NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTICE: 01-GSFC-01

National Environmental Policy Act: **Thermoshpere Ionosphere Mesosphere Energetics and Dynamics (TIMED) Mission**

AGENCY: NASA's Goddard Space Flight Center Solar Terrestrial Probes (STP) Program

ACTION: Finding Of No Significant Impact

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321, *et seq.*), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA policy and procedures (14 CFR Subpart 1216.3), NASA has made a Finding of No Significant Impact (FONSI) with respect to the proposed TIMED mission. The mission would involve the testing, processing, and launching of the TIMED spacecraft. The spacecraft would be launched aboard a Boeing Delta II 7920-10 launch vehicle from Vandenberg Air Force Base, California in mid 2001. TIMED is the initial mission under NASA Goddard Space Flight Center's Solar Terrestrial Probes (STP) Program and is a component of the Sun-Earth Connection (SEC) Theme in the NASA Headquarters Office of Space Science. SEC is designed to answer fundamental questions about the solar atmosphere and flares, the Earth's magnetosphere and upper atmosphere, and the connections among them. TIMED's objective would be to develop a basic understanding of the least explored, least understood region of the atmosphere.

DATE: Comments in response to this notice must be provided in writing to NASA within 30 days after publication of this notice.

ADDRESSES:

Written comments should be addressed to
Mr. John Wolff
NASA Goddard Space Flight Center
Code 460
Greenbelt, Maryland 20771
or via email to
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The Environmental Assessment (EA) prepared for this mission which supports the FONSI may be viewed at:

(a) NASA Headquarters , Library, Room 1J20, 300 E Street SW, Washington, DC 20546 (202-358-0167)

(b) NASA, Goddard Space Flight Center, STP Program Office, Greenbelt, MD 20771 (301-286-2113)

(c) Lompoc Public Library, 501 East North Avenue, Lompoc, CA 93436-3406

(d) Santa Maria Public Library, 420 South Broadway, Santa Maria, CA 93454-5199

(e) Santa Barbara Public Library, 40 East Anapamu Street, Santa Barbara, CA 93101-2000

(f) University of Califorinia, Santa Barbara Library, Government Publications Department, Santa Barbara, CA 93106-9010

A limited number of copies of the Environmental Assessment (EA) are available on a first request basis by contacting Mr. John Wolff at the address, telephone number, or electronic mail address indicated herein.

FOR FURTHER INFORMATION CONTACT:
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SUPPLEMENTAL INFORMATION:

NASA has reviewed the EA for the TIMED mission and has determined that it represents an adequate and accurate analysis of the scope and level of associated environmental impacts. The EA is hereby incorporated by reference in this FONSI.

NASA proposes to test, process, and launch the TIMED satellite into Earth's orbit to gather information about the interaction between the Sun and the Earth's atmosphere and their impact on human activities in space. The TIMED satellite would be shipped to Vandenberg Air Force Base (VAFB), California, where it would be processed and launched in mid 2001.

The proposed mission and the No-Action Alternative were examined in the EA. The No-Action Alternative would not fulfill the need for scientists to gather important information to gain a better understanding of the temperature, density, and wind structure in the Mesosphere, Lower Thermosphere and Ionosphere (MLTI) region between the Earth and Sun.

The environmental consequences of testing, processing, and launching TIMED were addressed. The possible environmental impacts that were considered included, but were not limited to, air and water quality impacts, land and biotic resources, adverse health and safety impacts, launch debris and re-entry. The launch vehicle chosen for this mission is the Boeing Delta II 7920-10 Medium Expendable Launch Vehicle. TIMED will be co-manifested with the Jason-1 spacecraft. Satellite size, weight, and orbit

placement drove the vehicle selection. The environmental impacts of the launch vehicle have been addressed in previous NASA environmental assessments. The areas of potential impact considered in this assessment were those affected by the activities that would originate and take place at VAFB, NASA Goddard Space Flight Center (GSFC), Greenbelt, Maryland, and the Johns Hopkins University Applied Physics Laboratory (JHUAPL), Laurel, Maryland.

All of the activities involved in these missions are within the normal scope and level of activities at VAFB. The components, which would be utilized in the spacecraft and instruments, would be of materials normally encountered in the space industry. The spacecraft would not utilize any fuel/propellants or Earth-pointing lasers. TIMED would carry minute quantities of radioactive material needed for the scientific instruments calibration. The use of radioactive sources in these missions has been reviewed in accordance the Presidential Directive/National Security Council Number 25 (PD/NSC-25) and the NASA Safety Manual (NPG 8715.3). The launch approval requirements have been met. The sources are of low level, are adequately contained, have limited accessibility, and pose no significant hazard to personnel or the environment.

