

February 23, 1990

To: Governmental Agencies, Public Officials, Public Groups and Interested Individuals

Attached for thirty (30) days of public and governmental agency notification, in compliance with the National Environmental Policy Act and the regulations of the President's Council on Environmental Quality, is the Finding of No Significant Impact and the Environmental Assessment for the Titan IV/Solid Rocket Motor Upgrade Program and operations at Vandenberg Air Force Base, California and Cape Canaveral Air Force Station, Florida.

The Finding of No Significant Impact and the Environmental Assessment address the environmental consequences associated with the construction and modifications to existing launch complexes and certain support facilities at Vandenberg AFB, California and Cape Canaveral AFS, Florida and construction of a second Solid Motor Assembly Building(SMAB) and a Payload Fairing Cleaning Facility (PFCF) at Cape Canaveral AFS, Florida to support a maximum launch rate of 37 Titan launch vehicles from 1991 through 1995 and will also provide for the launching of a larger launch vehicle known as the Titan IV - Type 2 or Solid Rocket Motor Upgrade (SRMU) from Vandenberg AFB, California and Cape Canaveral AFS, Florida.

The thirty (30) day public and agency notification period begins on February 26, 1990, and continues until March 28, 1990. Copies of the Finding of No Significant Impact and the Environmental Assessment may be obtained by writing to:

Department of the Air Force Headquarters Space Systems Division/DEV Attn: Mr. Dan Pilson P. O. Box 92960 Los Angeles, CA 90009-2960

or by calling: Mr. Dan Pilson at (213) 643-1409.

Sincerely,

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Donald R. Simmons, Lt Colonel, USAF Acting Director, Acquisition Civil Engineering

FINDING OF NO SIGNIFICANT IMPACT

TITAN IV/SRMU PROGRAM

CAPE CANAVERAL AIR FORCE STATION, FLORIDA AND VANDENBERG AIR FORCE BASE, CALIFORNIA

1. PROPOSED ACTION

In support of the U.S. Department of Defense (DOD) space program, the U.S. Air Force (USAF) proposes to expand its existing Titan IV launch program at Cape Canaveral Air Force Station (CCAFS), Florida, and Vandenberg Air Force Base (VAFB), California. The proposed action is to increase the launch rate to a maximum of 37 Titan IV vehicles from 1991 through 1995 and to increase payload capacity for Shuttle-class payloads with a larger solid rocket motor known as the Titan IV-Type 2 or the Solid Rocket Motor Upgrade (SRMU). To support the expanded Titan IV program, the USAF proposes to modify existing launch complexes (LCs) and certain support facilities at CCAFS and VAFB and to construct a second Solid Motor Assembly Building (SMAB) and a Payload Fairing Cleaning Facility (PFCF) at CCAFS.

The Titan IV program has evolved rapidly since 1985 when the USAF began the Complementary Expendable Launch Vehicle (CELV) program to provide launch capability to supplement the Space Shuttle. The CELV program developed the Titan 34D7 launch vehicle, an expanded version of the Titan 34D. The USAF initially planned to launch 10 CELVs from CCAFS. An Environmental Assessment (EA) for this program, which evaluated the impacts of modifications to LC-41 and 10 launches of the CELV, also supported a Finding of No Significant Impact (FONSI).

In mid-1986, the USAF expanded the CELV program to 24 launches (total) from CCAFS and VAFB. At that time, the Titan 34D7 was renamed Titan IV. A supplemental EA addressed the increased number of launches and modifications to facilities at CCAFS, and a separate EA was prepared for the Titan IV launches from VAFB. FONSIs were also supported by these EAs.

The expanded Titan IV program will provide increased launch frequencies and greater lift capacity to ensure adequate launch capability for DOD payloads. For some launches, the SRMU will be used to provide increased thrust for the Titan IV vehicle so that it can launch Shuttle-class DOD payloads. The SRMU will increase payload capacity 25 to 35% above that of the Titan IV-Type 1 vehicle. To achieve the increased launch rates proposed for the Titan IV program and to process the larger SRMU, new facilities and modifications to existing facilities are needed at CCAFS and VAFB.

