-foot construction buffer for equipment operation and laydown, Alternative 1 would potentially affect up to 5.33 acres of surface area within karst zone 1 and 0.36 acre of surface area within karst zone 4. This would translate to approximately 41,796 cubic feet of underground disturbance within karst zone 1 and 2,853 cubic feet of underground disturbance within karst zone 4.

Potential adverse effects to undisturbed areas of karst zone 1 under Alternative 1 would include habitat loss or degradation, increases in RIFA post construction, and, more generally, a reduction of nutrient sources relied upon by karst invertebrates that are found at or near the land surface (e.g., declining population of cave crickets). However, potential effects on designated KPAs from the construction of Alternative 1 would represent less than 1 percent of total KPA designated on JBSA-BUL.

None of the species were detected during prior surveys near the Proposed Action area. This does not mean that the species are not present. Only a small number of individuals of each of these species are likely present in the subsurface and would be impacted by construction, resulting in lethal and sublethal takes of those individuals. Takes would occur from construction activities, such as excavation. Non-lethal takes (e.g., impacts to survival, growth, and reproduction) would occur from vegetation clearing and other work at the surface that may affect runoff into currently unknown karst features.

The 2024 BO determined that the level of anticipated take was not likely to jeopardize the continued existence of the Madla Cave meshweaver, *Rhadine exilis*, and *Rhadine infernalis* under the Proposed Action. Some incidental take would occur where the activities intersect the subject species, and the implementation of proposed conservation measures ultimately would result in avoidance and minimization of most of the adverse effects. Individuals present in the Proposed Action area and exposed to construction may be killed or injured by the proposed activities, particularly during trenching within karst zone 1. However, the effects would be limited to very small numbers of individuals of each species due to previous efforts to locate features on the Installation and the distance from known occupied features. JBSA would implement both general and species-specific conservation measures with the intent to avoid and minimize adverse effects to the endangered karst invertebrates.

Alternative 1 may affect, and is likely to adversely affect, *Rhadine exilis, Rhadine infernalis,* and Madla Cave meshweaver

Bracted Twistflower
Ground disturbance from the Proposed Action, such as vegetation removal, heavy machinery, trenching, boring, fill piles, and construction staging areas, could have detrimental effects to the flowering plant and its seeds if present. A bracted twistflower basal rosette survey conducted on 9 February 2024 on adjacent areas of JBSA-BUL concluded that no plants were found. Spring surveys will be conducted again in April–May for a higher likelihood of detecting the flower when the plant is flowering to ensure presence/absence. In the event bracted twistflowers are found during the spring surveys, individual plants identified would be flagged and protected from construction activities when possible. If protection is not possible, under USFWS guidance, seeds would be collected in June–July by the Section 10(a)(1)(A) permit holder and used to re-introduce in the vicinity of the Proposed Action area.

Alternative 1 may affect, but is not likely to adversely affect, the bracted twistflower.

Migratory Birds
Site disturbance and noise associated with construction activities under Alternative 1 could affect migratory birds that use the ROI for stop-over during migration, foraging, or breeding (see **Table 3-7**). Many such species do not breed in central Texas and have ample foraging or stop-over elsewhere on JBSA-BUL or in the ROI. The migratory birds that do breed in central Texas have breeding seasons that generally overlap that of the GCWA. As such, construction scheduling and phasing would account for and avoid any known habitat areas where these birds likely would be present. These measures would be in addition to the seasonal restrictions in place for the GCWA.

Under Alternative 1, most migratory birds likely would avoid construction sites by relocating elsewhere on JBSA-BUL or in the ROI. Should any migratory birds (or nests of migratory birds) identified by the USFWS as a species of particular conservation concern be observed on or around construction sites, construction work would cease and JBSA's Natural Resources Office would be consulted prior to conducting any further work. In general, vegetation or structures containing nests of migratory birds would be left in place until abandonment. Therefore, Alternative 1 would result in short-term, minor effects on migratory birds. No long-term, appreciable effects on populations of migratory birds would be likely to result from Alternative 1.

3.10.2.3 Alternative 2 – NW Military Highway

Vegetation
Potential effects on vegetation under Alternative 2 would be the same as described for Alternative 1.

Wildlife
Potential effects on wildlife and their habitat under Alternative 2 would be the same as described for Alternative 1.

Federally Listed Species
Effects determinations under Alternative 2 would be the same as described for Alternative 1 for the piping plover, red knot, San Marcos salamander, fountain darter, Comal Springs riffle beetle, Helotes mold beetle, monarch butterfly, Cokendolpher Cave harvestman, Government Canyon bat cave meshweaver, Government Canyon bat cave spider, Robber Baron Cave meshweaver, Peck's Cave amphipod, and Texas wild-rice. Alternative 2 would have no effect on these species.

Tricolored Bat
Alternative 2 may affect, but is not likely to adversely affect, the tricolored bat.

Golden-Cheeked Warbler
On JBSA-BUL, the construction of Alternative 2 would affect GCWA buffer habitat. Potential effects on GCWA habitat under Alternative 2 would be avoided by design. Potentially suitable habitat for the GCWA also exists elsewhere in the ROI, some of which has connectivity to designated habitat on JBSA-BUL. Some areas of known or potential GCWA habitat outside the boundary of JBSA-BUL could also be affected, either directly or indirectly, by the construction of Alternative 2.

The on-Base portion of Alternative 2 would affect approximately 4 acres of GCWA buffer habitat where training and operational restrictions apply. As these areas typically support GCWA foraging activities around established territories, Alternative 2 would reduce foraging opportunity for GCWAs that nest in nearby habitat areas of JBSA-BUL. However, construction under Alternative 2 within or near areas of designated GCWA buffer habitat would occur outside of the GCWA breeding season of 1 March to 15 August. These avoidance measures would minimize the potential to adversely affect GCWAs; however, short- and long-term, minor effects on GCWAs would result from Alternative 2 due to the removal of 4 acres of designated GCWA buffer habitat.

Overall, with seasonal restrictions and other protection measures in place at JBSA-BUL, Alternative 2 may affect, but is not likely to adversely affect, GCWA .

Karst Invertebrates
Construction of the main line portion of Alternative 2 from the cantonment to a natural gas connection point along NW Military Highway would occur within Bexar County karst zones 1 and 4 (see **Section 3.10.1.3**). Assuming a 50-foot construction buffer for equipment operation and laydown, Alternative 2 would potentially affect up to 9.36 acres of surface area within karst zone 1 and 1.51 acres of surface area within karst zone 4. This would translate to approximately 73,359 cubic feet of underground disturbance within karst zone 1 and 11,907 cubic feet of underground disturbance within karst zone 4.

Potential adverse effects to undisturbed areas of karst zones 1 and 4 under Alternative 2 would be similar to those described under Alternative 1, although larger in area. Effects would be limited to very small numbers of individuals of each species due to previous efforts to locate features on the Installation and the distance from known occupied features. The same general and species-specific conservation measures

would be implemented with the intent to avoid and minimize adverse effects to the endangered karst invertebrates.

Alternative 2 may affect, and is likely to adversely affect, *Rhadine exilis, Rhadine infernalis,* and Madla Cave meshweaver.

Migratory Birds
Potential effects on migratory birds under Alternative 2 would be the same as those described for Alternative 1.

3.10.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Biological resources on JBSA-BUL would continue to be managed in accordance with the JBSA INRMP. On a regional level, biological resources would continue to be managed by federal, state, and local governments, as well as through other private, quasi-public, and public interests.

3.10.2.5 Cumulative Effects

Conservation laws and initiatives would continue to limit, control, or guide development in a manner that protects natural resources in the public interest (e.g., habitat management for the GCWA and federally listed karst species on JBSA-BUL). JBSA-BUL would continue to maintain and implement a USFWS-approved INRMP and comply with the provisions of BOs issued by the USFWS under the ESA. These measures would ensure populations of native or special status plants and animals on and around JBSA-BUL remain at levels commensurate with conservation objectives for the region or range of such species. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects on regional biological resources would be anticipated to occur with implementation of the Proposed Action.

3.10.3 Best Management Practices and Mitigation Measures

JBSA or the involved contractors would implement the following BMPs to reduce potential effects on or from biological resources:

- Cease construction work and notify JBSA's Natural Resources staff if migratory birds (or nests of migratory birds) identified by the USFWS as a species of conservation concern are observed on or around construction sites.
- Comply with JBSA environmental specifications during construction activities.
- Revegetate disturbed areas with native species; Texas Parks and Wildlife Department recommends incorporating pollinator conservations and management into revegetation and landscaping plans.
- Design, construct, and maintain project-specific stormwater management features to the benefit of wildlife habitat, when applicable and possible.
- Do not conduct vegetation removal and construction within nesting GCWA habitat or in KPAs.
- Conduct vegetation removal between 16 September and 28 February to avoid bird nesting season, when GCWA are present; tricolored bat birthing; bracted twistflower flowering; disturbing monarch butterfly life-cycle stages, which include the egg, the larvae (caterpillar), and the pupa (chrysalis) stages; and the majority of oak wilt season.
- Notify the TCEQ immediately upon encountering a void larger than 6 inches in any direction during trenching activates and complete a void mitigation plan using TCEQ-10256, *Solution Feature Discovery Notification Form*.

- Identify all oak species within the construction footprint prior to initiating vegetation removal. Immediately paint all oaks that are trimmed or accidentally wounded during the action with pruning paint. Sterilize equipment between individual trees to prevent the spread of oak wilt.
- Avoid mature trees when possible to keep canopy intact.
- Survey the construction footprint in April or May, i.e., prior to initiating vegetation clearing, to identify any bracted twistflowers in the area. Flag identified plants and protect from construction activities when possible.
- Place silt fencing in the EAPP in accordance with all TCEQ requirements as well as safeguards around Cement Cave from sediment and runoff.
- Place fueling points outside karst zone 1 or 2 and over containments.
- Once construction is complete, reseed all disturbed areas with regionally native wildflower seed mix to include milkweed species known in the area that are host species for the monarch butterfly.
- Schedule operations and maintenance activities, to include mowing and brush management, that affect vegetation between 16 September and 28 February to minimize impacts to protected species.
- Thoroughly wash all equipment and machinery used for construction prior to entering the Installation to avoid the introduction of invasive species to the area. Continue monitoring and removal of invasive species.

3.11 CULTURAL RESOURCES

Cultural resources include a broad range of resources consisting of physical evidence of past human activity. The term encompasses prehistoric or historic structures, buildings, objects, sites, districts (i.e., a collection of related structures, buildings, objects, and/or sites), landscapes, natural features, Traditional Cultural Properties (TCPs), and cemeteries. These terms are further described as follows:

- **Archaeological Resources –** prehistoric or historic sites, objects, and districts where remnants of physical evidence, such as artifacts, features, and ecological evidence, of a past culture are present.
- **Architectural Resources –** structures, buildings, objects, sites, and districts that are over 45 years old.
- **Cemeteries –** the burial locations, formal or informal, of deceased persons from any time period, prehistoric or historic.
- **TCPs –** places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important to their continued cultural identity. For example, a Native American "sacred site" is one with established religious significance to, or ceremonial use by, a Native American religion.

Cultural resources that are significant must possess sufficient historic integrity to qualify the resource as a historic property, as defined by the NHPA.

The ROI for cultural resources is the APE.[11] The archaeological APE is the construction limits of disturbance for the Proposed Action. The architectural APE is twofold: The APE for physical effects (direct APE) associated with the Proposed Action is the construction limits of disturbance, while the APE for visual effects (indirect APE) includes areas from which the Proposed Action would be distinctly visible. The direct and

[11] As defined in Section 106 of the NHPA, the APE is "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any properties exist…. [The APE] is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" (36 CFR § 800.16).

indirect architectural APEs for the Proposed Action are defined as 50 meters (164 feet) and 800 meters (0.5 mile) around each project location, respectively.

3.11.1 Archaeological Resources, including Traditional Cultural Properties

Archaeological investigations at JBSA-BUL have recorded 446 archaeological sites on the Base since 1977. Thirty of these sites have been determined eligible for listing in the National Register of Historic Places (NRHP); 18 sites are currently under review for eligibility. Seven sites are known to contain human remains, including at least one Native American burial site.

Native American Tribes identified as having a historical association with the JBSA area include three federally recognized tribes: Comanche Nation, Oklahoma; Mescalero Apache Tribe of the Mescalero Reservation, New Mexico; and Tonkawa Tribe of Indians of Oklahoma. JBSA consults with these tribes when planning to conduct a proposed action on JBSA, including JBSA-BUL. To date, none of these Native American Tribes has expressed interest or provided input on the Proposed Action.

Although no TCPs or sacred sites have been formally designated as such on JBSA-BUL, Native American human remains have been identified through prior archaeological investigations conducted at the Base (Air Force, 2020c). Pursuant to the NAGPRA, standard operating procedure for the inadvertent discovery of Native American human remains is part of the PA in place between JBSA and the SHPO (Air Force, 2020c).

There are no known archaeological sites or TCPs in the ROI outside the boundary of JBSA-BUL. However, two cemeteries occur in the vicinity of Camp Bullis Road toward its intersection with I-10. As reflected in the Heritage Assets map for Bexar County, Mission Burial Park North is located adjacent to and east of I-10. From I-10, this cemetery is situated north-northwest of Camp Bullis Road, about 0.5–0.6 mile away. Seidenschnur Graves is situated east-southeast to south-southwest of Camp Bullis Road, about 0.5–0.7 mile away.

3.11.2 Architectural Resources

There are numerous architectural resources associated with JBSA-BUL, including 18 buildings or structures determined eligible for listing in the NRHP on an individual basis, as a contributing element to an eligible historic district, or by Program Alternative. Per a recent Section 106 consultation with the Texas Historical Commission (THC) or SHPO (THC # 202109070; THC, 2021), JBSA is preparing a formal nomination for the "Upper Military" portion of the JBSA-BUL cantonment for listing in the NRHP. **Table 3-8** identifies the contributing elements of the proposed historic district. **Figure 3-7** (below) depicts the proposed historic district within the JBSA-BUL cantonment. Two of the buildings, Buildings 5902 and 5908, were also determined eligible for listing in the NRHP on an individual basis.

Table 3-8
Buildings Included in the Proposed "Upper Military" Historic District on JBSA-BUL

Building Number	Site Date	Site Type
5900	1930	Technical Training Classroom
5901	1930	Vehicle Operations Administration
5902	1930	Air Education and Training Command Technical Training Support
5903	1930	Administrative Office, Non-Air Force
5904	1930	Chapel, Base
5905	1930	Separate Toilet/Shower Building
5906	1951	Administrative Office, Non-Air Force
5907	1930	Separate Toilet/Shower Building
5908	1930	Headquarters Named/Numbered Division
6000	1931	Consolidated Open Mess

Source: Freeman, 1998; Air Force, 2020b

There are no historic properties located in the ROI outside the boundary of JBSA-BUL. As reflected in the Heritage Assets map for Bexar County, the closest historic properties listed in the NRHP lie approximately 3 miles northwest of Camp Bullis Road and 5 miles southeast of NW Military Highway.

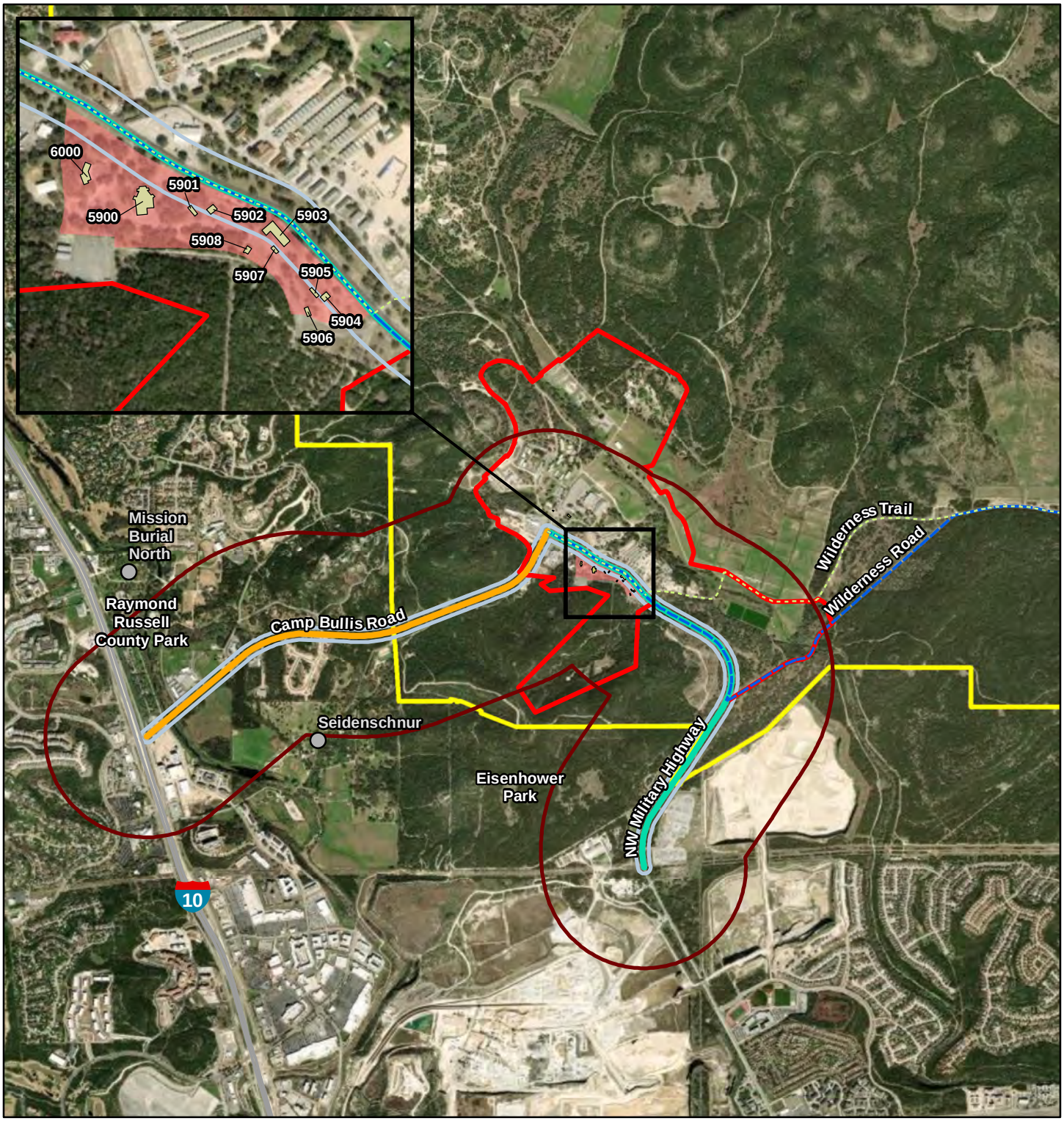


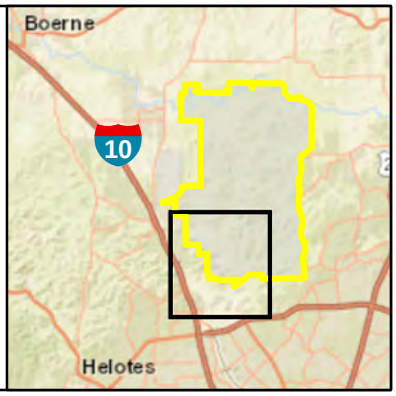
FIGURE 3-7
Proposed JBSA-BUL Historic District

- Cemeteries
- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Direct APE (50m)
- Indirect APE (800m)
- NRHP-Eligible Structures
- Proposed Historic District

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



3.11.3 Environmental Consequences

3.11.3.1 Evaluation Criteria

Pursuant to the NHPA, the Air Force defined a significant effect on cultural resources within the ROI consistent with the Criteria of Adverse Effect (36 CFR 800.5). These include one or more the following:

- physical destruction or damage;
- an alteration that is inconsistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, including restoration, rehabilitation, repair, maintenance, stabilization, HAZMAT remediation, and provision of handicapped access;
- removal of the property from its historic location;
- change of the character of the property's use or of contributing physical features within the property's setting;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect or deterioration (except in certain religious or cultural cases); and
- transfer, lease, or sale of property out of federal ownership or control without adequate preservation controls.