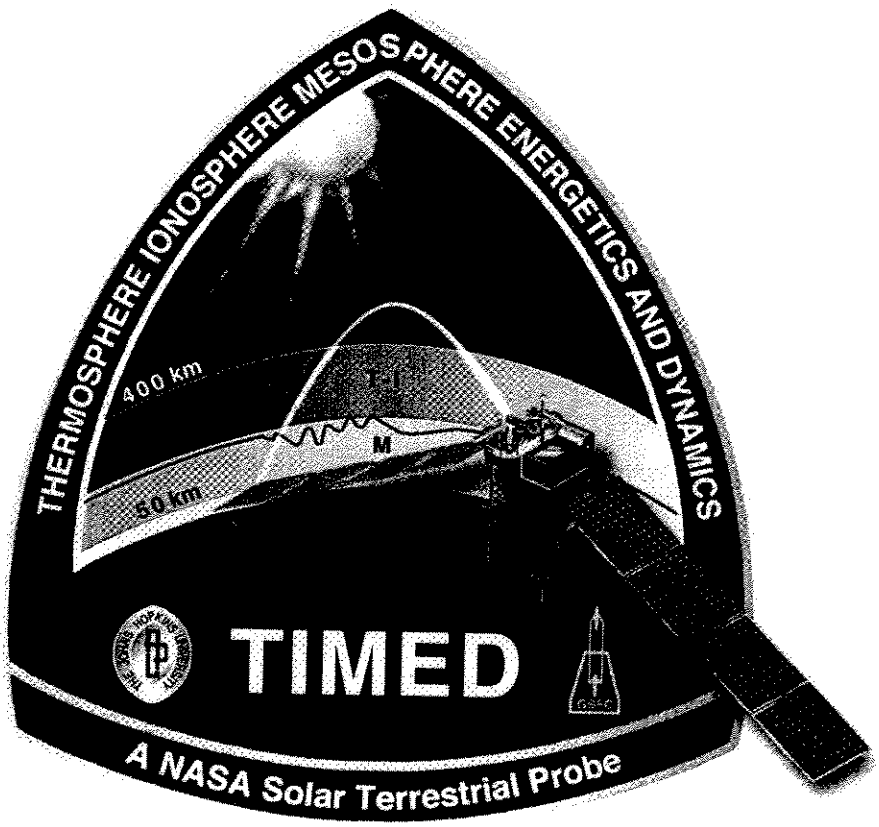
There would be no substantial impact on air or water quality, threatened or endangered species or critical habitat, cultural resources, and wetlands or floodplains. No other environmental issues of concern were identified in the EA. Hazards associated with the TIMED mission have been analyzed and do not raise any environmental or safety concerns.

On the basis of the TIMED EA, NASA has determined that the environmental impacts associated with the mission would not have a significant impact on the quality of the human environment.

A. V. Diaz
Director
NASA Goddard Space Flight Center

2/28/01
Date

ENVIRONMENTAL ASSESSMENT FOR THE THERMOSPHERE• IONOSPHERE•MESOSPHERE•ENERGETICS AND DYNAMICS (TIMED) MISSION



January 2001

National Aeronautics and Space Administration
Goddard Space Flight Center
Solar Terrestrial Probes Program Office
Greenbelt, Maryland 20771

Environmental Assessment

for the

Thermosphere•Ionosphere•Mesosphere•Energetics and Dynamics (TIMED) Mission

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Lead Agency:

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Proposed Action:

NASA's Office of Space Science (OSS) is responsible for all of NASA's programs relating to astronomy, the solar system, and the Sun and its interaction with Earth. The objective of the OSS "Sun-Earth Connection" Theme focuses on the solar atmosphere and flares, Earth's magnetosphere and upper atmosphere, and the connections among them. The TIMED mission is a component of this strategy. NASA proposes to implement the TIMED mission, which includes the testing, processing, and launching of this spacecraft from Vandenberg Air Force Base, California.

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EXECUTIVE SUMMARY

The National Aeronautics and Space Administration's (NASA) Goddard Space Flight Center (GSFC) has determined that an Environmental Assessment (EA) should be prepared in accordance with the National Environmental Policy Act (NEPA) to evaluate the environmental consequences of implementing the Thermosphere•Ionosphere•Mesosphere•Energetics and Dynamics (TIMED) mission. This EA discusses the mission's objectives as well as their potential environmental effects. The scope of this assessment includes the testing, transporting, processing, and launching of the spacecraft.

