INITIAL STUDY

PROJECT TITLE: Permit Renewal for Explosive Ordnance Disposal Range		CALSTARS CODING: 24315-300244-50-71
PROJECT ADDRESS: Vandenberg Air Force Base	CITY: Vandenberg Air Force Base	COUNTY: Santa Barbara
PROJECT SPONSOR: Vandenberg Air Force Base	CONTACT: Kevin Case	PHONE: (805) 606-3919

APPROVAL ACTION UNDER CONSIDERATION BY DTSC:

☐ Initial Permit Issuance ☒ Permit Renewal ☐ Permit Modification ☐ Closure Plan
☐ Removal Action Workplan ☐ Remedial Action Plan ☐ Interim Removal ☐ Regulations
☐ Other (specify):

STATUTORY AUTHORITY:

☒ California H&SC, Chap. 6.5 ☐ California H&SC, Chap. 6.8 ☐ Other (specify):

DTSC PROGRAM/ ADDRESS: 9211 Oakdale Avenue, Chatsworth, CA 91311	CONTACT: Mike Eshaghian	PHONE: (818) 717-6679

PROJECT DESCRIPTION:

SITE DESCRIPTION - The Explosive Ordnance Disposal (EOD) Range is located west of the airfield runways on the northern portion of Vandenberg AFB, California (Figure 1). Defined by a 2,500-foot diameter circular boundary, the EOD Range is approximately 1 mile west of the intersection of Mira and Tangair Roads and 300 feet south of Mira Road (Figure 2). Most of the area defined by this boundary (approximately 1.5 acres) is designated as a buffer zone for safety reasons; the active portion of the range consists of a graded area approximately 200 feet in diameter and directly west of Building 1560. Building 1560 is an earth reinforced bunker used for personnel protection during disposal operations.

EOD RANGE OPERATIONS

The proposed Permit Renewal is for the EOD Range operations at the Vandenberg Air Force Base (AFB). The EOD Range receives unexploded propellant, explosive, and pyrotechnic (PEP) materials. These materials include obsolete ordnance, explosive waste from training operations, materials with an expired shelf life, or explosive waste discovered on base. The PEP materials are detonated in the open at the site, which has been used for this purpose since 1945. Detonations are conducted at a point approximately in the center of the graded area. The EOD Range operations are regulated under the RCRA Part B Permit. In order to allow maximum flexibility for range operations, the previous permit specifies a maximum of 250 pounds of cased (fragment-producing) explosive or 500 pounds of non–fragment-producing explosive per detonation, or 500 pounds of explosive per day, or 1,500 pounds of explosive per month, or 8,000 pounds of explosive per year.

There are no physical structures or treatment equipment involved in the detonation operation. Every batch of PEP materials that is detonated is carefully prepared, consistent with the Department of Defense (DoD) ordnance disposal technical orders, by highly trained EOD specialists. Since the objective is the complete destruction of the item being detonated, EOD personnel are trained to use ample quantities of the donor charge (i.e., C-4 plastic explosive). Generally, no undetonated materials remain. Any remaining undetonated PEP materials would be detonated again to ensure complete destruction. When the operation is complete there is nothing left except a small crater at the detonation point. Explosive safety requirements established by DoD agencies minimize the potential for any type of mishap. EOD Range operations dictate that no explosives, other than those being disposed of, are located on the site during the disposal activity.

Routine detonations are conducted approximately one to two events per month, and each detonation uses approximately 33 pounds of C-4 explosive. These detonations are conducted on the ground, and sufficient explosive is used so that no visible trace of the items being destroyed remains after the detonation. The explosives are placed such that the force of the explosion is downward into the item being destroyed and into the

ground. Generally, the only material thrown upward by the explosions is soil. These explosions create small craters (approximately 2 feet across and 1 foot deep) in the ground. The craters are filled in during re-grading activities, which occur two or three times per year.

In addition to the monthly detonations using C4, twice a year a simulated truck bomb is exploded at the EOD Range for the training purposes which is not a regulated activity and is not part of this permit. The "truck bombs" use a mixture of ammonium nitrate and fuel oil as the explosive. Vehicles (trucks) are obtained from the Defense Reutilization and Marketing Office (DRMO) and taken to Transportation where all fluids are drained and hazardous materials such as batteries are removed. The vehicles are then towed to the Range where the explosives are placed in them and detonated. Because these detonations are above the ground and not directed, they do not create craters and result in debris being thrown several hundred feet. The debris is later gathered and disposed of as scrap at DRMO.

ENVIRONMENTAL IMPACT ANALYSIS:

It is anticipated that EOD operations at the range will continue at much the same level as they have over the last few years. Specifically, there will be one to two EOD detonation events per month. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. Implementation of the following current practices is anticipated to preclude any adverse environmental impacts:

- Retaining the EOD Range at its current size and configuration would avoid any impacts to visual resources/aesthetics, agriculture resources, biological resources, cultural resources, geological resources, hydrology and water quality, land use and planning, mineral resources, noise, recreation, and utilities and service systems.

- Continuing the frequency of operations at the EOD Range at their current level would avoid any impacts to air quality, hydrology and water quality, noise, population and housing, public services, transportation and traffic

- Adherence to current safety and operational procedures at the range would preclude any hazards and hazardous materials impacts.

1. Aesthetics

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Visual resources include natural and man-made features that give a particular environment its aesthetic qualities. Evaluation of effects from an operation on visual resources considers visual sensitivity, which is the degree of public interest in a visual resource and concern over adverse changes in the quality of the resource.

Vandenberg AFB encompasses 35 miles of coastline along the Pacific Ocean, including rocky headlands, coastal bluffs, and sandy beaches. A large dune complex, rolling hills, erosional valleys, and a broad sweeping mesa are found on North Base while the Transverse Range is a major mountain feature on South Base. Man-made elements are located throughout the base. Space and missile launch complexes are located near the coast, and radar towers, telemetry stations, and supporting utilities are distributed widely. The nearby urbanized cantonment area and the airfield represent the developed core of the base. However, even in the cantonment area, open space accounts for a large portion of the land use.

The marine traffic off the western border of Vandenberg AFB consists primarily of fishing vessels and occasional pleasure boats. Visibility from the ocean is limited. Passenger railroad traffic provides the closest views of the area; about four passengers and eight freight trains pass through Vandenberg AFB daily. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event.EOD Range activity averages 1 to 2 events per month.

Analysis as to whether or not project activities would:

a. Have a substantial adverse effect on a scenic vista.

Impact Analysis:
The EOD Range is located on a relatively flat portion of land in a remote area of Vandenberg AFB. For this reason, operations at the range do not have any adverse effect on a scenic vista, cause any substantial damage to scenic resources (e.g., trees, rock outcroppings, and historic buildings within a state scenic highway), or substantially degrade the existing visual character or quality of the site and its surroundings.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway.

Impact Analysis:
As noted above in subsection (a), the EOD Range is located on a relatively flat area south of Mira Road and southwest of the airfield area. Most of the range is at an elevation of about 300 feet above mean sea level. South of the range the terrain slopes down to Cañada Tortuga Creek. The range itself is in a fairly remote location and is not visible from the cantonment area or the ocean.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Substantially degrade the existing visual character or quality of the site and its surroundings.

Impact Analysis:
The visual environment in the vicinity of Vandenberg AFB is varied, contains historic vistas and natural viewsheds, and is characterized by rolling hills covered with chaparral and oak trees, valleys used for grazing or more intensive agriculture, and urbanized areas of the Lompoc Valley. Topography is largely dominated by the east-west–trending Santa Ynez Mountains, which narrow toward the coast and terminate at Point Arguello. Views of the coastline are generally not available from inland locations due to access limitations and intervening topography.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Create a new source of substantial light of glare that would adversely affect day or nighttime views in the area.

Impact Analysis:
Operations at the range are conducted during daylight hours (between dawn and dusk). There are no permanently installed lighting fixtures at the facility. Because of its remote location, any lighting used at the EOD Range is unlikely to be visible outside the base. Therefore the EOD Range does not represent a source of substantial light or glare that would adversely affect any daytime or nighttime views in the area.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

2. Agricultural Resources

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Description of Baseline Environmental Conditions: Open space on Vandenberg AFB, when topography and natural resource management allows, is frequently outleased for cattle grazing or farming. Approximately 23,600 acres of rangeland is suitable and available for these purposes and is permitted to the Bureau of Prisons, U.S. Penitentiary at Lompoc. This rangeland is divided into six management units: Point Sal, San Antonio, Santa Lucia, Surf, Honda, and Sudden.

About 1,104 acres of land are available for dryland farming (Vandenberg AFB 2000e). Crops grown on base include beans and barley; whenever possible, the crops are rotated. This farmland falls under the definition of Prime and Unique Farmland. Areas of outleased farmland are located along Point Sal Road, San Antonio Creek, the Santa Ynez River, and Ocean Avenue. The nearest farmland to the EOD Range is approximately 1.3 miles to the southeast.

The remaining acreage (approximately 22,496 acres) is used by the Bureau of Prisons for cattle grazing. Cattle are moved often to avoid overgrazing any portions of the rangeland and to allow plant regrowth after grazing. The grazing unit nearest the EOD Range is Surf, which is about one-quarter mile southwest of the range.

Analysis as to whether or not project activities would:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.

   Impact Analysis:
   Although approximately 1,104 acres of Vandenberg AFB are designated as Prime and Unique Farmland, the EOD Range is not located on or near any of these areas. The nearest farmland with this designation is approximately 1.3 miles from the range. Therefore, operations at the EOD Range would not convert any of these resources to non-agricultural use and do not conflict with any zoning for agricultural use. Current operations at the EOD Range do not involve any changes in the existing environment that would result in the conversion of farmland to non-agricultural use.

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☐ Less Than Significant Impact
   ☒ No Impact

b. Conflict with existing zoning or agriculture use, or Williamson Act contract.

   Impact Analysis:
   The active area of the EOD Range is designated for industrial land use. The remainder of the land within the EOD boundary is designated as open space. Land within the EOD Range boundary is also designated as an explosive safety zone. The proposed project will not conflict with nor change the existing zoning at this site.

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☐ Less Than Significant Impact
   ☒ No Impact

c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural uses.

Impact Analysis:
The subject proposed project is a permit renewal of the EOD Range portion of the Vandenberg AFB site, no changes are proposed as part of this permit renewal.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

3. Air Quality

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Existing Air Quality

The Clean Air Act (CAA) required U.S. Environmental Protection Agency (U.S. EPA) to establish ambient ceilings for certain criteria pollutants. Subsequently, U.S. EPA promulgated regulations that set National Ambient Air Quality Standards (NAAQS). Two classes of standards were established: primary and secondary. Primary standards prescribe the maximum permissible concentration in the ambient air required to protect public health. Secondary standards specify levels of air quality required to protect public welfare, including materials, soils, vegetation, and wildlife, from any known or anticipated adverse effects. The criteria pollutants for which the NAAQS have been established are sulfur dioxide, (SO_2), oxides of nitrogen (NO_x), carbon monoxide (CO), ozone (O_3), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), particulate matter 10 microns or less in diameter (PM_{10}), reactive organic compounds (ROCs), and lead (Pb).

California has also established its own air quality standards, known as the California Ambient Air Quality Standards (CAAQS). The CAAQS are generally more stringent than the NAAQS and have incorporated additional standards for sulfates (SO_4), hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter.

The U.S. EPA classifies air quality within each Air Quality Control Region (AQCR) with regard to its attainment of federal primary and secondary NAAQS. According to U.S. EPA guidelines, an area with air quality better than the NAAQS for a specific pollutant is designated attainment for that pollutant. Any area not meeting ambient air quality standards is classified non-attainment. When there is a lack of data for the U.S. EPA to define an area, the area is designated unclassified and treated as an attainment area until proven otherwise. Pollutant concentrations within the Santa Barbara Air Basin atmosphere are assessed relative to the federal and state ambient air quality standards.

The Santa Barbara County Air Pollution Control District (SBCAPCD) is required to monitor air pollutant levels to ensure federal and state ambient air quality standards are met. If ambient air quality standards are not met, SBCAPCD must develop a plan (called a Clean Air Plan) to meet them. If air quality in Santa Barbara County exceeds government standards, the area is classified as an "attainment" area. If regional air quality contains pollutant levels violating these standards, the area is classified as a "non-attainment" area.

Santa Barbara County was previously classified as a moderate non-attainment area for the federal ozone standard under the federal Clean Air Act, but was reclassified as a serious non-attainment area in 1997. The county was also classified as a moderate non-attainment area for the state ozone standard. The county's 2001 Clean Air Plan documented improvements in air quality and formally requested that the U.S. EPA redesignate the county as an attainment area for the federal 1-hour ozone standard. Based on Santa Barbara County's demonstrated improvement

in air quality, on 16 June 2003, U.S. EPA signed the final rulemaking to redesignate the county as an attainment area for the 1-hour federal ozone standard. However, the county remains in non-attainment of the state 1-hour ozone standard and the state standard for PM_{10}. The 2004 Clean Air Plan addresses how Santa Barbara County will attain the state 1-hour ozone standard.

Ozone Non-attainment

Ozone is not produced directly by any pollutant source. Instead, it is formed by a reaction between nitrogen oxides and reactive organic compounds in the presence of sunlight. A reduction in ozone is dependent on a reduction in nitrogen oxides and reactive organic compound emissions. Reduction of these pollutants has the added benefit of reducing the concentration of entrained PM_{10} emissions. Reduction of PM_{10} emissions is important because Santa Barbara County is currently in violation of the state standard for PM_{10}.

Ozone concentrations are generally highest during the summer months and coincide with atmospheric inversions. At their maximum, ozone concentrations tend to be regionally distributed. This is due to the homogeneous dispersion of the precursor emissions in the atmosphere. Hence, when an inversion occurs, the mixing of the precursor pollutants is within a much smaller volume of air. In 2002, Santa Barbara County reported zero days during which the 1-hour federal standard was exceeded and three days during which the 8-hour NAAQS standard was exceeded at various monitoring stations throughout the county. The more stringent CAAQS one-hour standard was exceeded on 3 days.