3.11.3.2 Alternative 1 – Camp Bullis Road (Preferred)

Archaeological Resources, including Traditional Cultural Properties
There are no recorded archaeological sites or TCPs found within the archaeological APE for Alternative 1. Therefore, no impacts to archaeological resources would be anticipated to occur under Alternative 1.

During the construction of Alternative 1, should any human remains be unearthed or discovered, work would be halted immediately and JBSA would adhere to the applicable provisions of NAGPRA. In such an event, a qualified professional archaeologist, with assistance from the SHPO, would determine if remains are Native American, Euro-American, or indeterminate. Should all parties concur that the remains are Native American, those remains would be temporarily curated at JBSA-BUL until their disposition is determined. Further, under Alternative 1, no human remains would be disinterred prior to following the applicable provisions of the Texas Health and Safety Code. Any human remains discovered in caves, regardless of how fragmentary, would be treated as intentional interments.

Likewise, should any archaeological materials be unearthed or discovered during the construction under Alternative 1, work would stop immediately and JBSA would contact the Cultural Resources Officer to investigate the area in question and consult the SHPO regarding the appropriate treatment of the site. Work would not resume until the specific area Cultural Resources Officer investigation was complete, and appropriate treatment by a qualified archaeologist is completed.

The portion of Alternative 1 not contained by JBSA-BUL would occur within 0.5 mile of two cemeteries; however, given the natural and built environment features that minimize visibility from the cemeteries to areas along Camp Bullis Road, potential viewshed effects would be negligible at this distance.

Architectural Resources
A portion of Alternative 1 from the cantonment and west thereof would occur within the indirect APE in relation to the proposed "Upper Military" historic district (**Figure 3-7**). No other historic properties eligible or potentially eligible for listing in the NRHP would occur within the direct or indirect architectural APEs for Alternative 1.

Concurrence with these determinations has not yet been received, and Section 106 consultation between SHPO and JBSA is ongoing.

3.11.3.3 Alternative 2 – NW Military Highway

Archaeological Resources, including Traditional Cultural Properties
There are no recorded archaeological sites or TCPs found within the archaeological APE for Alternative 2. Therefore, no impacts on archaeological resources are anticipated to occur under Alternative 2. However, there are three archaeological sites located within 100 feet of Alternative 2. **Table 3-9** provides a summary of these sites.

Table 3-9
Archaeological Sites in Proximity to Alternative 2

Site No.	Site Type	Site Date	NRHP-Eligibility Status	Citation
41BX1438	Structure (military)	Historic	Determined not eligible.	Prewitt #135 (2002)
41BX1010	Camp	Prehistoric	Determined not eligible.	Veni (2009)
41BX0920	Camp/quarry	Prehistoric	Determined not eligible.	Veni (2009)

Source: Air Force, 2020
NHRP = National Register of Historic Places

Only one archaeological site (41BX1438) would have the potential for indirect effects from Alternative 2. The siting and design of Alternative 2 would avoid this site, to the extent practicable. Site-specific erosion and sedimentation controls and waste management practices required under Alternative 2 would further reduce the potential for any indirect adverse effects on this site. Any inadvertent discoveries of human remains or archaeological materials would result in the discontinuation of work within the area, and would be handled as described under Alternative 1.

No impacts to historic archaeological sites or TCPs listed, eligible, or potentially eligible for listing in the NRHP would result from the off-Base portion of Alternative 2.

Architectural Resources
A portion of Alternative 2 from the cantonment and east to south thereof would occur within direct and indirect architectural APEs in relation to the proposed “Upper Military” historic district (**Figure 3-7**). No other historic properties eligible or potentially eligible for listing in the NRHP would occur within the direct or indirect architectural APEs for Alternative 2.

Concurrence with these determinations has not yet been received, and Section 106 consultation between SHPO and JBSA is ongoing.

3.11.3.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Cultural resources on JBSA-BUL would continue to be managed in accordance with the JBSA *Integrated Cultural Resources Management Plan* (ICRMP) (Air Force 2020b). On a regional level, cultural resources would continue to be managed by federal, state, and local governments, as well as through other private, quasi-public, and public interests.

3.11.3.5 Cumulative Effects

Historic preservation laws and initiatives would continue to limit, control, or guide development in a manner that protects cultural resources in the public interest (e.g., nomination of the “Upper Military” historic district for listing in the NRHP). JBSA-BUL would continue to maintain and implement its ICRMP and PA in coordination with the SHPO and other interested consulting parties, including its obligations under Section 106 of the NHPA. These measures would ensure that cultural resources continue to be evaluated and considered in planning for future actions that could affect such resources on or around JBSA-BUL. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects to cultural resources would be anticipated to occur with implementation of the Proposed Action.

3.11.4 Best Management Practices and Mitigation Measures

The Air Force would implement the following BMPs to reduce potential effects on cultural resources under the Proposed Action:

- Comply with JBSA environmental specifications during construction activities.
- Plant native and habitat-appropriate trees and vegetation to limit undesirable views from historic properties that could result from projects included in the Proposed Action such as newly constructed buildings or structures.
- Comply with applicable development standards and regulations with respect to architectural design of the Proposed Action in accordance with the JBSA Installation Development Plan (Air Force, 2018b). .

No mitigation measures for potential effects on cultural resources were identified by analysis.

3.12 SOCIOECONOMICS

Socioeconomics refer to the attributes of the human environment, particularly the demographic and economic characteristics of an area and its population. Demography specifically refers to the composition of a population in an area and looks at factors such as age and race. Economic characteristics include variables related to the economy, such as employment, income, poverty, and housing.

The socioeconomic ROI is Bexar County, Texas.

3.12.1 Existing Conditions

3.12.1.1 Population

Bexar County was one of the fastest growing US counties in the last decade (**Table 3-10**) (US Census Bureau [USCB], 2020). Although the rate of population growth in Bexar County is projected to slow by 6 percent in the decade between 2020 and 2030, the projected population for the year 2050 is 2,695,668, a 34 percent increase from the 2020 Census count (TWDB, 2021a). If current projections hold true, Bexar County will continue to experience population growth well above that occurring at a national level over the next several decades.

Table 3-10
Population Growth in the ROI by Comparison (2013–2023)

Geographic Area	2013 Population	2023 Population	Percent Change in Population from 2010 to 2020 (%)
Bexar County	1,753,238	2,037,344	16.2
Texas	25,639,373	29,640,343	15.6
United States	311,536,594	332,387,540	6.7

Source: USCB, 2020d, 2013, 2023a

3.12.1.2 Housing

Housing characteristics for Bexar County are generally consistent with state and national trends (**Table 3-11**). Home ownership and value are lower when compared to state and national level data. A higher percentage of the population in Bexar County rents homes compared to the state and national populations. Although home ownership and rental rates are also lower when compared to those at the state and national levels, overall, the housing market in Bexar County is comparable.

Table 3-11
Housing Characteristics in the ROI

Housing Characteristic	Bexar County	Texas	United States
Total housing units	807,160	11,890,808	142,332,876
Owner-occupied housing unit rate (%)	59.1	62.6	65.0
Renter-occupied housing unit rate (%)	40.9	37.4	35.0
Median value of owner-occupied housing units ($)	244,100	260,400	303,400
Median gross rent ($)	1,290	1,339	1,348

Source: USCB, 2019, 2023b

3.12.1.3 Labor Force and Employment

The employment rate for Bexar County is similar to the rate in Texas and slightly higher than the rate in the US. The top industry sectors for employment in Bexar County are similar to those for Texas and the US, the exception being San Antonio's popularity as a tourist destination in lieu of manufacturing jobs (**Table 3-12**).

Table 3-12
Labor Force and Employment Characteristics in the ROI

Labor Force or Employment Characteristic	Bexar County	Texas	United States
Civilian Labor Force (% of total population 16 years and over)	64.6	64.7	63
Employed (%)	61.0	61.4	59.8
Unemployed (%)	3.5	3.3	3.3
Armed Forces (% of total population 16 years and over)	1.7	0.5	0.5
Largest industry sectors for employment (over 15% of labor force)	• Management, business, science, and arts occupations • Sales and office occupations • Service occupations	• Management, business, science, and arts occupations • Sales and office occupations • Service occupations	• Management, business, science, and arts occupations • Sales and office occupations • Service occupations

Source: USCB, 2023c

3.12.1.4 Community Services

Community support functions in the ROI include both military and civilian institutions and organizations that collectively contribute to law enforcement, fire protection, medical, and educational services. A health clinic, police/military police station, and fire station are located in the cantonment area along with various retail services for the visitor and working populations of the Base. Other JBSA installations in the ROI offer redundant and more specialized community support services.

A network of community support resources throughout Bexar County and within the municipal limits of San Antonio also serve the ROI, providing law enforcement, fire protection, and medical services to the resident population at-large. Additionally, through various public-to-public and public-to-private initiatives, mutual-aid agreements are in place to reduce response times to emergency incidents on and around military installations throughout the region. For example, Shavano Park, an incorporated jurisdiction to the south of JBSA-BUL, often responds to fire and medical emergencies on the Base, and vice versa (JBSA, 2020).

3.12.2 Environmental Consequences

3.12.2.1 Evaluation Criteria

The Air Force defines a significant effect on socioeconomics as an appreciable change to current demographic or economic conditions in the ROI that would be harmful for surrounding communities and residents.

3.12.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Alternative 1 would not result in a permanent increase to the population of JBSA-BUL or within the ROI. Temporary construction workers under Alternative 1 likely would be procured from within, or in close proximity to, the ROI. No appreciable change in the population of the ROI would be likely to occur under Alternative 1. Therefore, no appreciable change in the demand for housing and public or social services would be associated with Alternative 1; potential adverse effects would be negligible.

Alternative 1 would result in a minor increase in the demand for materials and labor needed to construct and install the natural gas pipeline conveyance. However, given the limited scope and temporary nature of Alternative 1, the material and labor supply in the ROI (or nearby areas of Texas) would be sufficient to meet the demand for such resources. Under Alternative 1, short-term, minor, beneficial effects on local economic conditions likely would result in the form of increased expenditures (e.g., procurement of construction materials and temporary jobs) and incidental spending.

3.12.2.3 Alternative 2 – NW Military Highway

Potential socioeconomic effects in the ROI under Alternative 2 would be the same as described for Alternative 1.

3.12.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Current conditions and trends would continue to change over time with respect to demographics and socioeconomics.

3.12.2.5 Cumulative Effects

When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative socioeconomic effects would be anticipated to occur with implementation of the Proposed Action.

3.12.3 Best Management Practices and Mitigation Measures

No BMPs or mitigation measures for socioeconomics were identified by analysis.

3.13 Utilities and Infrastructure, including Transportation

Infrastructure consists of the systems and structures that enable a population in a specified area to function. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as developed. The availability of infrastructure and its capacity to support more users, including residential and commercial expansion, are generally regarded as essential to the economic growth of an area. Infrastructure components generally include transportation and utility systems, as well as other types of essential services.

Transportation is defined as the system of roadways, highways, and transit services on JBSA-BUL, and those external to the Base, that support the movement of people, materials, or services to and from the

northern San Antonio area. Utilities include natural gas, sanitary sewer/wastewater, electrical, potable water, communications systems, and solid waste management.

The ROI for utilities and infrastructure is JBSA-BUL and the larger San Antonio metropolitan area where services are procured.

3.13.1 Transportation

JBSA-BUL is located adjacent to the city of San Antonio and is approximately 21 miles northwest of the downtown area. Intermodal road, rail, and air transportation networks connect San Antonio, the county seat of Bexar County and the second largest city in Texas, to other parts of the state and the US. The city of San Antonio and JBSA-BUL are serviced by I-10, which runs along the western side of the Base boundary. The I-10 corridor extends to the south San Antonio. Frontage roads along I-10 provide access to the commercial and residential areas to the south and southwest of JBSA-BUL. Camp Bullis Road extends under I-10 to the west and southwest to residential areas.

The roadway system within JBSA-BUL is made up of a network of roads and trails with different surface types, including pavement, gravel, and dirt. The two paved primary roads on the JBSA-BUL cantonment are NW Highway and Camp Bullis Road, with most buildings on the Base adjacent to these roads. The main access roads to the training areas from the cantonment area are Camp Bullis Road, Lewis Valley Road, Marne Road, Malabang Trail, and Wilderness Trail. There is only one access control gate for JBSA-BUL, located immediately south of the cantonment on NW Military Highway. All non-military and commercial vehicles (e.g., propane delivery trucks) access the Base via this gate (Air Force, 2017).

3.13.2 Utilities

3.13.2.1 Propane and Natural Gas

Most facilities in the JBSA-BUL cantonment burn propane gas to meet their heating needs. However, the aging propane tank and distribution system is in poor condition and operates inefficiently. Although natural gas services are readily available in the vicinity of JBSA-BUL, currently there is no means to deliver natural gas to the cantonment area of the Base.

3.13.2.2 Sanitary Sewer

JBSA-BUL operates a small wastewater treatment system to support training and operations at the Base. Wastewater is collected and conveyed to a packaged (modular) wastewater treatment plant located in the cantonment area of the Base. The packaged wastewater treatment plant has adequate capacity to meet the Base's peak wastewater flow of 0.68 million gallons per day. Treated effluent discharges to one of three settling ponds to the south of the wastewater treatment plant (Air Force, 2020).

JBSA seeks a connection with the San Antonio Water System for conveyance of wastewater generated on JBSA-BUL. Planning for a proposed wastewater pipeline conveyance that connects with the San Antonio Water System is currently underway. JBSA's anticipated timeframe for that proposed action is approximately 2025–2030, the same as that anticipated for the Proposed Action of this EA.

3.13.2.3 Other Utilities

Electricity
JBSA-BUL receives electrical power through City Public Service Energy. There are no contractual limitations on the amount of electricity the Base may purchase. Electric utility lines extend along Camp Bullis Road through to the intersection of Camp Bullis Road and NW Military Highway. However, most facilities within the JBSA-BUL cantonment rely primarily on propane gas to meet their heating needs.

Potable Water
JBSA-BUL operates a small water production, storage, and distribution system. There are three water supply wells that withdraw water from the Trinity Aquifer system underlying the Base. Water withdrawals

are treated on Base prior to being pumped to elevated storage tanks on JBSA-BUL, with a total storage capacity of 0.45 million gallons.

Communications Systems
Information technology communications systems on JBSA-BUL are limited and many lack compatibility with modern standards and related capabilities. Information technology communications systems in other portions of the ROI are generally abundant and most are compatible with modern standards and related capabilities.

Solid Waste Management
Solid waste management primarily relates to the availability of landfills to support a population's residential, commercial, and industrial needs. Solid waste generated on JBSA-BUL is collected and disposed of by a certified contractor at a TCEQ-approved landfill located off Base (FSH, 2009).

3.13.3 Environmental Consequences

3.13.3.1 Evaluation Criteria

The Air Force defines a significant effect on or from utilities and infrastructure within the ROI as one or more of the following:

- measurable change or service reduction within the regional transportation network;
- prolonged or repeated interruption of public transportation services regionally;
- prolonged or repeated service disruptions to utility end users; and
- substantial increase in utility demand relative to existing and planned regional uses.