Both the proposed mission and the No-Action Alternative were examined in this EA. The No-Action alternative would not fulfill NASA's science needs.

The environmental consequences of all aspects of the testing, transporting, pre-launch processing, launching, and re-entry of TIMED were considered. Among possible impacts that were considered are air and water quality impacts, local land area contamination, adverse health and safety impacts, the disturbance of biotic resources, socioeconomic impacts, and adverse effects in wetland areas, and areas containing historical sites. All of the activities involved in these missions are within the normal scope and level of activities conducted at the sites involved. On the basis of this EA, NASA has determined that the environmental impacts associated with the mission would not have a significant impact on the quality of the human environment.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY ..... *iii*

TABLE OF CONTENTS ..... *iv*

ABBREVIATIONS AND ACRONYMS ..... *v*

1.0 PROPOSED ACTION AND ALTERNATIVES *6*

1.1 PURPOSE AND NEED FOR PROPOSED ACTION **6**

1.2 TIMED **7**

1.2.1 Mission Description 7

1.2.2 Science Objectives 7

1.2.3 Spacecraft Description 8

1.2.4 Launch Vehicle Description 9

1.3 ALTERNATIVES TO PROPOSED PAYLOAD **10**

1.4 ALTERNATIVES TO PROPOSED LAUNCH SITE AND VEHICLE **10**

2.0 AFFECTED ENVIRONMENT *11*

2.1 NASA GODDARD SPACE FLIGHT CENTER **11**

2.2 JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY **11**

2.3 VANDENBERG AIR FORCE BASE **11**

3.0 ENVIRONMENTAL IMPACTS OF PROPOSED ACTION AND ALTERNATIVES .. *12*

3.1.1 Air Quality 12

3.1.2 Hydrology and Water Quality 12

3.1.3 Land Resources 12

3.1.4 Noise 13

3.1.5 Biotic Resources 13

3.1.6 Marine Resources 13

3.1.7 Cultural And Historical Resources 13

3.1.8 Socioeconomic Effects And Environmental Justice 13

3.1.9 Hazards 13

3.1.10 Launch Failures 15

3.1.11 Orbital Debris 15

3.1.12 Pollution Prevention 15

3.2 NO-ACTION ALTERNATIVE **17**

4.0 AGENCIES CONSULTED *18*

5.0 LIST OF PREPARERS *19*

6.0 REFERENCES CITED *20*

ABBREVIATIONS AND ACRONYMS

CCSDS	Consultant Committee for Space Data Systems
CEQ	Council on Environmental Quality
EA	Environmental Assessment
ELV	Expendable Launch Vehicle
EOS	Earth Observing System
EPCRA	Emergency Planning and Community Right-to-Know Act
FUV	Far Ultraviolet
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
GUVI	Global Ultraviolet Imager
JHUAPL	Johns Hopkins University / Applied Physics Laboratory
KSC	Kennedy Space Center
MLTI	Mesosphere, Lower Thermosphere and Ionosphere
MSPSP	Missile System Pre-launch Safety Plan
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NMP	New Millennium Program
NPD	NASA Policy Directive
OSC	Orbital Sciences Corporation
OSS	Office of Space Science
PD/NSC	Presidential Directive/National Security Council
PPA	Pollution Prevention Act
SABER	Sounding of the Atmosphere using Broadband Emission Radiometry
SEC	Sun-Earth Connection
SEE	Solar EUV Experiment
SLC	Space Launch Complex
SSI	Spaceport Systems International
STP	Solar Terrestrial Probes
TIDI	TIMED Doppler Interferometer
TIMED	Thermosphere•Ionosphere•Mesosphere•Energetics and Dynamics
UV	Ultraviolet
VAFB	Vandenberg Air Force Base

1.0 PROPOSED ACTION AND ALTERNATIVES

1.1 PURPOSE AND NEED FOR PROPOSED ACTION

NASA'S Office of Space Science (OSS) is responsible for all of the NASA programs relating to astronomy, the solar system, and the Sun and its interaction with Earth. The objective of the OSS "Sun-Earth Connection" (SEC) Theme is to answer issues pertaining to the solar atmosphere and flares, Earth's magnetosphere and upper atmosphere, and the connections among them. The SEC Theme is designed to maintain a sufficient level of scientific investigation and technological innovation so that the United States retains a leading position in research and exploration through this next century. The TIMED mission is a component of this strategy. TIMED is also the first in a series of missions for the Solar Terrestrial Probes (STP) Program under the SEC Theme. Specifically, OSS hopes to gain insight into and to explore and understand the dynamics of the Sun and its interactions with the Earth and other planetary bodies and with the interstellar medium.