Santa Barbara County's air quality historically violated both CAAQS and NAAQS for ozone. The severity of the ozone violation for the County is currently classified as "moderate" by state government. The degree to which Santa Barbara County is in non-attainment for ozone is dependent on the "design value" concentration. The design value represents the fourth highest 1-hour observed concentration during a 3-year period at any individual monitoring station.

Santa Barbara County attained the federal 1-hour ozone standard by averaging no more than one exceedance of the standard per year at any monitoring station for three consecutive years.

PM_{10} Non-attainment

Particulate matter 10 microns or less in diameter is produced either by direct emission of particulates from a source or by formation of aerosols as a result of chemical reactions in the atmosphere involving precursor pollutants. The sources of PM_{10} can also be categorized as natural (geogenic) or resulting from human activity (anthropogenic). The largest source of PM_{10} emissions in the county is entrained paved road dust. Other sources of PM_{10} emissions include dust from construction and demolition, agricultural activities, entrained road dust from unpaved roads, natural dust, and particulate matter released during combustion.

As previously mentioned, Santa Barbara County exceeds CAAQS for PM_{10}. Exceedances of the annual standard predominantly occur at the Paradise Road monitoring station. Exceedances of the 24-hour standard are more widespread across the county, although they do not occur as frequently.

EOD Range Operations

Air Force Instruction 32-7040, *Air Quality Compliance*, requires installations to comply with all federal, state, and local air quality standards. "Air quality compliance involves prevention, control, abatement, documentation, and reporting of air pollution from stationary and mobile sources" (U.S. Air Force 1994). This Air Force Instruction also requires installations to "prepare and periodically update a comprehensive base air emissions inventory." Data from the inventory are provided to federal, state, and local regulatory agencies as required or upon request.

Vandenberg AFB periodically prepares a Comprehensive Emission Inventory Report (CEIR), which is submitted to the Santa Barbara County Air Pollution Control District. The CEIR contains emissions data for the previous calendar year for stationary and mobile sources throughout the base. Explosive ordnance disposal emissions reported for calendar year 1999 are shown in Table 1.

Table 1
1999 Explosive Ordnance Disposal Emissions (in pounds)

Pollutant	Hourly	Yearly
Carbon monoxide	4.644	241.539
Subtotal for Criteria Pollutant	4.644	241.539
Cyanide Compounds	0.085	4.461
Subtotal for Hazardous Air Pollutant (Title III)	0.085	4.461
Cyanide compounds	0.085	4.461
Ammonia	0.109	5.717
Subtotal for Other Toxic Pollutant (AB 2588)	0.195	10.178

Source: Vandenberg AFB 2000b.

Because of its location within Santa Barbara County, Vandenberg AFB is subject to SBCAPCD rules and regulations. Rules that are applicable to the EOD Range operations are listed in Table 2.

Table 2
Applicable SBCAPCD Air Quality Compliance Rules

Rule	Title
Rule 202	Exemptions to Rule 201
Rule 302	Visible Emissions
Rule 304	Particulate Matter—Northern Zone
Rule 306	Dust and Fumes—Northern Zone
Rule 309	Specific Contaminants

The SBCAPCD Rule 202 specifically exempts explosive ordnance detonation operations from permitting requirements provided the aggregate emissions from the operations do not exceed 10 tons per calendar year. However, such owners/operators of these facilities are required to maintain records that clearly show the exemption threshold has not been exceeded. Based on the emissions data available for EOD operations at Vandenberg AFB, the permitting exemption applies to the EOD Range.

Analysis as to whether or not project activities would:

a. Conflict with or obstruct implementation of the applicable air quality plan.

Impact Analysis:
As noted in the Environmental Setting, the Vandenberg Air Force Base (VAFB) must comply with National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). Additionally, the VAFB falls within the Santa Barbara County Air Pollution Control District (District) which is required to monitor air pollutant levels to ensure federal and state ambient air quality standards are met. If these standards are not met, the District must develop a plan to meet them. The subject project is a permit renewal for the Explosive Ordnance Disposal Range (EOD) and related operations the activities include routine detonations of one or two per month and truck bomb training exercises which will not increase the amount of vehicle activity beyond the established baseline, therefore EOD operations will be in compliance with applicable air quality plans of the District.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Impact Analysis:
Please see the Environmental Setting for the air quality standards with which the VAFB must comply for all base operations and the response as it specifically relates to EOD operations.

The SBCAPCD Rule 202 specifically exempts explosive ordnance detonation operations from permitting requirements provided the aggregate emissions from the operations do not exceed 10 tons per calendar year. However, such owners/operators of these facilities are required to maintain records that clearly show the exemption threshold has not been exceeded. Based on the emissions data available for EOD operations at Vandenberg AFB, the permitting exemption applies to the EOD Range.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

c. Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Impact Analysis:
As noted above in the Environmental Setting, Santa Barbara County, the county in which the VAFB is located, was re-designated as an attainment area for the 1-hour federal ozone standard, but remains in non-attainment of the state 1-hour ozone standard and the state standard for PM 10. As noted, the District is required to monitor air pollutant levels to ensure federal and state ambient air quality standards are met. The subject permit renewal is for the routine EOD operations, routine detonation operations at the EOD Range do not generate ozone precursors. As such, they would not conflict with or obstruct implementation of the County's Clean Air Plan and they would not violate any air quality standard or contribute substantially to the County's non-attainment status for ozone.

The EOD Range operations are regulated under RCRA Part B Permit with specified pounds of explosives per detonation per day, month and year, there are no changes being proposed respecting these detonation range operations, therefore it is not anticipated that the proposed project will result in cumulatively considerable net increase of PM 10 emissions.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

d. Expose sensitive receptors to substantial pollutant concentrations.

Impact Analysis:
The detonation range is located more than 4 miles from the nearest off-base residents, more than 1 mile from the nearest schools or other sensitive receptors, and more than 2 miles from the nearest public airport. The subject permit renewal is not proposing any changes to routine operation and EOD procedures therefore it is not anticipated that the proposed project will result in exposure of substantial pollutant concentrations to sensitive receptors.

The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

e. Create objectionable odors affecting a substantial number of people.

Impact Analysis:
As noted the proposed permit renewal concerns the EOD Range and detonation operations, there are no objectionable odors associated with these operations, therefore no impact.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

f. Result in human exposure to Naturally Occurring Asbestos (see also Geology and Soils, f.).

Impact Analysis:
Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also

found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a toxic air contaminant by the CARB in 1986. All types of asbestos are hazardous and may cause lung disease and cancer.

Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties of the Sierra Nevada Foothills, the Klamath Mountains and Coast Ranges. Although there are recorded occurrences of naturally occurring asbestos around Santa Barbara County, none have been found to occur on the subject project site.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*
c) Department of Conservation, Geological Survey, Governor's Office of Planning and Research, "Addressing Naturally Occurring Asbestos in CEQA Documents."

4. Biological Resources

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Vegetation

Vandenberg AFB is located in a transitional ecological region that lies at the northern and southern distributional limits of many species and contains diverse biological resources of considerable importance. Fourteen major vegetation and habitat types have been described and mapped on the base (Vandenberg AFB 1996). Among these vegetation types, the major communities found near the EOD Range are Burton Mesa chaparral and nonnative grassland; small areas of seasonal shallow freshwater marsh wetlands also occur. The following descriptions of chaparral, nonnative grassland, and seasonal freshwater wetlands are adapted from the Integrated Natural Resource Management Plan (Vandenberg AFB 1996) and a recent natural resources survey near the EOD Range (Vandenberg AFB 2000d).

Chaparral

Chaparral is a dense, evergreen, and rigid form of shrubby vegetation native to the coastal areas of California. It occurs on acidic substrates including stabilized sand, granite, and metamorphosed rock types. Under increased moisture conditions, it grades into Bishop pine or tanbark oak forest types, and under drier conditions, it frequently is replaced by coastal sage scrub. Its continued reproduction and survival is closely linked with fire. Chaparral provides valuable wildlife habitat and also is important in providing vegetative cover that controls erosion, especially on steep slopes and ridges. Central Coast maritime chaparral, which includes Burton Mesa chaparral, occurs on well-drained, sandy substrates within the zone of summer coastal fog incursion (Vandenberg AFB 2000d).

Many regionally endemic species are found in chaparral on Vandenberg AFB, particularly in the Burton Mesa chaparral. A key threat to chaparral is invasion by exotic plant species, particularly iceplant and pampas grass (Vandenberg AFB 1996). Central Coast Maritime chaparral is dominated by manzanitas (*Arctostaphylos* spp.), California lilacs (*Coeanthus* spp.), and chamise (*Adenostoma fasciculatum*). This community is restricted mostly to Vandenberg AFB and its vicinity, where it is widespread and variable, found on mesas and higher ridges. It occurs on parts of the Burton Mesa, San

Antonio Terrace, Lompoc Terrace, South Base canyon slopes, and on some of the slopes of the lower Santa Ynez Mountains (Vandenberg AFB 2000d).

Central Coast maritime chaparral is a sensitive community and has the state rank of S2.2 (threatened). It is a regionally declining plant community, and much of its remaining acreage in California occurs on the base, where it also has reduced in area considerably over the years. Many regionally endemic species and special status plants are found in Central Coast maritime chaparral on Vandenberg AFB. Important special status species are Lompoc yerba santa (*Eriodictyon capitatum*), manzanitas (*Arctostaphylos rudis*, *A. purissima*, *A. tomentosa* ssp. *eastwoodiana*), seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*), black-flowered figwort (*Scrophularia atrata*), and dune larkspur (*Delphimium parryi* ssp. *blochmanieae*). Bell's sage sparrow (*Amphispiza belli belli*) is a federal species of concern that is partial to open chaparral, particularly to previously burned areas with dead snags that provide perches (Vandenberg AFB 2000d).

Nonnative Grassland

This community is dominated by introduced annual and perennial grasses. Annual grasslands are found on varying slopes, aspects, and substrates, and species composition also is variable. Dominant species include bromes (*Bromus* spp.), wild oats (*Avena* spp.), and fescues (*Vulpia* spp.). At Vandenberg AFB, this community forms the resource base for grazing leases. The perennial exotic species veldt grass (*Ehrharta calycina*) and pampas grass (*Cortaderia jubata*) also often dominate grassland areas on the base, and have invaded and degraded many native scrub communities. Grasslands, both native and nonnative, cover a substantial number of acres on Vandenberg AFB (Vandenberg AFB 1996).

Seasonal Freshwater Wetlands

Freshwater marsh typically is dominated by perennial herbs such as California bulrush (*Scirpus californicus*) and broad-leaved cattail (*Typha latifolia*), and has the state rank of S2.1 (very threatened). Marshes provide important habitat values for plants and wildlife, including several special-status species such as the federally endangered plant species Gambel's watercress (*Rorippa gambelii*), the species of concern the black-flowered figwort (*Scrophularia atrata*), the threatened California red-legged frog (*Rana aurora draytonii*), and the species of concern the western spadefoot toad (*Spea hammondii*) (Vandenberg AFB 2000d).

Wildlife

Biological surveys in areas near the EOD Range were conducted in 2000 as part of an environmental assessment for another project in the area. The species listed in Table 3 were observed either directly or indirectly (through sound, sign, or other means), and are therefore likely to occur in the area around the EOD Range.

Other bird species observed during earlier surveys include northern harrier (*Circus cyaneus*), horned lark (*Eremophilia alpestris*), and loggerhead shrike (*Lanius ludovicianus*). Herpetofauna previously observed in the vicinity of the airfield near Tangair Road include striped racer (*Masticophis lateralis*) and western toad (*Bufo boreas*).

Sensitive Biological Resources

Among the plant communities near the EOD Range, Burton Mesa chaparral (Central Coast maritime chaparral) and seasonal freshwater marsh wetlands are designated sensitive by the California Department of Fish and Game (CDFG). Central Coast maritime chaparral has the state rank of S2.2 (restricted, threatened). It is a regionally declining plant community, and much of its remaining acreage in California occurs on the base, where its area has also decreased considerably over the years. Many regionally endemic species and special status plants are found in this type of chaparral on Vandenberg AFB (Vandenberg AFB 2000c).

Freshwater marsh has a CDFG rank of S2.1 (restricted, very threatened). A unique variant of this habitat occurs in shallow depressions, flats, or swales scattered in grasslands, coastal scrub, or chaparral on the Burton Mesa. Small areas of seasonal freshwater marsh occur in shallow swales southeast of the EOD Range (see Figure 2).

Table 3
Animal Species Observed in Areas Near the EOD Range

Common Name	Scientific Name
Mammals	
Mule deer	*Odocoileus hemionus*
Coyote	*Canis latrans*
Brush rabbit	*Sylvilagus bachmani*
Pocket gopher	*Thomomys bottae*
Birds	
Anna's hummingbird	*Calypte anna*
California thrasher	*Toxostoma redivivum*
Wrentit	*Chamaea fasciata*
California towhee	*Pipilo crissalis*
Spotted towhee	*Pipilo maculatus*
Song sparrow	*Melospiza melodia*
White-crowned sparrow	*Zonotrichia leucophrys*
Western meadowlark	*Sturnnella neglecta*
Killdeer	*Charadrius vociferous*
Bewick's wren	*Thryomanes bewickii*
Savannah sparrow	*Passerculus sandwichensis*
American pipit	*Anthus rubescens*
European starling	*Sturnus vulgaris*
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Black-bellied plover	*Pluvialis squatarola*
California quail	*Callipepla californica*
Red-winged blackbird	*Agelaius phoeniceus*
Herpetofauna	
Pacific chorus frogs	*Pseudacris regilla*

Source: Vandenberg AFB 2000c.

Two rare plant species dominate the Burton Mesa chaparral in the vicinity of the EOD Range:

- Sand mesa or shagbark manzanita (*Arctostaphylos rudis*; federal species of concern, CNPS List 1B, plants that are rare or endangered in California and elsewhere).
- La Purisima manzanita (*Arctostaphylos purissima*; CNPS List 1B).