3.13.3.2 Alternative 1 – Camp Bullis Road (Preferred)

Transportation
Under Alternative 1, roadways in the ROI would generally remain accessible to military and civilian users. Localized increases in traffic on JBSA-BUL and along the utility ROW west of the Base would be likely to result from the delivery of equipment and construction materials, removal of debris, and daily commuting of construction workers. Some delays and road closures would be likely in localized areas along the ROW during construction. However, increases of traffic under Alternative 1 would be a small fraction of existing levels of traffic in the ROI and traffic measures would be in place to minimize delays. Therefore, potential effects on transportation under Alternative 1 would be short-term and negligible.

Propane and Natural Gas
The construction of Alternative 1 would allow for the shut down and removal of the aging propane gas tank and distribution system in the JBSA-BUL cantonment. Because propane is more polluting fuel source as compared to natural gas, Alternative 1 would result in minor, beneficial effects on the environment in the ROI. Minor, beneficial effects on the security and safety environment of JBSA-BUL would also result from Alternative 1.

Sanitary Sewer
The operation of Alternative 1 would not affect the condition or capacity of existing sanitary sewer services on JBSA-BUL. However, the siting and construction of Alternative 1 could affect JBSA's proposed plan to construct a wastewater line conveyance that connects with the San Antonio Water System. Alternative 1 would occur within the same anticipated timeframe as that of the proposed wastewater line conveyance. Further, the utility ROW along Camp Bullis Road is also under consideration as a route for the proposed wastewater line conveyance. Should Camp Bullis Road be selected as the utility ROW for both proposed projects, potential effects could occur if the ROW does not provide adequate space to meet the siting and design requirements of both projects.

Other Utilities
Construction associated with Alternative 1 would occur in localized areas of JBSA-BUL and along the utility ROW west of the Base. Electricity, potable water, and communications systems are readily available in the ROI. During construction, these systems and services would largely be met onsite (e.g., mobile systems for power and communications). The condition and capacity of electricity, potable water, and communications systems in the ROI would also be adequate to support the operation of Alternative 1 post-construction.

Solid waste management under Alternative 1 would comply with all applicable federal, state, and local regulations. Procurement of construction materials would consider life-cycle management and all solid waste generated during the construction of Alternative 1 would be recycled or reused to the maximum extent possible.

Therefore, potential effects on or from these utilities that could result from Alternative 1 would be short-term and negligible.

3.13.3.3 Alternative 2 – NW Military Highway

Transportation
Under Alternative 2, roadways in the ROI would generally remain accessible to military and civilian users. Localized increases in traffic on JBSA-BUL and along the utility ROW south of the Base would be likely to result from the delivery of equipment and construction materials, removal of debris, and daily commuting of construction workers. Some delays and road closures would be likely in localized areas along the ROW during construction. However, increases of traffic under Alternative 2 would be a small fraction of existing levels of traffic in the ROI and traffic measures would be in place to minimize delays. Therefore, potential effects on transportation under Alternative 2 would be short-term and negligible.

Propane and Natural Gas
The construction of Alternative 2 would allow for the shut down and removal of the aging propane gas tank and distribution system in the JBSA-BUL cantonment. For the reasons stated above under Alternative 1, Alternative 2 would result in minor, beneficial effects on the environment in the ROI and, on JBSA-BUL, from improved security and safety.

Sanitary Sewer
The operation of Alternative 2 would not affect the condition or capacity of existing sanitary sewer services on JBSA-BUL. However, the siting and construction of Alternative 2 could affect JBSA's proposed plan to construct a wastewater line conveyance that connects with the San Antonio Water System. Alternative 2 would occur within the same anticipated timeframe as that of the proposed wastewater line conveyance. Further, the utility ROW along NW Military Highway is also under consideration as a route for the proposed wastewater line conveyance. Should NW Military Highway be selected as the utility ROW for both proposed projects, potential effects could occur if the ROW does not provide adequate space to meet the siting and design requirements of both projects.

Other Utilities
Potential effects on or from the condition or capacity of electricity, potable water, communications systems, and solid waste management under Alternative 2 would be the same as those described above under Alternative 1.

3.13.3.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. Utility and infrastructure systems would continue to operate, providing essential services to the population of JBSA-BUL and that of the larger San Antonio metropolitan area. Over time, the use, capacity, and condition of such systems would be expected to change with supply and demand or technology innovation. On JBSA-BUL, facilities in the cantonment would continue to rely on propane gas, including regular truck deliveries to replenish fuel levels, to meet their heating needs.

3.13.3.5 Cumulative Effects

When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, beneficial effects on utilities and infrastructure would be observed with the new wastewater and natural gas connections.

3.13.4 Best Management Practices and Mitigation Measures

No specific BMPs for utilities and infrastructure (beyond standard construction site management) were identified by analysis.

No mitigation measures for utilities and infrastructure were identified by analysis.

3.14 HAZARDOUS MATERIALS AND WASTE

The *Comprehensive Environmental Response, Compensation, and Liability Act* (42 USC § 9601 et seq.) (CERCLA) defines HAZMAT as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions [in 49 CFR 173]" (49 CFR 171.8).

As used in this EA, HAZMAT includes contaminants (i.e., chemicals, substances, or compounds) known to present potential risks to health, safety, or the environment when they occur at certain concentrations, and that are managed under one or more applicable regulatory programs. HAZMAT associated with the Proposed Action is described in **Section 3.14.1**; the term "hazardous substance" is used interchangeably with HAZMAT.

Hazardous wastes are defined by the *Resource Conservation and Recovery Act* (42 USC § 6901 et seq.), as amended (RCRA), as "a solid waste, or combination of solid wastes" that either exhibit hazardous properties (i.e., characteristics such as ignitability, corrosivity, reactivity, or toxicity) or are listed by the USEPA as being found to pose substantial present or potential hazards to human health and the environment. When found to persist in the environment, localized conditions such as soil, topography, water resources, and climate may affect the extent of contamination from or exposure to hazardous substances. Hazardous wastes associated with the Proposed Action are described in **Section 3.14.2**; the term "hazardous substance" is used interchangeably with "hazardous waste."

RCRA authorizes mandatory procedures and requirements for federal facilities that use, accumulate, transport, store or dispose of hazardous substances, materials, and wastes.

The ROI for hazardous substances, materials, and wastes includes JBSA-BUL and northern San Antonio; in particular, areas that may be affected by construction of the Proposed Action.

3.14.1 Existing Conditions

3.14.1.1 Hazardous Materials

Hazardous substances in use at JBSA-BUL include flammable and combustible liquids, acids, corrosives, caustics, anti-icing chemicals, compressed gases, solvents, paints, paint thinners, and pesticides. JBSA-BUL maintains a hazardous waste management plan (HWMP) for operations that involve the handling, storage, transportation, and use of these substances. The HWMP includes procedures for the prevention, containment, and response to discharges of such substances on the Base. On JBSA-BUL, hazardous substances are used and applied in strict accordance with label and manufacturer instructions. When not used, these materials are stored in appropriate, clearly labeled containers and secured in HAZMAT storage lockers or cabinets that are accessible only by authorized personnel.

Section 311 of the CWA, as amended by the *Oil Pollution Act* (Public Law 101-380), establishes requirements to prevent, prepare for, and respond to oil discharges at specific types of facilities, including

military bases. The intent is to prevent oil from reaching navigable waters and adjoining shorelines and to contain discharges of oil. To do so, facilities are required to develop and implement SPCC plans to establish procedures, methods, and equipment requirements for response and cleanup actions. JBSA-BUL maintains an SPCC plan to guide response and cleanup actions immediately following an accidental release or discharge of oil into the environment.

There are four USTs located within 100 meters of the Proposed Action **(Figure 3-8**). Two active service station USTs are situated immediately northwest of Camp Bullis Road, near the main line terminus in the JBSA-BUL cantonment. A third UST (Facility No. TX89620 [closed]) is located between JBSA-BUL and I-10. The fourth UST (Facility No.TX38931 [active]) is located along Camp Bullis Road near its intersection with I-10 (Air Force, 2017).

Per- and Polyfluoroalkyl Substances
Per- and Polyfluoroalkyl substances (PFAS) are a group of manufactured chemicals used in industry and consumer products since the 1940s due to their useful properties. There are thousands of different chemicals in the PFAS group, some of which are more widely used and studied than others. Most PFAS share characteristics of concern in their ability to move, persist, and bioaccumulate in the environment over time. Although PFAS exposure in humans at relatively low concentrations is common, research suggests that exposure to concentrated sources of PFAS over long periods of time may be linked to adverse health outcomes (USEPA 2021a).

The DoD identifies PFAS as emerging contaminants of concern as components of legacy aqueous film forming foam (AFFF) used to extinguish petroleum fires. In 2016, the USEPA issued a lifetime drinking water health advisory for two PFAS precursors in AFFF and health-based regional screening levels for a third PFAS used as a firefighting agent in AFFF. Per DoD's relative risk evaluation site evaluation framework, the Air Force continues to evaluate potential AFFF releases on its current and former bases.

There are no known PFAS-contaminated areas associated with the Proposed Action, and PFAS are not further discussed in this EA.

Pesticides
The application of all pesticides at JBSA-BUL, including herbicides, fungicides, insecticides, and rodenticides, is authorized by JBSA's *Integrated Pest Management Plan*, which includes processes and procedures to minimize pesticide usage, enhance environmental protection, and maximize the use of integrated pest management techniques.

Pesticide usage outside the Base boundary is also subject to federal regulation under the Toxic Substances Control Act (15 USC § 2601 et seq.). In cooperation with the USEPA, the Texas Department of Agriculture is the lead authority for pesticide regulation in the state. For example, the State agency registers pesticide products, enforces pesticide label compliance, and trains and licenses professional applicators,

3.14.1.2 Asbestos

The Air Force manages asbestos in accordance with DAFI 32-1001, *Civil Engineer Operations*, and applicable USEPA regulations. Nonfriable asbestos is not considered HAZMAT until removed or disturbed. The JBSA *Asbestos Management Plan* identifies the need for asbestos management, abatement, and removal, where applicable, when funding is available, or where damage or exposure warrants the need (JBSA, 2019). The *Asbestos Management Plan* focuses on in-place management of asbestos, meaning, where applicable, asbestos-containing material (ACM) can be left in place until there is a need for removal (i.e., due to conditions, renovation, demolition) (JBSA, 2020). Disruption of these materials causes asbestos to become airborne, producing a risk of inhalation.

JBSA-BUL has the potential to have abandoned underground transite water mains and servicing lines. Transite is an asbestos-containing cement material that was used to make water pipes and other similar items in the mid-twentieth century (Stenstedt, 2019). Transite resembles concrete, and sometimes the asbestos layers or fibers are visible. The Proposed Action would not involve or disturb other structures known to contain ACMs.

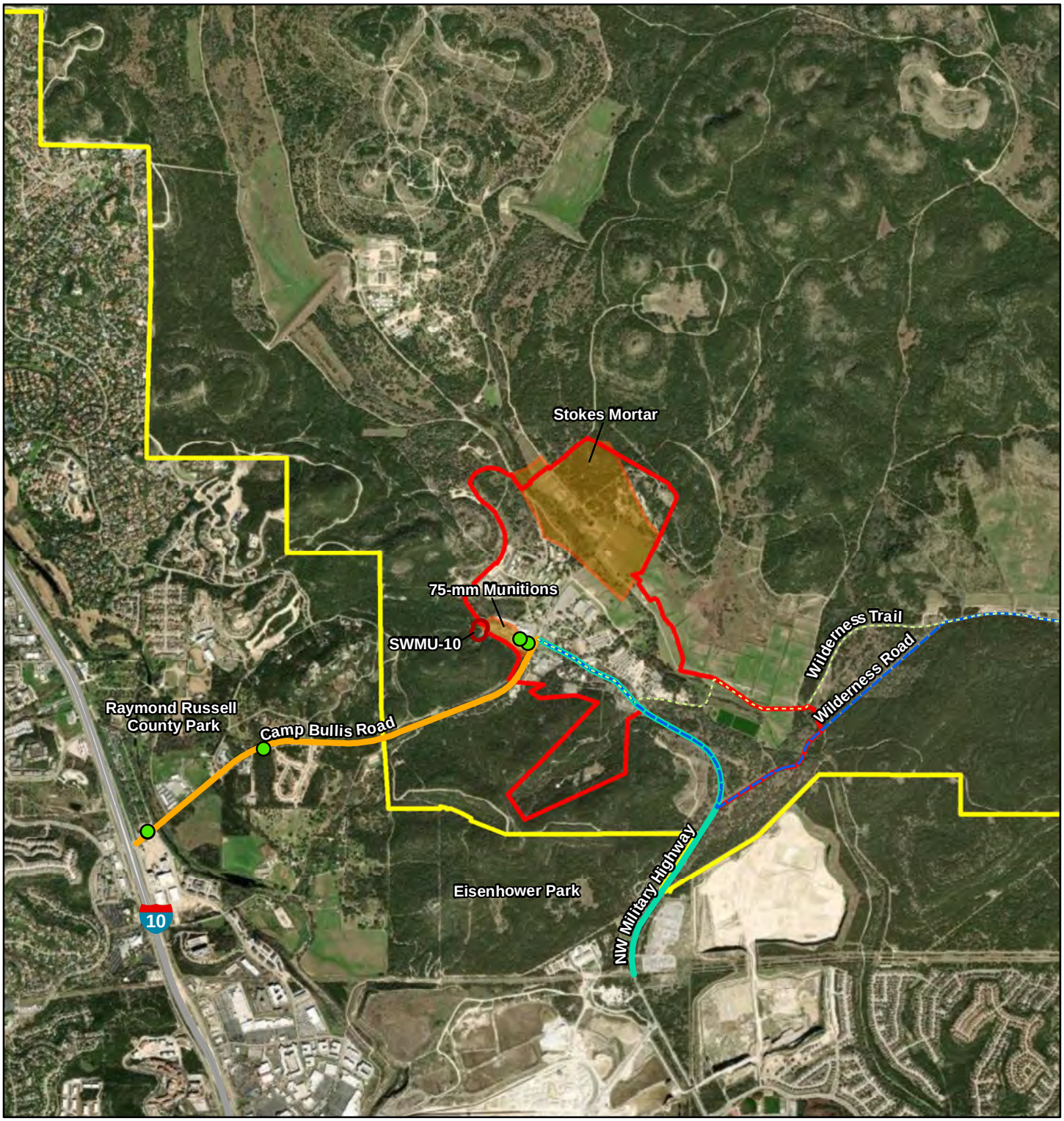


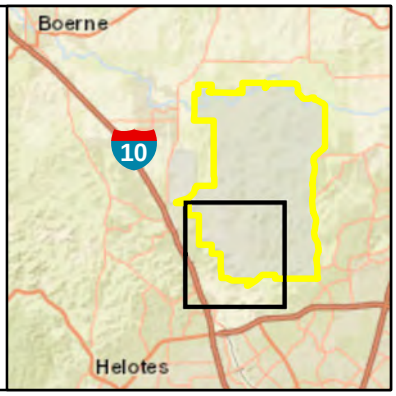
FIGURE 3-8
Hazardous Materials and Waste

- Underground Storage Tank (Within 100 m)
- Alternative 1: Camp Bullis Road
- Alternative 2: NW Military Highway
- Wilderness Road
- Wilderness Trail
- Cantonment Area
- Installation Boundary
- Solid Waste Management Unit (SWMU)
- Military Munitions Response Program Sites

N

0 0.5 1 Mile

Imagery: ESRI, 2021
Coordinate System: WGS 1984 UTM Zone 14N



3.14.1.3 Other Hazardous Materials

The Proposed Action would not involve demolition or renovation of any buildings or other existing structures; therefore, the potential to encounter HAZMAT, including lead-based paint or polychlorinated biphenyls, would be very low. These materials are not further discussed in this EA.

3.14.1.4 Hazardous Wastes

Activities that require the use of HAZMAT or substances may also generate hazardous wastes. Accordingly, RCRA also authorizes mandatory procedures and requirements for federal facilities that accumulate, transport, treat, store, or dispose of hazardous waste. In Texas, the TCEQ implements the RCRA program under the federally delegated authority of the USEPA.

Pursuant to RCRA, JBSA-BUL is classified as a small-quantity generator of hazardous waste (#TX4210020133). Activities that generate hazardous waste on the Base include vehicle operations and maintenance, construction, and small arms and weapons training. Hazardous waste generation, handling, and disposal at JBSA-BUL is conducted in accordance with the HWMP.

3.14.1.5 Environmental Restoration Program Sites

To comply with RCRA, JBSA-BUL implements the cleanup of hazardous waste through its Environmental Restoration Program (ERP). ERP sites on the Base are subject to more detailed site assessments and, when necessary, media sampling to identify cleanup options. Applicable regulatory requirements determine the scope of remedial actions, monitoring, and eventual closure of the site under RCRA authority.

The ERP site on JBSA-BUL is associated with two former landfill sites regulated under RCRA as single solid waste management unit (SWMU)-10. SWMU-10 is located immediately west of the 75-mm Munitions site (FR004) (see **Figure 3-8**). SWMU-10 is managed in accordance with a TCEQ Industrial Hazardous Waste permit (#50335). No other ERP sites on JBSA-BUL are known to occur within the Proposed Action ROI (Air Force, 2017).

No contaminated sites subject to RCRA or CERCLA regulation were identified for the off-Base portion of the ROI.

3.14.1.6 Military Munitions Response Program Sites

Current and historic military training activities at JBSA-BUL are a source of munitions constituent releases to the environment. Munitions constituents include antimony, chromium, copper, lead, zinc, white phosphorus, and explosives. In most cases, these are found in soils associated with firing points/lines, target/impact areas, range floors, and berms used as backstops at the firing sub-ranges. However, there is a potential for munitions constituents to migrate into other environmental media; surface or groundwater being of most concern. Once soils containing such constituents are disturbed, they are classified as hazardous waste and subject to RCRA requirements.