Alternative actions considered for the Titan IV program include no action, alternative sites, and alternative launch vehicles. Alternatives were eliminated from detailed consideration in this environmental assessment (EA) because they were incapable of meeting the mission requirements of the Titan IV program.

1.1. Project Location

Cape Canaveral Air Force Station

CCAFS is located along the eastern coast of Florida near the city of Cocoa Beach in Brevard County. The base is about 15 mi north of Patrick AFB and adjacent to the National Aeronautics and Space Administration's (NASA's) Kennedy Space Center (KSC). CCAFS occupies about 15,800 acres (25 mi²) of a barrier island that is bounded on the east by the Atlantic Ocean and on the west by the Banana River.

The facilities at CCAFS that would be affected by the proposed action are located in the northwest portion of the base. These include LCs 40 and 41 and the Titan Integrate-Transfer-Launch (ITL) Area immediately south of the LCs. A new facility, the SMAB, is proposed to be constructed at a site near the ITL Area on narrow man-made causeway in the Banana River.

The ITL Area is located on a man-made island in the Banana River; the LCs are located on previously disturbed land and are industrial in character. LCs 40 and 41 were constructed in 1963-64. LC-41 was used by the USAF from 1964 to 1977 for Titan launches; it was reactivated in 1986 and renovated to support Titan IV launches. LC-40 has been used for Titan launches from 1964 to the present. The site for the proposed new SMAB is currently vacant except for a railroad spur on which rail cars containing rocket fuel and oxidizer are stored.

Vandenberg Air Force Base

VAFB, occupying 98,400 acres (154 mi²) along the south central coast of California, is located 140 mi northwest of Los Angeles and about 5 mi west of Lompoc in Santa Barbara County. VAFB is bounded by the Pacific Ocean to the west and south. VAFB is bisected by Ocean Avenue, which runs from Lompoc to a public beach at Surf.

The facilities at VAFB that would be affected by the proposed action are located on South AFB and include Space Launch Complex (SLC) 4E, from which Titan IV vehicles would be launched, and the Solid Rocket Subassembly Facility (SRSF) (Bldg. 398), located at SLC-6.

1.2 Project Description

The proposed action consists of (1) an increase in the Titan IV launch rate from CCAFS and VAFB from 24 to 37 through 1995, (2) the development and use of an enhanced Titan IV vehicle having larger solid rocket motors (SRMUs) capable of carrying Shuttle-class payloads, and (3) the expansion and renovation of Titan launch and support facilities at CCAFS and VAFB to process and handle the increased launch rates and larger Titan IV-Type 2 (SRMU) vehicles.

Existing facilities at CCAFS are not capable of processing solid rocket motors or the proposed SRMUs at a rate that could support the higher launch frequencies. Launch frequencies are also limited at present, because only one launch pad (LC-41) is available and because solid rocket motor assembly and inspection must be completed on the pad. The proposed action will provide a second SMAB that could accommodate a three-segment SRMU or a seven-segment solid rocket motor, thereby eliminating on-pad assembly and increasing the pre-launch processing rate. Because the existing Payload Fairing Cleaning Facility is incapable of handling the proposed launch frequencies, an additional PFCF will be built. An additional launch site (LC-40) will be renovated to support the launch of Titan IV-Type 1 and Type 2

(SRMU). LC-40 will require a new Mobile Service Tower, a new Umbilical Tower, and an overpressure suppression system (OSS). LC-41 will undergo structural modifications to accommodate the SRMU and will also have an OSS installed. Other minor renovations of structural, mechanical, and electrical systems will be made at the existing SMAB, the Vertical Integration Building, the Motor Inert Storage building and the Receipt, Inspection, and Storage building at CCAFS.

The existing facilities at VAFB are adequate to support the proposed launch rates; however, modifications are needed at Bldg. 398 for processing and storage of the larger SRMU segments and at SLC-4E to accommodate the Titan IV-Type 2 (SRMU) vehicle.

2. SUMMARY OF ENVIRONMENTAL IMPACTS

2.1 Cape Canaveral Air Force Station

Air Quality

Construction, pre- and post-launch processing, and launch activities during the Titan IV program will not significantly impact air quality.

Modelling results indicate that particulate matter (PM-10) emissions from earthwork and excavation would be about 5% and 1% of the 24-hr and annual National Ambient Air Quality Standard (NAAQS) for PM-10. Background levels in the CCAFS area are well below the NAAQS, therefore, the incremental increase from construction activities of the Titan IV program would not result in standards violations. In addition, PM-10 increases would be temporary, lasting only for the construction period.

During construction and pre- and post-launch processing, vehicles and equipment will emit nitrogen oxides (NO_x) , sulfur dioxide (SO_2) , hydrocarbons, carbon monoxide (CO), and PM-10. Emissions will be sporadic and concentrated near the source, and ambient air quality outside the immediate vicinity of operation will not be adversely affected.

Ground support activities and launch vehicle fueling will also result in emissions of trace quantities of volatile organic compounds (VOCs), hydrazines, nitrogen tetroxide, NO_{p} and CO. Emissions of hydrazine and nitrogen tetroxide will be minimized by pollution control devices and will conform to all required regulatory permits.

Combustion of solid rocket motors at launch will produce a ground level exhaust cloud containing aluminum oxide particulates, hydrogen chloride vapor or droplets, and carbon monoxide gas. The CO will rapidly oxidize to carbon dioxide (CO₂) in the atmosphere, therefore, it will not adversely affect ambient air quality. Modelling results indicate that the maximum 1-hr hydrogen chloride concentration at the nearest off-base location would be 0.22 parts per million (ppm), well below the National Research Council-recommended short-term public emergency guidance level (SPEGL) of 1 ppm. Similarly, the maximum 24-hr aluminum oxide particulate concentration off-base was predicted to be about 25 micrograms/m³, well below the NAAQS of 150 micrograms/m³. Adverse air quality impacts would not be expected, because even when this increment is added to the highest historical background PM-10 concentration, the NAAQS will not be violated. In addition, the probability of maximum background concentration occurring coincidentally with launch is very low.

The incremental effects of Titan IV launches on stratospheric ozone and hence, groundlevel ultraviolet-B radiation, will be much less than effects attributable to other natural and man-made causes.

Water Resources

Adverse impacts to surface waters and groundwater will not result from the Titan IV program. During construction, control measures, such as straw barriers and berms, will be implemented to minimize erosion and sedimentation. New wastewater streams will discharge to the Banana River from the stormwater runoff retention pond and the sewage plant at the proposed SMAB. Discharges will be in accordance with the effluent limitations defined by state permits, and will not adversely affect the water quality of the Banana River.

During launch, about 400,000 gallons of deluge water will be required. About 320,000 gallons will be collected in a sump, then drained to percolation ponds at LCs 40 and 41 in accordance with a state industrial wastewater discharge permit for the facilities. The remaining 80,000 gallons will be dispersed by the force of the vehicle exhaust into the atmosphere and to grade near the launch pad.

Percolation through the soil to groundwater will prevent the release of deluge water to nearby surface waters, therefore, no adverse surface water impacts will result. Percolation will likely cause slight groundwater mounding beneath the LCs. Based on local groundwater velocity, it would take a minimum of eleven years for the mound to reach the wetlands that are one-quarter mile west of the complexes. Groundwater quality will not be adversely affected by percolation because dilution by natural groundwater would be expected. An existing groundwater monitoring program at the LCs will continue during the Titan IV program, and will enable quick detection of contamination and appropriate mitigative action, if needed.

The deluge water dispersed by the exhaust will contain hydrogen chloride vapor or droplets and aluminum oxide particulates. Depending on prevailing winds, deposition from the cloud would be on land, in the Banana River, or in the Atlantic Ocean. No adverse impacts will result because both water bodies have sufficient buffering capacity to neutralize the acidic character of the hydrogen chloride. The aluminum oxide is insoluble and will not affect water quality.

Ecology

No significant impacts to the biota of CCAFS and surrounding areas will result from the expanded Titan IV program. Habitat will not be lost or permanently disturbed, and populations of resident species will not be significantly changed. Hydrogen chloride and aluminum oxide in the ground cloud formed from SRM exhaust would have minor impacts on populations of wildlife and vegetation outside the perimeter fence of each pad. Noise from Titan IV launches exceeding 95 dBA could result in a temporary hearing loss in sensitive wildlife near the launch pads. Wildlife that are heavily dependent on auditory (as opposed to visual) information may be more susceptible to predation if they experience short-term hearing loss. However, because no more than six Titan IV launches would occur per year, launch noise will not significantly contribute to wildlife hearing loss. Because the sonic boom from the Titan IV launches will occur over open ocean waters, it will not significantly impact terrestrial wildlife. Sea birds and mammals may exhibit startle responses.

Aquatic biota in a 0.3-ha (0.8-acre) wetland will be displaced by construction of the new SMAB. There will be no dredging or alteration of aquatic habitat in the Banana River. With the implementation of erosion and sedimentation control, no significant adverse impacts to the aquatic ecosystem will occur as a result of construction.

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Depending on prevailing winds, acid deposition from the ground cloud may occur in the wetlands and Banana River to the west of both LCs or the Atlantic Ocean to the east. Fish and insects in the areas of heaviest HCl deposition could be adversely affected by a decreased pH. For the most part, the buffering capacity of the Banana River will be sufficient to prevent significant impacts to aquatic biota.

Deluge water would discharge to grassy percolation areas at the LCs, and gate valves would prevent water movement off-site. Therefore, deluge water discharge will not adversely affect aquatic ecosystems.

Threatened and Endangered Species

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The impacts of security and operations lighting at the LCs and ITL Area on endangered sea turtles is a major concern associated with all CCAFS launch programs. Lights that emit in the ultraviolet, violet-blue, and blue-green wavelengths disorient sea turtle hatchlings in nests on the beach. When hatchlings are disoriented, they move inland rather than seaward and subsequently suffer increased mortality. Light management plans designed to reduce beach lighting are being developed for all existing facilities at CCAFS. With the approval of the U.S. Fish and Wildlife Service (FWS) and the implementation of these plans, significant impacts to endangered sea turtle populations will not result.

Consultation between the USAF and the FWS regarding the effects of the launch vehicle's ground cloud and launch noise on two federally listed threatened species, the Florida scrub jay and the southeastern beach mouse, resulted in a Biological Opinion issued by the FWS that stated that "the operational phase of the Titan IV program is not likely to jeopardize the continued existence of the scrub jay or southeastern beach mice." The FWS issued an incidental take exemption to the USAF for losses of either species in the vicinity of the launch complexes.

Floodplains and Wetlands

The low-lying areas at the new SMAB site will be elevated with fill (loamy sand with shell) to 9 ft above mean sea level (MSL). This elevation is above both the base (100-year) and critical action (500-year) floodplains. Because of the small area affected by the proposed

construction relative to the floodplain of this lagoon system, the action would have no effect on flood potential in the drainage basin. A Sect. 404 dredge-and-fill permit has been obtained from the U.S. Army Corps of Engineers.

Construction of the SMAB will require the removal of about 0.8 acre of wetland vegetation (primarily woody shrubs) along the southern causeway portion of the site. The total area of vegetation, both wetland and non-wetland, on the SMAB site is about 14 acres. All vegetation on the site is secondary growth with no unique plant communities and no habitat for protected species; therefore, significant adverse impacts will not occur. To compensate for wetlands disturbance, a new 1.6-acre wetland will be created on the western boundary of the site.

Man-made Environment

New construction and proposed modifications for the Titan IV program are compatible with the existing industrial nature of land use at CCAFS.

The projected population increase during construction would be about 650, which represents 0.1% of Brevard County's projected 1990 population. About 160 additional persons would be expected to migrate into the area for the Titan IV launch operations period. Many of these employees would locate in Cape Canaveral and Coccoa Beach. The estimated increase represents about 0.6% of the combined projected 1990 populations of these communities. The population increase expected from construction and operation will have a negligible impact on the local infrastructure, services, and economy.

An estimated 600 vehicles might be added by the Titan IV program to the existing traffic volume entering CCAFS access points. Given the existing levels of service, there is little probability of a major reduction of speed or flow rate.

The Florida State Historic Preservation Officer (SHPO) has provided official comment on the proposed project and has indicated that no significant archaeological or historical sites are recorded or considered likely to be present within the project areas, and that no adverse impacts to cultural, archaeological, or historic resources will occur as a result of the proposed action. Y

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Hazardous Waste

The small increases in hazardous wastes generated at CCAFS as a result of the Titan IV program will be mitigated by management practices, as stipulated by applicable federal and state regulations. The Titan IV program is being evaluated under the USAF hazardous waste minimization program; measures will be implemented to reduce the production of hazardous wastes, where feasible, and recycling will be encouraged. Therefore, hazardous waste from the Titan IV program will not have a significant impact on the environment.

Safety 5 1

The Titan IV program will not result in an unreasonable or increased risk to the public. Potential impacts to public safety will be prevented by the safety and disaster preparedness plans for the program and for CCAFS.

Cumulative Impacts

The Titan IV program is one of many under development in the Brevard County region. Others include military-related projects and urban/industrial development.

The proposed Titan IV program is a successor to the Titan 34D program, which is being phased out. The environment is not expected to be impacted to a greater intensity than by previous Titan launch programs.

2.2 Vandenberg Air Force Base

Air Quality

Construction activities at VAFB will involve minimal earthmoving operations; therefore, fugitive dust emissions will be small, and significant air quality impacts are not expected. Vehicle and equipment emissions at VAFB will be the same as those described for CCAFS, and will not result in significant adverse impacts.

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Modelling results indicate that combustion products from launch would result in a maximum 1-hr HCl concentration at the nearest off-base location equal to the SPEGL of 1 ppm. As is the case with all potentially hazardous launch-related activities, VAFB meteorological forecasting staff will conduct dispersion modeling before launch to ensure that adverse concentrations do not occur over populated areas on-base or off-base.

The maximum 24-hr aluminum oxide particulate concentration off-base was predicted to be ~105 micrograms/m³, which is below the 24-hr NAAQS of 150 micrograms/m³ but greater than the California Ambient Air Quality Standard of 50 micrograms/m³. However, the predicted PM-10 concentration is quite conservative, because maximum background and launch impacts are assumed to coincide in time. Because of the unlikelihood of such an occurrence, significant PM-10 impacts will not be expected.

Water Resources

Construction at VAFB will not require the disturbance of land, therefore, erosion and sedimentation impacts to surface waters will not occur.

Water quality in Spring Canyon Creek (an intermittent stream) reflects the cumulative impacts of deposition from ground clouds and deluge discharge from previous Titan launches at SLC-4E and SLC-4W. Deposition reduces the pH and alkalinity upstream of the site, and aluminum oxide accumulates in streambed sediments. With future launches, water quality will continue to be degraded by the ground cloud. Uncontrolled deluge water discharge will not occur, however, during future Titan IV launches; wastewater will be collected and treated onsite. Because only two launches per year are planned, impacts from the ground cloud deposition will not be significant.

A surface water monitoring plan will be implemented as part of the Titan IV program. If significant water quality changes are evident, the California Regional Water Quality Control Board will advise the USAF of appropriate mitigation measures.

Surface water supplies in the region will not be utilized by the Titan IV program; therefore, adverse impacts will not occur. The groundwater supply at South VAFB will not be significantly impacted by Titan IV launches at SLC-4E. Based on launch requirements and a launch rate of two per year, annual groundwater withdrawn for deluge and washdown water will be about 0.3% of annual groundwater supplies currently consumed at South VAFB. Because about 80% of deluge and washdown water will be collected and treated, adverse impacts to groundwater quality will not occur during normal operation.

Ecology

Construction activities associated with the proposed action will have negligible impacts on terrestrial vegetation.

Launches will temporarily increase noise and will produce acid deposition on vegetation and fauna. Because only two Titan IV launches per year are planned, impacts of acid deposition will not be significant.

Certain launch trajectories of Titan IV vehicles will produce sonic booms that may intersect the surface on or near the Channel Islands near VAFB, which are important breeding grounds for several protected species of marine mammals and sea birds. Based on previous studies of the potential sonic boom effects expected of Space Shuttle launches from VAFB, the Titan IV launch would generate a sonic boom of a substantially lower magnitude. (This determination is based on the size and shape of the vehicle and the size of its exhaust plume relative to the Shuttle). Significant adverse impacts to marine species during previous launches from VAFB over the past 25 years have not been observed during field studies, therefore, it is projected that future Titan IV launches, at a rate of two per year, will not significantly impact threatened or endangered species of the Channel Islands.

Deposition onto Spring Canyon Creek and its watershed from the ground cloud would to reduce the pH and alkalinity upstream of the site and maintain the existing poor aquatic habitat in the creek. Because only two launches are planned per year, impacts to aquatic habitat will not be significant. Deluge water discharge at SLC-4E will be collected and treated; therefore, adverse impacts to the wetlands in Spring Canyon will not occur.

Man-made Environment

A maximum of 15 construction and 21 operations workers will be needed for the expanded Titan IV program. No impacts to regional and local community resources are expected from this small increase in labor requirements.

The proposed action involves modifications to existing structures at SLC-4E and internal modifications to Bldg. 398, thus, no historic or archaeological sites would be affected by the proposed action. Consultation with the California SHPO has resulted in a determination of no adverse effect from the proposed action.

Hazardous Waste

The small increases in hazardous wastes generated at VAFB as a result of the Titan IV program will be mitigated by management practices, as stipulated by applicable federal and state regulations. The Titan IV program is being evaluated under the USAF hazardous waste minimization program; measures will be implemented to reduce the production of hazardous wastes, where feasible, and recycling will be encouraged. Therefore, hazardous waste from the Titan IV program will not have a significant impact on the environment.

Safety

The Titan IV program will not result in an unreasonable or increased risk to the public. Potential impacts to public safety will be prevented by the safety and disaster preparedness plans for the program and for VAFB.

Cumulative Impacts

The Titan IV program is one of many under development in the Santa Barbara County region. Others include military-related projects, oil and gas development projects, and urban/industrial development.

The proposed Titan IV program is a successor to the Titan 34D program, which is being phased out. The environment is not expected to experience any significant impacts of greater

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intensity than that of previous Titan programs. Therefore, cumulative impacts to the environment are not expected to be significant.

3. FINDINGS

Based upon the above, a Finding of No Significant Impact is made. Copies of the Environmental Assessment on the proposed action, dated February 1990, can be obtained from:

> Headquarters, Space Systems Division, SSD/DEW Attn: Mr. Daniel Pilson P.O. Box 92960, Worldway Postal Center Los Angeles, CA 90009-2960