Special-status wildlife species previously recorded in the vicinity of the EOD Range include the following.

- California red-legged frog (*Rana aurora draytonii*; federally threatened).
- Mountain plover (*Charadrius montanus*; federal candidate).
- Western spadefoot toad (*Spea hammondii*; federal species of concern).
- Western burrowing owl (*Speotyto cunicularia hypugea*; federal species of concern).
- Bell's sage sparrow (*Amphispiza belli belli*; federal species of concern).

Analysis as to whether or not project activities would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

   Impact Analysis:

As noted in the Project Description, the EOD Range receives unexploded propellant, explosive, and pyrotechnic (PEP) materials. The PEP materials are detonated in the open at the site, which has been used for detonation activities since 1945. The EOD Range operations are regulated under the RCRA Part B Permit. The area is essentially devoid of vegetation and doesn't present a suitable habitat for most species. As part of routine operations at the EOD Range, the active area is bladed to prevent the growth of vegetation and reduce fire hazards. Since this area is essentially devoid of vegetation, it does not present a suitable habitat for most species. Open detonation activities, coupled with surface blading, discourages habitation by burrowing animals. Operations at the EOD Range do not appear to have interfered substantially with the movement of native or migratory wildlife.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Impact Analysis:
As previously noted, the VAFB encompasses 35 miles of coastline along the Pacific Ocean including rocky headlands, coastal bluffs, and sandy beaches. Space and missile launch complexes are located near the coast, however the cantonment area is more inland and within a large open space, south of the EOD range the terrain slopes down to Canada Tortuga Creek. As noted in the Setting, Central coast maritime chaparral is a sensitive community and is listed as threatened habitat at both the state and federal levels. It is a regionally declining plan community and much of its remaining acreage in California occurs on the base where it also has reduced in area considerably over the years. Recommendations for managing chaparral include use of existing roads, fuelbreaks, and natural barriers as firebreaks for controlled burning. To reduce the potential for soil erosion and disturbance to the natural chaparral community, which allows invasion by exotics, establishing new firebreaks should be avoided (Vandenberg AFB 1996).

Maintenance of the existing cleared area and firebreak around the EOD Range would not impact the vegetation in the area. Any future expansion of the range involving disturbance or removal of vegetation would need to be coordinated closely with state and local agencies. Disturbed areas would need to be monitored to ensure invasion by exotic plant species does not occur and to prevent erosion of sloped areas south of the range.

Vernal pools are located near the EOD Range, but are outside the area normally used for range activities and are unlikely to be affected by operations there. Range operations do not conflict with any local policies or ordinances protecting biological resources, nor do they conflict with an approved local, regional, or state habitat conservation plan.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Impact Analysis:
Freshwater marshes are found in Barka Slough and in the dune swale wetlands or slacks on the San Antonio Terrace. A unique variant of freshwater marsh habitat occurs in shallow depressions, flats, or swales scattered in grasslands, coastal scrub, or chaparral on the Burton Mesa. These areas have similar topography and associated species as vernal pools dominated by non-persistent vegetation. Such seasonal wetlands are inundated for a short period during the year. They appear to be restricted in occurrence on Vandenberg AFB, but have not been well mapped or studied. They are dominated by low-growing, persistent brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*) and cut-leaved plantain (*Plantago coronopus*) (Vandenberg AFB 2000d). Small areas of this type of wetland occur scattered in the chaparral in the vicinity of the EOD Range; they are outside the active area of the range, but are inside the range boundary, therefore no impact.

Conclusion:
☐ Potentially Significant Impact

☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact Analysis:
As noted in the Setting, various species have been observed near the EOD Range and will likely continue to be observed due around the Range site although occurrences are not likely directly on the subject EOD Range site. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event.EOD Range activity averages 1 to 2 events per month. Operations at the EOD Range do not appear to have interfered substantially with the movement of native or migratory wildlife.

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Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

e. Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Impact Analysis:
As noted above, the proposed EOD Range operations will be performed consistent with applicable local policies or ordinances respecting the protection of listed plant and animal species.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impact Analysis:
Please refer to responses noted above.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

5. Cultural Resources

Project activities likely to create an impact:

- Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Cultural Setting

Overview

The prehistory of California's central coast spans the entire Holocene and may extend back to late Pleistocene times. Various studies in the area have identified artifacts that indicate use of the area as early as 11,000 to 12,000 years ago. Given the length of time the area has been used and inhabited, there are a large number of archaeological sites at Vandenberg AFB; to date there are over 2,200 known sites on the base. These sites contain items such as plant and animal remains, stone tools, workshop areas, ceremonial rock art, and other evidence of occupation. Such archaeological sites provide important information about the culture and lifeways of the local inhabitants.

During more recent times, the Vandenberg area contained ranch houses, adobe structures, a railroad station at Surf Beach, at least three wharves, a small town, and other structures. There are few of these structures still in existence; most of them were either torn down or destroyed through natural processes. As a result, there are few standing or intact structures that have been evaluated as part of the historical architectural record (Vandenberg AFB 2000e).

The area's use as a military facility dates back to 1941, when Camp Cooke was established as an Army training facility. Camp Cooke was deactivated after World War II, then reactivated briefly in the 1950s as a training facility during the Korean War. Ultimately, the northern portion of Camp Cooke was transferred to the Air Force as Cooke AFB, and was later renamed as Vandenberg AFB.

Ethnohistory

People living in the Vandenberg AFB area prior to historic contact are grouped with the Purisimeño Chumash, one of several linguistically related members of the Chumash culture. Accounts of early explorers in the Santa Barbara Channel area indicate the Chumash people lived in large, densely populated villages with well-built structures. The total Chumash-speaking population is estimated to have been 18,500. Their culture included a hereditary form of leadership, and chiefs exercised control over more than one village, reflecting a simple chiefdom social organization. The Chumash engaged in craft specialization and maintained exchange systems (Arnold 1992; Johnson 1988).

Relatively little is known about the Chumash in the Vandenberg region. Explorers noted that villages were smaller and lacked the formal structure found in the channel area (Greenwood 1978). Approximately 22 villages were used by the Purisimeño Chumash at historic contact, with populations between 30 and 200 per village (Glassow 1996). About five ethnohistoric villages are identified by King (1984) on Vandenberg AFB, along with another five villages in the general vicinity.

Contact with early Euro American explorers, beginning with the maritime voyages of Cabrillo in A.D. 1542–1543, undoubtedly had an effect on the Chumash culture. The effect may have been profound, and some researchers have convincingly argued that Old World diseases substantially impacted Chumash populations more than 200 years before Spanish occupation began in the 1770s (Erlandson and Bartoy 1995, 1996; Preston 1996).

Unquestionably, drastic changes to Chumash lifeways resulted from the Spanish occupation that began with the Portolá expedition in A.D. 1769. The first mission in Chumash territory was established in San Luis Obispo in 1772, followed shortly thereafter by San Buenaventura (1782), Santa Barbara (1786), and La Purísima Concepción, established in 1787 in the present location of Lompoc. The Santa Ynez Mission was established in 1804. Eventually, nearly the entire Chumash population was under the mission system (Grant 1978). During the 1830s, the missions were secularized in an attempt to turn the mission centers into pueblos and make the Indians into Mexican citizens.

History

Vandenberg AFB history is divided into the Mission, Rancho, Anglo-Mexican, Americanization, Regional Culture, and Suburban periods (Palmer 1999). The Mission Period began with the early Spanish explorers and continued until 1820. Established in 1787, Mission La Purísima encompassed the area between Gaviota and Guadalupe. Farming and ranching were the primary economic activities at the Mission, which was responsible for supplying the Santa Barbara Presidio with food supplies. Missionaries also had the Chumash weave wool blankets for the Santa Barbara Presidio. In addition to sheep, crops such as wheat, barley, corn, peas, and beans were grown at Mission La Purísima. Agricultural activities primarily occurred along the major streams such as San Antonio Creek and the Santa Ynez River (Palmer 1999).

The Rancho Period of Vandenberg AFB history began in 1820 and continued until 1845 (Palmer 1999). Following secularization in 1834, the Alta California government granted former mission lands to Mexican citizens as ranchos. The EOD Range is located within what was Rancho Jesus Maria, which originally encompassed 42,184 acres and was granted to Lucas, Antonio, and Jose Olivera in 1837. Rancho Jesus Maria included lands from just south of Shuman Canyon (northern boundary) to the Santa Ynez River (southern boundary), and from the Pacific Ocean to a few kilometers east of San Antonio Terrace and Burton Mesa on the east (Tetra Tech, Inc. 1988). Lucas Olivera is thought to have constructed an adobe at the site of the Marshallia Ranch in 1837; this site is located about 4 miles northeast of the EOD Range. By 1839, Antonio and Jose Olivera had sold their part of the land grant to Jose Valenzuela, who, in 1847, sold a one-third share to Don Pedro Carrillo and a one-third share to Lewis T. Burton. Cattle ranching was the primary economic activity during the Rancho Period (Palmer 1999).

The Bear Flag Revolt and the Mexican War marked the beginning of the Anglo-Mexican Period (1845–1880). Cattle ranching continued to flourish during the early part of this period, with as many as 500,000 cattle in Santa Barbara County during the 1850s. However, severe droughts during the 1860s decimated cattle herds and less than 5,000 cattle remained in the entire county. The combination of drought and change in government from Mexican to the United States caused substantial changes in land ownership. By 1851, approximately 42 percent of the land grants were owned by non-Mexicans; by 1864, after a few years of drought, 90 percent of the southern California ranchos were mortgaged. The various shares in Rancho Jesus Maria changed hands, with Lewis Burton increasing his holdings. His son, Ben Burton, inherited all of Rancho Jesus Maria upon Burton's death in 1879. Sheep ranching and grain farming replaced the old rancho system during this period. Dairy farming became an important economic activity during this time, particularly as Swiss-Italians immigrated into the area. Early roads were established during the 1860s and 1870s to obtain supplies that were surfed in at Point Sal. Farming remained a limited activity, due in part to the difficulty of shipping to markets. Lompoc was established during this period by the Lompoc Temperance Colony (Palmer 1999).

Increased population densities characterize the Americanization Period (1880–1915). The railroad reached the area in the late 1890s, providing a more efficient means of shipping and receiving goods and supplies, which in turn increased economic activity. Ranching continued and agriculture increased, particularly with development of steam-powered threshers. Row crops became increasingly common, and sugar beets were one of the most economically important crops. Union Sugar Company had a substantial influence on economic growth in the region. Oil exploration began in earnest during this period. Union Oil began to purchase Rancho Jesus Maria property in 1903; they ultimately obtained subsurface rights to 120,000 acres in the area. Ben Burton leased the former Rancho Jesus Maria for grazing and farming during the early part of the Americanization Period. However, by 1900 the rancho was divided into four parcels and sold. These four parcels were further subdivided by 1906. Edwin Marshall formed the Jesus Maria Rancho Corporation in December of 1906; by the 1920s the Marshall Ranch encompassed 52,000 acres and prospered by raising cattle and beets. Its headquarters were constructed between 1906 and 1933 at the location of the Olivera adobe. An elaborate system of line camps and other facilities supported the ranch operations. Marshall also introduced eucalyptus trees as a potential source of commercial firewood.

Ranching and farming continued on the Marshall Ranch during the early part of the Period of Regional Culture (1915–1945). At various times, the Marshall Ranch experimented with game birds, chickens, turkeys, and purebred bulls. Grain was raised on coastal terraces, and Union Sugar purchased farm land in the San Antonio Valley from Marshall for agricultural purposes. In 1933, the Marshall family moved to the Olivera adobe, and expanded and modernized the building. A wooden-framed guest house was added in 1935 and a dude ranch operation began. The facility became known as the Marshallia Ranch and catered to Hollywood personalities. Visitors could arrive by airplane at an air strip in front of the house, and they could enjoy ranching activities, horseback riding, or tennis. The ranch was sold to Frank Long upon the death of Edwin Marshall in 1937. Cattle ranching and guest operations continued until the start of World War II, when the property was condemned for Camp Cooke. However, the army allowed the Marshallia Ranch to stay open to serve army officers. All ranching, farming, and dairy farming in the Vandenberg AFB area was substantially reduced when Camp Cooke was established in 1941. This army training facility was built on approximately 90,000 acres along the coast, and included the area of Rancho Jesus Maria. Camp Cooke was deactivated at the end of World War II (Palmer 1999).

The Suburban Period (1945–1965) began with the end of World War II. After Camp Cooke was deactivated, the Army continued the historic tradition and leased much of the area for ranching and farming. Oil drilling reached its peak during this period. Union Oil drilled a number of wells on the San Antonio Terrace, and the Jesus Maria No. 4 produced commercial quantities of oil. Most of the Suburban Period is characterized by military use of the area. Camp Cooke was reactivated in 1950 for training during the Korean War. It was put into caretaker status from 1953 to 1956. The Cantonment area became so overgrown that sheep were used to manage the vegetation and reduce the fire hazard. In November of 1956, the army transferred 64,000 acres of North Camp Cooke to the Air Force, and it was renamed the Cooke Air Force Base (Palmer 1999). In 1958 the base had its first missile launch, the Thor, and was renamed Vandenberg AFB. The southern section of the current base was transferred to the Air Force from Army and Navy control in 1964 (Vandenberg AFB 1992). Post-transfer use of both North and South Vandenberg AFB has related primarily to the construction and operation of missile launch and support facilities. Specific activities include management of the launch,

testing, and evaluation of ballistic missile and space systems for the Department of Defense (DoD), and operation of the Western Range (Science Applications International Corporation [SAIC] 1995; Vandenberg AFB 1992).

Local Setting

There are five known archaeological sites within the EOD Range boundary. One site is approximately 300 meters from the detonation point; the others are further away.

Current operations at the EOD Range do not have any impact on cultural resources, since the nearest archaeological site is located approximately 300 meters from the detonation point. This distance is generally considered to be sufficient to avoid impacts from continuing operations. Therefore, EOD Range operations, if kept at their current scope, would not affect any cultural resources. Therefore, no further analysis is deemed necessary.