There are two Military Munitions Response Program (MMRP) sites in the vicinity of the Proposed Action. These include the 148-acre Stokes Mortar site (FR001), part of which overlaps the northern extent of the cantonment, and the 75-mm Munitions site (FR004) in the southwest portion of the cantonment. The southern boundary of FR001 lies approximately 0.4 mile north of the Proposed Action. The FR004 site is immediately adjacent to the utility ROW, southwest of the intersection of NW Military Highway and Camp Bullis Road in the cantonment (i.e., the main line central terminus under the Proposed Action). However, FR004 received regulatory closure under MMRP following a munitions and explosives of concern removal action in 2016. Although removal actions also were conducted at the Stokes Mortar site in 2014 and 2016, FR001 remains an active RCRA site due to the potential presence of additional munitions and explosives of concern and munitions debris. Both FR001 and FR004 are subject to land use controls; however, neither would apply to the Proposed Action. No other ERP sites on JBSA-BUL are found in proximity to the Proposed Action (Air Force, 2017). JBSA-BUL historically has been used as an impact area, and unexploded ordinances (UXO) have the potential to occur on the surface and subsurface throughout the

entire Installation. No other contaminated sites subject to RCRA or CERCLA regulation that occur in proximity to the Proposed Action outside the JBSA-BUL boundary were identified.

3.14.2 Environmental Consequences

3.14.2.1 Evaluation Criteria

The Air Force defines a significant effect from HAZMAT and hazardous waste within the ROI as one or more of the following:

- a substantial increase in the generation of a hazardous substance;
- an increase in exposure of persons to a hazardous substance; and
- an increased presence in the environment of a hazardous substance.

3.14.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Hazardous Materials
Under Alternative 1, hazardous substances such as oils, lubricants, paints, or similar products would be temporarily stored and used at project sites during construction. Quantities would be limited to those required for the project and construction contractors would manage them in accordance with applicable federal, state, and local regulations and procedures. Appropriate BMPs would be used to prevent pollutants from entering the environment and migrating via soil, groundwater, or surface water. Contractors would be required to perform daily inspections of equipment, maintain appropriate spill-containment materials on Base, and store all fuels and other materials in appropriate containers. Equipment maintenance activities would not be conducted on any project sites associated with Alternative 1.

Under Alternative 1, the USTs that lie within or adjacent to the utility ROW would either be removed in accordance with applicable federal, state, and local laws and regulations, or avoided by design. Therefore, with standard plans, procedures, and protocols in place during the construction and operation of Alternative 1, potential effects from the use of hazardous substances would be negligible.

Excavation and earthwork associated with Alternative 1 may be required in soils with concentrations of contaminants exceeding applicable regulatory criteria. In such an event, soils would be categorized, based on a waste characterization performed by the 802 CES/CEIE, as hazardous waste and removed for transportation to a permitted disposal facility in the San Antonio metropolitan area. As any soils removed from the post must have analytical testing, prior to soil removal the contractor would perform soil sampling and testing for every 200 cubic yard that would be removed from JBSA. A copy of the results would be required to be provided to the JBSA area specific Environmental Office to determine proper disposal. Soil removal would not be allowed until this determination had been completed. All soils would be manifested and signed for by authorized JBSA Environmental office representatives only.All workers involved and the general public in the vicinity of the site would be protected by engineering or administrative controls, as appropriate (see **Section 3.16** below). Soils characterized at a minimum as Type II Non-Hazardous Wasteif not reused on site, would be transported off Base for disposal at a TCEQ permitted disposallocation approved by 802 CES/CIE. Therefore, with standard management and control measures in place to address hazardous wastes, either generated from or encountered during Alternative 1, potential effects would be short term and minor.

Pesticides
Implementation of Alternative 1 would not result in a change to the application of pesticides, herbicides, fungicides, insecticides, and rodenticides at JBSA-BUL. These activities would continue to be monitored under JBSA's Integrated Pest Management Plan.

Asbestos
In the event that transite pipes were encountered and subsequently damaged during excavation, the JBSA area specific Environmental Office would be notified for further instructions. Repair or abatement of the pipes would be performed by a certified abatement team.

Hazardous Waste
The construction of Alternative 1 would generate small quantities of hazardous waste. Contractors would manage such waste in accordance with applicable requirements and management plans. Under Alternative 1, project-related hazardous waste would be segregated from non-hazardous waste, stored in appropriate containers, and transported by licensed contractors for disposal at a permitted facility in the San Antonio metropolitan area.

Environmental Restoration Program and Military Munitions Response Program Sites
Alternative 1 would not involve any activities directly within an ERP or MMRP site. Alternative 1 would involve earthwork within 100 ft of the 75-mm Munitions site; however, adverse impacts would not be anticipated as a result of implementation of Alternative 1. Additionally, UXO clearance of the selected route area may be necessary prior to beginning construction due to historic use of JBSA-BUL as an impact area.

3.14.2.3 Alternative 2 – NW Military Highway

Potential effects from the use, accumulation, transport, storage, or disposal of hazardous substances, materials, and wastes under Alternative 2 would be similar to those described for Alternative 1.

3.14.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. JBSA-BUL and private sector companies external to the Base would continue to manage hazardous substances, materials, and wastes in compliance with applicable management plans and federal, state, and local regulations.

3.14.2.5 Cumulative Effects

All activities in the San Antonio metropolitan area involving the use, transport, treatment, storage, and disposal of HAZMAT and hazardous waste would continue to be regulated under federal, state, and local laws and regulations. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, no significant cumulative effects on or from HAZMAT and hazardous waste would be anticipated to occur with implementation of the Proposed Action.

3.14.3 Best Management Practices and Mitigation Measures

The Air Force would implement the following BMPs for HAZMAT and hazardous waste:

- Comply with JBSA environmental specifications during construction activities.
- Adhere to the JBSA HWMP to minimize impacts from the handling and disposal of hazardous substances and ensure compliance with state and federal HAZMAT regulations.
- Properly handle, remove, and dispose of ACMs in accordance with Air Force, local, state, and federal regulations.
- Report spills of any regulated substances to the Edwards Aquifer Authority within 72 hours of the event.
- Properly handle and remove all hazardous and toxic substances used during construction, demolition, and renovation activities.

Failure to implement BMPs under the Proposed Action likely would result in adverse short- and long-term impacts to personnel due to exposure of materials that are known to be hazardous to humans.

No mitigation measures for HAZMAT and hazardous waste were identified by analysis.

3.15 HEALTH AND SAFETY

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Occupational safety and health (OSH) programs address the health and safety of people at work. These programs impose regulatory requirements for the benefit of employees and the public, including implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage.

The *Occupational Safety and Health Act* (29 USC §§ 651–678) (OSHA) is the primary federal statute for regulating the safety and health of workers in the US. It establishes worker-protection standards that must be followed to prevent and minimize potential safety and health risks. OSH regulations cover potential exposure to a wide range of chemical, physical, and biological hazards and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure via administrative or engineering controls, substitution, or use of PPE. Many states are delegated authority to enforce OSHA regulations; however, Texas does not have its own occupational safety and health regulatory program (i.e., the federal rules govern workplace safety and health in the private sector).

The ROI for health and safety is JBSA-BUL and the larger San Antonio metropolitan area from which military personnel and contractors would travel to conduct work at or in the vicinity of the Base.

3.15.1 Existing Conditions

The health and safety of onsite military and civilian workers are safeguarded by numerous DoD and military branch-specific requirements designed to comply with standards issued by federal OSHA, USEPA, and state OSH agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of PPE, administrative controls, engineering controls, and permissible exposure limits for workplace stressors. OSH requirements applicable to the Proposed Action would address workers and public health and safety during the involved construction and operational activities.

Health and safety hazards can often be identified and reduced or eliminated before an activity begins. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself, together with the exposed (and possibly susceptible) population or public. The degree of exposure depends primarily on the proximity of the hazard to the population.

Hazards associated with the Proposed Action generally include transportation, construction, and maintenance and operational activities. Human-use areas associated with facility and infrastructure projects create potentially unsafe environments (e.g., noise, fire, or explosion due to a rapid oxidation process) for workers and/or members of the public. Noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

OSH is the responsibility of each employer, as applicable. Although such responsibilities vary by industry or employment sector, employer responsibilities generally include:

- review potentially hazardous workplace conditions;
- monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous substances), physical (e.g., noise propagation, falls), and biological (e.g., infectious waste, wildlife, poisonous plants) agents, and other stressors;
- evaluate and recommend controls (e.g., prevention, administrative, engineering, and PPE) to ensure exposure is eliminated or adequately controlled; and
- perform occupational health physicals for those workers subject to the use of respiratory protection, engaged in hazardous waste work, asbestos, lead, or other work requiring medical monitoring.

On JBSA-BUL, all military and civilian personnel conducting work on the Base are subject to applicable OSH regulations, including those pertaining to the construction and operation of the Proposed Action. Military personnel also oversee law enforcement, control access, and provide emergency response services on the Base and, through numerous mutual-aid agreements, off the Base.

Explosives safety is of particular concern in the JBSA-BUL cantonment due to the use of propane gas for heating. Propane is pressurized into a liquid state for storage and transportation. Therefore, even a minor discharge creates a hazard of ignition or explosion. When used to power a building or facility, large quantities of propane must be stored in a nearby outdoor storage tank. Because of these factors, propane use increases the probability of an accidental fire or explosion in the cantonment.

3.15.2 Environmental Consequences

3.15.2.1 Evaluation Criteria

The criteria used to determine the potential for a significant adverse impact on human and environmental health includes any work or operational activity carried out in non-compliance with applicable OSH regulations.

3.15.2.2 Alternative 1 – Camp Bullis Road (Preferred)

Alternative 1 would increase the health and safety risk for construction workers, pipeline maintenance or operational staff, and the general public on and in the vicinity of JBSA-BUL. These risks would extend to the larger San Antonio metropolitan area for work-related travel or job duties that occur regionally. Human and environmental health impacts under Alternative 1 would include the potential for a physical injury or fatality, an exposure to a hazardous substance, and fire or explosion from a rapid oxidation process during construction and operation of Alternative 1.

To comply with applicable health and safety regulations, Alternative 1 would require the preparation of a project-specific health and safety plan. The health and safety plan would contain guidance and direction to prevent or minimize potential risks in human-use areas associated with the Proposed Action. At a minimum, this plan would include emergency response and evacuation procedures; operational manuals; PPE recommendations (e.g., breathing and hearing protection); protocols and procedures for handling, storing, and disposing of HAZMAT and hazardous wastes; information on the effects and symptoms of potential exposures; and guidance with respect to hazard identification. The responsible party would also be required to submit each health and safety plan to JBSA for review and approval and would be responsible for educating workers on site through daily briefings.

The construction of Alternative 1 would create a potential risk for worker or public exposure to contaminated soils. Such an exposure could occur directly through contact with the contaminated media or indirectly via inhalation or ingestion of airborne particulate matter. However, any known or potentially contaminated soils impacted under Alternative 1 would be subject to further assessment and/or sampling to determine whether concentrations exist above applicable regulatory thresholds. If necessary, an activity hazard analysis would be conducted to identify potential exposure risks specific to a site or area. The analysis would also recommend engineering and administrative controls protective of human health and the environment, as appropriate. All on-Base workers involved in the construction of Alternative 1 would comply with applicable recommendations to include the donning of PPE. Additional precautions may include wearing respirators, washing and disposing of clothing and equipment at project sites, and the monitoring of airborne contaminants, among others. Additionally, project sites would be fenced and signage posted to further reduce safety risks to military personnel, visitors, or members of the general public.

All facilities and infrastructure associated with Alternative 1 would comply with standards pertaining to construction materials, leak protection, monitoring, and spill containment. Further, all hazardous and petroleum wastes generated from Alternative 1 on JBSA-BUL would be handled, stored, and disposed of in accordance with the Base's RCRA permit. Construction activities in the off-Base portion of Alternative 1 would also be subject to regulation and permitting under RCRA and related environmental laws. Compliance with current regulatory standards and management plans would ensure health and safety precautions remain in place during the operation of Alternative 1.

Alternative 1 would not pose an operational safety risk to the military mission of JBSA-BUL. As necessary, construction activities would be de-conflicted with the safety zones in place for aircraft operations, firing ranges, or areas where explosives are detonated. Construction of the Proposed Action would occur during

normal daylight working hours (i.e., no light or glare would affect nighttime training and operations). Safety risks to or from military activities taking place concurrently with the Proposed Action would be manageable under established protocols and procedures.

Therefore, through adherence to project- and Base-specific health and safety measures, Alternative 1 would result in short-term, minor effects on human and environmental health, and safety.

3.15.2.3 Alternative 2 – NW Military Highway

Potential effects on health and safety under Alternative 2 would be the same as those described for Alternative 1.

3.15.2.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing system of propane tanks and distribution lines would continue to operate but, over time, would fall into disrepair. All military and civilian personnel on JBSA-BUL or under contract for work related to JBSA-BUL would continue to be subject to federal OSH regulations. Built environment conditions on and in the vicinity of the Base would continue, and no additional health and safety risks associated with the Proposed Action would occur. Because propane operations would continue at JBSA-BUL under the No Action Alternative, so would the increased probability of an accidental fire or explosion in the cantonment (e.g., from a vehicle accident during fuel delivery).

3.15.2.5 Cumulative Effects

All construction activities in the San Antonio metropolitan area would continue to be regulated to ensure the health and safety of workers and the public. When considered in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions at JBSA-BUL, potential cumulative effects to health and safety would not be likely to occur under the Proposed Action.

3.15.3 Best Management Practices and Mitigation Measures

No specific BMPs for health and safety (beyond standard OSH regulations and operational protocols at JBSA-BUL) were identified by analysis.

No mitigation measures for health and safety were identified by analysis.

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CHAPTER 5 REFERENCES

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APPENDIX A
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DEPARTMENT OF THE AIR FORCE
502D AIR BASE WING
JOINT BASE SAN ANTONIO

8 April 2022

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Dear Mr. Baker

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for its proposed conversion from propane to natural gas energy to service the Joint Base San Antonio, Bullis (JBSA-BUL) cantonment area (**Attachment 1**). To account for possible environmental concerns, the Air Force is engaging early with all potentially affected resource agencies as it formulates this undertaking. Accordingly, the Air Force seeks consultation with your office.

Proposed Action

The EA will, as required by law and regulations, consider the potential impacts of the Proposed Action, which would involve construction and installation of a below-ground natural gas pipeline from a privately operated main line through JBSA-BUL to the cantonment; construction, trenching, and excavation of new natural gas pipeline infrastructure within the JBSA-BUL cantonment; and deactivation and removal or in-place demolition of the existing propane system infrastructure.

Throughout the proposed project, the Air Force would adhere to industry regulations and standards for pipeline transportation and safety and incorporate such regulations into the design of the pipeline system. It is anticipated that the Proposed Action would use a combination of trenching (above ground) and boring (below ground) to install the pipelines based on any existing environmental constraints. Upon selecting a viable route from the main line to JBSA-BUL and acquiring the necessary easements or rights of way, the Proposed Action would be constructed over the course of approximately 5 years from 2025 through 2029.

Purpose and Need

The purpose of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. Under the Proposed Action, the Air Force would install a

below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment and convert existing propane infrastructure to natural gas. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, efficient, cost-effective, and less-polluting energy source.

The Proposed Action is needed to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and Department of Defense and Air Force policies, plans, and directives.

Project Location

Under the Proposed Action, the Air Force would install a below-ground natural gas pipeline from a privately operated main line to the JBSA-BUL cantonment. The Air Force considered multiple route alternatives from possible main line connection points and selected two for more detailed analysis in the EA (**Attachment 2**). Within the cantonment, above- and below-ground distribution lines would branch out and connect with facilities located therein. This portion of the Proposed Action would be the same under the selected alternatives.

Environmental Assessment

The EA will assess the potential environmental consequences of the Proposed Action and No Action Alternative. Potential impacts identified during the initial planning stages include effects on air quality, infrastructure/utilities, biological and cultural resources, geological resources, and water resources. The EA will also examine the reasonably foreseeable environmental trends and planned actions that, when combined with the Proposed Action, could result in potential adverse cumulative effects on a regional scale. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EA.

So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response to my point of contact for this matter, as provided below, not later than 30 days from receipt of this correspondence. Please send your response via postal mail or email (preferred) to:

ATTN: Ms. Monica Guerrero
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The Air Force appreciates your interest in and support of its military mission at JBSA-BUL. We thank you in advance for your assistance and look forward to your response.

Sincerely

ROBERSON.EDWARD.LEWIS.1124911636
Digitally signed by ROBERSON.EDWARD.LEWIS.1124911636
Date: 2022.04.05 15:12:41 -05'00'

EDWARD L. ROBERSON, P.E.

2 Attachments:
1. Map of Joint Base San Antonio, Bullis
2. Map of Pipeline Route Alternatives

DEPARTMENT OF THE AIR FORCE
502D AIR BASE WING
JOINT BASE SAN ANTONIO

8 April 2022

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Dear Mr. Wolfe

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for its proposed conversion from propane to natural gas energy to service the Joint Base San Antonio, Bullis (JBSA-BUL) cantonment area (**Attachment 1**). To account for possible environmental concerns, the Air Force is engaging early with all potentially affected resource agencies as it formulates this undertaking. Accordingly, the Air Force seeks consultation with the Texas Historical Commission State Historic Preservation Officer.

Proposed Action

The EA will, as required by law and regulations, consider the potential impacts of the Proposed Action, which would involve construction and installation of a below-ground natural gas pipeline from a privately operated main line through JBSA-BUL to the cantonment; construction, trenching, and excavation of new natural gas pipeline infrastructure within the JBSA-BUL cantonment; and deactivation and removal or in-place demolition of the existing propane system infrastructure. Pursuant to 36 CFR §§ 800.4(a) and (b), we request your assistance in defining the Area of Potential Effect (APE) and information on any historic properties located therein that may be affected by the proposed undertaking. Location maps of each alternative are attached for your review (see **Attachment 2**).