NASA has determined that an EA should be prepared to evaluate the environmental consequences of implementing the TIMED mission. The scope of this EA includes the testing, transporting, processing, and launching of the satellite. This document was completed in accordance with the following regulations: the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321, *et seq.*), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA's policy and procedures (14 CFR Subpart 1216.3).

1.2 TIMED

1.2.1 Mission Description

The STP Program at NASA's GSFC, along with the Johns Hopkins University Applied Physics Laboratory (JHUAPL), who is providing the science instrument package and the spacecraft bus, are the lead organizations managing and developing the TIMED mission. The purpose of the TIMED mission is to place a single spacecraft into a circular orbit around the Earth in mid 2001. TIMED is co-manifested with Jason-1 using a Boeing Delta II 7920-10 Expandable Launch Vehicle (ELV). TIMED would be launched into a 625 km (388 miles) orbit for a two-year mission, with a total satellite mass-to-orbit of 600 kg (1323 lbs.). The proposed orbit would be inclined by 74.1 degrees with respect to the equator.

From launch until the end of its mission, TIMED would make observations in response to scheduled instructions from the Mission Operations Center at the JHUAPL in Laurel, Md. These observations would include major investigations under principal investigators from collaborating institutions, as well as guest investigators. Data would be stored in computer memory on the satellite until contact with the ground station is established, and then downlinked to Earth.

1.2.2 Science Objectives

The two-year TIMED mission would focus on the portion of Earth's atmosphere located between 60 and 180 kilometers (40-110 miles) above the surface, where the solar x-ray and ultraviolet (UV) radiation (the most variable part of the solar spectrum) is absorbed.

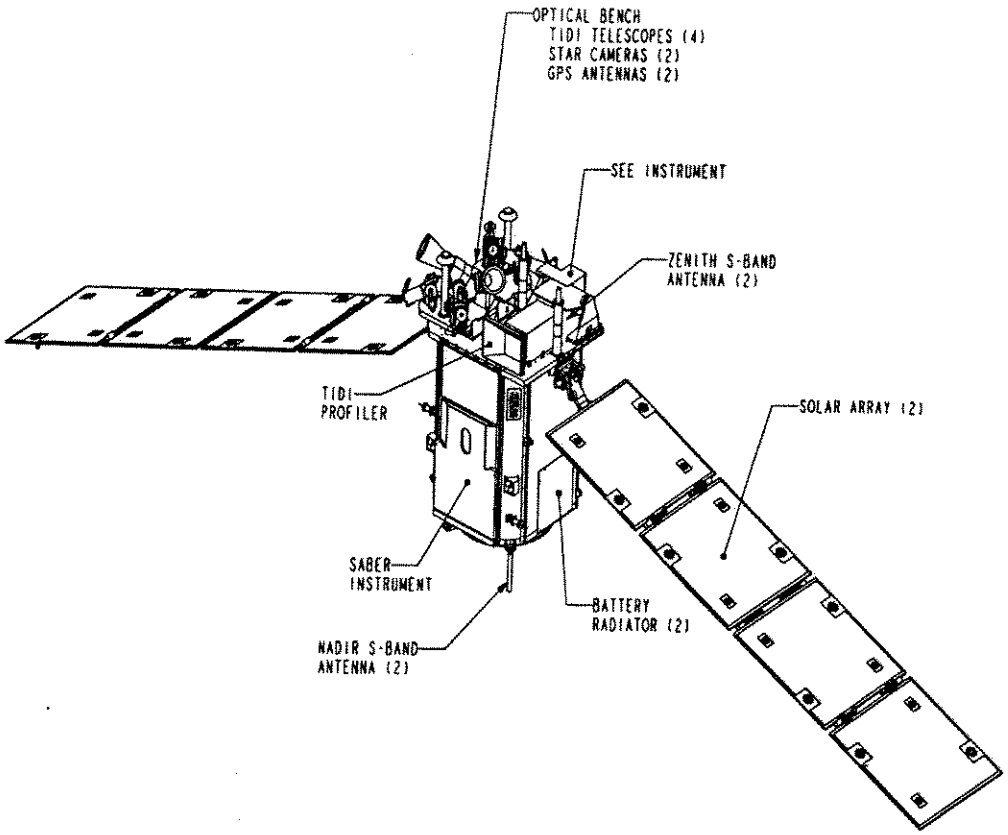
TIMED would examine the entire region as a whole; its basic structure and thermal balance, how the mesosphere is coupled to the thermosphere/ionosphere, how the Mesosphere, Lower Thermosphere and Ionosphere (MLTI) region is coupled to space and the lower atmosphere below, and how energy is transported from one altitude or latitude to another. TIMED would gain a better understanding of the dynamics of this gateway region and its effects upon communications, satellites, and spacecraft reentering Earth's atmosphere.