Analysis as to whether or not project activities would:

a. Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Cause a substantial adverse change in the significance of an archeological resource pursuant to 15064.5.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Disturb any human remains, including those interred outside of formal cemeteries.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

6. Geology and Soils

Project activities likely to create an impact:

- Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Geologic Setting

Vandenberg AFB is a geologically complex area that includes the transition zone between the southern Coast Range and western Transverse Ranges geomorphic provinces of California. The southern Coast Ranges, located north of the Santa Ynez River, comprise northwest-southeast trending faults and folds of the earth's crust that appear as elongate valleys and ranges on the surface. The western Transverse Ranges are located south of the Santa Ynez River and comprise east-west trending valleys and ranges (Norris and Webb 1990). The Santa Maria Basin occupies the space between the southern Coast Range and the western Transverse Range. Major geomorphic features of the Santa Maria Basin on Vandenberg AFB include the Casmalia and Purisima Hills, San Antonio Terrace, Barka Slough, Lompoc Valley, Burton Mesa, and beaches, rocky headlands, and points. The EOD Range is located on Burton Mesa.

The base is underlain predominantly by marine sedimentary rocks of Late Mesozoic age (140 to 70 million years before the present) and Cenozoic age (70 million years to the present). The basal unit underlying the entire base is the Franciscan Formation of upper Jurassic age (Dibblee 1950). The Franciscan Formation consists of a series of sedimentary and volcanic rocks with numerous serpentine intrusions. Extensive folding and faulting throughout the Vandenberg AFB area has created four structural regions: the Santa Ynez range, the Lompoc lowland, the Los Alamos syncline, and the San Rafael mountain uplift (Reynolds, Smith and Hills, Inc. [Reynolds] 1985). The Santa Ynez range consists of a very thick Cretaceous-Tertiary sedimentary section uplifted along the Santa Ynez fault; it was subsequently folded. The Lompoc lowland is an area of low relief that is structurally synclinal but has Franciscan basement relatively close to the surface. The Los Alamos syncline is a deep structural downwarp traversing the Los Alamos and upper Santa Ynez valleys. The San Rafael Mountains have been uplifted by faulting along the southwestern margin of the mountain range. The majority of folds in these structural regions are oriented to the northwest.

Stratigraphically, the Mesozoic and Cenozoic marine sedimentary rocks that overlie the Franciscan basement can be divided into two regions: the Santa Ynez Mountains and the Santa Maria Basin (Reynolds 1985). Formations in the Santa Ynez Mountains were deposited in the Santa Barbara embayment from Cretaceous to Pliocene time. The Santa Maria Basin developed during Miocene time and had sediment accumulation during the Pliocene and Pleistocene ages.

Burton Mesa extends from San Antonio Valley to the Santa Ynez River Valley. It consists of a peneplain about 400 feet (122 meters) in elevation, and is dissected locally by canyons (Dibblee 1950). Recent and older sand dunes are located along the coastal part of the Burton Mesa but do not extend as far inland as they do on the San Antonio Terrace (Cooper 1967). Irregular, hummocky topography covers the dune field area of Burton Mesa (Johnson 1983; Woodring and Bramlette 1950). The Pleistocene Orcutt Sand is exposed in the inland portion of the mesa. The Orcutt Sand consists of poorly consolidated to partially indurated eolian deposits with local basal gravels.

The EOD Range is located on the central portion of Burton Mesa, a wide erosional platform approximately 300 feet above the San Antonio Creek floodplain to the north and the Santa Ynez floodplain to the south. The geology of Burton Mesa in the vicinity of the EOD Range consists of Monterey Formation bedrock, comprised of siliceous shale, diatomite, and chert. The bedrock is unconformably overlain by a thin veneer of unconsolidated sediments up to approximately 30 feet thick. The unconsolidated sediments comprise Pleistocene Orcutt Sand, recent alluvium, and recent dune sands. These sediments are predominantly fine- to medium-grained, moderately to well sorted, light brownish-gray sand. The ground surface of the EOD Range is fairly level.

Soil Types

The U.S. Soil Conservation Service (Shipman 1972) has identified and mapped the soils in the area of the EOD Range as sand, sandy clay, loamy sand, and clay soils. In 2002, Tetra Tech, Inc. collected soil samples from 12 locations at the EOD Range as part of an investigation of potential environmental impacts to the soil and groundwater from range operations. Surface and subsurface soil samples were collected from nine hand-auger borings within the graded area. The surface soils were observed to be sands and silty sands; however, a clay or clayey sand horizon was generally encountered at depths between 0.5 and 3 feet below ground surface. In the boring logs, the upper portion of soil was described as silty sand, brown, fine- or fine to medium-grained, subangular to rounded, and poorly graded. Below this

was the clay horizon, described as clayey sand; brown, gray, or dark gray; fine to medium grained; poorly sorted; and slightly moist.

Metals and organic compounds commonly sorb to clay particles and, as a result, contaminants transported to the subsurface via rainwater percolation may be concentrated in the first few inches of the clayey material.

Geologic Hazards

Potential structural damage, landslides, tsunamis, surface fault ruptures, and liquefaction are related to regional earthquake activity.

Vandenberg AFB is located in Seismic Hazard Zone 4, as defined by the Uniform Building Code (ICBO 1991), characterized by areas likely to sustain major damage from earthquakes and corresponding to intensities of 7 or higher on the Modified Mercalli Scale. Seismic Hazard Zone 4 is the most severe seismic region.

In the event of a tsunami reaching the coast of Vandenberg AFB, it is unlikely that the EOD Range would be affected due to the elevation and the distance of Burton Mesa from the ocean (approximately 300 feet and 1 mile, respectively). The potential for tsunamis is considered low. The Lompoc earthquake of 1927 had a magnitude of 7.3 and occurred approximately 10 miles offshore, near Point Arguello. A tsunami produced by this earthquake was recorded from the San Diego area north to the San Francisco area. At Pismo Beach and the town of Surf, the sea wave was approximately 2 meters high.

Surface fault rupture occurs along faults during earthquakes that are typically magnitude 5.5 and larger. The potential for surface fault rupture on Vandenberg AFB is generally considered to be low (U.S. Air Force 1987). Although there are no known active faults in the immediate area of the EOD Range, the Lion's Head Fault is an active fault and the potential exists for surface ground rupture along it and seismic disturbance at the range.

At present, there are no known areas on Vandenberg AFB where liquefaction has occurred (U.S. Air Force 1987). Liquefaction is the sudden loss in shear strength because of a rapid increase in soil pore water pressures resulting from cyclic loading during a seismic event. There is little to no liquefaction hazard at the EOD Range, since the area is lacking necessary groundwater within the potentially liquefiable zone.

Due to the near level to gently sloping topography of the active area of the EOD Range, landslides are not considered to be a potential hazard.

Analysis as to whether or not project activities would:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. (Refer to Division of Mines and Geology Special Publication 42).

   - Strong seismic ground shaking.

   - Seismic-related ground failure, including liquefaction.

   - Landslides.

   Impact Analysis:
   The EOD Range is located in a seismically active region of Central California. Nearby geologic faults include the Hosgri Fault to the west, the Lion's Head Fault zone to the north-northeast, and the Santa Ynez Fault zone to the east-southeast (Alterman *et al*. 1994). The generally east-west trending Los Alamos Baseline fault zone is located east of the EOD Range. Earthquakes on one of these fault zones or more distant regional faults could produce strong ground shaking at the range.

   The Lion's Head fault is located approximately 8 miles north of the EOD Range. It is a northwest-southeast trending fault that is oriented roughly parallel to the coastline. The Lion's Head fault may be an extension of the Baseline/Los Alamos Fault system, which extends from Lake Cachuma to the San Antonio Valley. The Lion's Head and Baseline/Los Alamos faults are considered to be active (International Conference of Building Officials [ICBO] 1997; Woodward Clyde Consultants [Woodward-Clyde] 1985). Another active fault, the Pacifico fault, crosses the southern tip of Vandenberg AFB at Jalama Beach County Park, approximately 10 miles south of the EOD Range. Other known active faults in Santa Barbara County include the Big Pine, Graveyard-Turkey Trap, Mesa, More Ranch, Nacimiento, Santa Cruz Island, Santa Rosa Island, and Santa Ynez Faults. Movement of any of these known active faults would

potentially affect the EOD Range, as would activity along the regional San Andreas Fault system (U.S. Air Force 1987). Inactive faults, including the offshore Lompoc Fault, located in the offshore Santa Maria Basin, and local faults currently considered inactive, such as the Honda and Point Sal faults, also have the potential to affect the EOD Range.

In Santa Barbara County, the recurrence interval for major earthquakes (magnitudes 5.2 to 7.0 on the Gutenberg and Richter scales) is wide ranging, from every 14 to 115 years. Although Vandenberg AFB is located in an area subject to earthquakes, the base has not reported damage to its facilities from earthquakes (U.S. Air Force 1987). The EOD Range is located within a geologically active area, and there is potential for strong ground shaking in the event of a large earthquake. The only structure at the site is Building 1560, a metal building that is only used when operations are being conducted at the range; therefore, the potential hazard to this building is minimal. There is no infrastructure at the range, so there are no hazards to waste water disposal systems.

Because of its location on a fairly level area that is 300 feet or more above the nearest floodplains, the EOD Range is unlikely to be subject to landslides, slope failure, or tsunamis resulting from seismic activity. The potential for liquefaction is considered low because of the lack of groundwater at the site. There are no expansive soils at this location.

There are several known, active faults near the EOD Range. A major earthquake on one of these faults, or on a regional fault, could result in strong ground shaking and possible ground rupture at the range. However, since the range is in use for short periods only approximately once per month, the likelihood of personnel injury because of seismic activity is quite remote.

Additionally, the proposed project is a permit renewal for the EOD Range which as noted consists of a graded area approximately 300 feet in diameter, the site is re-graded two or three times per year. It is not anticipated that the proposed project will have an adverse effect on people or structures in and around the EOD Range site.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Result in substantial soil erosion or the loss of topsoil.

Impact Analysis:
Detonations at the EOD Range are conducted above ground. Generally, the only material thrown upward by the explosions is soil. These explosions create small craters (approximately 2 feet across and 1 foot deep) in the ground. The craters are filled in during re-grading activities, which occur two or three times per year.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Impact Analysis:
Please refer to responses in subsections (a) and (b).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

Impact Analysis:
Please refer to responses in subsections (a) and (b).

Conclusion:

☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of water.

Impact Analysis:
Not applicable to the proposed project.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

f. Be located in an area containing naturally occurring asbestos (see also Air Quality, f.).

Impact Analysis:
As noted in the Air Quality section above, although there are recorded occurrences of naturally occurring asbestos around Santa Barbara County, none have been found to occur on the subject project site.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

c) Department of Conservation, Geological Survey, Governor's Office of Planning and Research, "Addressing Naturally Occurring Asbestos in CEQA Documents."

7. Hazards and Hazardous Materials

Project activities likely to create an impact:
❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Hazardous Materials Management

The PEP materials detonated at the EOD Range come from research and development, testing, and air and space launch systems at Vandenberg AFB. Generally these materials comprise unserviceable, unstable, or unusable munitions and explosive materials. They are classified as hazardous because they exhibit ignitable, reactive, or toxic characteristics. Hazardous wastes that are not PEP are not accepted at the EOD Range (Vandenberg AFB 2004).

Open detonation of PEP at the range is conducted by trained EOD personnel. Detonation operations do not involve the use of any structures or treatment equipment. Instead, the detonation takes place on a cleared, relatively flat area of the range near Building 1560. The building, an earth-reinforced bunker, is used to shelter personnel during disposal activities (Vandenberg AFB 2004).

Because PEP waste is explosive, sampling, testing, or subjecting it to chemical analysis to determine its composition represents a health and safety risk to personnel. In addition, many of the PEP materials are inside metal casings, which precludes taking a sample for analysis. Therefore, before materials are taken to the EOD Range for disposal, the process owner/operator must provide a detailed description of the process that generated the materials, a physical and chemical description of the materials, and any other information that will document the generator's knowledge of the process and waste stream including the Material Safety Data Sheets (MSDSs). This information is used to develop the VAFB Profile for the waste. A Gantt number can then be assigned. The generator must present both the VAFB Profile and the Gantt number when taking waste to the EOD Range for disposal.

When hazardous wastes are received at the EOD Range, EOD personnel visually inspect the waste and compare it to the appropriate VAFB Profile to identify it. When the waste is received from a military unit, it can often be verified against a stock number. In other cases, the waste is verified by applying process knowledge and/or by EOD personnel experience and training. If there is a discrepancy between the waste being brought to the range and the VAFB Profile, the waste will not be accepted until the discrepancy has been resolved.

The PEP wastes are always detonated immediately; they are not stored at the EOD Range. The wastes are rendered non-reactive when they are detonated.

According to the *EOD Waste Management Plan:*

> The EOD Range is inspected prior to and after each operation. Whenever PEP wastes are detonated, EOD personnel bring explosive charges to the EOD Range. Thoroughly trained EOD specialists carefully prepare each batch of PEP to be detonated in accordance with Department of Defense (DoD) ordnance disposal technical orders. All EOD operations are conducted by a minimum of two experienced personnel. PEP materials scheduled for open detonation are carefully placed on the ground in the designated waste detonation area. Supplementary explosives are added and detonation is conducted from a remote location.
>
> EOD personnel conduct a visual inspection of the detonation site to verify that no observable residue remains after each EOD Range operation. The objective is the complete destruction of the item being detonated. EOD personnel are trained to use sufficient quantities of the disposal charge to ensure the objective is achieved. In the event of a malfunction or incomplete destruction, EOD personnel will conduct additional detonation operations until complete destruction has occurred. Grading, as necessary, will fill the crater at the detonation point (Vandenberg AFB 2004).