Throughout the proposed project, the Air Force would adhere to industry regulations and standards for pipeline transportation and safety and incorporate such regulations into the design of the pipeline system. It is anticipated that the Proposed Action would use a combination of trenching (above ground) and boring (below ground) to install the pipelines based on any existing environmental constraints. Upon selecting a viable route from the main line to JBSA-BUL and acquiring the necessary easements or rights of way, the Proposed Action would be constructed over the course of approximately 5 years from 2025 through 2029.

Purpose and Need

The purpose of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. Under the Proposed Action, the Air Force would install a below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment and convert existing propane infrastructure to natural gas. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, efficient, cost-effective, and less-polluting energy source.

The Proposed Action is needed to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and Department of Defense and Air Force policies, plans, and directives.

Project Location

Under the Proposed Action, the Air Force would install a below-ground natural gas pipeline from a privately operated main line to the JBSA-BUL cantonment. The Air Force considered multiple route alternatives from possible main line connection points and selected two for more detailed analysis in the EA. **Attachment 2** depicts the alternatives selected for analysis in the EA in relation to known, below-ground cultural resources on JBSA-BUL; two other alternatives, considered but eliminated from further analysis, are also shown. Within the cantonment, above- and below-ground distribution lines would branch out and connect with facilities located therein. This portion of the Proposed Action would be the same under the selected alternatives.

Environmental Assessment

The EA will assess the potential environmental consequences of the Proposed Action and No Action Alternative. Potential impacts identified during the initial planning stages include effects on air quality, infrastructure/utilities, biological and cultural resources, geological resources, and water resources. The EA will also examine the reasonably foreseeable environmental trends and planned actions that, when combined with the Proposed Action, could result in potential adverse cumulative effects on a regional scale. In support of this process, we would appreciate your input concerning the potential effects of the Proposed Action on historic properties as well as assistance in defining the APE for the Proposed Action.

So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response to my point of contact for this matter, as provided below, not later than 30 days from receipt of this correspondence. Please send your response via postal mail or email (preferred) to:

ATTN: Ms. Dayna Cramer
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Email: dayna.a.cramer.civ@army.mil

The Air Force appreciates your interest in and support of its military mission at JBSA-BUL. We thank you in advance for your assistance and look forward to your response.

Sincerely

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2 Attachments:
1. Map of Joint Base San Antonio, Bullis
2. Map of Pipeline Route Alternatives

DEPARTMENT OF THE AIR FORCE
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8 April 2022

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Dear Chairman Nelson Sr.

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) for its proposed conversion from propane to natural gas energy to service the Joint Base San Antonio, Bullis (JBSA-BUL) cantonment area (**Attachment 1**). To account for possible environmental concerns, the Air Force is engaging early with all potentially affected Native American Tribes as it formulates this undertaking. Accordingly, the Air Force seeks consultation with the Comanche Nation, Oklahoma.

Proposed Action

The EA will, as required by law and regulations, consider the potential impacts of the Proposed Action, which would involve construction and installation of a below-ground natural gas pipeline from a privately operated main line through JBSA-BUL to the cantonment; construction, trenching, and excavation of new natural gas pipeline infrastructure within the JBSA-BUL cantonment; and deactivation and removal or in-place demolition of the existing propane system infrastructure.

Throughout the proposed project, the Air Force would adhere to industry regulations and standards for pipeline transportation and safety and incorporate such regulations into the design of the pipeline system. It is anticipated that the Proposed Action would use a combination of trenching (above ground) and boring (below ground) to install the pipelines based on any existing environmental constraints. Upon selecting a viable route from the main line to JBSA-BUL and acquiring the necessary easements or rights of way, the Proposed Action would be constructed over the course of approximately 5 years from 2025 through 2029.

Pursuant to Section 106 of the *National Historic Preservation Act* (NHPA), implementing regulations at 36 CFR Part 800, and Department of Defense (DOD) Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes,* we would like to initiate government-to-government consultation on the Proposed Action. The Air Force requests assistance from your Tribe to identify properties of cultural and religious significance that may be located within the APE for this action. The Air Force desires to discuss the proposal in detail

with you so that we may understand and consider any comments, concerns, and suggestions you may have. Pursuant to 36 CFR §§ 800.4(a) and (b), we request your assistance in defining the Area of Potential Effect (APE) and information on any historic properties located therein that may be affected by the proposed undertaking. Additionally, we invite you, pursuant to 36 CFR § 800.4(a)(4), to provide information on any properties of historic, religious, or cultural significance that may be affected by our proposed undertaking.

Regardless of whether the Comanche Nation, Oklahoma chooses to consult on this project, the Air Force will comply with the *Native American Graves Repatriation Act* by informing you of any inadvertent discovery of archaeological or human remains and consulting on their disposition. As a federal undertaking, we are also seeking the input of the Texas State Historic Preservation Office and other interested consulting parties.

Purpose and Need

The purpose of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. Under the Proposed Action, the Air Force would install a below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment and convert existing propane infrastructure to natural gas. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, efficient, cost-effective, and less-polluting energy source.

The Proposed Action is needed to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and Department of Defense and Air Force policies, plans, and directives.

Project Location

Under the Proposed Action, the Air Force would install a below-ground natural gas pipeline from a privately operated main line to the JBSA-BUL cantonment. The Air Force considered multiple route alternatives from possible main line connection points and selected two for more detailed analysis in the EA. **Attachment 2** depicts the alternatives selected for analysis in the EA in relation to known, below-ground cultural resources on JBSA-BUL; two other considered alternatives and their potential to affect these resources are also shown. Within the cantonment, above- and below-ground distribution lines would branch out and connect with facilities located therein. This portion of the Proposed Action would be the same under the selected alternatives.

Environmental Assessment

The EA will assess the potential environmental consequences of the Proposed Action and No Action Alternative. Potential impacts identified during the initial planning stages include effects on air quality, infrastructure/utilities, biological and cultural resources, geological resources, and water resources. The EA will also examine the reasonably foreseeable environmental trends and planned actions that, when combined with the Proposed Action, could result in potential adverse cumulative effects on a regional scale. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EA. As a government-to-government consultation, we would appreciate any input you have to identify properties of cultural and religious significance that may be located within the APE for this action and regarding concerns of potential effects of the Proposed Action on significant cultural resources.

So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response to me no later than 30 days from receipt of this correspondence. Please send your response via postal mail at the address above or via email (preferred) to michael.d.waldrop6.civ@mail.mil.

The Air Force appreciates your interest in and support of its military mission at JBSA-BUL. We thank you in advance for your assistance and look forward to your response.

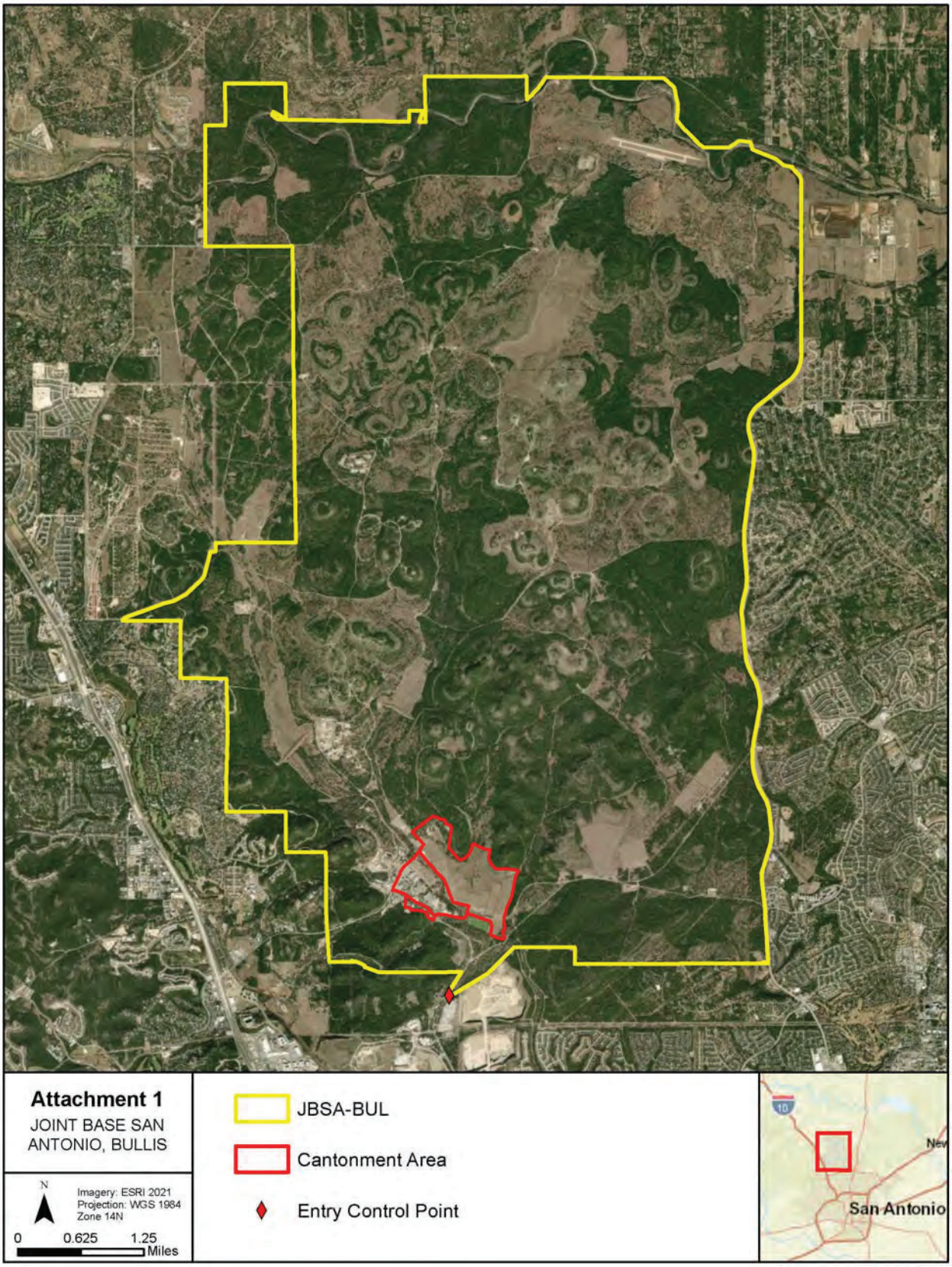
Sincerely

WALDROP.MICHAEL.DUANE.1160753451
Digitally signed by WALDROP.MICHAEL.DUANE.1160753451
Date: 2022.03.24 14:39:31 -05'00'

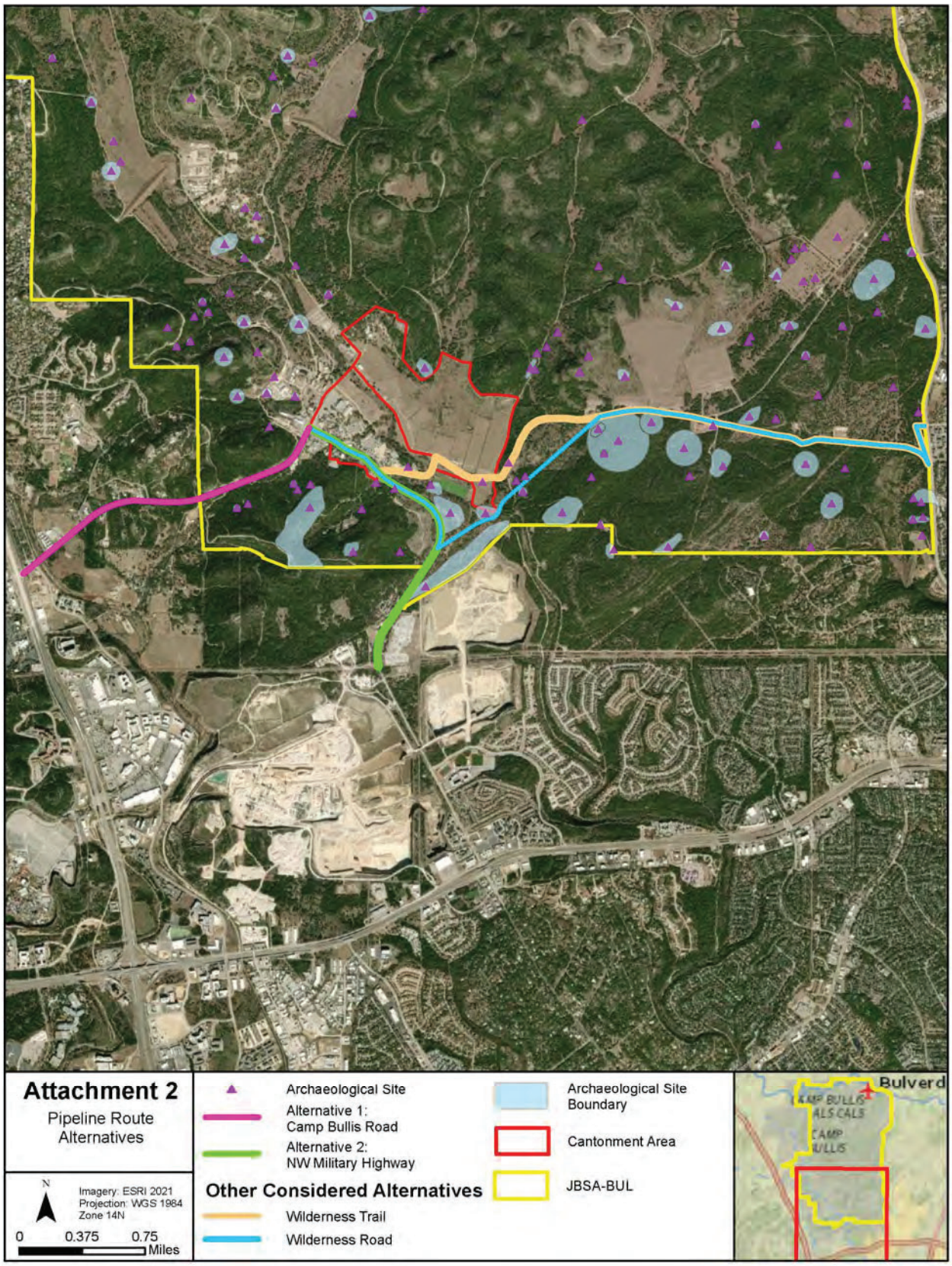
MICHAEL D. WALDROP

2 Attachments:
1. Map of Joint Base San Antonio, Bullis
2. Map of Pipeline Route Alternatives

Attachment 1 – Map of Joint Base San Antonio, Bullis



Attachment 2 – Map of Pipeline Route Alternatives



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Austin Ecological Services Field Office
1505 Ferguson Lane
Austin, TX 78754-4501
Phone: (512) 937-7371

In Reply Refer To: 03/10/2025 13:26:06 UTC
Project Code: 2025-0066276
Project Name: Camp Bullis Natural Gas Conversion Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Austin Ecological Services Field Office
1505 Ferguson Lane
Austin, TX 78754-4501
(512) 937-7371

PROJECT SUMMARY

Project Code: 2025-0066276
Project Name: Camp Bullis Natural Gas Conversion Project
Project Type: Military Development
Project Description: The Air Force 502d Air Base Wing (502 ABW) at JBSA proposes to modernize the cantonment by conversion from propane to natural gas energy. As compared to propane, natural gas is a less-polluting source of energy, and a new distribution system would result in more efficient operations. The Air Force plans to procure a third party to design, construct, operate, and maintain the proposed natural gas distribution system. This proposal would first seek to route and install a new natural gas pipeline that provides connectivity to the cantonment from a privately operated main line proximate to the Base. A secondary network of pipelines would then be installed for distribution to facilities within the cantonment. This project would be implemented over approximately 5 years from 2025 to 2029.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@29.68879145,-98.55979228933242,14z

Counties: Bexar and Comal counties, Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 20 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 3 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Golden-cheeked Warbler *Setophaga chrysoparia*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/33

Piping Plover *Charadrius melodus*	Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions:

- Wind Energy Projects

Species profile: https://ecos.fws.gov/ecp/species/6039

Rufa Red Knot *Calidris canutus rufa*	Threatened

There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions:

- Wind Energy Projects

Species profile: https://ecos.fws.gov/ecp/species/1864

AMPHIBIANS

NAME	STATUS
San Marcos Salamander *Eurycea nana*	Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/6374

Texas Blind Salamander *Eurycea rathbuni*	Endangered

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:

- Effects to water quality and quantity in the Edwards Aquifer and to surface waters in the recharge and contributing zones of the Edwards Aquifer must be considered if they adversely affect water quality and quantity in Texas blind salamander habitat

Species profile: https://ecos.fws.gov/ecp/species/5130

FISHES

NAME	STATUS
Fountain Darter *Etheostoma fonticola*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/5858

INSECTS

NAME	STATUS
[no Common Name] Beetle *Rhadine exilis*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/6942

NAME	STATUS
[no Common Name] Beetle *Rhadine infernalis* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3804	Endangered
Comal Springs Dryopid Beetle *Stygoparnus comalensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7175	Endangered
Comal Springs Riffle Beetle *Heterelmis comalensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3403	Endangered
Helotes Mold Beetle *Batrisodes venyivi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1149	Endangered
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

ARACHNIDS

NAME	STATUS
Cokendolpher Cave Harvestman *Texella cokendolpheri* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/676	Endangered
Government Canyon Bat Cave Meshweaver *Cicurina vespera* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7037	Endangered
Government Canyon Bat Cave Spider *Tayshaneta microps* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/553	Endangered
Madla Cave Meshweaver *Cicurina madla* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2467	Endangered
Robber Baron Cave Meshweaver *Cicurina baronia* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2361	Endangered

CRUSTACEANS

NAME	STATUS
Peck's Cave Amphipod *Stygobromus (=Stygonectes) pecki* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8575	Endangered

FLOWERING PLANTS

NAME	STATUS
Bracted Twistflower *Streptanthus bracteatus* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2856	Threatened
Texas Wild-rice *Zizania texana* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/805	Endangered

CRITICAL HABITATS

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
[no Common Name] Beetle *Rhadine infernalis* https://ecos.fws.gov/ecp/species/3804#crithab	Final
Bracted Twistflower *Streptanthus bracteatus* https://ecos.fws.gov/ecp/species/2856#crithab	Final

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Nicholas Sutton
Address: 350 Hills St
Address Line 2: Suite 112
City: Richland
State: WA
Zip: 99354
Email nsutton@easbio.com
Phone: 6789382429

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Air Force

From: Duncan, Hal
To: GUERRERO, MONICA J GS-11 USAF AETC 802 CES/CEIEA
Cc: Arvey, Hannah
Subject: [Non-DoD Source] JBSA Environmental Assessment
Date: Wednesday, April 13, 2022 4:22:39 PM
Attachments: image001.png

Hi Monica,

My name is Hal and I handle energy and environmental issues for Rep. Roy. I am reaching out because we received a letter regarding an upcoming EA that JBSA will be conducting on its conversion from propane to natural gas. I'd be more than happy to discuss this in more detail at your convenience.