Previous studies of this region have been limited because it is difficult to reach. This atmospheric region is too high for balloons to reach and ground-based instruments can only see a small part of the atmosphere over the observation site. Rockets flown into the region can only provide local snapshots of its activity.

But with technological advances in remote sensing, TIMED would be able to observe this relatively unexplored frontier from space obtaining an unprecedented set of comprehensive global measurements of the MLTI region's temperature, pressure, winds, and chemical composition, along with the energy inputs and outputs.

1.2.3 Spacecraft Description

TIMED is a atmospheric remote sensing aluminum and honeycomb panel framework spacecraft. The spacecraft is composed of flight hardware and ground support equipment designed for transportability, integration, test, and operations. The spacecraft has a mass of about 600 kg (1323 lbs.) and generates about 426 watts (two 1-axis solar panels) of power and utilizes a 50-Ah NiH2 battery. The spacecraft consists of four instruments:



- Global UltraViolet Imager (GUVI) – a spatial scanning UV spectrograph designed to measure the composition and temperature profiles and auroral energy inputs;

- Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) – A multichannel radiometer designed to measure the pressure, temperature, minor species and infra-red cooling rates;

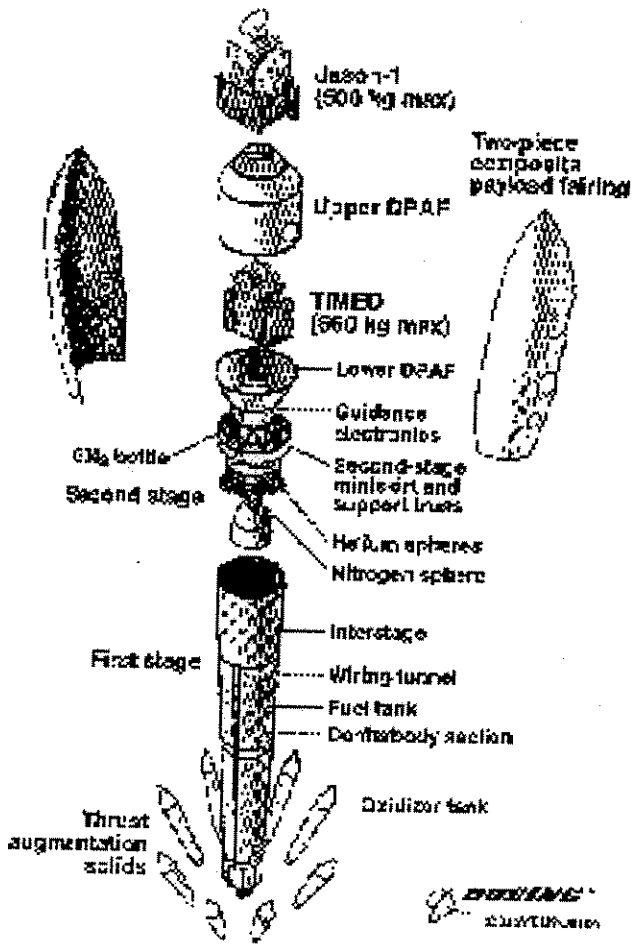
- Solar EUV Experiment (SEE) – A suite of photometers and a spectrometer designed to measure the solar X-ray, UV and Far UltraViolet (FUV) irradiance; and

- TIMED Doppler Interferometer (TIDI) – A Fabry-Perot Interferometer designed to measure the winds and temperature profiles.

The spacecraft would be supported by optical and radar ground measurements for ground truthing and coordinated campaigns. The science data downlink rate would be 4 MBPS (S-band, Consultant Committee for Space Data Systems (CCSDS) compliant).

1.2.4 Launch Vehicle Description

The TIMED and Jason-1 payloads would be integrated with a Boeing Delta-II 7920-10 ELV. The Delta II launch vehicle consists of a payload fairing and first and second stage propulsion systems with nine strap-on boosters. Six of these motors are ignited at liftoff and the remaining three motors have extended nozzles and are ignited in flight after burnout of the first six. During ascent, the payload would be protected from aerodynamic forces by a 3-meter (10 foot) payload fairing. The fairing incorporates interior acoustic absorption blankets as well as flight-proven contamination-free separation joints. The payload fairing would be jettisoned from the launch vehicle during second-stage powered flight. The two-stage Delta II 7920-10 launch vehicle is shown to the right.



1.3 ALTERNATIVES TO PROPOSED PAYLOAD

The alternatives considered in this assessment were the proposed action and the No-Action Alternative. Under the No-Action Alternative, the TIMED mission would not be implemented. This alternative was used as the baseline against which the potential environmental effects of the proposed action were measured.

1.4 ALTERNATIVES TO PROPOSED LAUNCH SITE AND VEHICLE

The Vandenberg Air Force Base (VAFB), California, launch site was selected due to the orbit that the TIMED spacecraft needs to be inserted into.

Launch vehicle selection for the TIMED mission is driven by the spacecraft size and mass as well as the desired orbital insertion energy. Other considerations that were addressed in selection of the launch vehicle include cost, reliability, and potential environmental impacts associated with the launch system.

TIMED was originally proposed for launch on an Orbital Sciences Corporation (OSC) Taurus vehicle, but due to cost it was decided to launch TIMED on a Delta co-manifested with the Jason-1 spacecraft. The proposed launch vehicle, the Delta II 7920-10 ELV, is reliable and cost-effective. The Delta has been launched over 260 times since 1960. It would be more cost effective, would have less impact on the environment, and would burn less fuel to piggyback these two spacecraft than to have separate ELV's for each one. A more thorough description of each of the space vehicles that were considered for launching TIMED is provided in the New Millennium Program (NMP) EA (NASA 1998).

2.0 AFFECTED ENVIRONMENT

2.1 NASA GODDARD SPACE FLIGHT CENTER

NASA's GSFC, located in Greenbelt, Md., is a NASA field center that has managed a number of NASA's astronomy and space physics missions. Full-up spacecraft environmental testing of the TIMED observatory would be conducted here. Observatory environmental testing is well within previous experience at GSFC with no substantial environmental impacts associated with the activities involved.

2.2 JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

The JHUAPL, located in Laurel, Md., was selected by NASA GSFC to design, develop, and fabricate the spacecraft and environmentally test the observatory for the TIMED mission. Additionally, the TIMED instrument package will be integrated onto the bus at JHUAPL prior to shipment to VAFB.

JHUAPL has an extensive history of supplying space flight hardware to the federal government and private corporations. TIMED testing is well within previous experience at the facility with no substantial environmental impacts associated with the activities involved.

2.3 VANDENBERG AIR FORCE BASE

VAFB, where TIMED would be processed and launched, is located in Santa Barbara County, Ca. It occupies 398 square kilometers (98,400 acres) of land and is bounded on the west by 56 km (35 miles) of Pacific Ocean coastline. The nearest cities are Santa Maria, 10 km (6.2 miles) to the northeast and Lompoc immediately to the east. The base is administratively divided into North Vandenberg and South Vandenberg. North Vandenberg contains Space Launch Complex-2 (SLC-2) and South Vandenberg houses SLC-4 and SLC-6, which is part of the California Commercial Spaceport. Spacecraft testing and processing for TIMED would take place at the Spaceport Systems International (SSI) facility located on South Vandenberg.

The surrounding environment at VAFB has been described in detail in previous EA's, including the Earth Observing System (EOS) Programmatic EA (NASA 1997a), and the NMP EA (NASA 1998).

3.0 ENVIRONMENTAL IMPACTS OF PROPOSED ACTION AND ALTERNATIVES

The TIMED mission was tested at JHUAPL and NASA GSFC from the summer or 1999 to the fall of 2000 and is scheduled to be shipped in the last quarter of 2000 to VAFB for launch processing. The environmental consequences of testing, processing, and integration of TIMED with the Boeing Delta II 7920-10 ELV from SLC-2 at VAFB are discussed below. Environmental consequences of launching a Delta II ELV has been addressed previously in the EOS and NMP EA's (e.g., 1997a and 1998)

Testing, processing, and launching procedures for the TIMED mission are similar to those for NASA's EOS and NMP missions, with the sole exception that the TIMED instruments perform different scientific functions. Thus, the possible impacts of processing and launching TIMED are consistent with those outlined in the NMP EA (NASA 1998) for activities at VAFB. The proposed testing and payload processing procedures fall within the normal scope of operations at VAFB. All payload and launch processing procedures will take place indoors in the SSI and at SLC-2 using existing trained personnel.

3.1.1 Air Quality

TIMED testing and processing activities at VAFB have minor potential air quality impacts associated with them. Testing and processing includes cleaning the instrument with small amounts of volatile solvents. These chemicals will be used indoors under environmentally controlled conditions with adequate ventilation and will not impact the external environment. These activities are within the normal scope of operations at the facilities.

3.1.2 Hydrology and Water Quality

Municipal water is used for payload integration, testing, and processing. At VAFB it is used for payload processing, deluge water (for fire suppression), launch pad wash down, and potable water. Water usage for payload processing fits within the current scope of water discharge permit definitions. Solvents and rinsates generated during processing will be disposed of as hazardous materials in compliance with all existing federal, applicable state, and local base regulations. It is expected that no more than 3.8l (one gallon) of each solvent or rinsate would be used to process TIMED. No substantial hydrologic or water quality effects are expected from testing and processing the TIMED satellite.

3.1.3 Land Resources

Testing and processing of TIMED would take place indoors, in existing facilities, using existing personnel. This falls within the scope of normal activities at VAFB. No unique effects on land resources would result from these activities.

3.1.4 Noise

Testing activities at VAFB would occur during normal hours of operation. These activities are not anticipated to create noise above and beyond normal operational noises.

3.1.5 Biotic Resources

Normal testing and processing of the TIMED observatory are not expected to cause substantial impacts to terrestrial, wetland, or aquatic biota at VAFB.

3.1.6 Marine Resources

The potential effects from TIMED testing and processing at VAFB on the marine environment are considered minimal to nonexistent.

3.1.7 Cultural And Historical Resources

Since no surface or subsurface areas will be disturbed and testing, processing, and launching are typical activities at VAFB, no archeological, historic, or cultural sites listed or eligible for listing in the National Register of Historic Places are expected to be affected by the TIMED spacecraft.

3.1.8 Socioeconomic Effects And Environmental Justice

Testing, processing, and launching activities would take place using existing personnel, away from residential areas. No jobs would be created or re-located during these activities. There are no substantial socioeconomic effects resulting from the TIMED mission. Executive Order 12898, Federal Actions to Address Environmental Justice In Minority Populations and Low-income Populations, directs Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their activities on low-income populations or minority populations in the United States. The TIMED mission does not raise any environmental justice concerns. The TIMED project is small in size and scope and would not produce any substantial environmental or human health impacts. Therefore, there would be no disproportionately high or adverse impacts on minority or low-income populations from the implementation of the TIMED mission.

3.1.9 Hazards

The TIMED observatory presents routine environmental safety hazards which are discussed below.

TIMED has eighteen (18) electro-explosive devices used for the actuators. To control hazards, the pyro firing circuit incorporates two separation switches, a flight arming plug, an enable relay, and a fire relay. These safety mechanisms are designed to prevent hazards associated with the ordnance subsystems.

The spacecraft contains two nickel-hydrogen 50 AH batteries. The batteries would be shipped to VAFB in a discharged state and then charged in the payload processing facilities. Hazards associated with the potential rupture are controlled through battery design (IAW MIL-STD-1522A, Approach A) and have a minimum safety factor of 3:1 (burst: maximum expected operating pressure). The battery cells are sealed to control both H_2 (hydrogen) and potassium hydroxide (KO)H emissions. Appropriate handling procedures would be followed in the handling of the batteries.

A minimal amount of mercury would be contained within the spacecraft Ground Support Equipment (GSE) inspection lamps. Proper containment and handling procedures would be followed.

The TIDI instrument contains two (2) Europium-152 radioactive sources that are to be used for on-orbit calibration. The activity of the source is 1.0 micro curie. The source material would be sealed in a capsule that is made of stainless steel and beryllium and is fusion welded. Inside this capsule the source material would be in a ceramic matrix and bonded to the stainless steel backing. The active area of the source is 0.187 inches. The sealed sources would be installed inside the TIDI instrument before transit to VAFB and through final processing. Safety procedures are in place to minimize risks.

The use of the radioactive sources in the TIMED mission has been reviewed in accordance with Presidential Directive/National Security Council Number 25 (PD/NSC-25), "Scientific or Technological Experiments with Possible Large Scale Adverse Environmental Effects and Launch of Nuclear Systems into Space" dated December 14, 1977, as revised May 8, 1996, and NASA Safety Manual (NPG 8715.3). These documents establish the level of review, analysis, and approval required for launch of radioactive material based on the level of radiological risk. For the TIMED mission the approval of the NASA Nuclear Flight Safety Assurance Manager is the only action required. The TIMED sources are of low level, are adequately contained, and have limited accessibility, posing no significant hazard to personnel or the environment.

Solvents used for cleaning during the spacecraft testing and launch processing includes ethyl and isopropyl alcohol. The amount used would be minimal and controlled at all times in well-ventilated areas. Solvents would be stored in approved containers. VAFB operates as a generator of hazardous waste and as a Treatment, Storage, and Disposal facility. The disposal of hazardous wastes generated during the processing and launch of TIMED is governed by VAFB's Hazardous Waste Management Plan.

Safe hardware and support equipment would be used to ensure safety for both personnel and equipment during all phases of processing. A Missile System Pre-Launch Safety Plan (MSPSP 7363-9066) has been prepared in accordance with GSFC, Kennedy Space Center (KSC), and Air Force Western Range Safety

Office requirements. The MSPSP documents TIMED satellite compliance with the requirements established by the Western Range Regulations.

While potential health and environmental hazards connected to TIMED exist, a number of safety mechanisms are in place to minimize risks. All potentially hazardous activities at VAFB have been documented and hazard reduction addressed. The procedures are within the scope of normal activities and meet all NASA safety requirements. No substantial environmental consequences are associated with these activities.

3.1.10 Launch Failures

Launch from the Delta II ELV is within the scope of normal operations at VAFB. The spacecraft is not expected to contribute to any environmental consequences during a launch failure. The environmental consequences of Delta II failure have been addressed in several environmental documents, including the EOS and NMP EA documents (NASA 1997a and NASA 1998).

3.1.11 Orbital Debris

NASA Policy Directive (NPD) 8710.3, "NASA Policy for Limiting Orbital Debris Generation," states that "NASA's policy is to employ design and operations practices that limit the generation of orbital debris, consistent with mission requirements and cost-effectiveness." Orbital debris is a NEPA issue only as to its potential impact upon returning to Earth. The NPD requires that each program or project conduct a formal assessment for the potential to generate orbital debris.

The launch, operation, and re-entry of the TIMED satellite satisfy the conditions of NASA's policy objectives (TIMED's Orbital Debris Assessment Report, TIMED-7363-9068 Rev. 1).

3.1.12 Pollution Prevention

Executive Order 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements", pledges the federal government to prevent pollution at the source and commits the government to comply with the Emergency Planning and Community Right-to-know Act (EPCRA) and Pollution Prevention Act (PPA).

Federal agencies must report annually on the amount of toxic chemicals generated as waste or released into the environment as part of the Toxic Release Inventory under EPCRA and PPA. Federal agencies must also comply with the emergency planning and notification requirements of EPCRA, which requires notification of chemicals stored on the facility and the reporting of an annual chemical inventory.

Each Federal Agency was required to establish a voluntary goal to reduce total releases and off-site transfers of toxic chemicals or toxic pollutants by 50%. They were also required to establish a plan and goals for eliminating or reducing the unnecessary use and acquisition of extremely hazardous substances and toxic chemicals.

NASA, as an agency, is complying with Executive Order 12856. NASA has achieved a 50% reduction in releases of toxic chemicals to the environment and off-site transfers for treatment and disposal. NASA Centers have established chemical inventory databases for use in management and reporting of the chemicals. Each Center performs TRI reporting and emergency planning and notification reporting to the local authorities. Each Center also submits annual Pollution Prevention Progress. The NASA Centers work to identify and implement pollution prevention opportunities through source and waste reduction and new technologies.

3.2 NO-ACTION ALTERNATIVE

Although the absence of launching operations related to TIMED might spare the environment surrounding VAFB SLC-2 of potential environmental impacts, the launch of the TIMED satellite is within the scope of existing operations at VAFB and would have a limited impact on the surrounding environment. In addition, cancellation of the mission would preclude scientists from gaining important information concerning the exploration of the energetics and dynamics of the Earth's upper atmosphere.

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6.0 REFERENCES CITED

Executive Order, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*, EO 12856, August 3, 1993.

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