Emergency Reporting

Planning documents such as the *Full Spectrum Threat Response Plan*, 30 SW FSTR Plan 10-2, and the *Hazardous Materials Emergency Response Plan*, 30 SW Plan 32-4002-A, provide information and procedures for notifications and responses if there is a hazardous material or POL release on the base. The required response depends on the seriousness and scope of the release, which is defined as either a "minor" or a "major" incident. In addition, owners/operators of all facilities at Vandenberg AFB where hazardous materials are handled, stored, or processed are required to prepare a Business Plan. The Business Plan includes an Emergency Response Plan (Form E) and must be submitted annually to the Fire Protection Flight, 30 CES/CEF. The facility owner/operator must keep a copy of the Business Plan on file, as well. The Fire Protection Flight maintains both a hard copy and an electronic database of the Business Plans; the database is also available to the Environmental Flight, the Bioenvironmental Engineering Element, and the Readiness Flight. An electronic copy of the Vandenberg AFB Business Plans is also provided to the Santa Barbara County Fire Protection Services Division.

If the release affects a small area, does not pose a life-threatening situation (or requires, at most, evacuating only personnel who are nearby), and can be controlled and cleaned up without assistance from emergency personnel, it is considered minor. Site personnel are to follow the procedures outlined in the facility's Emergency Response Plan (Form E), including reporting of the incident to the appropriate authorities. Any incident that involves release of a hazardous material or POL that escapes containment and is released to the environment must be reported to the Environmental Flight, 30 CES/CEV, which will assess the appropriate notification and cleanup requirements. The Santa Barbara County Chapter of CAER (Community Awareness and Emergency Response) and the Santa Barbara County Fire Chiefs have jointly approved the Hazardous Materials Minor Spill and Release Report Guide (the CAER Form). On Vandenberg AFB, the need for preparing and submitting a CAER Form to Santa Barbara County will be determined by 30 CES/CEV. If the situation warrants, 30 CES/CEV will also make required or appropriate notifications to the U.S. Fish and Wildlife Service, the California Department of Fish and Game, and the State Historic Preservation Officer.

A release that poses a life-threatening situation, is beyond the capabilities of the owner/operator to contain and clean up, and/or requires immediate evacuation of all personnel from the release area is considered a major incident. The Command Post should be contacted immediately so that appropriate response personnel can be deployed.

Site Safety

Vandenberg AFB is a closed, secured military installation with controlled access. Hazardous waste management units at the base are secured at all times, and access is limited to authorized personnel only.

Warning signs are posted every 300 feet around the perimeter of the range. At each interval, a sign is posted, stating in both English and Spanish, "Danger, Explosive Disposal Range, Keep Out". The access road to the range has a locked gate with a similar warning sign. There is no fencing around the perimeter of the range, but the dense vegetation in the area serves as a deterrent to entry. The EOD Range is in a remote location of the base, further diminishing the likelihood of non-EOD personnel being in the area. Entry to the site is restricted to authorized personnel only.

Personnel working at the EOD Range have gone through specialized EOD training at the Navy Technical Ordnance School, as well as 40-hour HAZWOPER training. There are a minimum of two personnel on-site at all times when detonation operations are underway. Communication is provided by the base telephone system and by two-way radios. A red flag is displayed near Building 1560 when demolition activities are being conducted on the range.

The following safety equipment is kept on-site:

- First aid kit, medium (1)
- Fire extinguisher, 2.5 gal water (2)
- Shovels (2)
- Pulaski fire tool (1)

The active area of the EOD Range is bladed to minimize the growth of vegetation and serves as a fire prevention measure. The graded area of the range is surrounded by a firebreak. An explosive safety zone with a radius of 2,500 feet has been established around the range.

Groundwater

Tetra Tech, Inc. conducted sampling and analysis of soil and groundwater at the EOD Range in 2002 in order to assess potential environmental impacts resulting from operations at the range. Groundwater was collected from a monitoring well that had been installed during an earlier investigation (EOD-MW-1); the groundwater sample was analyzed for metals via Environmental Protection Agency (EPA) methods SW6010B and SW7470A, for nitroaromatics and nitramines (explosives) via EPA method SW8330, and for total petroleum hydrocarbons (TPH) via EPA method SW8051B. Metal analyses were performed for the 17 California Assessment Method (CAM 17) metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc) plus aluminum and iron. This suite of metals includes the heavy metals that are commonly associated with ordnance disposal and satisfies the requirements for characterizing the sampled media as hazardous or non-hazardous. It also includes all of the metals referenced in the EOD Waste Stream Inventory (Tetra Tech, Inc. 2003).

Background threshold values (BTVs) for groundwater, soil, and bedrock on Vandenberg AFB were developed by Jacobs Engineering Group (JEG 1994). These BTVs were approved by the Department of Toxic Substances Control (DTSC) and Regional Water Quality Control Board (RWQCB) for use in identifying metal contaminants of potential concern (COPCs) in soil and groundwater from sites on Vandenberg AFB (Vandenberg AFB *et al*. 1995) and they have been widely used for site investigation, remedial investigation, and feasibility study work across the base. The Vandenberg AFB groundwater BTVs were developed based on analyses of filtered groundwater samples, which reduces variability in metal concentrations caused by suspended solids. Therefore, a sample of filtered groundwater was analyzed for dissolved metal concentrations for comparison to the groundwater BTVs. A sample of unfiltered groundwater was also analyzed for total metal concentrations to assess metal concentrations that potential receptors could be exposed to. Finally, the groundwater sample was analyzed for explosives to assess the potential presence of PEP residue from routine EOD Range operations and for TPH to assess the potential presence of fuel oil residue from truck bomb detonations.

Two metals, aluminum and iron, were detected at concentrations exceeding the BTVs in the filtered groundwater sample. No other dissolved metals were detected at concentrations above their respective BTVs. Although the analysis results for six metals (antimony, beryllium, mercury, selenium, silver, and thallium) were below the BTVs for those metals, it should be noted that the method detection limits (MDLs) for those metals were above the associated BTVs. Therefore, it is possible that these metals were present at concentrations exceeding their BTVs, but their presence could not be detected because of the analysis criteria. Of these six metals, only silver is listed in the EOD Wastestream Inventory (Tetra Tech 2003).

Four metals, aluminum, arsenic, iron, and mercury, were detected at concentrations above the tap water Preliminary Remediation Goals (PRGs) set by EPA Region IX in the unfiltered groundwater sample. These results were similar to

those obtained during a previous investigation by Tetra Tech in 2000. EOD-MW-1 was purged dry after only 9 gallons of water had been removed, indicating this groundwater body produces a limited volume of water. Based on that limitation, the groundwater at the EOD Range is unlikely to be used as a potable water supply. Therefore, comparison of metal concentrations in the groundwater sample to tap water PRGs is highly conservative.

No explosives or TPH were detected in the groundwater sample.

Soils

During the Tetra Tech investigation in 2002, soil samples were collected from the surface (0 to 6 inches below ground surface [bgs]) and subsurface (below 6 inches bgs). Both surface and subsurface samples were collected from hand augur borings within the graded area at the EOD Range. Field observations indicated that the depth of grading is not more than 4 to 8 inches, so these samples were considered representative of the graded soil column. Analytical results for surface soil samples were compared to the surface alluvium BTVs while results for subsurface soil samples were compared to subsurface alluvium BTVs.

Soil samples were analyzed for metals via EPA methods SW6010B and SW7471A, for explosives via EPA method SW8330, and for TPH via EPA method SW8015B. Metal analyses were performed for the CAM 17 metals plus aluminum and iron. Aluminum, antimony, cadmium, copper, lead, selenium, and silver were detected in soil samples at concentrations exceeding the BTVs; however, none of the detected concentrations of these metals exceeded the PRGs for industrial soil. Arsenic was the only metal detected at concentrations exceeding the PRG for industrial soil; however, the background concentrations of arsenic exceed the PRGs, and as only one arsenic result was above the BTV, it is likely that the arsenic is naturally occurring. Concentrations of metals detected in subsurface soils were generally higher than those detected in surface soils. Since all but one of the subsurface soil samples was collected from the clayey horizon encountered at 0.5 to 3 feet bgs, the results reflect the tendency of metals to sorb to clay particles. It should be noted, though, that the BTVs for subsurface soils are generally higher than for surface soils, indicating that subsurface concentrations are naturally higher. Concentrations of metals detected during the 2002 investigation were generally similar to those detected during the previous investigation (Tetra Tech 2000). No clear trends suggesting increasing or decreasing metal concentrations were apparent (Tetra Tech 2003).

Detectable concentrations of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX, or Royal Dutch Explosive) were found in the replicate pair of samples from one boring (1,100 and 520 micrograms per kilogram in the primary and replicate sample, respectively). These concentrations were well below the PRG for industrial soil of 15,670 micrograms per kilogram and also below the PRG for residential soil of 4,400 micrograms per kilogram. No other explosives were detected in the soil samples.

The two samples collected from the detonation point were found to contain TPH, possibly reflecting the presence of small amounts of diesel fuel or motor oil residue from the truck bombs detonated at the range. In the surface soil sample, TPH were detected at a concentration of 110 milligrams per kilogram (mg/kg), and in the subsurface soil sample TPH were 14 mg/kg. For reference, the Vandenberg AFB UST program cleanup level for TPH in soil is 100 milligrams per kilogram. No other soil samples were analyzed for TPH (Tetra Tech 2003).

In May 2005, Clean Harbors collected a soil sample from the EOD Range and sent it for analysis for TPH as diesel and as motor oil via EPA method 8015 Modified and for CAM 17 metals via EPA methods 6020/7471A. Oilfield Environmental and Compliance, Inc. performed the analyses. Results from the analysis for TPH were non-detect. Results for metals analysis were as follows: barium, 10 mg/kg; chromium, 3 mg/kg; copper, 11 mg/kg; lead, 30 mg/kg; nickel, 3.1 mg/kg; vanadium, 7.3 mg/kg; and zinc, 13 mg/kg. The results for all other metals were non-detect. The only metal detected above its BTV was lead; the surface and subsurface alluvium BTVs for lead are 13.0 and 10.0 mg/kg, respectively; the PRG for industrial soil is 750 mg/kg.

Installation Restoration Program Sites

Installation Restoration Program (IRP) Site 21 is located on Burton Mesa approximately 1.75 miles east of the Pacific Ocean. It is on the northwest corner of Tangair and Mira Roads, about 4,700 feet from Building 1560 at the EOD Range. The site was used for firefighter training from 1958 until July 1989, when it was decommissioned. During training exercises, jet propellant-4 (JP-4) was sprayed onto a mock airplane located on the site and then ignited. Other materials, such as solvents (including trichloroethene, acetone, and methyl ethyl ketone), lubrication oil, hydraulic fluid, transformer oil, and transmission fluid, were also burned at the site, particularly during the period from 1960 to 1965 (Reynolds 1985).

Two interim removal actions (IRAs) have occurred at Site 21, one performed in 1997 and another in 2000. During both IRAs, oil-water separators and associated piping were removed and properly disposed of. A third IRA is being performed to reduce risks due to chemicals of concern identified at the site to acceptable levels. The IRA will include contaminated soil between and beneath both burn pits with the goal of closing the site (U.S. Air Force 2004).

Installation Restoration Program Site 43, also known as Landfill 8, is located immediately southwest of the intersection of Tangair and Titan Roads. It is also about 4,700 feet from Building 1560. Vandenberg AFB operated Landfill 8 between

1961 and 1966 as a cut-and-fill facility, and the landfill is currently covered with soil and vegetation. The previous site investigation (SAIC 1990) has shown the presence of oil and grease and metals in the soil. Chemicals of concern located at the site are unexploded ordnance and petroleum, oil, and lubricants. Landfill 8 was approved for no further action in 1995.

During investigations conducted in 2000 and 2002, no hazardous levels of PEP compounds or metals were detected in soil or groundwater samples collected at the EOD Range. The results of these investigations indicate that operations at the range are adequate to destroy the PEP compounds and have not resulted in significant environmental contamination of the soil or groundwater by PEP compounds or metals. During the 2002 investigation, TPH were detected in surface soil at a concentration slightly above the Vandenberg AFB UST program cleanup level of 100 mg/kg.

These results indicate that current practices at the EOD Range are not resulting in the accumulation of metals, PEP, or TPH at concentrations that would be considered significant. Therefore, continued operations at the range would not be expected to cause any impacts from these substances. No hazardous materials/hazardous waste management impacts are expected to occur from IRP Sites 21 and 43 because of their distance from the EOD Range.

Analysis as to whether or not project activities would:

a. Create a significant hazard to the public or the environment throughout the routine transport, use or disposal of hazardous materials.

   Impact Analysis:
   Hazardous materials that are transported to the EOD Range for detonation are brought by truck over roads on Vandenberg AFB. These materials are not transported over public roadways. Once they arrive at the range, PEP materials are unloaded next to the detonation area and detonated as soon as possible. No PEP materials are stored at the site. These procedures minimize the potential of hazards to the public and the environment.

   The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month.

   Operations at the EOD Range are conducted in accordance with Technical Order GOA-1-1-22, *EOD Safety Precautions*. This Technical Order specifies that no range operations are to be conducted during rain events or at night. EOD personnel check with the Base Weather Station before any planned detonations, and if there is no rain or lighting within 3 miles of the range and there is no forecast of rain over the next few hours, operations proceed as scheduled.

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☒ Less Than Significant Impact
   ☐ No Impact

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

   Impact Analysis:
   As noted in the Setting, PEP materials detonated at the EOD Range come from research and development, testing and air and space launch systems at the AFB. Due to the explosive nature of the waste, chemical analyses are conducted to determine composition and relative potential for health and safety risks associated with the handling and detonation processes.

   Vandenberg AFB has its own fire department and emergency response capabilities. Ambulance service is contracted, and the closest regional hospital is located in Lompoc. Uniformed Air Force personnel are available to respond to the site in the event of an emergency. Emergency response to an accidental or unauthorized release of hazardous materials is implemented by the Vandenberg AFB Disaster Response Force (DRF), which comprises the Battle Staff, the Disaster Control Group (DCG), and their respective elements. The DRF concept of operations allows for all or just certain elements of the DRF to be activated depending on the nature of the situation. Certain elements of the DRF may even be activated in advance of certain hazardous operations such as space booster and ICBM launches and fueling operations involving highly toxic hypergolic propellants; such predisposition will normally be

made in accordance with standing operating plans and procedures. The DRF is activated at the direction of the Installation Commander and notification of DRF elements will normally be accomplished by the Command Post.