I've copied the congressman's military affairs staffer, Hannah, for her awareness.

Best,
Hal

Hal Duncan
Legislative Assistant
Rep. Chip Roy (TX-21)
202-225-4236

CHIP ROY
U.S. CONGRESS - 21ST DISTRICT OF TEXAS

From:	GUERRERO, MONICA J GS-11 USAF AETC 802 CES/CEIEA
To:	Michael Robertson
Cc:	SCHMIDT, FRANZ J GS-13 USAF AETC 802 CES/CEI; ABDULAHAD, ELIAS GS-13 USAF AETC 802 CES/CENPE; MURDAUGH, ADAM L GS-12 USAF AETC 802 CES/CENPE
Subject:	Meeting with Congressman Chip Roy staffer 11 May
Date:	Thursday, May 19, 2022 3:15:27 PM
Attachments:	Congressman Chip Roy Natural Gas Line PowerPoint.pptx

Michael,

On Wednesday 11 May at 0830 Central Time, JBSA NEPA and Energy Management met with Congressman Chip Roy staffers, Mr. Hal Duncan and Ms. Hannah Arvey, via Microsoft Teams. We discussed the EA for Bullis Natural Gas Conversion. I've attached the PowerPoint that JBSA made for the meeting. Below is what was discussed:

- We told them a bit about the EA and the Project.
- They are on board with the project and they sympathize with how long it has taken to get the project going (10 years in the making)
- Mr. Duncan asked if the EA will end up in an EIS. I told them we don't expect it to.
- Mr. Duncan asked what organizations does JBSA coordinate with. I told them that we reach out to a lot of organization for the EA, such as TCEQ, EPA, senators, Local jurisdictions, local tribes. But for the project itself, we'll mainly coordinate with the COSA and CPS since it is a privatization project.
- Mr. Duncan asked if we expect any communities/organizations to push back on the project. I said I don't think so.
- Mr. Duncan explained that their office is reaching out because they wanted to get an understanding on what to expect from their "constituents" (i.e. if they get calls from people complaining about the project). Mr. Duncan emphasized that if we need any type of support from their office, to reach out them.
- I told them that if they have any questions or concerns about the project, then feel free to reach out to us. I said that their office will have a chance to review the EA when it's out to the public in Fall/Winter of this year. They said they'll look out for it.

Very Respectfully,

Monica Guerrero, EIT
Environmental Engineer
National Environmental Policy Act Program
802d Civil Engineer Squadron
monica.guerrero.2@us.af.mil
Comm: (210) 671-5320

502d Air Base Wing
Joint Base San Antonio

Camp Bullis Natural Gas Conversion EA

11 May 2022

Agenda

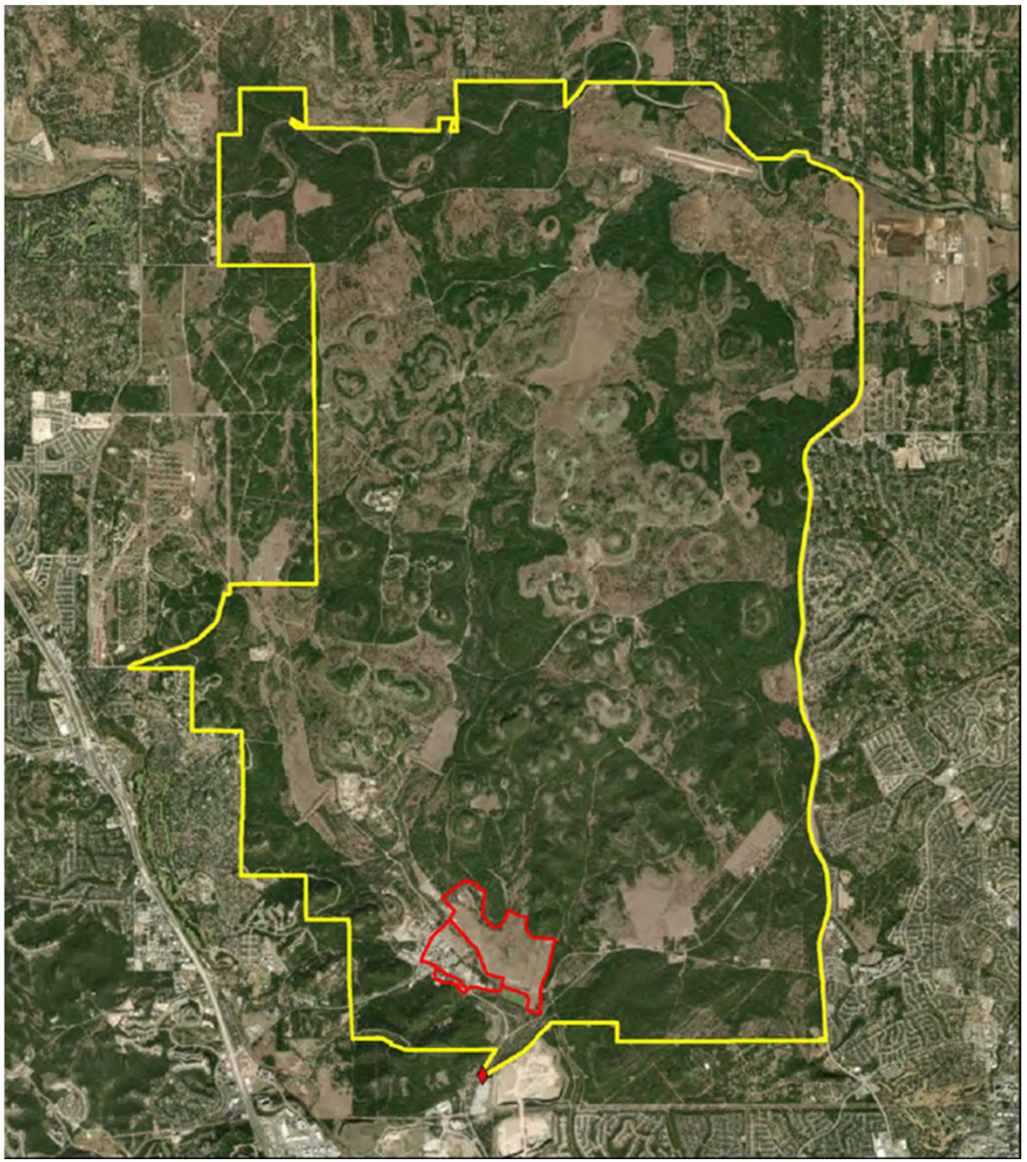
- Environmental Assessment
- Project Overview
- Project Details
- Questions and Discussion

Environmental Assessment

- Concise public document that briefly discusses the purpose and need, alternatives, and potential environmental impacts of a proposed federal action.
- Purpose is to evaluate the potential environmental consequences of the proposed action.
- Helps determine whether the Proposed Action and Alternatives result in a significant impact on the human environment.
- 40 CFR § 1501.3
- Main concern for environmental impacts:
  - Edwards Aquifer
  - Endangered bird species
  - Karst invertebrate species

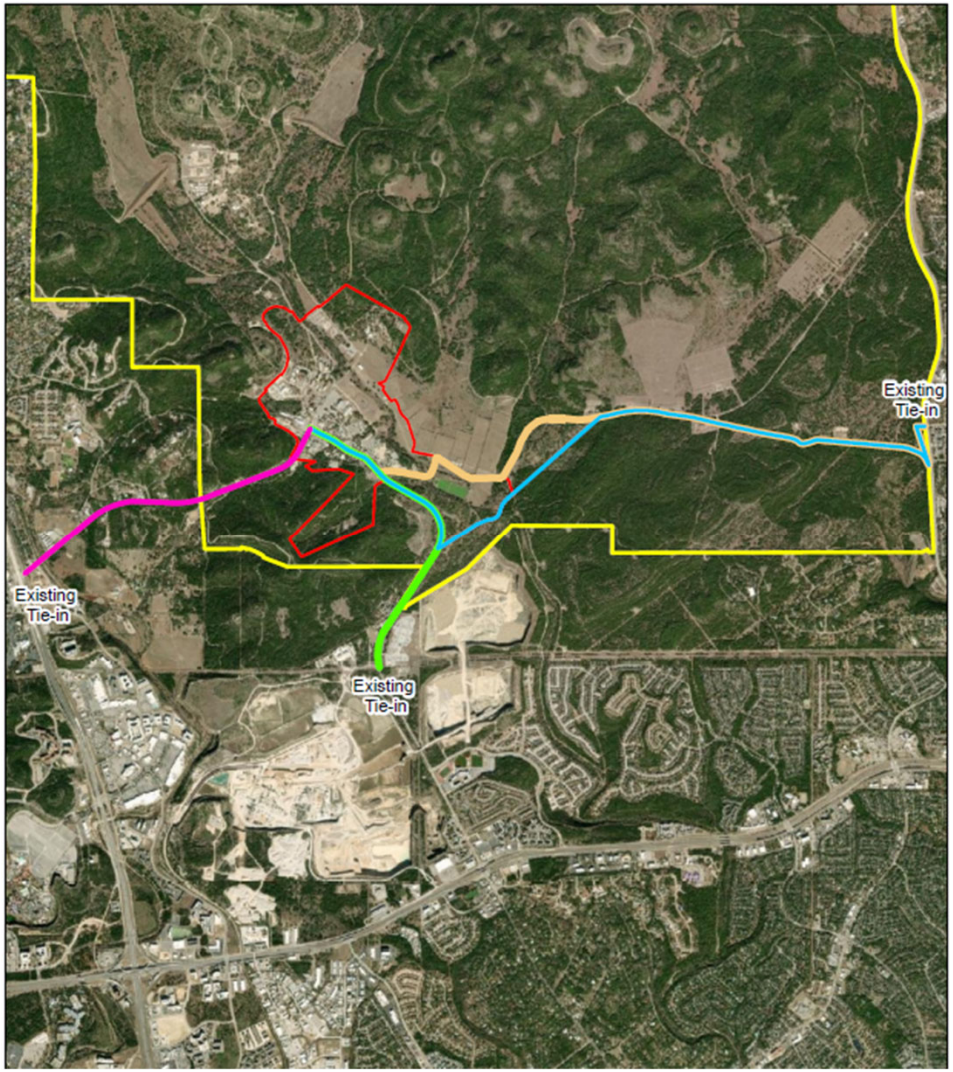
Project Overview

- Project: JBSA Camp Bullis Natural Gas Conversion Project
- Location: JBSA – Camp Bullis
- Contractor: CPS Energy
- Timing: executed 2025 – 2029
- Brief Description: Camp Bullis cantonment area buildings to be converted from propane to natural gas energy. Camp Bullis is presently utilizing propane gas via above the ground storage tanks. The desire is to convert to a natural gas system via underground pipeline infrastructure.



Project Details

One Team, One Mission: Your Success!



JBSA-BUL

Cantonment Area

Alternative 1: Camp Bullis Road

Alternative 2: NW Military Highway

Alternative 3: Wilderness Trail

Alternative 4: Wilderness Road

Questions/Discussion

- EA Coordinator: Monica Guerrero, monica.guerrero.2@us.af.mil
- Lead Utility Manager: Adam Murdaugh, adam.murdaugh.1@us.af.mil
- Energy Management Chief: Elias Abdulahad, elias.abdulahad@us.af.mil

-----Original Message-----
From: Phillip Covington (Parks) <Phillip.Covington@sanantonio.gov> Sent: Thursday, May 26, 2022 3:13 PM
To: GUERRERO, MONICA J GS-11 USAF AETC 802 CES/CEIEA <monica.guerrero.2@us.af.mil>
Subject: [Non-DoD Source] JBSA-BUL Environmental Assessment

Hi Monica,

The City of San Antonio's Parks and Recreation Department received the attached correspondence in the mail last week.

We have no immediate concerns regarding the proposed installation of the natural gas pipeline, but we would request to be contacted in the event that Alternative #2 is considered as it appears this route could potentially impact the frontage to Eisenhower Park.

Please feel free to contact me directly with any questions/concerns. Thanks very much!

Best,

Phillip A. Covington, III
Special Projects Manager
Edwards Aquifer Protection Program

City of San Antonio
Parks and Recreation Department
5800 Historic Old Highway 90 West
San Antonio, Texas 78227

Office: 210.207.3003
Fax: 210.207.8444

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 2, 2022

Ms. Monica Guerrero
Environmental Compliance
U.S. Air Force – 802d CES/CEIE
1555 Gott Street
JBSA-Lackland, TX 78236-5645

Via: **E-mail**

Re: **TCEQ NEPA Request #2022-045. Installation of JBSA-BUL Below-Ground Natural Gas Pipeline. Bexar County.**

Dear Ms. Guerrero,

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers the following comments:

In accordance with the general conformity regulations in 40 CFR Part 93, this proposed action was reviewed for air quality impact. The proposed action is located in Bexar County, which is designated nonattainment for the ozone National Ambient Air Quality Standards (NAAQS) with a classification of marginal and proposed reclassification by the United States Environmental Protection Agency to moderate. General conformity requirements apply.

Volatile organic compounds (VOC) and nitrogen oxides (NOX) are precursor pollutants that lead to the formation of ozone. A general conformity demonstration may be required when the total projected direct and indirect VOC or NOX emissions from an applicable action are equal to or exceed the de minimis emissions level, which is 100 tons per year (tpy) for ozone NAAQS marginal nonattainment areas. Based on the information provided, the emissions from this proposed action are expected to be below the general conformity de minimis threshold and are not anticipated to impact the state implementation plan.

We recommend the environmental assessment address actions that will be taken to prevent surface and groundwater contamination.

The proposed project is within the Edwards Aquifer Contributing Zone as defined in Title 30, Texas Administrative Code, Chapter 213. Based on the nature of the proposed activity, pollution control measures would be required under these rules to protect the Edwards Aquifer. In developing the Environmental Assessment, the applicant should address the Edwards Aquifer Protection rules (30 TAC 213), including appropriate water pollution abatement structures and best management practices.

The management of industrial and hazardous waste at the site including waste treatment, processing, storage and/or disposal is subject to state and federal regulations. Construction and Demolition waste must be sent for recycling or disposal at a facility authorized by the TCEQ. Special waste authorization may be required for the disposal of asbestos containing material.

TCEQ Industrial Hazardous Waste (IHW) Permit No. 50335 sets out specific corrective action or remedial requirements for the Solid Waste Management Unit (SWMU) 10 - Landfill 12, outlined in Compliance Plan (CP) Table VIII, which may be impacted by the proposed

construction/redevelopment activities. The Remediation Division recommends that the environmental assessment take this into consideration.

Thank you for the opportunity to review this project. If you have any questions, please contact the agency NEPA coordinator at (512) 239-2619 or NEPA@tceq.texas.gov

Sincerely,

Ryan Vise,
Division Director
External Relations

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Chairman
Lake Jackson

Dick Scott
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Houston

Robert L. "Bobby" Patton, Jr.
Fort Worth

Travis B. "Blake" Rowling
Dallas

Lee M. Bass
Chairman-Emeritus
Fort Worth

T. Dan Friedkin
Chairman-Emeritus
Houston

Carter P. Smith
Executive Director

May 9, 2022

Monica Guerrero
802d CES/CEIE-Environmental Compliance
155 Gott Street, Building 5595
JBSA-Lackland, TX 78236

RE: Environmental Assessment preparation for conversion from propane to natural gas energy, Joint Base San Antonio, Bullis, Bexar County, Texas

Dear Ms. Guerrero:

Texas Parks and Wildlife Department (TPWD) has received the review request for the proposed project referenced above. The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) per the National Environmental Policy Act (NEPA).

Project Description

The proposed project would covert Joint Base San Antonio, Bullis (JBSA-BUL) from propane to natural gas energy. The conversion would require the construction and installation of a below-ground natural gas pipeline from a privately operated main line through JBSA-BUL to the cantonment; construction, trenching, and excavation of new raturel gas pipeline infrastructure; and deactivation and removal or in-place demolition of the existing propane system infrastructure. Multiple pipeline route alternatives were initially considered; the Air Force has selected two alternative pipeline routes to evaluate in detail in the EA.

TPWD has reviewed the project information provided and offers the following comments and recommendations.

General Construction Recommendations

General information regarding beneficial management practices (BMPs) that would be implemented during construction were not included in the project information provided to TPWD. To assist in project planning, TPWD provides the following general construction recommendations.

Recommendation: In general, TPWD recommends the judicious use and placement of sediment control fence to exclude wildlife from discrete areas that would be disturbed by trenching or excavating, particularly in project areas located immediately adjacent to undeveloped tracts that may provide suitable habitat for wildlife. In many cases, sediment control fence placement for the purposes of controlling erosion and protecting water quality can be modified minimally to also provide the benefit of excluding wildlife access to

construction areas. The exclusion fence should be buried at least six inches and be at least 24 inches high. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed sites have been revegetated. Construction personnel should be encouraged to examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities.

Recommendation: TPWD recommends that any open trenches or excavated areas be covered overnight and/or inspected every morning to ensure no wildlife species have been trapped. If covering trenches or excavated areas is not feasible, escape ramps fashioned from soil or boards should be installed at an angle of less than 45 degrees (1:1) in trenches and excavated areas that will allow wildlife to climb out on their own.

Recommendation: For soil stabilization and/or revegetation of disturbed areas within the proposed project areas, if applicable, TPWD recommends erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. Because the mesh found in many erosion control blankets or mats pose an entanglement hazard to wildlife, TPWD recommends the use of no-till drilling, hydromulching and/or hydroseeding due to a reduced risk to wildlife. If erosion control blankets or mats would be used, the product should contain no netting or contain loosely woven, natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic mesh matting and hydromulch containing microplastics should be avoided.

Federal Regulations

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits taking, attempting to take, capturing, killing, selling, purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts, or nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The U.S. Fish and Wildlife Service (USFWS) Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

The diversity of habitats within JBSA-BUL is suitable to support a diversity of wildlife species. In particular, the range of habitats provides areas of cover, feeding, nesting, and loafing for many species of birds including grassland birds, Neo-tropical migrants, and raptors. Additionally, the project area is in the middle of the Central Migratory Flyway through which millions of birds pass during spring and fall migration.

Based on the information provided, it appears that both alternative routes to be considered in the EA are located primarily within or adjacent to Ashe juniper and oak woodlands. Ashe juniper and oak woodlands provide suitable nesting, feeding, loafing and cover habitat for birds.

Recommendation: TPWD recommends that any necessary vegetation clearing or soil excavation within the project areas or in areas needed to provide heavy equipment access to the proposed pipeline installation sites be scheduled to occur outside of the March 15 through September 15 migratory bird nesting season. Contractors should be made aware of the potential of encountering migratory birds (either nesting or wintering) in the proposed project site and be instructed to avoid negatively impacting them.

If vegetation clearing must be scheduled to occur during the nesting season, TPWD recommends the vegetation to be impacted should be surveyed for active nests by a qualified biologist. Nest surveys should be conducted no more than five days prior to scheduled clearing to ensure recently constructed nests are identified. If active nests are observed during surveys, TPWD recommends a 100-foot radius buffer of vegetation remain around nests until eggs have hatched and the young have fledged; however, the size of the buffer zone is dependent on various factors and can be coordinated with the local or regional USFWS office.

Clean Water Act

Section 404 of the Clean Water Act (CWA) establishes a federal program to regulate the discharge of dredged and fill material into the waters of the U.S., including wetlands. The U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (USEPA) are responsible for making jurisdictional determinations and regulating wetlands and other waters under Section 404 of the CWA.

Waterways and wetlands, regardless of their jurisdictional status, generally provide valuable habitat for wildlife and protect waterways from sediment loads in runoff water. Such habitats are priority habitat types targeted for conservation by TPWD across the state.

The general project area includes creeks and unnamed tributaries that may be jurisdictional. Construction activities associated with the pipeline installation may be subject to the CWA.

Recommendation: TPWD recommends avoiding or minimizing fill impacts to wetlands or other waters of the U.S. by boring under aquatic habitats. Bore entrance and exit pits should be located outside of the vegetated riparian corridors whenever possible. Additionally, TPWD recommends consulting

with the regulatory branch of the USACE pursuant to the CWA, including jurisdictional determinations, delineations, and mitigation. The USACE-Fort Worth District Regulatory Division should be contacted for more information on impacts to wetlands, permitting, and mitigation requirements.

State Regulations

Parks and Wildlife Code – Chapter 64, Birds

State law prohibits any take or possession of nongame birds, including their eggs and nests. Laws and regulations pertaining to state-protection of nongame birds are contained in chapter 64 of the Texas Parks and Wildlife Code (PWC); specifically, section 64.002 provides that no person may catch, kill, injure, pursue, or possess a bird that is not a game bird. PWC section 64.003, regarding destroying nests or eggs, provides that, no person may destroy or take the nests, eggs, or young and any wild game bird, wild bird, or wild fowl. PWC chapter 64 does not allow for incidental take.

Recommendation: Please review the *Federal Regulations: Migratory Bird Treaty Act* section above for recommendations as they are applicable for chapter 64 of the PWC compliance.

Parks and Wildlife Code, Section 68.015

TPW Code regulates state-listed threatened and endangered animal species. The capture, trap, take, or killing of state-listed threatened and endangered animal species is unlawful unless expressly authorized under a permit issued by the USFWS or TPWD. A copy of *TPWD Guidelines for Protection of State-Listed Species*, which includes a list of penalties for take of species, can be found on the TPWD Wildlife Habitat Assessment Program website. State-listed species may only be handled by persons with appropriate authorization from the TPWD Wildlife Permits Office. For more information regarding Wildlife Permits, please contact the Wildlife Permits Office at (512) 389-4647.

The potential occurrence of state-listed species in the project area is primarily dependent upon the availability of suitable habitat. Direct impacts to high quality or suitable habitat therefore are directly proportional to the magnitude and potential to directly impact state-listed species. State-listed amphibians and reptiles that are typically slow moving or unable to move due to cool temperatures are especially susceptible to being directly impacted during vegetation clearing, site preparation, and working in aquatic environments.

Recommendation: Please review the TPWD county list for Bexar County, as rare and protected species could be present, depending on habitat availability. TPWD's Annotated County Lists are available online using the

TPWD Rare, Threatened, and Endangered Species of Texas (RTEST) web application. The potential occurrence of state-listed and species of greatest conservation need (SGCN) and the probability of potential impacts from the project should be evaluated in the EA being prepared

Based on the potential locations of the proposed pipeline installation, there is potential to encounter state-listed species, particularly amphibians, in the project areas. Also, small wildlife such as lizards, tortoises, and snakes are susceptible to falling into open pits, trenches, bore holes, etc. left open and/or uncovered in a project area. The following BMPs are provided to assist in project planning to avoid and/or minimize potential impacts to wildlife.

Amphibians

Observations of the Cascade Caverns salamander (*Eurycea latitans*) and the Texas salamander (*E. neotenes*) have been documented in the Texas Natural Diversity Database (TXNDD) near the project area. The two state-listed salamander species may occur in springs, streams, and caves with rocky or cobble beds

Recommendation: Contractors should be made aware of the potential to encounter state-listed amphibians in or near project areas and should be instructed to avoid negatively impacting them if encountered. Near water sources, TPWD recommends the EA being prepared include plans to minimize impacts to adjacent vegetation and install appropriate erosion control BMPs. Additionally, TPWD recommends locating staging areas and fuels or other hazardous chemicals away from water bodies to avoid potential spills or leaks into adjacent aquatic areas.

Species of Greatest Conservation Need

In addition to state- and federally-protected species, TPWD tracks species considered to be Species of Greatest Conservation need (SGCN) that, due to limited distributions and/or declining populations, face threat of extirpation or extinction but currently lack the legal protection given to threatened or endangered species. Special landscape features, natural communities, and SGCN are rare resources for which TPWD actively promotes conservation, and TPWD considers it important to evaluate and, if necessary, minimize impacts to such resources to reduce the likelihood of endangerment and preclude the need to list SGCN as threatened or endangered in the future. These species and communities are tracked in the TXNDD. The most current and accurate TXNDD data can be requested from the TXNDD website.

Please note that the absence of TXNDD information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of

rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. This information cannot be substituted for on-the-ground surveys.

> **Recommendation:** Please review the current TPWD county list for Bexar County as rare and protected species could be present, depending on habitat availability. If during construction, the project area is found to contain SGCN or protected species, natural plant communities, or special features, TPWD recommends that precautions be taken to avoid impacts to them.

I appreciate the opportunity to review and comment on this project. Please contact me at (361) 431-6003 ext. 829 or **russell.hooten@tpwd.texas.gov** if we may be of further assistance.

Sincerely,

Russell Hooten

Russell Hooten
Wildlife Habitat Assessment Program
Wildlife Division

/rh 48410

-----Original Message-----
From: Bartels, Brian C CIV USARMY CESWF (USA)
<Brian.C.Bartels@usace.army.mil>
Sent: Monday, June 6, 2022 2:41 PM
To: GUERRERO, MONICA J GS-11 USAF AETC 802 CES/CEIEA
<monica.guerrero.2@us.af.mil>
Subject: SWF-2022-00185 (EA for proposed conversion from propane to natural gas energy pipeline at JBSA, Bullis cantonment area in Bexar County, Texas) - Additional Information Request

Ms. Guerrero:

This email is regarding information received April 11, 2022, concerning an EA for natural gas pipeline at JBSA, Bullis in Bexar County, Texas. This project has been assigned Project Number SWF-2022-00185. Please include this number in all future correspondence concerning this project.

We have reviewed this project in accordance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Under Section 404, the U. S. Army Corps of Engineers (USACE) regulates the discharge of dredged and fill material into waters of the United States (WOTUS), including wetlands. Our responsibility under Section 10 is to regulate any work in, or affecting, navigable WOTUS. Any such discharge or work would require a Department of the Army (DA) permit or authorization of a permit.

Based on the information available to us, potential waters of the U.S. (WOTUS) would be crossed for each proposed alternative route of the proposed pipeline; however, we are unable to determine whether a DA permit or permit authorization would be required because we do not have specific enough project information to discern if a discharge of dredged or fill material would occur within WOTUS (i.e., would the potential WOTUS be avoided by directional drilling?). For us to continue our evaluation of the proposed project please provide the following, where applicable:

* Detailed project description, map(s), and / or KMZ showing the specific location(s) of where construction activities intersect water features (e.g., river, stream, wetland, pond, etc.).
* Please include whether a discharge of dredged or fill material would occur within a water feature or whether the water feature would be avoided, e.g., by using horizontal directional drilling (HDD).
* For each potential project location in a WOTUS or water feature, provide the following site-specific information when applicable:
* Latitude and longitude coordinates in decimal degrees, county / parish, waterway name,
    * ecological characterization of the project location (i.e., stream type, wetland type, other type of water feature) including the NWI classification and soil series,
    * dimensions of the ordinary high-water mark (OHWM),
    * proposed method of construction (e.g., open trench, HDD, span structure, culvert, etc.),
    * type(s) and amount (in cubic yardage) of dredged / fill material proposed to be discharged below the OHWM / within wetland boundary,
    * acreages of proposed temporary and permanent impacts to WOTUS,
    * dimensions of proposed crossing(s), typical cross-section, and
    * dimensions of temporary / permanent rights-of-way.

If a discharge of dredged or fill material is not proposed to occur within WOTUS, then the Regulatory Division can issue a no-permit required letter at the request of the applicant. Additional information, including more detailed data for a jurisdictional determination might be required to complete our evaluation of your project.

We encourage you to consult with a qualified specialist (biologist, ecologist, or other specialist qualified in jurisdictional determinations) that is familiar with the Great Plains Regional Supplement to the 1987 USACE Wetlands Delineation Manual and the USACE Regulatory Program (33 CFR Parts 320-331).

Please consider the potential effects of the proposed action on cultural resources (RE: Section 106 of the National Historic Preservation Act) and federally listed threatened and endangered (T&E) species in your planning efforts. For additional information about T&E species, please contact the U.S. Fish and Wildlife Service (Arlington Field Office <https://www.fws.gov/office/arlington-ecological-services> , Austin Field Office <https://www.fws.gov/office/austin-ecological-services> , Clear Lake Field Office <https://www.fws.gov/office/texas-coastal-ecological-services/visit-us/locat ions/texas-coastal-ecological-services-field-office---clear-lake>).

We encourage you to avoid and minimize adverse impacts to streams, wetlands, and other WOTUS in planning this project. We gladly will oblige a pre-application meeting from the applicant to discuss project specifics and answer questions regarding our processes.

Please note that it is unlawful to start work without a DA permit when one is required. For more information on the USACE Regulatory Program, please reference the Fort Worth District Regulatory Branch <https://www.swf.usace.army.mil/Missions/Regulatory/> :

* Electronic submittal process <https://www.swf.usace.army.mil/Missions/Regulatory/Electronic-Submittal-Ins tructions/> ,
* General permits (NWPs / RGPs) <https://www.swf.usace.army.mil/Missions/Regulatory/Permitting/General-Permi ts/> , and
* Application submittal forms (e.g., pre-application meeting request) and templates <https://www.swf.usace.army.mil/Missions/Regulatory/Permitting/Application-S ubmittal-Forms/> .

If you have any questions about the evaluation of your submittal, please contact me at your convenience.

Brian Bartels
Regulatory Specialist, Regulatory Division-Evaluations Branch
U.S. Army Corps of Engineers (CESWF-RDE)
819 Taylor Street, Rm. 3A37
P.O. Box 17300
Fort Worth, Texas 76102-00300
M: 316-617-9534
O: 817-886-1742
brian.c.bartels@usace.army.mil

<mailto:brian.c.bartels@usace.army.mil> http://www.swf.usace.army.mil/Missions/Regulatory.aspx <http://www.swf.usace.army.mil/Missions/Regulatory.aspx>

Please refrain from sending hard-copy documents to the regulatory office unless specifically requested. Details regarding our electronic application submittal process may be viewed at: https://www.swf.usace.army.mil/Portals/47/docs/regulatory/publicnotices/2020

http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey <http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey>

From: Gray, Natasha A CIV USARMY CESWF (USA)
To: GUERRERO, MONICA J GS-11 USAF AETC 802 CES/CEIEA
Cc: Bartels, Brian C CIV USARMY CESWF (USA)
Subject: SWF-2022-00185 (Joint Base San Antonio (JBSA-Bullis) Pipeline)
Date: Monday, April 18, 2022 9:50:14 AM
Attachments: image001.emz
image002.png

Dear Ms. Guerrero:

Thank you for your letter received April 11, 2022, concerning a proposal by The United States Air Force for the construction of a natural gas pipeline located on Joint Base San Antonio, Bullis cantonment area. The project has been assigned Project Number SWF-2022-00185, please include this number in all future correspondence concerning this project.

Mr. Brian Bartels has been assigned as the regulatory project manager for your request and will be evaluating it as expeditiously as possible.

You may be contacted for additional information about your request. For your information, please refer to the Fort Worth District Regulatory Division homepage at http://www.swf.usace.army.mil/Missions/regulatory and particularly guidance on submittals at https://swf-apps.usace.army.mil/pubdata/environ/regulatory/introduction/submital.pdf and mitigation at https://www.swf.usace.army.mil/Missions/Regulatory/Permitting/Mitigation that may help you supplement your current request or prepare future requests.

If you have any questions about the evaluation of your submittal or would like to request a copy of one of the documents referenced above, please refer to our website at http://www.swf.usace.army.mil/Missions/Regulatory or contact Mr. Brian Bartels by telephone (817) 886-1742, or by email Brian.C.Bartels@usace.army.mil, and refer to your assigned project number. Please note that it is unlawful to start work without a Department of the Army permit if one is required.

Please help the regulatory program improve its service by completing the survey on the following website: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

Brandon W. Mobley
Chief, Regulatory Division

Please do not mail hard copy documents to Regulatory staff or office, unless specifically requested. For further details on corresponding with us, please view our Electronic Application Submittals

special public notice at:
https://www.swf.usace.army.mil/Portals/47/docs/regulatory/publicnotices/2020/PublicNoticeElectronicApplications.pdf?ver=2019-11-21-123723-627

USACE Fort Worth District Regulatory Division Website
http://www.swf.usace.army.mil/Missions/Regulatory.aspx

Please assist us in better serving you by completing the survey at the following website:
https://regulatory.ops.usace.army.mil/customer-service-survey/

From: Robinson, Donelle M
To: GUERRERO, MONICA J GS-11 USAF AETC 802 CES/CEIEA
Cc: Williams, Christina
Subject: [Non-DoD Source] Environmental Assessment for Joint Base San Antonio, Bullis
Date: Monday, April 25, 2022 11:49:32 AM

Dear Monica Guerrerro,

The U.S. Fish and Wildlife Service (Service) received your letter regarding the draft Environmental Assessment for the proposed conversion from propane to natural gas energy to service Joint Base San Antonio, Bullis cantonment area April 8, 2022. We received the letter on April 18.

Your letter states that you are seeking consultation with our office, but additional information is needed to initiate consultation. Please note that your agency must make the determination regarding the type of consultation that is needed, and then we can concur or not with the effects for the species considered. Note that we do not consult on determinations of "no effect." A determination of "may affect, not likely to adversely affect" indicates that the effects on listed species are discountable (extremely unlikely to occur), insignificant (so small they cannot be meaningfully measured, detected or evaluated), or wholly beneficial (all effects benefit the species and/or critical habitat).

If consultation is being requested using the Environmental Assessment as the biological assessment, this should be stated along with the type of consultation requested. Although you requested we respond within 30 days, the timeframes for consultation can only begin once there is sufficient information to initiate consultation, and we will need additional information, as noted below. These timeframes are 60 days for an informal consultation and 90 days for a formal consultation, with an additional 45 days after formal consultation concludes to finish the biological opinion. However, the biological assessment may be separate from the Environmental Assessment and might not affect the environmental impact analysis timeframe.

If you are using the Environmental Assessment for the biological assessment, the document must contain all of the information necessary to include in a biological assessment. The actions must be fully described as well as the effects of the action on each species. Each species should be considered separately as the effects may not be the same, and relevant information for each species should also be included, such as whether habitat exists, and how much habitat exists, in the area being considered. Note that for karst species, if the subsurface was previously disturbed in its entirely (i.e., including the depth and width of excavations), then we would not anticipate additional effects to those areas.