The base is also a member of the Santa Barbara County areas Local Emergency Protection Commission (LEPC), through which other response entities are coordinated, including the State Office of Emergency Services (OES) and the Santa Barbara County Office of Emergency Services. These entities are involved in emergency planning and coordination of responses to hazardous material incidents throughout the area, which includes Vandenberg AFB.

Vandenberg AFB has specific mutual aid agreements with the City of Lompoc and City of Santa Maria Fire Departments, as well as the Santa Barbara County Sheriff's Department. The Santa Barbara Fire Protection Services serves as the local Certified Unified Protection Agency (CUPA). Ambulance support is provided by a contractor. The base has concluded Memorandums of Understanding/Memorandums of Agreement (MOUs/MOAs) with the Lompoc Hospital in Lompoc and the Marian Medical Center in Santa Maria.

The Plans and Programs Office, 30 SW/XP, maintains current MOUs/MOAs with the fire agencies of Santa Barbara County, City of Santa Maria, City of Lompoc, the U.S. Forest Service, and the California Department of Forestry. Due to established emergency response procedures and mechanisms, the proposed project will not create a significant hazard to the public or the environment, however should an emergency event occur, trained personnel will act consistent with these procedures and in cooperation with appropriate local agencies.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school.

Impact Analysis:
As noted in subsection (a) hazardous materials that are transported to the EOD Range for detonation are brought by truck over roads on Vandenberg AFB, these materials are not transported over public roadways. The range is located more than 4 miles from the nearest off-base residents, more than 1 mile from the nearest schools or other sensitive receptors, and more than 2 miles from the nearest public airport. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month.

Therefore, operations at the EOD Range are unlikely to present a significant hazard to the public or to schools.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to public or the environment.

Impact Analysis: Vandenberg Air Force Base is included on a hazardous waste and substances sites list, however, the activities at EOD Range would not create a significant hazard to public or the environment**.**

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

e. Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.

Impact Analysis:
Please refer to response in subsection (b).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

8. Hydrology and Water Quality

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Hydrology

Water resources include groundwater and surface water and their physical, chemical, and biological characteristics. Water supply and wastewater management is also discussed in this section along with the presence of jurisdictional waters of the United States (see below).

The major freshwater resources of the Vandenberg AFB region include seven streams, comprising two major and five minor drainages. The major drainages are San Antonio Creek and the Santa Ynez River. the minor drainages are Cañada Tortuga, Shuman, Cañada Honda, Bear, and Jalama Creeks. Burton Mesa, which lies just north of the Santa Ynez river floodplain, is a broad, flat plateau that rises approximately 300 feet above the river floodplain and covers an area of about 50 square miles. It is bounded on the west by the Pacific Ocean, on the north by San Antonio Creek, and on the east by the Purisima Hills.

Drainage from Burton Mesa flows primarily in two directions, south into the Santa Ynez River and northwest into San Antonio Creek and the Pacific Ocean. Purisima Point is approximately 5 miles north of the mouth of the Santa Ynez River.

The south and southwest margins of the mesa are flanked by terrace deposits. Most of the length of the western margin is mantled by sand dunes. The flat surface of the mesa is covered by the sandy deposits of the Orcutt Sand.

Surface Water

Burton Mesa is bound by the two major drainages on North Vandenberg AFB: the Santa Ynez River and San Antonio Creek. The Santa Ynez River forms the boundary between North and South Vandenberg AFB and marks the southern boundary of Burton Mesa. San Antonio Creek marks the northern boundary of Burton Mesa. Both of these drainages flow west toward the Pacific Ocean. Cañada Tortuga is located on Burton Mesa, south of the EOD Range, and flows west to the Pacific Ocean. In addition, a number of unnamed drainages are located on Burton Mesa and flow north to San Antonio Creek, south to the Santa Ynez River, or west to the Pacific Ocean.

There is no perennial surface water at the EOD Range. Cañada Tortuga Creek is approximately 1,600 feet south of the detonation point at the EOD range; there is also a seasonal pond approximately 1,300 feet southeast of the detonation point.

Groundwater

Groundwater on Vandenberg AFB occurs mainly in unconsolidated alluvial deposits beneath the river and stream channels in the valleys and canyons. Aquifers capable of yielding large quantities of water usable for water supply are generally restricted to the deeper portions of the Santa Ynez River and San Antonio Creek groundwater basins (Evenson and Miller 1963; Hutchinson 1980; Jacobs Engineering Group [JEG] 1994).

The EOD Range is south of the San Antonio Creek Groundwater Basin and north of the Santa Ynez River Groundwater Basin, but is not located within a designated groundwater basin (SAIC 1990). Previous investigations indicate that

groundwater does not appear to exist in the unconsolidated soils of the Orcutt Formation on the Burton Mesa in the vicinity of the EOD Range, but perched water tables within the soil horizons may form during the rainy season. The underlying siliceous Monterey shale acts as an aquitard, preventing downward migration of water and producing isolated seasonal pockets of groundwater at the Orcutt Formation-Monterey Formation interface where irregularities in the bedrock form depressions. Groundwater is believed to be present approximately 100 feet bgs, beneath the shale formation under EOD Range. Groundwater flow direction at the range has been estimated to be toward the southwest; however, additional monitoring wells would need to be installed to verify this.

Monitoring well EOD-MW-1 has historically produced a very limited volume of water, which supports the findings of earlier investigations and indicates that whatever groundwater there is at the range likely is present as isolated pockets. During the Tetra Tech investigation in 2002, this well went dry after only 9 gallons of water were purged. Tetra Tech attempted to install two additional monitoring wells at the EOD Range; however, the monitoring well borings were drilled all the way to the Monterey Formation contact at approximately 25 feet bgs and no groundwater was encountered. Therefore, both borings were abandoned and monitoring wells were not installed.

Analysis as to whether or not project activities would:

a. Violate any water quality standards or waste discharge requirements.

Impact Analysis:
The subject proposed project involves the detonation of unexploded propellant, explosive, and pyrotechnic materials. Detonations are conducted on the ground, small craters result which are then filled during grading activities. Any debris that may remain is cleared, detonations occur approximately two to three times per year. Surface water at the EOD Range generally percolates into the soil; there are no apparent surface water drainages at this site. The effects of runoff water from the range are minimal. Detonation activities at the site leave very little residue that would be carried off the site via water flow and would not violate any water quality standards or waste discharge requirements.

Although groundwater does occur on Vandenberg AFB, it is generally in the vicinity of San Antonio Creek and the Santa Ynez River. Groundwater, when it does occur on the Burton Mesa, is usually in the form of perched water tables that form during the rainy season. Therefore, activities at the EOD Range are unlikely to have any effect on groundwater in the area. Laboratory analysis of groundwater samples collected at the EOD Range has shown there is no contamination of groundwater by PEP or metals.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficient in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Impact Analysis:
Please refer to the response in subsection (a).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site.

Impact Analysis:
Please refer to the response in subsection (a).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated

☐ Less Than Significant Impact
☒ No Impact

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site.

Impact Analysis:
Please refer to the response in subsection (a).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

e. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Impact Analysis:
Not applicable to the proposed project.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

f. Otherwise substantially degrade water quality.

Impact Analysis:
Please refer to the response in subsection (a).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

g. Place within a 100-flood hazard area structures which would impede or redirect flood flows.

Impact Analysis:
The EOD Range is not within a 100-year flood hazard area nor is it within an area likely to be inundated by seiche, tsunami, or mudflow.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

h. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Impact Analysis:
Not applicable to this proposed project.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

i. Inundation by sieche, tsunami or mudflow.

Impact Analysis:
As noted throughout this analysis, detonations are conducted two to three times per year, although the potential for a tsunami exists due to the close proximity of the AFB to the Coast, it is not anticipated that the proposed permit renewal of the EOD will result in an adverse impact in such an event.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

9. Land Use and Planning

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Vandenberg AFB encompasses over 98,400 acres, representing approximately 6 percent of the total land area of Santa Barbara County. The base is physically divided into two parts by the Santa Ynez River and State Highway 246. These two areas of Vandenberg AFB are commonly referred to as North Base and South Base. Much of Vandenberg AFB is open space set aside as security or safety buffer zones. The open space, when topography and natural resource management allows, is frequently outleased to the UDP for cattle grazing or farming.

Space launch, missile test, telemetry, and tracking facilities are scattered throughout the base. Several space launch complexes, launch facilities, launch support complexes, and a California Commercial Spaceport on base provide for military and commercial launches, which take place on a regular basis. These facilities support the primary mission of Vandenberg AFB.

According to the Base General Plan (Vandenberg AFB 2000), the base comprises the following land use areas: airfield operations and maintenance/space and missile launch activities, industrial, outdoor recreation, open space, and cantonment. The cantonment area is centrally located on North Vandenberg AFB and includes residential, administrative, industrial, recreational, open space, airfield, and community land uses. This area is concentrated between California Boulevard and New Mexico Avenue to the east, Ocean View Avenue and Airfield Road to the west, Lompoc-Casmalia Road to the north, and 13th Street to the south. The greatest use of land on Vandenberg AFB (approximately 90 percent) is for open space, followed by industrial (approximately 6 percent), and aircraft operations and maintenance/space and missile launch activities (approximately 2 percent). Development and land use at Vandenberg AFB is managed by 30 CES/CECB, Base Planning.

The EOD Range is located in an area designated for industrial land use. It does not physically divide an established community. Operations at the range do not conflict with any agency land use plan, policy, or regulation that has been adopted to avoid or mitigate an environmental effect. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month.

Current operations at the EOD Range do not conflict with any habitat or natural community conservation plans. However, any plans to expand the range would need to be closely coordinated with 30 CES/CEV to avoid impacts to sensitive biological resources. Therefore, no further analysis is deemed necessary.

Analysis as to whether or not project activities would:

a. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Conflict with any applicable habitat conservation plan or natural community conservation plan.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

10. Mineral Resources

Project activities likely to create an impact:
None.

Description of Baseline Environmental Conditions:

Analysis as to whether or not project activities would:
Mineral resources at Vandenberg AFB include diatomite, gold, limestone, geothermal steam, and petroleum. The federal government holds title to 15 percent of mineral rights, while the remaining 85 percent are held by private interests. The majority of these privately held mineral rights are located on North Base (Vandenberg AFB).

There are no current mineral resources recovery activities on Vandenberg AFB, therefore, no further analysis is deemed necessary.

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

11. Noise

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

General Description

Noise is usually defined as unwanted sound. Depending on its intensity, it has the potential to disrupt sleep, interfere with speech communication, or even damage hearing. Noise is generated by a variety of interior and exterior sources. Exterior noise sources can be mobile or stationary, such as motor vehicles, aircraft, construction work, industrial processes, various human activities, and miscellaneous operations such as emergency vehicles and air conditioning units. For wildlife, noise can have physiological and behavioral effects that ultimately could affect survival and reproduction at an individual and population level.

Sound waves, traveling outward from a source, exert a sound pressure, which is commonly assigned a "sound pressure level," measured in decibels (dB). Environmental noise is usually measured in A-weighted decibels (dBA); the A-weighting describes a correction for variations in the typical human ear's frequency response at commonly encountered noise levels. in general, a fluctuation in sound of 1 dBA is noticeable only under laboratory conditions. A change of 3 dBA is just noticeable in field conditions, a 5 dBA change is clearly noticeable, and a 10 dBA change is perceptually twice (or half) as loud. For example, a noise level of 70 dBA sounds approximately twice as loud as 60 dBA and four times as loud as 50 dBA.

Impulse noise is defined as being of short duration (typically less than 1 second), high intensity, abrupt onset and rapid decay, and often rapidly changing spectral composition. Impulse noise is characteristically associated with such sources as explosions, impacts, the discharge of firearms, the passage of supersonic aircraft (sonic boom), and many industrial processes (U.S. Army Center for Health Promotion and Preventive Medicine [USACHPPM] 2005b).

Individual responses to noise can vary, depending upon a number of factors including intensity, duration, repetition, time of day, and interference with activity. The Naval Surface Warfare Center at Dahlgren, Virginia, has developed a set of guidelines to evaluate the potential for complaints about impulsive noise generated by activities such as detonation of explosives and artillery firing (Table 4).

Table 4
Blast Noise Guidelines

Predicted Sound Level (dB)	Risk of Complaints and Damage
Less than 115	Low risk of noise complaints
115–130	Moderate risk of noise complaints
130–140	High risk of noise complaints, possibility of damage
More than 140	Threshold for permanent physiological damage to

	unprotected human ears. High risk of physiological and structural damage claims.

Source: Pater 1976 (in USACHPPM 2005a).

Working in coordination with the Vandenberg AFB Public Affairs and Claims Offices, it was determined that no complaints regarding noise from EOD operations have been filed by on- or off-base personnel in recent history. Detonations at the EOD Range are heard as nothing more than a brief, muffled rumble in the nearest areas of the Cantonment area, where the majority of the base population is located.

Regional Setting

North Vandenberg AFB contains most of the base facilities, and South Vandenberg AFB is largely undeveloped with some scattered facilities. Noise levels measured on North Vandenberg AFB are generally typical of levels in urban areas with little industrialization. Noise levels on South Vandenberg AFB would be expected to be similar to levels found in rural areas, except around active launch complexes, where noise levels during operations may be similar to those at an industrial site.

An additional source of noise in the area is the Vandenberg AFB Airfield, which follows state regulations concerning noise and maintains a day-night noise level (Ldn, a 24-hour average noise assessment without "penalty" decibels added to the quieter nighttime levels) equivalent to 65 dBA or lower for off-base areas. Other less frequent, but more intense, sources of noise in the region are space and missile launches from Vandenberg AFB. Typically, during launch activities and low-level aircraft flights, Ldn increases to 48 to 67 dBA (Vandenberg AFB 2000c).

The EOD Range is more than 1 mile from the nearest portion of the Cantonment area (the southernmost area), approximately 1 mile southwest of the airfield, and approximately 4,500 feet east of the Union Pacific Railroad line. There are no known sensitive receptors in the vicinity of the site. The nearest off-base residential areas are more than 4 miles from the range. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month.

Potential changes to the natural and human environments resulting from these operations, relative to the existing environmental conditions:

Effects on wildlife are likely to occur, although they are also likely to be of short duration. Since the active area of the EOD Range is kept cleared of vegetation, there is no habitat that is likely to attract wildlife to the range itself. While detonations would likely produce a startle effect and cause wildlife to leave the nearby area temporarily, the presence of numerous wildlife species in the area (refer to Table 3 and the text discussion in section 4, Wildlife) suggests that animals become habituated to occasional noise and human activity in the area and thus are not likely to be driven away permanently.

A EOD Noise Study (SRS Technologies 2005) report provides the following results and discussion: Existing noise levels on VAFB are generally quite low due to the large areas of undeveloped landscape and relatively sparse noise sources. Background noise levels are primarily driven by wind noise; however, louder noise levels can be found near industrial facilities, transportation routes the Off-road Vehicle (ORV) recreation area, and the model airplane recreation area. Rocket launches and aircraft overflights create louder intermittent noise levels. General ambient hourly average sound levels on VAFB measurements have been found to range from around 35 dB to 56 dB (Thorson et al. 2001).
There is a harbor seal haul out site located in the vicinity of Purisima Point. This is about 4.5 km from the detonation pit. The C-weighted SEL is from the EOD detonation is near 80 dB with the unweighted peak level between 100 dB and 105 dB. SRS Technologies has been studying the impacts of rocket launch noise and sonic boom at VAFB for many years. When the A-weighted SEL approaches 100 dB, most of the seals will enter the water during a launch. For rocket launch noise, the ASEL is typically about 20 dB below the CSEL. The information for harbor seal reactions to the more analogous sonic booms is not as clear. A sonic boom with a peak overpressure of 125.1 dB caused 50% of the seals to flee into the water (Berg, et al. 2001). With the much lower levels expected from the EOD detonation, it is likely that there will be little reaction from the seals.
For humans, OSHA **1910.95(b)(2)** Permissible Noise Exposures states that "Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level." The GIS map shows that the closest facility to the detonation pit is the Pegasus Checkout Facility (Building 1555). The anticipated peak noise levels at this facility will be between 125 dB and 130 dB, substantially below OSHA requirements. At building 2500, about 2.5 km from the detonation pit, the noise from the blast is described as "startling." (Ray Fields – personal communication).

At the nearest sensitive wildlife location, the **California least tern** nesting area, the peak sound pressure is around 100 dB (Figure 3). The (*Sterna antillarum browni*) is a federal and state endangered species that breeds in the coastal foredunes of VAFB. Its primary breeding colony site is located at Purisima Point. The breeding season for the California least tern on VAFB is from April through August. Least terns are known to be highly susceptible to disturbances including noise. Airfield operations on VAFB are restricted to provide protection to this species during nesting season. All aircraft avoid overflights at a slant range of greater than 1,900 feet of the areas near Point Purisima. Least terns nest from the end of April until the end of July. If blasts are planned, CEVPN has term monitors on the site daily and they should monitor for any reaction.

There are several other federal special status plant, fish, and wildlife species occur along the coast and near the Santa Ynez River, within the area that would be affected by the detonation. Species with potential to be affected by the detonation include:

The **western snowy plover** (*Charadius alexandrinus nivosus)*, is a federally threatened species that breeds and winters along the VAFB coastline, on sandy beaches and dune areas. Snowy plovers nest and winter on the foredunes along the coast of VAFB, from near Point Sal to Purisima Point, and along beaches north and south of the Santa Ynez River mouth. Their breeding season extends from March 1 through September 30, with the highest breeding activity occurring between May and August. Observations of snowy plover during rocket launches has shown this species to be largely unaffected by noise. During the recent launch of the Titan IV, snowy plovers near the Santa Ynez river were exposed to an unweighted peak of 133 dB with no apparent reaction.

The **southwestern willow flycatcher** (*Empidonax traillii extimus*), a federal and state endangered species, has been observed during the nesting season (May through August) in willow riparian habitat along the Santa Ynez River, within three miles of the river mouth. At this location, the peak unweighted sound level will be about 100 dB.

Vernal pool fairy shrimp (*Branchinecta lynchi*), a federally threatened species, are an aquatic invertebrate that occupies a variety of different vernal pool habitats. Detonation craters have been reported as containing habitat for this species, and the species has been found in these craters. A project is currently on-going on VAFB to document all vernal pools capable of supporting this species and other dependent species. EOD detonation crater will be surveyed prior to detonations for presence of vernal pool fairy shrimp.

Gaviota tarplant (*Hemizonia increscens* ssp. *villosa*), a federal and state endangered plant species, is presently being inventoried throughout VAFB. This plant occurs in grasslands and coastal sage scrub and is commonly found in previously disturbed areas, especially with sandy soils, such as EOD detonation site. The EOD Site will be surveyed for presence of Gaviota tarplant prior to detonations.

Analysis as to whether or not project activities would:

a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

   Impact Analysis:
   Noise impacts would be considered significant if they substantially increased the ambient noise levels for adjoining areas with sensitive receptors. Noise impact criteria are based partly on land use compatibility guidelines and partly on factors relating to the duration and magnitude of noise level changes. Short-term duration noise from detonations at the EOD Range is restricted to daytime hours, unless an emergency situation dictates use of the range at night. A daytime noise level of 45 dBA is typically considered the threshold for interior noise in sensitive areas such as living quarters or offices. A daytime noise level of 65 dBA (i.e., allowing for attenuation of 20 dBA through building shell) is typically considered the threshold for exterior noise around these sensitive areas.

   Detonations at the EOD Range temporarily raise the ambient noise levels in the area. Although specific data for noise levels resulting from detonations at the range are not available, a comparison with noise levels from other activities on the base (aircraft traffic, missile launches) indicates that operations at the EOD Range could produce noise levels that are of short duration and would likely be below the 65 dBA threshold at off-base residential areas. The nearest sensitive receptors on the base are more than 1 mile from the EOD Range; they are well outside the 65 dBA noise contour for the Vandenberg AFB Airfield (Vandenberg AFB 2000e) and are also likely to be outside the 65 dBA noise contour for the EOD Range.

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☒ Less Than Significant Impact
   ☐ No Impact

b. Exposure of persons to or generation of excessive groundbourne vibration or groundbourne noise levels.

Impact Analysis:
The sound produced by exploding bombs varies, depending on their type and their height above or below ground at detonation. Sound levels from the detonation of explosive equivalent to small projectiles (60 grams of TNT) were 144 dB peak while the sound levels from the equivalent of larger projectiles (20 kilograms of TNT) were 163 dB peak, both at a distance of 100 meters from the detonation point (Paakkonen 1991). For comparison, the startup of a jet airplane produces a sound level of approximately 126 dB at a distance of 100 meters (Siemens 2005) and a jackhammer produces a sound level of approximately 120 dBA at a distance of 50 feet (USACHPPM 2005a). Noise from a Minuteman missile launch is approximately 125 dBA at 1.8 miles and 80 dBA at 7.9 miles (Vandenberg AFB 2000c).

The donor charge used during EOD operations at the range is C-4 explosive. Approximately 33 pounds of C-4 are used for each detonation, although the actual amounts vary. As noted throughout this analysis, the activities at the EOD Range are periodic and in short duration. Additionally, the detonation range is located more than 4 miles from the nearest off-base residents, more than 1 mile from the nearest schools or other sensitive receptors, and more than 2 miles from the nearest public airport, therefore it is not anticipated that the proposed activities at the EOD Range will result in excessive groundbourne vibration or groundbourne noise levels.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

c. A substantial permanent increase in ambient noise levels in the vicinity above levels existing without the project.

Impact Analysis: Existing noise levels on VAFB are generally quite low due to the large areas of undeveloped landscape and relatively sparse noise sources. Background noise levels are primarily driven by wind noise; however, louder noise levels can be found near industrial facilities, transportation routes the Off-road Vehicle (ORV) recreation area, and the model airplane recreation area. Rocket launches and aircraft overflights create louder intermittent noise levels. General ambient hourly average sound levels on VAFB measurements have been found to range from around 35 dB to 56 dB (Thorson et al. 2001).
Please also see response in subsection (a).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact Analysis: For humans, OSHA **1910.95(b)(2)** Permissible Noise Exposures states that “Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.” The GIS map shows that the closest facility to the detonation pit is the Pegasus Checkout Facility (Building 1555). The anticipated peak noise levels at this facility will be between 125 dB and 130 dB, substantially below OSHA requirements. At building 2500, about 2.5 km from the detonation pit, the noise from the blast is described as “startling.” (Ray Fields – personal communication).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☒ Less Than Significant Impact
☐ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

c) SRS Technologies
2005 *EOD Noise Study, Vandenberg Air Force Base, California.Prepared for 30CES/CEV Vandenberg AFB.*

12. Population and Housing

Project activities likely to create an impact:
None.

Description of Baseline Environmental Conditions:

The proposed activities at the EOD Range are anticipated to remain at their current level, there will be no impacts related to population and housing, therefore, no further analysis is deemed necessary.

Analysis as to whether or not project activities would:

a. Induce substantial population growth in area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

13. Public Services

Project activities likely to create an impact:

- ❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Fire protection is provided by the Vandenberg AFB fire department. If needed, additional assistance from the local area is available through mutual aid agreements with the City of Lompoc, City of Santa Maria, and County of Santa Barbara. Police protection is provided by the 30th Security Forces Squadron (30 SFS).

There are no schools, parks, or other public facilities associated with the EOD Range.

Mutual aid agreements are in place so that, during a heightened emergency, additional resources are available to respond to needs at the base.

The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month.

Analysis as to whether or not project activities would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

   - Fire protection
   - Police protection
   - Schools
   - Parks
   - Other public facilities

   Impact Analysis:
   Fire and security protection provided by the Vandenberg AFB fire department and 30 SFS are adequate to respond to most needs on the base, including those at the EOD Range. Detonations at the EOD Range carry the possibility of starting a wildfire. However, the active area of the range is routinely bladed to remove any vegetation, and the base maintains a firebreak around the area. These actions minimize the risk of injury or property damage due to wildland fires. If a fire were to spread to the surrounding vegetation as a result of EOD Range activities, personnel at the range would immediately notify the Vandenberg AFB fire department. The base also maintains mutual aid agreements with the City of Lompoc, City of Santa Maria, and County of Santa Barbara, thus ensuring additional firefighting and emergency response services are available if needed.

   As noted in the Setting, police protection is provided by the 30th Security Forces Squadron (30 SFS) stationed on Vandenberg AFB. Services related to schools, parks and other public facilities do not apply to the proposed project.

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☐ Less Than Significant Impact
   ☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

14. Recreation

Project activities likely to create an impact:
None.

Description of Baseline Environmental Conditions:

Outdoor recreation on Vandenberg AFB includes camping, picnicking, hunting, fishing, horseback riding, birding, bicycling, hiking, whale watching, and off-road vehicle use. Many of these activities are limited to specific areas and/or season. Other activities, such as training programs and educational and environmental tours, are also conducted. Special-interest recreational areas include a golf course; stables; football, baseball, and softball fields; tennis courts; and running tracks.

Areas near the EOD Range are designated as hunting area 2 and 2A (shotgun and archery). Other than this, there are no recreational opportunities in the vicinity of the EOD Range. The range is not accessible by the public, and entry to the site is restricted to authorized personnel only and for official business only, not for recreational purposes. Therefore, no further analysis is deemed necessary.

Analysis as to whether or not project activities would:

a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

   Impact Analysis:

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☐ Less Than Significant Impact
   ☐ No Impact

b. Include recreational facilities or require construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

   Impact Analysis:

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☐ Less Than Significant Impact
   ☐ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

15. Transportation and Traffic

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

Routine detonations take place approximately once or twice a month and do not significantly contribute to the traffic within the base or surrounding locales.

The existing roadway system at Vandenberg AFB is a combination of freeway facility, arterial, and local roads. Characteristics of freeway facility roads include controlled access, high speeds, and large volume capacity. State Route 1 is a freeway facility road located on base property, outside the secured area. Caltrans is responsible for maintaining State Route 1. Arterial roads are characterized by large volume capacity, divided roads, and limited access to adjacent land uses. The only arterial road within Vandenberg AFB is a short portion of California Boulevard near the Santa Maria Gate. Local roads are characterized by two lanes and low speeds. Mira Road, the road leading to the EOD Range, is a local road.

Because of Vandenberg AFB's large size, rural highways, which are roadways not normally designated in the classification of roadways on military bases, are also found. The rural highway is a two-lane, high-speed road, which serves relatively low traffic volumes compared with urbanized areas. Its function is to provide quick and safe access to the more distant parts of the base. Traffic control at the numerous intersections on Vandenberg AFB is accomplished with traffic signals, signs, and right-of-way rules. The roadway system consists of asphalt and concrete surfaced roads of two-, three-, and four-lane width. Permanent access roads are surfaced with asphalt or concrete. The road inside the EOD Range access point is dirt and gravel base.

The permanent access roads at the Base are constructed to accommodate heavy vehicular traffic and do not have vehicle weight restrictions unless indicated by road signs. Most roads will support 18-wheel vehicles/trucks. Because the EOD personnel use vans or relatively smaller trucks to transport PEP material, there is minimal risk of road collapse during PEP transport operations.

The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. Various types of trucks up to 2.5 ton flatbed trucks are used to move PEP to the site. EOD Range activity averages 1 to 2 events per month. Generally, the only material thrown upward by the explosions is soil. These explosions create small craters (approximately 2 feet across and 1 foot deep) in the ground. The craters are filled in during re-grading activities, which occur two or three times per year. On-Base traffic typically consists of passenger vehicles, light trucks, vans, cargo trucks, and military vehicles.

The general traffic flow on Base is heaviest during the morning and evening peak hours (i.e., 7 to 9 a.m. and 3 to 5 p.m.). Waste is moved to the EOD Range during non-peak hours.

All Vandenberg AFB roads operate at an acceptable level of service (LOS).

Analysis as to whether or not project activities would:

a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

   Impact Analysis:
   As noted in the Setting, routine detonations take place approximately one to two events per month, no changes are being proposed to the original permit to operate the EOD Range. Therefore, no impact to the existing traffic load is anticipated.

   Conclusion:
   ☐ Potentially Significant Impact
   ☐ Potentially Significant Unless Mitigated
   ☐ Less Than Significant Impact
   ☒ No Impact

b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highway.

Impact Analysis: All Vandenberg AFB roads operate at an acceptable level of service (LOS).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Impact Analysis:
No changes are being proposed to the permit for the EOD Range, therefore no impact.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Result in inadequate emergency access.

Impact Analysis:
The EOD Range is used for detonations one to two events per month. The amount of traffic generated by these activities is not sufficient to significantly increase the traffic load on roadways leading to and from the range or to exceed the LOS of any of the roads on the base. It would also not interfere with emergency access to any locations on the base.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

e. Result in inadequate parking capacity.

Impact Analysis:
There is sufficient parking at the range to accommodate the vehicles needed to transport personnel, equipment, and material.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

f. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Impact Analysis:
Please see response to subsections (a) and (b).

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:
a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

16. Utilities and Service Systems

Project activities likely to create an impact:

❖ Detonation of unexploded propellant, explosive and pyrotechnic (PEP) materials

Description of Baseline Environmental Conditions:

There is no water supply to the EOD Range and no wastewater is generated there; therefore, range activities do not have any impact on these utilities. Solid waste generated by activities at the range is minimal, as there is virtually no residue from EOD operations. There are no water or wastewater lines at the EOD Range; continued operations there are not anticipated to require the construction of new water or wastewater treatment facilities or expansion of existing facilities. The traffic in and around the EOD Range remains the same for employees coming in and out of work. Mira Road outside the EOD Range has a traffic flow of approximately four vehicles per day. Waste is moved to the EOD Range during non-peak hours. Generally, one truck belonging to the EOD unit transports the PEP materials to the site per event. EOD Range activity averages 1 to 2 events per month. Therefore, no further analysis is deemed necessary.

Analysis as to whether or not project activities would:

a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Impact Analysis:
Not applicable to the proposed project.

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

e. Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

f. Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

g. Comply with federal, state, and local statutes and regulations related to solid waste.

Impact Analysis:

Conclusion:
☐ Potentially Significant Impact
☐ Potentially Significant Unless Mitigated
☐ Less Than Significant Impact
☒ No Impact

References Used:

a) Vandenberg Air Force Base (Vandenberg AFB)
2005 RCRA Part B Permit Application, Explosive Ordnance Disposal (EOD). November.

b) Tetra Tech, Inc. (Tetra Tech)
2005 *Initial Study for Explosive Ordnance Disposal Range, Vandenberg AFB. Prepared under USAF Contract No. F41624-03-D-8617, Task Order 0099.*

Finding Of De Minimis Impact To Fish, Wildlife And Habitat (Optional)[1]

[1] Complete only if a Finding of De Minimis Impact to fish, wildlife and habitat is proposed in lieu of payment of the Department of Fish and Game Notice of Determination filing fee required pursuant to section 711.4 of the Fish and Game Code. A finding of "no potential adverse effect" must be made to satisfy the requirements for the Finding of De Minimis Impact as required by title 14, California Code of Regulations, section 753.5.

The following provides substantial evidence as to why the project will have **no potential for adverse effect** on the listed resources as defined by section 711.2 of the Fish and Game Code:

In considering the effects of EOD Range operations on the environment at Vandenberg AFB, it should be borne in mind that activities at the range are not proposed, but rather have been ongoing since approximately 1945. Thus, most—if not all—potential adverse effects on the environment have already been addressed.

It is anticipated that EOD operations at the range will continue at much the same level as they have over the last few years. Specifically, there will be one or two EOD detonation events per month. Implementation of the following current practices is anticipated to preclude any adverse environmental impacts:

- Retaining the EOD Range at its current size and configuration would avoid any impacts to visual resources/aesthetics, agriculture resources, biological resources, cultural resources, geological resources, hydrology and water quality, land use and planning, mineral resources, noise, recreation, and utilities and service systems.

- Continuing the frequency of operations at the EOD Range at their current level would avoid any impacts to air quality, hydrology and water quality, noise, population and housing, public services, transportation and traffic

- Adherence to current safety and operational procedures at the range would preclude any hazards and hazardous materials impacts.

a. Riparian land, rivers, streams, watercourse, and wetlands under state and federal jurisdiction.

Discussion: Surface water at the EOD Range generally percolates into the soil; there are no apparent surface water drainages at this site. The effects of runoff water from the range are minimal. Detonation activities at the site leave very little residue that would be carried off the site via water flow and would not violate any water quality standards or waste discharge requirements.

Although groundwater does occur on Vandenberg AFB, it is generally in the vicinity of San Antonio Creek and the Santa Ynez River. Groundwater, when it does occur on the Burton Mesa, is usually in the form of perched water tables that form during the rainy season. Therefore, activities at the EOD Range are unlikely to have any effect on groundwater in the area. Laboratory analysis of groundwater samples collected at the EOD Range has shown there is no contamination of groundwater by PEP or metals.

The EOD Range is not within a 100-year flood hazard area nor is it within an area likely to be inundated by seiche, tsunami, or mudflow.

Finding:

☒ No potential for adverse effect.

b. Native and non-native plant life and the soil required to sustain habitat for fish and wildlife.

Discussion: Since Burton Mesa Chaparral is a regionally declining plant community occupied by many endemic species, and because much of the remaining acreage of this community is found on Vandenberg AFB, future construction or development at the base should avoid intact stands of this type of chaparral as much as possible.

Recommendations for managing chaparral include use of existing roads, fuelbreaks, and natural barriers as firebreaks for controlled burning. To reduce the potential for soil erosion and disturbance to the natural chaparral community, which allows invasion by exotics, establishing new firebreaks should be avoided (Vandenberg AFB 1996).

Maintenance of the existing cleared area and firebreak around the EOD Range would not impact the vegetation in the area. Any future expansion of the range involving disturbance or removal of vegetation would need to be coordinated closely with 30 CES/CEV. Disturbed areas would need to be monitored to ensure invasion by exotic plant species does not occur and to prevent erosion of sloped areas south of the range.

Vernal pools are located near the EOD Range, but are outside the area normally used for range activities and are unlikely to be affected by operations there. Range operations do not conflict with any local policies or ordinances protecting biological resources, nor do they conflict with an approved local, regional, or state habitat conservation plan.

Finding:

☒ No potential for adverse effect.

c. Rare and unique plant life and ecological community's dependent on plant life.

Discussion: Since Burton Mesa Chaparral is a regionally declining plant community occupied by many endemic species, and because much of the remaining acreage of this community is found on Vandenberg AFB, future construction or development at the base should avoid intact stands of this type of chaparral as much as possible.

Recommendations for managing chaparral include use of existing roads, fuelbreaks, and natural barriers as firebreaks for controlled burning. To reduce the potential for soil erosion and disturbance to the natural chaparral community, which allows invasion by exotics, establishing new firebreaks should be avoided (Vandenberg AFB 1996).

Maintenance of the existing cleared area and firebreak around the EOD Range would not impact the vegetation in the area. Any future expansion of the range involving disturbance or removal of vegetation would need to be coordinated closely with 30 CES/CEV. Disturbed areas would need to be monitored to ensure invasion by exotic plant species does not occur and to prevent erosion of sloped areas south of the range.

Vernal pools are located near the EOD Range, but are outside the area normally used for range activities and are unlikely to be affected by operations there. Range operations do not conflict with any local policies or ordinances protecting biological resources, nor do they conflict with an approved local, regional, or state habitat conservation plan.

Finding: ☒ No potential for adverse effect.

d. Listed threatened and endangered plant and animals and the habitat in which they are believed to reside.

Discussion: Effects on wildlife are likely to occur, although they are also likely to be of short duration. Since the active area of the EOD Range is kept cleared of vegetation, there is no habitat that is likely to attract wildlife to the range itself. While detonations would likely produce a startle effect and cause wildlife to leave the nearby area temporarily, the presence of numerous wildlife species in the area (refer to Table 3 below and the text discussion in section 4, Wildlife) suggests that animals become habituated to occasional noise and human activity in the area and thus are not likely to be driven away permanently.

Table 3
Animal Species Observed in Areas Near the EOD Range

Common Name	Scientific Name
Mammals	
Mule deer	*Odocoileus hemionus*
Coyote	*Canis latrans*
Brush rabbit	*Sylvilagus bachmani*
Pocket gopher	*Thomomys bottae*
Birds	
Anna's hummingbird	*Calypte anna*
California thrasher	*Toxostoma redivivum*
Wrentit	*Chamaea fasciata*
California towhee	*Pipilo crissalis*
Spotted towhee	*Pipilo maculatus*
Song sparrow	*Melospiza melodia*
White-crowned sparrow	*Zonotrichia leucophrys*
Western meadowlark	*Sturnnella neglecta*
Killdeer	*Charadrius vociferous*
Bewick's wren	*Thryomanes bewickii*
Savannah sparrow	*Passerculus sandwichensis*
American pipit	*Anthus rubescens*
European starling	*Sturnus vulgaris*
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Black-bellied plover	*Pluvialis squatarola*
California quail	*Callipepla californica*
Red-winged blackbird	*Agelaius phoeniceus*
Herpetofauna	
Pacific chorus frogs	*Pseudacris regilla*

Source: Vandenberg AFB 2000c.

Two rare plant species dominate the Burton Mesa chaparral in the vicinity of the EOD Range:

- Sand mesa or shagbark manzanita (*Arctostaphylos rudis*; federal species of concern, CNPS List 1B, plants that are rare or endangered in California and elsewhere).
- La Purisima manzanita (*Arctostaphylos purissima*; CNPS List 1B).

Special-status wildlife species previously recorded in the vicinity of the EOD Range include the following.

- California red-legged frog (*Rana aurora draytonii*; federally threatened).
- Mountain plover (*Charadrius montanus*; federal candidate).
- Western spadefoot toad (*Spea hammondii*; federal species of concern).
- Western burrowing owl (*Speotyto cunicularia hypugea*; federal species of concern).
- Bell's sage sparrow (*Amphispiza belli belli*; federal species of concern).

Finding: ☒ No potential for adverse effect.

e. All species of plant or animals as listed as protected or identified for special management in the Fish and Game Code, the Public Resources Code, the Water Code, or regulation adopted there under.

Discussion: Effects on wildlife are likely to occur, although they are also likely to be of short duration. Since the active area of the EOD Range is kept cleared of vegetation, there is no habitat that is likely to attract wildlife to the range itself. While detonations would likely produce a startle effect and cause wildlife to leave the nearby area temporarily, the presence of numerous wildlife species in the area (refer to Table 3 and the text discussion in section 4, Wildlife) suggests

that animals become habituated to occasional noise and human activity in the area and thus are not likely to be driven away permanently.

Finding: ☒ No potential for adverse effect.

f. All marine and terrestrial species subject to the jurisdiction of the Department of Fish and Game and the ecological communities in which they reside.

Discussion: Effects on wildlife are likely to occur, although they are also likely to be of short duration. Since the active area of the EOD Range is kept cleared of vegetation, there is no habitat that is likely to attract wildlife to the range itself. While detonations would likely produce a startle effect and cause wildlife to leave the nearby area temporarily, the presence of numerous wildlife species in the area (refer to Table 3 and the text discussion in section 4, Wildlife) suggests that animals become habituated to occasional noise and human activity in the area and thus are not likely to be driven away permanently.

Finding: ☒ No potential for adverse effect.

g. All air and water resources the degradation of which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that air and water.

Discussion: Effects on wildlife are likely to occur, although they are also likely to be of short duration. Since the active area of the EOD Range is kept cleared of vegetation, there is no habitat that is likely to attract wildlife to the range itself. While detonations would likely produce a startle effect and cause wildlife to leave the nearby area temporarily, the presence of numerous wildlife species in the area (refer to Table 3 and the text discussion in section 4, Wildlife) suggests that animals become habituated to occasional noise and human activity in the area and thus are not likely to be driven away permanently.

Finding: ☒ No potential for adverse effect.

Mandatory Findings of Significance

Based on evidence provided in this Initial Study, DTSC makes the following findings:

a. The project ☐ has ☒ does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

b. The project ☐ has ☒ does not have impacts that are individually limited but cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

c. The project ☐ has ☒ does not have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

Determination of Appropriate Environmental Document:

Based on evidence provided in this Initial Study, DTSC makes the following determination:

☒ The proposed project COULD NOT HAVE a significant effect on the environment. A **Negative Declaration** will be prepared.

☐ The proposed project COULD HAVE a significant effect on the environment. However, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A **Mitigated Negative Declaration** will be prepared.

☐ The proposed project MAY HAVE a significant effect on the environment. An **Environmental Impact Report** is required.

☐ The proposed project MAY HAVE a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on

attached sheets. An **Environmental Impact Report** is required, but it must analyze only the effects that remain to be addressed.

☐ The proposed project COULD HAVE a significant effect on the environment. However, all potentially significant effects (a) have been analyzed adequately in an earlier Environmental Impact Report or Negative Declaration pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier Environmental Impact Report or Negative Declaration, including revisions or mitigation measures that are imposed upon the proposed project. Therefore, nothing further is required.

Approvals:

Preparer's Signature		Date
Mike Eshaghian	Hazardous Substances Scientist	(818) 717-6679
Preparer's Name	Preparer's Title	Phone #

Permit Renewal Team Leader Signature		Date
Ray Leclerc	Senior Hazardous Substances Engineer	(916) 255-3582
Permit Renewal Team Leader Name	Permit Renewal Team Leader Title	Phone #

ATTACHMENT A

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