For more information on section 7 consultation procedures, please refer to the regulations here https://www.ecfr.gov/current/title-50/chapter-IV/subchapter-A/part-402, which also include the list of components of a biological assessment. Please let me know if you have any questions or would like to discuss this.

Sincerely,

Donelle Robinson, Ph.D.
Fish and Wildlife Biologist
Consultations and HCPs
U.S. Fish and Wildlife Service
Austin Ecological Services Field Office
(she/her/hers)

APPENDIX B
AIR CONFORMITY APPLICABILITY MODEL ANALYSIS

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

a. Action Location:

Base: CAMP BULLIS
State: Texas
County(s): Bexar
Regulatory Area(s): San Antonio, TX

b. Action Title: BUL NGC

c. Project Number/s (if applicable):

d. Projected Action Start Date: 9 / 2025

e. Action Description:

Propane use in the cantonment also represents a security and operational risk to the military mission of JBSA-BUL. As propane requires regular delivery to replenish storage tanks (rather than by buried line), it increases the probability of a security breach where tanks or vehicles could be weaponized. Because propane tank and distribution systems are often subject to dysfunction or failure due to age, damage, or corrosion, there is more potential for operational disruptions. In a disaster scenario, where propane could not be delivered to JBSA-BUL, an operational shutdown could occur.

As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and DOD and Air Force policies, plans, and directives.

Alternative 1 – Camp Bullis Road
Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from Interstate-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL, where an existing utility line easement is in place. The on-Base portion of this route would span 0.8 mile.

Alternative 2 – NW Military Highway
Under Alternative 2, the Air Force would construct a 2-mile-long natural gas pipeline from a point along NW Military Highway, approximately 0.4 mile to the south of JBSA-BUL. The on-Base portion of this route would continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

No Action Alternative
Under the No Action Alternative, the Air Force would continue to use propane to operate facilities in the JBSA-BUL cantonment. Concerns with respect to the reliability, safety, and security of the propane distribution system would continue to pose risks to the military mission. The cost for JBSA to operate and maintain the system, including its environmental impacts, would be likely to increase in the long term. While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the effects of the Proposed Action. The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

f. Point of Contact:

Name:	J. Michael Nied, PE(WI)
Title:	Environmental Engineer/Project Manager
Organization:	Environmental Assessment Services, LLC
Email:	mnied@easbio.com
Phone Number:	(608) 797-1326

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.153	100	No
NOx	1.339	100	No
CO	1.612		
SOx	0.002		
PM 10	7.315		
PM 2.5	0.055		
Pb	0.000		
NH3	0.001		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.017	100	No
CO	4.836		
SOx	0.007		
PM 10	21.946		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2027

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.017	100	No
CO	4.836		
SOx	0.007		
PM 10	21.946		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.017	100	No
CO	4.836		
SOx	0.007		
PM 10	21.946		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.017	100	No
CO	4.836		
SOx	0.007		
PM 10	21.946		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2030

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.305	100	No
NOx	2.678	100	No
CO	3.224		
SOx	0.005		
PM 10	14.631		
PM 2.5	0.111		
Pb	0.000		
NH3	0.002		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2031 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

J. Michael Nied, PE(WI), Environmental Engineer/Project Manager — Mar 10 2025

Name, Title — **Date**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: CAMP BULLIS
State: Texas
County(s): Bexar
Regulatory Area(s): San Antonio, TX

- Action Title: BUL NGC

- Project Number/s (if applicable):

- Projected Action Start Date: 9 / 2025

- Action Purpose and Need:

The purpose of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. Pursuant to 10 USC § 2913, the Proposed Action would install a below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment. From its terminus in the central portion of the cantonment, distribution lines would be installed that branch out and connect with facilities located therein. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, efficient, cost-effective, and less-polluting energy source. Under the Proposed Action, the military members and civilians working or training at JBSA-BUL, and the residents of communities adjacent to the Base, would accrue these benefits starting in approximately 2027.

The Proposed Action is needed to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. Propane is pressurized into a liquid state for storage and transportation. Therefore, even a minor discharge creates a hazard of ignition or explosion. When used to power a building or facility, large quantities of propane must be stored in a nearby outdoor storage tank. Because of these factors, propane use increases the probability of an accidental fire or explosion in the cantonment.

- Action Description:

Propane use in the cantonment also represents a security and operational risk to the military mission of JBSA-BUL. As propane requires regular delivery to replenish storage tanks (rather than by buried line), it increases the probability of a security breach where tanks or vehicles could be weaponized. Because propane tank and distribution systems are often subject to dysfunction or failure due to age, damage, or corrosion, there is more potential for operational disruptions. In a disaster scenario, where propane could not be delivered to JBSA-BUL, an operational shutdown could occur.

As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and DOD and Air Force policies, plans, and directives.

Alternative 1 – Camp Bullis Road
Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from Interstate-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL, where an existing utility line easement is in place. The on-Base portion of this route would span 0.8 mile.

Alternative 2 – NW Military Highway
Under Alternative 2, the Air Force would construct a 2-mile-long natural gas pipeline from a point along NW Military Highway, approximately 0.4 mile to the south of JBSA-BUL. The on-Base portion of this route would

continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

No Action Alternative
Under the No Action Alternative, the Air Force would continue to use propane to operate facilities in the JBSA-BUL cantonment. Concerns with respect to the reliability, safety, and security of the propane distribution system would continue to pose risks to the military mission. The cost for JBSA to operate and maintain the system, including its environmental impacts, would be likely to increase in the long term. While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the effects of the Proposed Action. The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

- Point of Contact

Name: J. Michael Nied, PE(WI)
Title: Environmental Engineer/Project Manager
Organization: Environmental Assessment Services, LLC
Email: mnied@easbio.com
Phone Number: (608) 797-1326

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Install Main Pipe
3.	Construction / Demolition	Install Connecting pipes

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Bexar
Regulatory Area(s): San Antonio, TX

- Activity Title: Install Main Pipe

- Activity Description:
Install Main 6 inch Pipe

- Activity Start Date
Start Month: 9
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.145561
SO_x	0.017084
NO_x	10.041899
CO	12.088832

Pollutant	Total Emissions (TONs)
PM 10	62.299159
PM 2.5	0.414590
Pb	0.000000
NH_3	0.007305

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075915
N_2O	0.016057

Pollutant	Total Emissions (TONs)
CO_2	1884.547782
CO_2e	1891.228877

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075915
N_2O	0.016057

Pollutant	Total Emissions (TONs)
CO_2	1884.547782
CO_2e	1891.228877

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 9
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 60
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 53060
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33951	0.00490	2.85858	3.41896	0.15910	0.14637
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02155	0.00431	531.19419	533.01712
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.74261	529.55369
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 60
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 50560
Amount of Material to be Hauled On-Site (yd^3): 2808
Amount of Material to be Hauled Off-Site (yd^3): 2808

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.13772	589.15263
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.02637	590.04433
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location
County: Bexar
Regulatory Area(s): San Antonio, TX

- Activity Title: Install Connecting pipes

- Activity Description:
Install section 1 connecting pipes 4 inch diameters

- Activity Start Date
Start Month: 9
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.145632
SO_x	0.017086
NO_x	10.043517
CO	12.089919

Pollutant	Total Emissions (TONs)
PM 10	47.430961
PM 2.5	0.414617
Pb	0.000000
NH_3	0.007328

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075930
N_2O	0.016059

Pollutant	Total Emissions (TONs)
CO_2	1885.420131
CO_2e	1892.102275

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075930
N_2O	0.016059

Pollutant	Total Emissions (TONs)
CO_2	1885.420131
CO_2e	1892.102275

3.1 Site Grading Phase

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 60
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 50560
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33951	0.00490	2.85858	3.41896	0.15910	0.14637
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02155	0.00431	531.19419	533.01712
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
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Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

3.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower

LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.2 Trenching/Excavating Phase

3.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 60
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 28150
Amount of Material to be Hauled On-Site (yd^3): 3128
Amount of Material to be Hauled Off-Site (yd^3): 3128

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.13772	589.15263
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.02637	590.04433
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

3.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

a. Action Location:

Base: CAMP BULLIS
State: Texas
County(s): Bexar
Regulatory Area(s): San Antonio, TX

b. Action Title: BUL NGC

c. Project Number/s (if applicable):

d. Projected Action Start Date: 9 / 2025

e. Action Description:

Propane use in the cantonment also represents a security and operational risk to the military mission of JBSA-BUL. As propane requires regular delivery to replenish storage tanks (rather than by buried line), it increases the probability of a security breach where tanks or vehicles could be weaponized. Because propane tank and distribution systems are often subject to dysfunction or failure due to age, damage, or corrosion, there is more potential for operational disruptions. In a disaster scenario, where propane could not be delivered to JBSA-BUL, an operational shutdown could occur.

As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and DOD and Air Force policies, plans, and directives.

Alternative 1 – Camp Bullis Road
Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from Interstate-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL, where an existing utility line easement is in place. The on-Base portion of this route would span 0.8 mile.

Alternative 2 – NW Military Highway
Under Alternative 2, the Air Force would construct a 2-mile-long natural gas pipeline from a point along NW Military Highway, approximately 0.4 mile to the south of JBSA-BUL. The on-Base portion of this route would continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

No Action Alternative
Under the No Action Alternative, the Air Force would continue to use propane to operate facilities in the JBSA-BUL cantonment. Concerns with respect to the reliability, safety, and security of the propane distribution system would continue to pose risks to the military mission. The cost for JBSA to operate and maintain the system, including its environmental impacts, would be likely to increase in the long term. While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the effects of the Proposed Action. The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

f. Point of Contact:

Name:	J. Michael Nied, PE(WI)
Title:	Environmental Engineer/Project Manager
Organization:	Environmental Assessment Services, LLC
Email:	mnied@easbio.com
Phone Number:	(608) 797-1326

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.153	100	No
NOx	1.339	100	No
CO	1.612		
SOx	0.002		
PM 10	5.100		
PM 2.5	0.055		
Pb	0.000		
NH3	0.001		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.016	100	No
CO	4.835		
SOx	0.007		
PM 10	15.299		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.016	100	No
CO	4.835		
SOx	0.007		
PM 10	15.299		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.016	100	No
CO	4.835		
SOx	0.007		
PM 10	15.299		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.458	100	No
NOx	4.016	100	No
CO	4.835		
SOx	0.007		
PM 10	15.299		
PM 2.5	0.166		
Pb	0.000		
NH3	0.003		

2030

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.305	100	No
NOx	2.677	100	No
CO	3.223		
SOx	0.005		
PM 10	10.199		
PM 2.5	0.111		
Pb	0.000		
NH3	0.002		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2031 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
San Antonio, TX			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

J. Michael Nied, PE(WI), Environmental Engineer/Project Manager — Mar 10 2025

Name, Title — **Date**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: CAMP BULLIS
State: Texas
County(s): Bexar
Regulatory Area(s): San Antonio, TX

- Action Title: BUL NGC

- Project Number/s (if applicable):

- Projected Action Start Date: 9 / 2025

- Action Purpose and Need:

The purpose of the Proposed Action is to construct and operate a natural gas distribution system with connectivity to the JBSA-BUL cantonment, where most of the Base's mission support facilities are concentrated. Pursuant to 10 USC § 2913, the Proposed Action would install a below-ground natural gas pipeline from a gas main located in proximity to JBSA-BUL to the cantonment. From its terminus in the central portion of the cantonment, distribution lines would be installed that branch out and connect with facilities located therein. A conversion to natural gas energy would accomplish multiple objectives in support of the military mission at JBSA-BUL. As compared to propane, natural gas is a more reliable, safe, secure, efficient, cost-effective, and less-polluting energy source. Under the Proposed Action, the military members and civilians working or training at JBSA-BUL, and the residents of communities adjacent to the Base, would accrue these benefits starting in approximately 2030.

The Proposed Action is needed to address mission safety, security, and operational risks associated with the propane tank and distribution system in the cantonment. Propane is pressurized into a liquid state for storage and transportation. Therefore, even a minor discharge creates a hazard of ignition or explosion. When used to power a building or facility, large quantities of propane must be stored in a nearby outdoor storage tank. Because of these factors, propane use increases the probability of an accidental fire or explosion in the cantonment.

- Action Description:

Propane use in the cantonment also represents a security and operational risk to the military mission of JBSA-BUL. As propane requires regular delivery to replenish storage tanks (rather than by buried line), it increases the probability of a security breach where tanks or vehicles could be weaponized. Because propane tank and distribution systems are often subject to dysfunction or failure due to age, damage, or corrosion, there is more potential for operational disruptions. In a disaster scenario, where propane could not be delivered to JBSA-BUL, an operational shutdown could occur.

As related to the military mission, the Proposed Action is needed to address the age, condition, and inefficient operation of the propane tank and distribution system in the cantonment. The Proposed Action would address these deficiencies in line with the energy efficiency and conservation goals set by various Executive Orders, federal statutes, and DOD and Air Force policies, plans, and directives.

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Under Alternative 1, the Air Force would construct a 2-mile-long natural gas pipeline from Interstate-10 via Camp Bullis Road. Approximately 1.2 miles of this route lies outside the boundary of JBSA-BUL, where an existing utility line easement is in place. The on-Base portion of this route would span 0.8 mile.

Alternative 2 – NW Military Highway
Under Alternative 2, the Air Force would construct a 2-mile-long natural gas pipeline from a point along NW Military Highway, approximately 0.4 mile to the south of JBSA-BUL. The on-Base portion of this route would

continue along NW Military Highway for 0.4 mile. This route would then connect to the cantonment via Wilderness Road (0.6 mile) to Wilderness Trail Road (0.5 mile).

No Action Alternative
Under the No Action Alternative, the Air Force would continue to use propane to operate facilities in the JBSA-BUL cantonment. Concerns with respect to the reliability, safety, and security of the propane distribution system would continue to pose risks to the military mission. The cost for JBSA to operate and maintain the system, including its environmental impacts, would be likely to increase in the long term. While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the effects of the Proposed Action. The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

- Point of Contact

Name: J. Michael Nied, PE(WI)
Title: Environmental Engineer/Project Manager
Organization: Environmental Assessment Services, LLC
Email: mnied@easbio.com
Phone Number: (608) 797-1326

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Install Main Pipe Alt 2
3.	Construction / Demolition	Install Connecting pipes

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Bexar
Regulatory Area(s): San Antonio, TX

- Activity Title: Install Main Pipe Alt 2

- Activity Description:
Install Main 6 inch Pipe

- Activity Start Date
Start Month: 9
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.145332
SO_x	0.017074
NO_x	10.036690
CO	12.085335

Pollutant	Total Emissions (TONs)
PM 10	40.142959
PM 2.5	0.414503
Pb	0.000000
NH_3	0.007232

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075867
N_2O	0.016049

Pollutant	Total Emissions (TONs)
CO_2	1881.739908
CO_2e	1888.417628

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075867
N_2O	0.016049

Pollutant	Total Emissions (TONs)
CO_2	1881.739908
CO_2e	1888.417628

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 60
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 34500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33951	0.00490	2.85858	3.41896	0.15910	0.14637
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02155	0.00431	531.19419	533.01712
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.74261	529.55369
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 60
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 32000
Amount of Material to be Hauled On-Site (yd^3): 1778
Amount of Material to be Hauled Off-Site (yd^3): 1778

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.13772	589.15263
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.02637	590.04433
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH_3
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location
County: Bexar
Regulatory Area(s): San Antonio, TX

- Activity Title: Install Connecting pipes

- Activity Description:
Install section 1 connecting pipes 4 inch diameters

- Activity Start Date
Start Month: 9
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.145632
SO_x	0.017086
NO_x	10.043517
CO	12.089919

Pollutant	Total Emissions (TONs)
PM 10	36.352908
PM 2.5	0.414617
Pb	0.000000
NH_3	0.007328

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075930
N_2O	0.016059

Pollutant	Total Emissions (TONs)
CO_2	1885.420131
CO_2e	1892.102275

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.075930
N_2O	0.016059

Pollutant	Total Emissions (TONs)
CO_2	1885.420131
CO_2e	1892.102275

3.1 Site Grading Phase

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 60
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 32000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.33951	0.00490	2.85858	3.41896	0.15910	0.14637
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.29762	0.00487	2.89075	3.51214	0.17229	0.15851
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02155	0.00431	531.19419	533.01712
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.74261	529.55369
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

3.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower

LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.2 Trenching/Excavating Phase

3.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 60
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 28150
Amount of Material to be Hauled On-Site (yd^3): 3128
Amount of Material to be Hauled Off-Site (yd^3): 3128

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.40191	0.00542	3.44643	4.21104	0.10704	0.09848
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.49122	0.00542	3.71341	4.67487	0.13603	0.12515
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02382	0.00476	587.13772	589.15263
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	588.02637	590.04433
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**NH_3**
LDGV	0.19688	0.00204	0.09352	3.14915	0.00341	0.00302	0.02398
LDGT	0.20780	0.00265	0.16826	3.54472	0.00466	0.00412	0.02560
HDGV	0.88960	0.00607	0.81696	13.49656	0.02221	0.01964	0.05118
LDDV	0.05923	0.00104	0.08015	3.47300	0.00257	0.00236	0.00816
LDDT	0.06429	0.00121	0.11899	2.35671	0.00318	0.00293	0.00853
HDDV	0.10067	0.00415	2.29325	1.53993	0.04152	0.03820	0.03216
MC	2.75789	0.00258	0.61961	12.22082	0.02261	0.02000	0.05397

- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
LDGV	0.01182	0.00456	306.50237	308.15391
LDGT	0.01429	0.00679	398.33566	400.71377
HDGV	0.06576	0.02785	913.82042	923.75244
LDDV	0.03309	0.00067	311.24898	312.27599
LDDT	0.02488	0.00098	361.99793	362.91230
HDDV	0.02133	0.00320	1236.32275	1237.80847
MC	0.11564	0.00295	389.00462	392.77426

3.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons