STRATEGIC DEFENSE INITIATIVE
DEMONSTRATION/VALIDATION PROGRAM
ENVIRONMENTAL ASSESSMENTS SUMMARY
AUGUST 1987

STRATEGIC DEFENSE INITIATIVE ORGANIZATION
SYSTEMS ENGINEERING
WASHINGTON D.C. 20301-7100

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This Environmental Assessment documents the results of an assessment of the potential for the magnitude of impacts from Demonstration/Validation activities of the SDI Demonstration/Validation Program, Environmental Assessments Summary, August 1987.

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Cover Sheet

Responsible Agency: Strategic Defense Initiative Organization

Proposed Action: Conduct Demonstration/Validation tests of six technologies: (1) Boost Surveillance and Tracking System (BSTS); (2) Exoatmospheric Reentry Vehicle Interception System (ERIS); (3) Ground-based Surveillance and Tracking System (GSTS); (4) Space-based Surveillance and Tracking System (SSTS); (5) Space-Based Interceptor (SBI) and; (6) Battle Management/Command and Control, and Communications (BM/C^3).

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Designation: Environmental Assessment

Abstract: The Strategic Defense Initiative Organization (SDIO) and its proponents (the U.S. Army and U.S. Air Force) plan to conduct Demonstration/Validation tests of the six technologies to demonstrate their respective ability to perform their required tasks, and to validate the requirements to determine their feasibility for a future decision on whether to proceed with Full-Scale Development. Demonstration/Validation tests would be conducted at 14 government facilities across the United States and the Republic of the Marshall Islands, and at contractor facilities. Tests would include analyses, simulations, component/assembly tests, and flight tests. This document summarizes the findings expressed in the six Environmental Assessments for Demonstration/Validation testing of the individual technologies, and analyzes the potential cumulative environmental consequences of testing of multiple technologies at a given facility. In the event that any other technology is ready for entry into Demonstration/Validation at a later date, an Environmental Assessment will be prepared for that technology and this summary will be updated.

Available to the Public: August 1987

EXECUTIVE SUMMARY

INTRODUCTION

The National Environmental Policy Act, the Council on Environmental Quality regulations implementing the Act (40 CFR 1500-1508), and the Department of Defense (DoD) Directive 6050.1 which supplements these regulations, direct that DoD officials take into account environmental consequences when authorizing or approving major Federal actions in the United States. Accordingly, this Environmental Assessment analyzes the potential environmental consequences of a proposed transition from Concept Exploration to Demonstration/Validation of six technologies being considered in the Strategic Defense Initiative program. Specifically, this document summarizes the conclusions expressed in the six Environmental Assessments for the individual technologies, and analyzes the potential cumulative environmental consequences of testing for multiple technologies at a given facility. The tests and evaluations associated with Demonstration/Validation will be in accordance with the Antiballistic Missile Treaty and are currently structured to conform to the restrictive interpretation of the Treaty. The decision to proceed to Demonstration/Validation of a given technology would not preclude other technologies, nor would it mandate the eventual Full-Scale Development or Production/Deployment of the technologies.

BACKGROUND

The President's announcement of a Strategic Defense Initiative on March 23, 1983, initiated an extensive research program to determine the feasibility of developing an effective ballistic missile defense system to protect the United States and its allies from enemy missile attack. The Strategic Defense Initiative Organization was established to plan, organize, coordinate, direct, and enhance the research and testing of technologies applicable to strategic defense. Future implementation of a Strategic Defense System would be based on the Strategic Defense Initiative research program.

Many technologies currently are being investigated. Among the technologies being considered for Demonstration/Validation are:

- o Boost Surveillance and Tracking System (BSTS)
- o Space-based Surveillance and Tracking System (SSTS)
- o Ground-based Surveillance and Tracking System (GSTS)
- o Space-Based Interceptor (SBI)
- o Exoatmospheric Reentry Vehicle Interception System (ERIS)
- o Battle Management/Command and Control, and Communications (BM/C^3).

DoD Directive 5000.1 calls for a staged approach to the DoD acquisition process. In keeping with that mandate, DoD's major system acquisition process consists of four distinct stages: Concept Exploration, Demonstration/Validation, Full-Scale Development, and Production/Deployment. These four stages are separated by three major decision points (Milestones I, II, and

III). Prior to Milestone I, the Defense Acquisition Board will review the results of Concept Exploration and recommend the technologies to be carried forward into Demonstration/Validation or to remain in the Concept Exploration stage. Selected Strategic Defense Initiative technologies are approaching the end of Concept Exploration and are preparing for Demonstration/Validation.

PURPOSE AND NEED

The purpose of the Demonstration/Validation program for the six technologies is to determine the ability of each technology to perform its intended function and to provide the information necessary to make an informed decision whether to proceed with Full-Scale Development of each technology. These activities are the first steps needed to support a decision to develop, produce, and deploy technologies which are integral to an effective strategic defense.

PROPOSED ACTION

The proposed action is the Demonstration/Validation program for the six candidate technologies presented above. This program would demonstrate whether the technologies can meet their specific performance requirements and would provide the information necessary for the Defense Acquisition Board to recommend a Milestone II decision to proceed into Full-Scale Development of each technology.

At present over 20 candidate technologies are in the Concept Exploration stage. Six technologies are mature enough to be considered for Demonstration/Validation. Demonstration/Validation activities for each of the six technologies would be grouped into the following categories:

- o Analyses
- o Simulations
- o Component/assembly tests
- o Flight tests.

These test activities would be conducted at existing or planned contractor and government facilities. Table S-1 summarizes categories of tests that would be conducted for each technology at each facility.

NO-ACTION ALTERNATIVE

The no-action alternative is to continue with Concept Exploration activities without progressing to the Demonstration/Validation stage at this time.

TABLE S-1.

SUMMARY: TECHNOLOGY TESTS BY FACILITY

FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C[3]
Alabama						
Advanced Research Center						A,S,C
California						
Edwards Air Force Base				C		
Vandenberg Air Force Base/ Western Test Range		F(1)	F(2)		F(2)	
Colorado						
National Test Facility, Falcon Air Force Station	A,S	A,S	A,S	A,S	A,S	A,S,C
Florida						
Cape Canaveral Air Force Station/Eastern Test Range	F	F(1)				
Eglin Air Force Base				A,S,C		
Kennedy Space Center		F(1)				
Hawaii						
U.S. Naval Pacific Missile Range Facility at Barking Sands					F(3)	
Maryland						
Harry Diamond Laboratories, Adelphi site					C	C

Key: A - Analyses
S - Simulations
C - Component/Assembly Tests
F - Flight Tests

(1) Possible satellite launch site
(2) Dedicated target launch site
(3) Possible dedicated target launch site

TABLE S-1. (Continued)

SUMMARY: TECHNOLOGY TESTS BY FACILITY

FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C^3
Massachusetts						
Electronic Systems Division, Hanscom Air Force Base						A,S,C
Nevada						
Nevada Test Site		C	C		C	C
New York						
Rome Air Development Center, Griffiss Air Force Base						A,S,C
Republic of the Marshall Islands						
U.S. Army Kwajalein Atoll			F	F	F	
Tennessee						
Arnold Engineering Development Center, Arnold Air Force Station		S,C			C	
Virginia						
Harry Diamond Laboratories, Woodbridge site					C	C
Contractors						
Lockheed Missiles and Space Company	A,S,C				A,S,C	
Grumman Aerospace Company	A,S,C					
Contractor		A,S,C	A,S,C,	A,S,C		A,S,C

Key: A - Analyses
S - Simulations
C - Component/Assembly Tests
F - Flight Tests

ENVIRONMENTAL SETTING

Figure S-1 identifies test locations and technologies that would be tested at each location. Table S-2, presented at the end of this Executive Summary, identifies the environmental characteristics and status of each facility for air quality, water quality, biological resources, infrastructure, hazardous waste, land use, visual resources, cultural resources, noise, and socioeconomics. The detailed information summarized in Table S-2 was analyzed to determine the potential effects on each facility of the proposed Demonstration/Validation activities and the capability of each facility and surrounding area to accommodate those activities. These analyses formed the basis for the identification of potential environmental consequences at each facility attributable to Demonstration/Validation activities.

ENVIRONMENTAL CONSEQUENCES

Many of the tests for the Demonstration/Validation program would be conducted at contractor facilities. These contractors are selected through the DoD procurement process and are required to meet all Federal, State, and local environmental laws and regulations necessary for facility operations.

If the procurement process required a selected contractor to use Federal funds to conduct an activity with a potential for significant environmental consequences, an environmental analysis of the consequences of such activities would also be required of the contractor. This analysis would be utilized by DoD in completing an environmental assessment or environmental impact statement, as appropriate.

To assess the potential for and the magnitude of impacts from Demonstration/Validation at each government facility, a two-step methodology was utilized. The first step was the application of assessment criteria to identify activities with no potential for significant environmental consequences. Activities were deemed to have no significant environmental consequences if they met all of the following criteria (i.e., all "yes" answers):

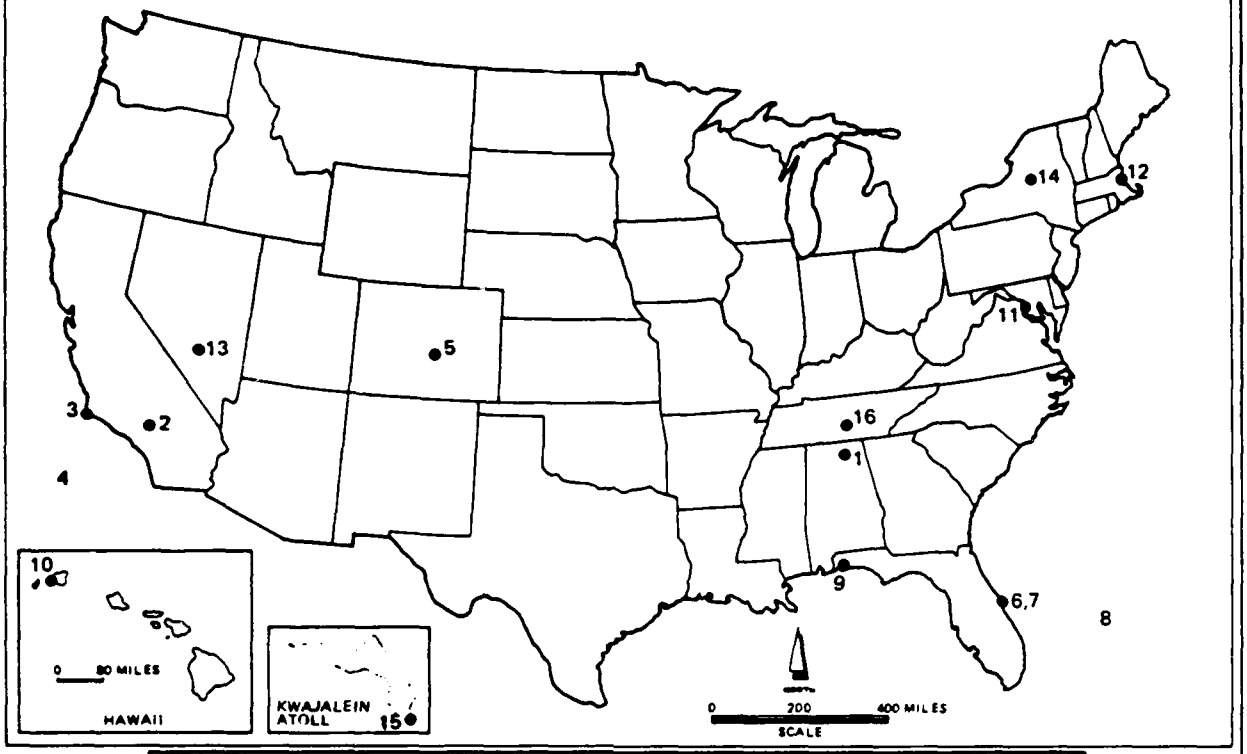
1. Are the facility and its infrastructure adequate for the proposed activity (i.e., can the tests be conducted without new construction, excluding minor modifications)?

2. Is current staffing at the facility adequate to conduct the test, excluding minor staff level adjustments?

3. Does the facility comply with applicable environmental standards?

4. Are the resources of the surrounding community adequate to accommodate the proposed testing?

If a proposed test was determined to present a potential for impact (i.e., a "no" answer to any of the above questions), the second step was to evaluate the activity in the context of the following environmental considerations: air quality, water quality, biological resources, infrastructure, azardous



FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C^3
ALABAMA 1. ADVANCED RESEARCH CENTER						●
CALIFORNIA 2. EDWARDS AIR FORCE BASE				●		
3,4. VANDENBERG AIR FORCE BASE/WESTERN TEST RANGE		●	●		●	
COLORADO 5. NATIONAL TEST FACILITY, FALCON AIR FORCE STATION	●	●	●	●	●	●
FLORIDA 6,7. CAPE CANAVERAL AIR FORCE STATION/EASTERN TEST RANGE	●	●				
8. EGLIN AIR FORCE BASE				●		
9. KENNEDY SPACE CENTER		●				
HAWAII 10. U.S. NAVAL PACIFIC MISSILE RANGE FACILITY, BARKING SANDS, KAUAI					●	
MARYLAND/VIRGINIA 11. HARRY DIAMOND LABORATORIES					●	●
MASSACHUSETTS 12. ELECTRONIC SYSTEMS DIVISION						●
NEVADA 13. NEVADA TEST SITE		●	●		●	●
NEW YORK 14. ROME AIR DEVELOPMENT CENTER, GRIFFISS AIR FORCE BASE						●
REPUBLIC OF THE MARSHALL ISLANDS 15. U.S. ARMY KWAJALEIN ATOLL			●	●	●	
TENNESSEE 16. ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AIR FORCE STATION		●			●	

DEMONSTRATION/VALIDATION LOCATIONS

FIGURE S-1

waste, land use, visual resources, cultural resources, noise, and socio-economics. As a result of that evaluation, consequences were assigned to one of three categories: insignificant, mitigable, or potentially significant.

Environmental consequences were determined to be **insignificant** if, in the judgment of the analysts or as concluded in existing environmental documentation, no potential for significant environmental impacts exists. Consequences were deemed **mitigable** if concerns exist but it was determined that all potential consequences could be readily mitigated through standard procedures, or by measures recommended in existing environmental documentation. If serious consequences exist that could not be readily mitigated, the activity was determined to represent **potentially significant** environmental impacts.

The six Environmental Assessments prepared for the technologies proposed for Demonstration/Validation evaluate the consequences of activities associated with each technology independently of those associated with any other technology. This Demonstration/Validation Program Summary evaluates the potential cumulative environmental effects of testing of several technologies at each facility.

Table S-3, at the end of this Executive Summary, summarizes potential cumulative impacts of the Demonstration/Validation program at each facility.

Facilities With Insignificant Impacts

Proposed Demonstration/Validation testing at nine locations was determined to represent ***insignificant*** potential for impacts based on the capability of the host facilities to conduct those programs without facility modification, infrastructure improvements, or additional staffing, and on the established environmental compliance history of the facilities. Those facilities where potential environmental consequences were deemed insignificant are:

- Alabama - Advanced Research Center
- California - Edwards Air Force Base
- Florida - Eglin Air Force Base
  Kennedy Space Center
- Maryland - Harry Diamond Laboratories
- Massachusetts - Electronic Systems Division
- Nevada - Nevada Test Site
- New York - Rome Air Development Center
- Virginia - Harry Diamond Laboratories.

Facilities With Mitigable Impacts

Proposed testing at five other sites was found to present a potential for environmental consequences. Evaluation of the magnitude and extent of the

consequences and the mitigation measures available indicated that the environmental consequences of tests at those facilities would be mitigable. The results of the environmental analyses conducted are summarized by state for each facility.

California

The potential for environmental consequences at **Vandenberg Air Force Base/ Western Test Range** is present because new or modified facilities and additional staff would be required for SSTS activities. No new facilities or staff would be required for ERIS or GSTS activities. Proposed Demonstration/ Validation activities for ERIS and GSTS would constitute an insignificant contribution to ongoing activities at Vandenberg Air Force Base. Potential impacts of SSTS activities are: air quality impacts from launches of the Titan IV or Space Shuttle; short-term impacts on water quality from construction or modification of Titan IV launch facility; and potential additional consumption of limited groundwater resources. These concerns were addressed in an environmental impact statement prepared for Space Shuttle operations, and will be addressed in an environmental impact statement in preparation for the modification and operation of the Titan IV launch facility. These potential impacts are considered mitigable.

Colorado

Potential for environmental consequences at the **National Test Facility** is present because new facilities would be constructed, additional staff would be required, and infrastructure, specifically sewage treatment and water supply, would not be adequate. Potential impacts of construction and operation are: air quality impacts due to increase in vehicular traffic; encroachment on a flood plain due to required expansion of the wastewater treatment plant; and depletion of water resources from increased water use. These concerns were addressed in an environmental assessment for the construction and operation of the National Test Facility, and mitigations were recommended. These impacts are therefore considered mitigable.

Florida

Potential for environmental consequences at **Cape Canaveral Air Force Station/ Eastern Test Range** is present because modification of facilities would be required. No additional staff would be required and infrastructure is adequate. The facility is in compliance with regulatory standards. A potential short-term impact to air quality from Titan IV launches is anticipated. The potential impacts are considered mitigable.

Hawaii

The potential for environmental consequences at the **U.S. Naval Pacific Missile Range Facility at Barking Sands** is present because additional facilities would be constructed for launching targets for ERIS flight tests. Potential air and water quality and biological resources impacts due to construction activities are readily mitigable with standard control measures. Hydrazine-nitrazine rocket propellants may be used and would be subject to Army Safe Operating Procedures. Impacts associated with new construction and temporary increase in staffing are considered mitigable.

Tennessee

A potential for environmental consequences at Arnold Engineering Development Center is present because construction of a new facility and additional staff would be required to accommodate SSTS testing. Testing for the ERIS program would use existing wind tunnels and would not require additional staff. The facility is in compliance with regulatory standards and the surrounding socio-economic setting can accommodate new staff. There are potential short-term impacts to air and water quality from SSTS space chamber construction activities. No impacts are expected from operation of the new space chamber or existing wind tunnels. Construction impacts are considered mitigable.

Facilities with Potentially Significant Impacts

Potentially significant impacts were identified at one facility, the **U.S. Army Kwajalein Atoll** in the Republic of the Marshall Islands. The results of the environmental analyses conducted for that facility are summarized in the following paragraphs.

The U.S. Army Kwajalein Atoll would be used for flight testing of ERIS, GSTS, and SBI technologies. Facility modifications on Meck Island required to support these programs would include expansion of the existing missile assembly building, refurbishment of the existing silo, and improvements to infrastructure support for the launch facility. Construction of a new missile assembly building and new launch platform for another program would be used by SBI. The U.S. Army has prepared two records of environmental consideration for those activities and has determined that the proposed construction qualifies for categorical exclusion from the need to conduct additional environmental analyses.

An estimated 305 additional non-Marshallese people would be required at the U.S. Army Kwajalein Atoll to support the proposed Demonstration/Validation programs, an increase of 12.5 percent over the most recent available population figure (2,432 persons on 30 June 1986). The total population would be below the highest population figure of nearly 6,000 people in 1972. Construction of additional new housing on Kwajalein Island is planned to support ERIS, GSTS, SBI, and several other Department of Defense programs. The U.S. Army has prepared an "Environmental Assessment for Family Housing Dwellings, FY 1987-1989 Phases" that concluded that the proposed construction does not constitute a major Federal action having a significant effect on the quality of the human environment.

In addition to new housing, increased infrastructure requirements would be met with the following planned construction: expansion of an existing power plant and a desalinization facility on Kwajalein Island; a sewage treatment facility and a water storage tank on Roi-Namur Island. An environmental assessment has been prepared for the construction and operation of the expanded power plant. The environmental assessment concluded that all potential impacts are mitigable and that the action does not constitute a major Federal action with potential for significant environmental impacts.

The activities associated with the ERIS, GSTS, and SBI Demonstration/Validation programs, and the resulting 12.5 percent facility population

increase may potentially result in environmental impacts. Specific areas of consideration are discussed below.

Water Quality in the ocean and lagoon near landfills may be degraded from leachate seepage into the ocean and dumping of untreated sewage in the lagoon off Roi-Namur Island. The source of the leachate was considered to be waste oil or sewage tank pumpage that was dumped on the landfill. The landfill is currently used only for disposal of construction materials, and ERIS, GSTS, and SBI activities are expected to continue the use of the landfill. The composition of the leachate and the potential change in the rate of seepage as a result of the disposal of construction wastes is unknown. A planned sewage treatment plant on Roi-Namur Island, or operational mitigation initiated by the U.S. Army Atoll Commander, are expected to mitigate all anticipated impacts related to sewage treatment. Indirect water quality impacts have not been evaluated in previous documents.

Biological Resources in the Kwajalein Atoll include the endangered Hawksbill Turtle and the threatened Green Sea Turtle. The water quality concerns identified above may impact these species. In addition, increased harvesting of coral reefs for construction materials could result in degradation of the marine habitat; however, the harvesting can be accomplished in a manner that will ensure that critical habitats of marine biota are not degraded. Indirect impacts on biological resources have not been addressed in previous documents.

Socioeconomic impacts of the relatively extensive influx of personnel and the associated employment opportunities created for Marshallese inhabitants of Kwajalein Atoll are potentially significant. Migration of Marshallese to the island of Ebeye in search of relatively high-paying jobs is likely. Ebeye is already densely populated, with substandard housing, high unemployment, and inadequate public health programs. In addition, the impact of increased Marshallese dependence on DoD expenditures is uncertain. The U.S. Army Kwajalein Atoll currently has a policy limiting the number of Marshallese employed, which may minimize the amount of influx of people to Ebeye Island.

No significant impacts are anticipated on land use, cultural or visual resources, or noise.

In recognition of the need to avoid, minimize, and mitigate any potential adverse impacts on the environment of the Kwajalein Atoll, the U.S. Army will prepare a comprehensive environmental impact statement addressing the continuing operations at the U.S. Army Kwajalein Atoll, which include the proposed Demonstration/Validation activities. The environmental impact statement will address the environmental concerns recognized in this Environmental Assessment and is expected to identify appropriate mitigations.

ENVIRONMENTAL CONSEQUENCES OF NO ACTION

If the no-action alternative is selected, no significant environmental consequences are anticipated. Concept Exploration would continue with utilization of current staffing and facilities.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Development of the six technologies through the Demonstration/Validation stage would result in irreversible and irretrievable commitment of resources such as electronic components, various metallic and nonmetallic structural materials, fuel, and labor. This commitment of resources is not different from those necessary for many other aerospace research and development programs; it is similar to the activities that have been carried out in previous aerospace programs over the past several years.

TABLE S-2.

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Alabama										
Advanced Research Center	No air concerns	No wastewater effluents	No threatened/ endangered species	Services currently adequate	None	No conflicts	Suburban wooded	None registered	Urban levels	Urban. About 70 employees
California										
Edwards Air Force Base	Portion of site in nonattain-ment area for ozone	Discharge to holding ponds; no NPDES permit	4 potential threatened or endan-gered species	Services currently adequate	Disposal at licensed commercial facilities	No conflicts	Remote desert area	About 400 prehistoric sites are protected	Inter-mittent flight tests	Rural/small town. About 13,000 employees
Vandenberg AFB/ Western Test Range	Attainment area, PSD permits in place	NPDES permitted releases	7 potential or listed threatened or endangered species, wetlands present	Services currently adequate	Disposal at licensed commercial facility, permitted onsite storage	No conflicts	Desert, coastal, wetlands	About 600 archeo-logical sites, 2 registered sites	Inter-mittent missile launches	Rural/small town. About 13,000 employees
Colorado										
National Test Facility, Falcon AFS	Attainment area	One NPDES permitted release	None	Services currently adequate. Potential water supply problems	Disposal at licensed commercial facilities	No conflicts	Semiarid grassland	None	Isolated location	Suburban. About 1,500 employees at Falcon AFS. Projected employment at National Test Facility is 2300.

TABLE S-2 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Florida										
Cape Canaveral AFS/ Eastern Test Range	Air Shed Class II, attainment area, PSD permits for boilers	One NPDES permitted release	10 threat-ened or endangered species	Services currently adequate	Disposal at licensed commercial facilities, 1 permitted storage facility	No conflicts	Barrier Island	7 sites on National Register protected 21 eligible sites	Inter-mittent missile launches	Small town. About 6,000 employees
Kennedy Space Center	Attainment area	2 NPDES permitted outfalls	9 threat-ened or endangered species	Services currently adequate	3 permit-ted stor-age facil-ities on-site treat-ment and recovery facilities	No conflicts	Barrier island	28 archeo-logical and hist-orical sites	Intermitt-ent mis-sile launches	Small town. About 3,400 employees
Eglin AFB	Attainment area, 2 PSD permits	5 releases, 2 NPDES permitted, 3 permits pending denial	9 threat-ened or endangered species	Services currently adequate	Permitted storage. Disposal at licensed commercial facilities	No conflicts	Wooded, lakes and streams	About 300 archeo-logical sites protected	Compliance with Air Force directive	Small town. About 6,000 employees

TABLE S-2 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Hawaii										
U.S. Naval Pacific Missile Range Facility, Barking Sands, Kauai	Attainment area, no PSD permits	No NPDES permits	5 threat-ened or endangered species	Services currently adequate	Interim status treatment and stor-age; dis-posal at licensed commerical facilities	Potential conflicts with local use of beaches	Sea coast	Several unregis-tered sites	Inter-mittent missile launches	Rural. About 800 employees
Maryland										
Harry Diamond Laboratories	5 permits	1 permit recent violation of standards	No known threatened or endang-ered species	Waste water treatment problems	Part B permit pending	No known conflicts	Visual impact from antenna platforms	No sites	No noise problems	Rural. About 1,000 employees
Massachusetts										
Electronic Systems Division	Attainment area	No permit required	No threat-ened or endangered species	Services currently adequate	None generated	No conflicts	Urban	None	Urban	Urban. About 5,000 employees
Nevada										
Nevada Test Site	In attain-ment for all standards	No releases	Several potential threatened or endang-ered species	Services currently adequate	RCRA Transpor-tation, Storage, Disposal Permit	No conflicts	Desert	Archeo-logical and hist-orical sites identi-fied	Inter-mittent short duration noise	Rural. About 8,000 employees

TABLE S-2 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
New York										
Rome Air Development Center, Griffiss AFB	Air Shed Class II, attainment area	Several NPDFS permits	Several threatened or endangered species	Services currently adequate	Facility in planning stage	No conflicts	Hills, agricul-ture and woodland	None known	Low noise level	Urban. About 8,000 eployees
Republic of the Marshall Islands										
U.S. Army Kwajalein Atoll	Good am-bient quality due to winds. Potential NOX ex-ceedence from pow-er plant	Permitted facilities at Kwajalein and Ebeye	2 threat-ened or endangered species	Water re-sources limited. Limited solid-waste disposal	Disposal by licensed commercial facilities	Potential conflicts	Flat, elongated terrain. Meck Island original features completely altered	Kwajalein, Roi-Namur registered historical sites	Inter-mittent missile launches	Densely populated islet. About 1,500 employees
Tennessee										
Arnold Engineering Development Center, Arnold AFS	2 PSD permits Attainment area	8 NPDFS permitted releases	Several threatened and en-dangered species. 2 desig-nated wet-lands present	Services currently adequate	RCRA permit for storage in negotiation disposal by licensed commercial facilities	No conflicts	Rural, hills, wooded	None	Inter-mittent rocket engine and other tests	Rural/small town. About 4,000 employees

TABLE S-2 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Virginia										
Harry Diamond Laboratories	None required	None required	No known threatened and endangered species	Services currently adequate	No hazardous waste	No known conflicts	Gentle rolling hills	1 historic site	No noise problems	Rural/ suburban. 125 employees

TABLE S-3.
CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Test Location	Test Facility	Technology	RESOURCE									
			Air	Water	Biological Resources	Infra-Structure	Hazardous Waste	Land Use	Visual Resources	Cultural Resources	Noise	Socio-economics
Alabama	Advanced Research Center	Cumulative	N	N	N	N	N	N	N	N	N	N
California	AF Astronautics Laboratory, Edwards AFB	Cumulative	N	N	N	N	N	N	N	N	N	N
California	Vandenberg AFB/ Western Test Range	Cumulative	M	M	M	M	N	N	N	M	N	M
Colorado	National Test Facility, Falcon AFS	Cumulative	M	N	N	M	N	N	N	N	N	M
Florida	Cape Canaveral AFS/ Eastern Test Range	Cumulative	M	M	M	N	N	N	N	N	N	N
Florida	Eglin AFB	Cumulative	N	N	N	N	N	N	N	N	N	N

Key:
N = No significant consequences
M = Mitigable consequences
PS = Potentially significant consequences

TABLE S-3 (Continued).
CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Test Location	Test Facility	Technology	RESOURCE									
			Air	Water	Biological Resources	Infra-Structure	Hazardous Waste	Land Use	Visual Resources	Cultural Resources	Noise	Socio-economics
Florida	Kennedy Space Center	Cumulative	N	N	N	N	N	N	N	N	N	N
Hawaii	U.S. Naval Pacific Missile Range Facility, Barking Sands, Kauai	Cumulative	M	N	M	N	N	M	N	N	N	N
Maryland	Harry Diamond Laboratories, Adelphi	Cumulative	N	N	N	N	N	N	N	N	N	N
Massachusetts	Electronic Systems Division, Hanscom AFB	Cumulative	N	N	N	N	N	N	N	N	N	N
Nevada	Nevada Test Site	Cumulative	N	N	N	N	N	N	N	N	N	N
New York	Rome Air Development Center, Griffiss AFB	Cumulative	M	M	N	N	N	N	N	N	N	N

Key: N = No significant consequences
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PS = Potentially significant consequences

TABLE S-3 (Continued).
CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Test Location	Test Facility	Technology	RESOURCE									
			Air	Water	Biological Resources	Infra-Structure	Hazardous Waste	Land Use	Visual Resources	Cultural Resources	Noise	Socio-economics
Republic of the Marshall Islands	Kwajalein Missile Range	Cumulative	M	PS	PS	M	N	N	N	M	N	PS
Tennessee	Arnold Engineering Development Center, Arnold AFS	Cumulative	M	M	N	N	N	N	N	N	M	M
Virginia	Harry Diamond Laboratories, Woodbridge	Cumulative	N	N	N	N	N	N	N	N	N	N

Key:
N = No significant consequences
M = Mitigable consequences
PS = Potentially significant consequences

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1. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The National Environmental Policy Act, the Council on Environmental Quality regulations implementing the Act (40 CFR 1500-1508), and the Department of Defense (DoD) Directive 6050.1 which supplements these regulations, direct that DoD officials take into account environmental consequences when authorizing or approving major Federal actions in the United States. Accordingly, this Environmental Assessment analyzes the potential environmental consequences of a proposed transition from Concept Exploration to Demonstration/Validation of six technologies being considered in the Strategic Defense Initiative program. Specifically, this document summarizes the conclusions expressed in the six Environmental Assessments for the individual technologies, and analyzes the potential effects on the environment of testing for multiple technologies at a given facility. The tests and evaluations associated with Demonstration/Validation will be in accordance with the Anti-ballistic Missile Treaty and are currently structured to conform to the restrictive interpretation of the Treaty. The decision to proceed to Demonstration/Validation of a given technology would not preclude other technologies, nor would it mandate the eventual Full-Scale Development or Production/Deployment of the six technologies.

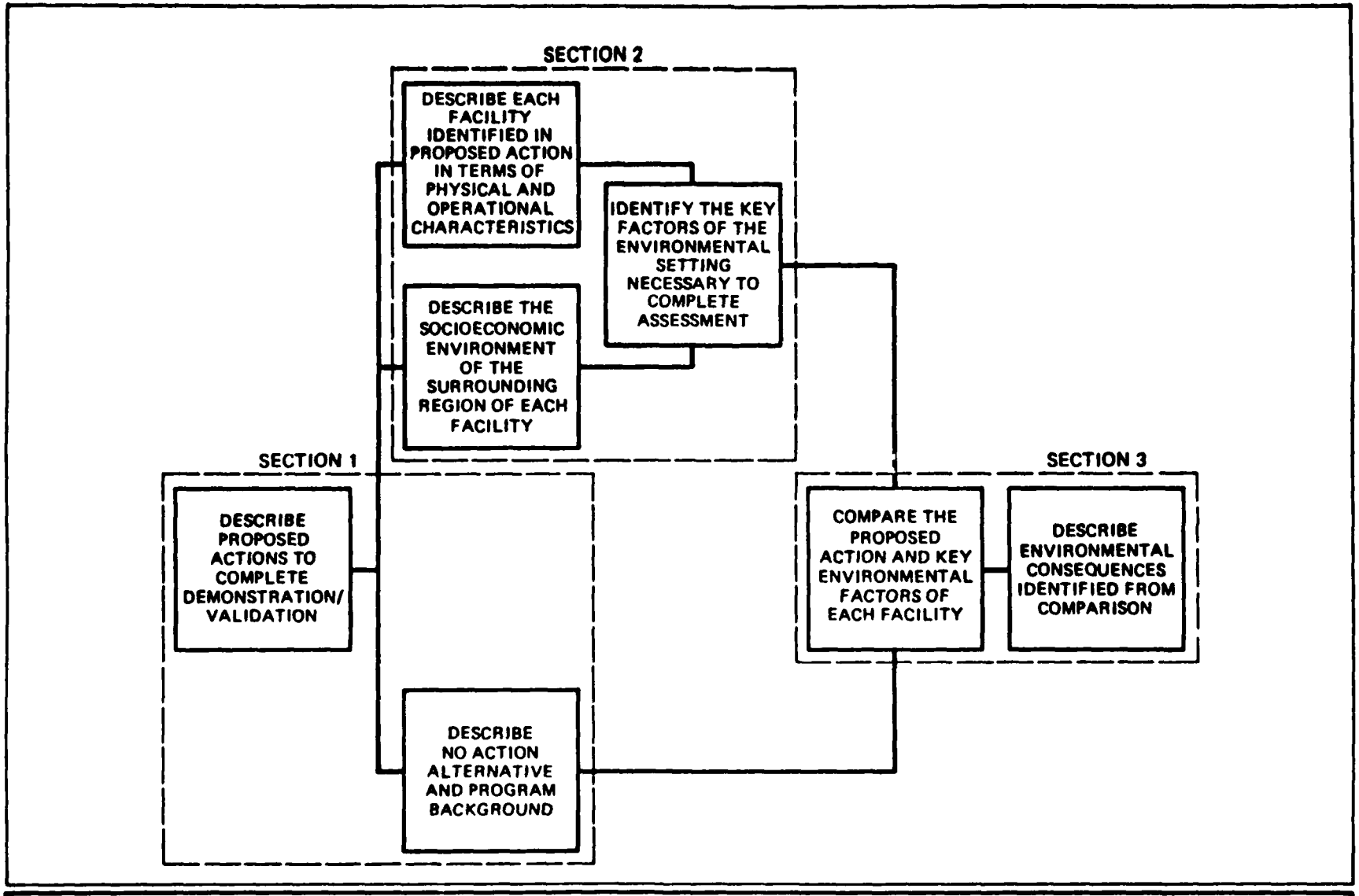
The approach followed to complete this assessment is presented in Figure 1-1. This section describes the test and evaluation activities that would be completed for Demonstration/Validation and identifies the contractor and government facilities where the activities would be carried out. Section 2 characterizes those facilities and their environmental setting and Section 3 assesses the potential environmental consequences of the activities.

Demonstration/Validation of the six technologies would consist of a number of tests. Descriptions of these tests were developed from documentation describing the six technologies, and interviews with program personnel who developed the documentation. The remainder of this section briefly describes the background of the Strategic Defense Initiative program, the purpose of and need for the six technologies, the proposed action, and the no-action alternative.

1.1 BACKGROUND

The President's announcement of a Strategic Defense Initiative on March 23, 1983, initiated an extensive research program to determine the feasibility of developing an effective ballistic missile defense system to protect the United States and its allies from enemy missile attack. The Strategic Defense Initiative Organization was established to plan, organize, coordinate, direct, and enhance the research and testing of technologies applicable to strategic defense. Future implementation of a Strategic Defense System would be based on the Strategic Defense Initiative research program.

The major program areas of the Strategic Defense Initiative Organization include: Systems Analysis and Battle Management (SA/BM); Surveillance, Acquisition, Tracking, and Kill Assessment (SATKA); Directed-Energy Weapons (DEW); Kinetic-Energy Weapons (KEW); Survivability, Lethality, and Key Technologies (SLKT); and Innovative Science and Technology (IST). Concept



GENERAL APPROACH TO COMPLETE ENVIRONMENTAL ASSESSMENT

FIGURE 1-1

Exploration activities have been conducted on over 20 separate technologies within the major program areas. Six of those technologies are being considered for Demonstration/Validation. This Environmental Assessment addresses the cumulative environmental consequences of Demonstration/Validation of the following six technologies at specific facilities.

- o Boost Surveillance and Tracking System (BSTS)
- o Space-based Surveillance and Tracking System (SSTS)
- o Ground-based Surveillance and Tracking System (GSTS)
- o Space-Based Interceptor (SBI)
- o Exoatmospheric Reentry Vehicle Interception System (ERIS)
- o Battle Management/Command and Control, and Communications (BM/C^3).

1.1.1 Classes of Architecture

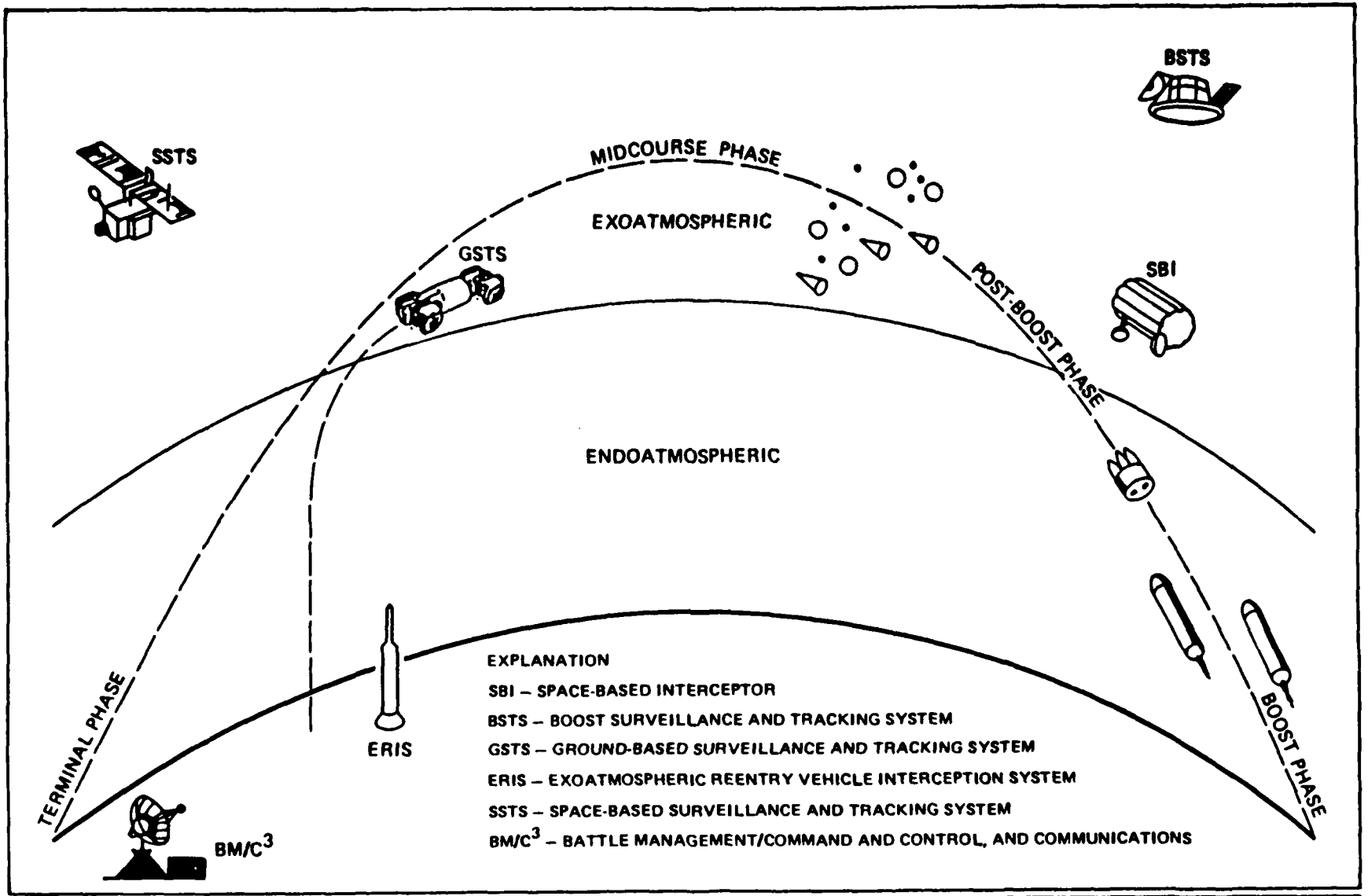
The Strategic Defense Initiative has produced several candidate architecture options and promoted advanced technology concepts to support these architectures. The term "architecture" refers to the function and interrelationship of individual elements or subsystems within a possible system. To date, three classes of possible architecture have been defined (100):

- o Combined space-based and ground-based sensors and weapons to counter long-range ballistic missiles
- o Ground-based weapons to counter long-range ballistic missiles
- o Airborne sensors and ground-based weapons to counter shorter-range tactical ballistic missiles.

The combined space- and ground-based architecture would employ a series of satellites to sense, track, and destroy the threatening missiles and reentry vehicles (i.e., warheads) in the boost, post-boost, or midcourse phase of their trajectory (Figure 1-2). A ground-based system, which would back up the satellites, would intercept warheads in the latter part of their flight. Early evolving systems for both space- and ground-based architectures would use kinetic-energy weapons; later systems may use directed-energy weapons (lasers or particle beams).

As currently envisioned, the ground-based architecture could meet an offensive missile in the midcourse and reentry phases, although boost-phase intercept capability (by use of ground-based directed-energy weapons) is currently being investigated. A series of satellites would provide early warning, and a ground-based intercept vehicle would then destroy the incoming warhead.

The third architecture would use airborne sensors to track shorter-range tactical ballistic missiles and ground-based weapons for target destruction. The short flight times of tactical ballistic missiles would require fast identification, tracking, discrimination, and reaction, which in turn would require greater sensor sensitivity and faster data processing.



OVERALL FUNCTIONAL CONCEPT OF
STRATEGIC DEFENSE INITIATIVE ELEMENTS

FIGURE 1-2

The six technologies that are being considered for Demonstration/Validation would, if deployed, form the first elements of a layered defense. A layered defense would consist of several sets of weapons and surveillance technologies that operate at different phases of an incoming ballistic missile's flight path: the boost phase, post-boost phase, midcourse phase, and terminal phase. These six proposed Demonstration/Validation technologies operate primarily within the boost, post-boost, and midcourse layers of defense.

1.1.2 Stages of Strategic Defense Initiative Development

The development and acquisition of a Strategic Defense System will proceed in accordance with the process described in Department of Defense Instruction (DoD) 5000.1. That instruction requires that major new systems be developed in four distinct stages: Concept Exploration, Demonstration/Validation, Full-Scale Development, and Production/Deployment. Each stage is subject to a formal proceed/desist decision (Milestones I, II and III). Figure 1-3 shows the decision points in the system acquisition process. As the figure indicates, the Milestone I decision would advance six of the candidate technologies (those labeled DEM/VAL PGM_a) to Demonstration/Validation. The other technologies would continue to be developed at the research stage. Those technologies would be reviewed at a later date by the Defense Acquisition Board, who would recommend that specific technologies or groups of technologies either enter into Demonstration/Validation or remain in Concept Exploration (i.e., those programs labeled DEM/VAL PGM_b and DEM/VAL PGM_c).

1.2 PURPOSE AND NEED

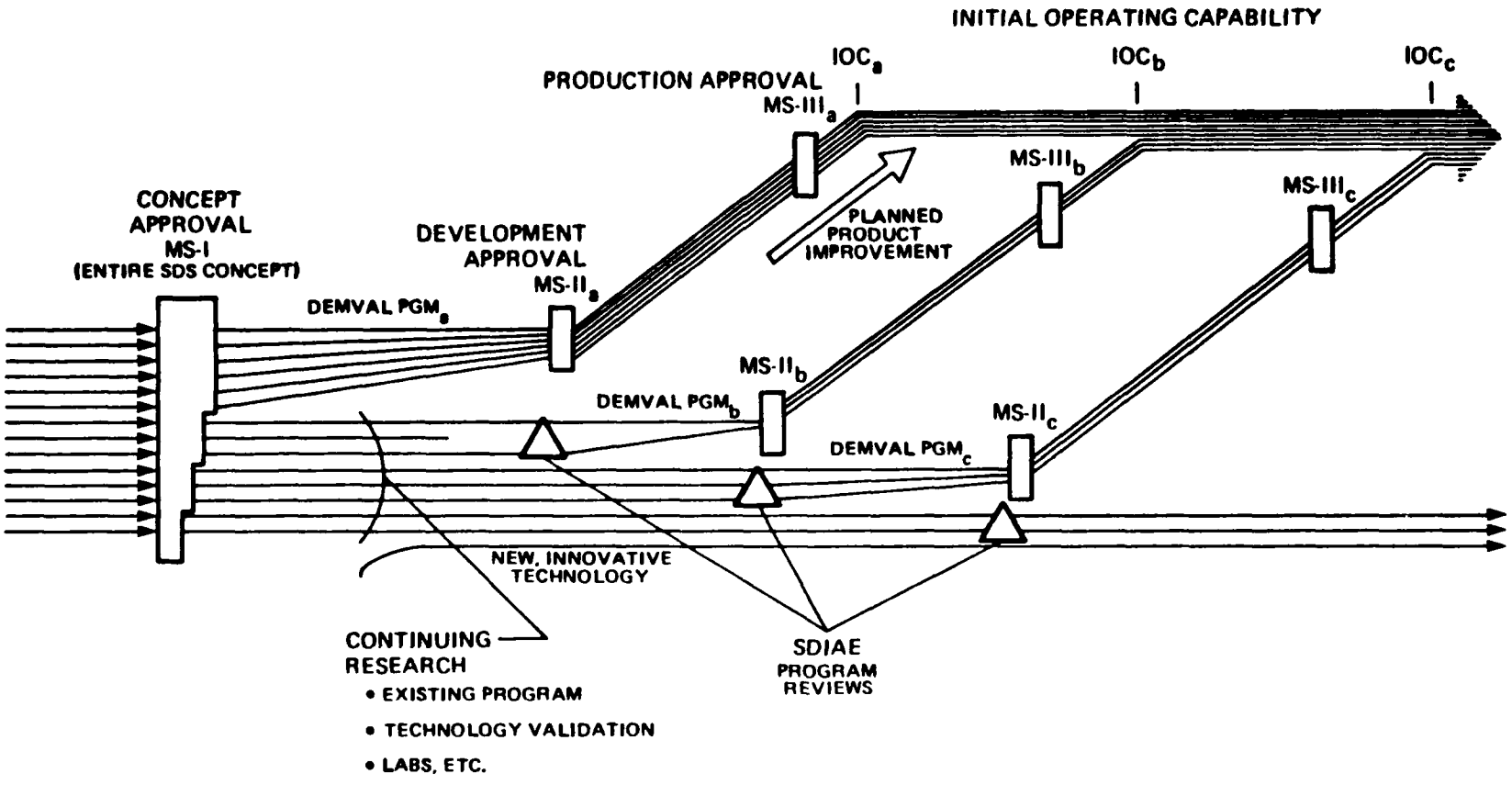
The purpose of the Demonstration/Validation program for the six technologies is to determine the ability of each technology to perform its intended function, and to provide the information necessary to make an informed decision whether to proceed with Full-Scale Development. These activities are the first steps needed to support a decision to develop, produce, and deploy these technologies, which are integral to an effective strategic defense.

1.3 PROPOSED ACTION

During the Demonstration/Validation stage, each of the six technologies would be tested to demonstrate its ability to meet its specific performance requirements and to provide the basis for deciding whether it should proceed to Full-Scale Development. The Demonstration/Validation activities for each of the six technologies are summarized below.

Demonstration/Validation of BSTS would require the fabrication and ground testing of two competing design concepts. After a system design review, one concept would be chosen for further development into a limited capability sensor-equipped satellite. The satellite would be launched into space for on-orbit evaluation.

Demonstration/Validation of the SSTS would require fabrication and ground testing of a limited capability SSTS satellite. The satellite would be



SDS ACQUISITION SYSTEM CONCEPT
PHASED DEVELOPMENT AND DEPLOYMENT

FIGURE 1-3

launched into space for an on-orbit evaluation. Fabrication and ground testing would take place in existing or planned contractor and government facilities. The on-orbit evaluation could require modifications to launch facilities depending on the launch vehicle/launch location option chosen.

Demonstration/Validation of SBI would include a flight test of the homing subsystem. Ground testing would evaluate the performance of other components. A system simulator would be used to evaluate the interfaces among all the subcomponents and to predict overall performance. Ground testing would be conducted in existing or planned facilities. Flight testing would use new launch facilities constructed for another program at an existing missile test range.

Demonstration/Validation of ERIS would require fabrication and ground testing of a limited capability homing kinetic-energy weapon. The homing kinetic-energy weapon would then be flight tested in a series of four to seven launches. The fabrication and ground testing of the homing kinetic-energy weapon would take place in existing contractor and government facilities. Flight testing would require modification of existing launch facilities at two DoD installations.

Demonstration/Validation of GSTS would require fabrication and ground testing of components and assemblies. It would also include launching two sensor-equipped boosters into a ballistic trajectory to test the search, acquisition, tracking, and discrimination performance against a target.

Demonstration/Validation of BM/C^3 would include analyses, simulations, and component/assembly testing of the communications, battle management, and command and control computer hardware and software. Most testing activities would occur in existing facilities.

The testing methodologies and techniques which would be employed during Demonstration/Validation fall into four basic categories: analyses, simulations, component/assembly tests, and flight tests. Methodologies and test locations are described in the following sections.

1.3.1 Analyses

Analysis is the application of diagnostic techniques or the enumeration and evaluation of data to establish the performance characteristics of a test object. Analyses are generally performed by manual methods or with the assistance of automated data processing equipment.

1.3.2 Simulations

Simulations create a digital representation of the physical world using specially developed computer software. Each simulation assigns a specific value to all physical parameters in the simulated system; these values are changed in subsequent simulations to determine: (1) how each parameter affects the simulated system, and (2) the optimal value for each parameter for maximum system efficiency.

1.3.3 Component/Assembly Tests

The objective of component/assembly testing is to control some particular aspect of the physical environment surrounding a hardware component being developed. During the test, data are collected on the environment and the performance of the hardware component being tested. A chamber generally represents the environment; the hardware component is subjected to the environment and the response of the hardware is recorded and analyzed.

1.3.4 Flight Tests

Flight tests are conducted within a missile range that generally consists of a launch area with launch pads or silos, associated launch control and support facilities, a safety area around the launch area, and a controlled land/sea/air area for flight and impact.

1.3.5 Test Locations

Table 1-1 provides a summary of the tests proposed for Demonstration/Validation. All tests currently planned for each of the six technologies during Demonstration/Validation are discussed in detail in the individual Environmental Assessments for each technology. Table 1-1 identifies the tests to be conducted at each test facility, the technology under which they would be performed, and the test methodologies that would be employed. Government facilities are listed in alphabetical order by the state or country in which they are located, followed by contractor facilities.

1.4 NO-ACTION ALTERNATIVE

The no-action alternative is to continue with Concept Exploration activities without progressing to the Demonstration/Validation stage at this time.

TABLE 1-1.

SUMMARY: TECHNOLOGY TESTS BY FACILITY

FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C[3]
Alabama						
Advanced Research Center						A,S,C
California						
Edwards Air Force Base				C		
Vandenberg Air Force Base/ Western Test Range		F(1)	F(2)		F(2)	
Colorado						
National Test Facility, Falcon Air Force Station	A,S	A,S	A,S	A,S	A,S	A,S,C
Florida						
Cape Canaveral Air Force Station/Eastern Test Range	F	F(1)				
Eglin Air Force Base				A,S,C		
Kennedy Space Center		F(1)				
Hawaii						
U.S. Naval Pacific Missile Range Facility at Barking Sands					F(3)	
Maryland						
Harry Diamond Laboratories, Adelphi site					C	C

Key: A - Analyses
S - Simulations
C - Component/Assembly Tests
F - Flight Tests

(1) Possible satellite launch site
(2) Dedicated target launch site
(3) Possible dedicated target launch site

TABLE 1-1. (Continued)

SUMMARY: TECHNOLOGY TESTS BY FACILITY

FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C[3]
Massachusetts						
Electronic Systems Division, Hanscom Air Force Base						A,S,C
Nevada						
Nevada Test Site		C	C		C	C
New York						
Rome Air Development Center, Griffiss Air Force Base						A,S,C
Republic of the Marshall Islands						
U.S. Army Kwajalein Atoll			F	F	F	
Tennessee						
Arnold Engineering Development Center, Arnold Air Force Station		S,C			C	
Virginia						
Harry Diamond Laboratories, Woodbridge site					C	C
Contractors						
Lockheed Missiles and Space Company	A,S,C				A,S,C	
Grumman Aerospace Company	A,S,C					
Contractor		A,S,C	A,S,C,	A,S,C		A,S,C

Key: A - Analyses
S - Simulations
C - Component/Assembly Tests
F - Flight Tests

2. ENVIRONMENTAL SETTING

Demonstration/Validation activities and the contractor and government facilities where they would be conducted were identified in Section 1. This section describes the location and mission of each government facility and presents a summary of the environmental considerations that were addressed in preparing the Environmental Assessments for each technology.

Many of the tests for the Demonstration/Validation program would be completed at contractor facilities. Some of the contractors have yet to be selected through the DoD procurement process. The selected contractor would be required to meet all Federal, State, and local environmental laws and regulations necessary for facility operations. If the procurement process required a selected contractor to use Federal funds to conduct an activity with a potential for significant environmental consequences, an environmental analysis of the consequences of such activities would also be required of the contractor. That analysis would be utilized by DoD in completing an environmental assessment or environmental impact statement, as appropriate.

2.1 FACILITY LOCATION AND MISSION

General descriptions of the facilities involved in Demonstration/Validation testing are provided in the following subsections. A detailed description of physical and operational characteristics, environmental concerns, and permit status for each facility is provided in Appendix A.

2.1.1 Alabama

The Advanced Research Center is located at a research park in proximity to the U.S. Army Strategic Defense Command in Huntsville. The Center is operated under the U.S. Army Strategic Defense Command Research and Technology Program. The Center performs simulations for ground-based elements of a Strategic Defense System. It contains computers and peripheral equipment used in advanced data processing research.

2.1.2 California

Edwards Air Force Base is located on the western edge of the Mojave Desert, approximately 100 miles north of Los Angeles. Edwards Air Force Base occupies over 301,000 acres in Los Angeles, Kern, and San Bernardino Counties. Some of the major missions at Edwards include evaluation of manned and unmanned aerospace vehicles, evaluation of aeronautical weapons systems, logistical support, and full-scale engineering development of aircraft.

Vandenberg Air Force Base/Western Test Range is located on the ccast of California 55 miles north of Santa Barbara. It is the third-largest air base in the United States and occupies 98,400 acres along 35 miles of Pacific coastline within Santa Barbara County. Vandenberg Air Force Base is the Strategic Air Command's pioneer missile base and the host organization for numerous other missions. Missiles are shipped to Vandenberg from storage; between 200 and 300 people are involved during the launch, including the

launch agency and Western Test Range personnel. Vandenberg's mission includes Strategic Air Command missile combat crew training and operational and flight testing of intercontinental ballistic missile related programs. In this capacity, Vandenberg provides evaluations of Strategic Air Command intercontinental ballistic missile performance and research and development test support. Vandenberg also serves as a site for nonmilitary launches.

The Western Test Range comprises a broad area of the Pacific Ocean which extends offshore from Vandenberg Air Force Base on the coast of California to the Indian Ocean. The range functions as the test area for space and missile operations. It includes a network of tracking and data gathering facilities throughout California, Hawaii, and the South Pacific, supplemented by instrumentation on ships and aircraft (93).

The Western Test Range is activated 60 to 70 times each year. Only that portion of the range affected by a launch is actually activated. Prior to a launch, range safety officers are responsible for determining if range evacuation is required and, if so, for implementing it.

2.1.3 Colorado

The **National Test Facility** will be constructed at Falcon Air Force Station (108). An interim facility will be operated out of the existing Consolidated Space Operations Center, also located at Falcon Air Force Station. This facility is in El Paso County, Colorado, about 12 miles east of Colorado Springs. The present mission of the Consolidated Space Operations Center is to provide support for military space operations through communications centralization and data link operations.

The Consolidated Space Operations Center was built to house two mission elements: the Satellite Operations Center and the Space Shuttle Operations Center (111). The former performs command, control, and communications service functions for orbiting spacecraft. The latter was to conduct DoD Shuttle flight planning, readiness, and control functions. The interim National Test Facility could be located at the Consolidated Space Operations Center because adequate support facilities are available (115).

2.1.4 Florida

The Eastern Space and Missile Center is the host organization for **Cape Canaveral Air Force Station/Eastern Test Range**, as well as Patrick Air Force Base. Cape Canaveral Air Force Station and Patrick Air Force Base are located between the Banana River and the Atlantic Ocean in Brevard County on Florida's east coast, approximately 20 miles southeast of Titusville. Patrick Air Force Base provides support for the people and mission of the Eastern Space and Missile Center. Cape Canaveral Air Force Station includes a system of missile launch facilities.

The Eastern Test Range is composed of a broad area of the Atlantic Ocean which extends offshore from Patrick Air Force Base and Cape Canaveral Air Force Station on the coast of Florida to the Indian Ocean. The range functions as the test area for space and missile operations. It includes a network of tracking and data gathering facilities on islands in the Atlantic. These facilities are augmented by ships and aircraft. Its radar, optic, telemetry,

and communications instrumentation acquire data that support launches from Cape Canaveral and the Kennedy Space Center. Launches and spacecraft operations in the Eastern Test Range are routinely monitored and supported by the Air Force Satellite Control Facility, the Consolidated Space Operations Center, and the MILSTAR satellite communication system.

Eglin Air Force Base is located in northwest Florida, approximately 5 miles north of Fort Walton Beach and 45 miles east of Pensacola. The complex consists of nearly 465,000 acres of land located in Santa Rosa, Okaloosa, and Walton Counties, and approximately 44,000 square miles in the Gulf of Mexico (128). The Armament Development and Test Center is the host unit at Eglin Air Force Base. The Test Center missions include development and initial procurement of air armaments, associated equipment research and development testing, and tenant organization support.

Kennedy Space Center is located between the Banana River and the Atlantic Ocean in Brevard County on Florida's east coast approximately 10 miles east of Titusville. Kennedy Space Center is located adjacent to Cape Canaveral Air Force Station to the north and west. Patrick Air Force Base is approximately 10 miles south. Kennedy Space Center is operated by the National Aeronautics and Space Administration and coordinates logistical and operational activities with Cape Canaveral Air Force Station and the Eastern Test Range. Facilities include launch pads for expendable missiles and the Space Shuttle.

2.1.5 Hawaii

The U.S. Naval Pacific Missile Range Facility at Barking Sands is located on the island of Kauai. The Pacific Missile Range Facility contains both land- and water-based facilities in support of DoD test programs (125). In addition, there are three separate launch facilities used to launch test flights of tactical missiles and other projectiles.

2.1.6 Maryland

Harry Diamond Laboratories are headquartered in Adelphi, about 5 miles from Washington, D.C. The principal function of Harry Diamond Laboratories is electronic research and development using simulations to test nuclear hardening of materials. The Aurora Facility at the Adelphi site has specialized facilities to test radiation effects.

2.1.7 Massachusetts

The Electronic Systems Division is located approximately 17 miles northwest of Boston. The facility's functions are primarily electronics research and development in terrestrial, atmospheric, and space environments. It is responsible for developing, acquiring, and delivering electronic systems and equipment for the command, control, communications, and intelligence functions of aerospace forces.

2.1.8 Nevada

The Nevada Test Site is located approximately 65 miles northwest of Las Vegas in southeastern Nye County, Nevada. The Nevada Test Site, 864,000 acres in size, operates facilities for underground testing of nuclear devices and

weapons testing. Exposure of materials and components to nuclear radiation is often an integral part of a nuclear test.

2.1.9 New York

Rome Air Development Center is located at Griffiss Air Force Base, 1 mile northeast of Rome, New York. The facility is the principal organization charged with Air Force research and development programs related to command, control, communications, and intelligence. Missions include communications, surveillance, intelligence data handling, information systems technology, and artificial intelligence.

2.1.10 Republic of the Marshall Islands

The **U.S. Army Kwajalein Atoll** is a northern atoll within the Ralik Chain of the Republic of the Marshall Islands, located east-southeast of Guam. Kwajalein Atoll consists of a very large interior lagoon (839 square miles) surrounded by approximately 100 component islets (67, 119). The U.S. Army Kwajalein Atoll encompasses Kwajalein Atoll and has technical facilities on the islands of Kwajalein, Roi-Namur, Ennylabegan, Meck, Ennugarret, Gagan, Gellinam, Omeleck, Eniwetak, Legan, and Illeginni (99). United States resident populations are located on Kwajalein and Roi-Namur. The primary mission of U.S. Army Kwajalein Atoll is to conduct missile flight testing in support of U.S. Army research and development efforts.

2.1.11 Tennessee

Arnold Engineering Development Center is located at Arnold Air Force Station approximately 7 miles southeast of Manchester, Tennessee. It is the nation's largest complex of wind tunnels, jet and rocket engine test cells, space simulation chambers, and hyper-ballistic ranges.

2.1.12 Virginia

The **Harry Diamond Laboratories** have facilities located near Woodbridge, Virginia. The principal function of Harry Diamond Laboratories is electronic research and development using simulations to test nuclear hardening of materials. The Woodbridge Research Facility has specialized facilities to test the survivability of material subjected to electromagnetic pulse.

2.2 AREAS OF ENVIRONMENTAL CONSIDERATION

To determine existing environmental conditions at government facilities, ten areas of environmental consideration were addressed: (1) air quality; (2) water quality; (3) biological resources; (4) infrastructure: electricity, solid waste, sewage treatment, water supply, transportation; (5) hazardous waste; (6) land use; (7) visual resources; (8) cultural resources; (9) noise; and (10) socioeconomics.

Several of the resource areas, specifically air and water quality, are regulated by federally mandated standards. The treatment, storage, and disposal of hazardous wastes are also regulated by Federal standards. Where federally

mandated standards do not exist, qualitative evaluations were determined. A discussion of each resource area is provided below. Table 2-1, at the end of this section, summarizes these environmental considerations at each government facility.

Air Quality

Air quality concerns at each facility were evaluated in terms of the National Ambient Air Quality Standards and the location of the facility in an attainment or nonattainment area.

Water Quality

Water quality concerns at each location were identified and the facility's record of compliance with permit requirements is presented.

Biological Resources

The Endangered Species Act protects threatened and endangered species. A review of the environmental documentation of the geographic area surrounding the facility was conducted to determine the documented presence of threatened and endangered species.

Infrastructure

Electricity, solid waste, sewage treatment, water supply, and transportation are infrastructure requirements that ultimately limit the capacity for growth. Capacity and current demand are described for each facility.

Hazardous Waste

The Resource Conservation Recovery Act regulates how a facility manages its hazardous waste. The record of compliance was reviewed to determine the facility's capability to handle any additional wastes and to determine any potential disposal problems.

Land Use

Base master plans, environmental management plans, and other documentation were reviewed to identify any current conflicts between the facility and local standards and to evaluate the probability of conflict resulting from any planned expansions.

Visual Resources

Existing environmental documentation was reviewed to determine if aesthetic concerns were an issue at any of the facilities.

Cultural Resources

Existing environmental documentation was reviewed to determine if any significant cultural resources in proximity to the facilities would be affected by test activities.

Noise

Existing environmental documentation was reviewed to determine if noise concerns were an issue at any of the facilities.

Socioeconomics

Key socioeconomic indicators (population, housing, employment, and income data) for the supporting region of each facility were examined to evaluate the potential consequences of increased population, expenditures, and employment.

TABLE 2-1.

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Alabama										
Advanced Research Center	No air concerns	No wastewater effluents	No threatened/ endangered species	Services currently adequate	None	No conflicts	Suburban wooded	None registered	Urban levels	Urban. About 70 employees
California										
Edwards Air Force Base	Portion of site in nonattain-ment area for ozone	Discharge to holding ponds; no NPDES permit	4 potential threatened or endan-gered species	Services currently adequate	Disposal at licensed commercial facilities	No conflicts	Remote desert area	About 400 prehistoric sites are protected	Inter-mittent flight tests	Rural/small town. About 13,000 employees
Vandenberg AFB/ Western Test Range	Attainment area, PSD permits in place	NPDES permitted releases	7 potential or listed threatened or endangered species, wetlands present	Services currently adequate	Disposal at licensed commercial facility, permitted onsite storage	No conflicts	Desert, coastal, wetlands	About 600 archeo-logical sites, 2 registered sites	Inter-mittent missile launches	Rural/small town. About 13,000 employees
Colorado										
National Test Facility, Falcon AFS	Attainment area	One NPDES permitted release	None	Services currently adequate. Potential water supply problems	Disposal at licensed commercial facilities	No conflicts	Semiarid grassland	None	Isolated location	Suburban. About 1,500 employees at Falcon AFS. Projected employment at National Test Facility is 2300.

TABLE 2-1 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Florida										
Cape Canaveral AFS/ Eastern Test Range	Air Shed Class II, attainment area, PSD permits for boilers	One NPDES permitted release	10 threat-ened or endangered species	Services currently adequate	Disposal at licensed commercial facilities, 1 permitted storage facility	No conflicts	Barrier Island	7 sites on National Register protected 21 eligible sites	Inter-mittent missile launches	Small town. About 6,000 employees
Kennedy Space Center	Attainment area	2 NPDES permitted outfalls	9 threat-ened or endangered species	Services currently adequate	3 permit-ted stor-age facil-ities on-site treat-ment and recovery facilities	No conflicts	Barrier island	28 archeo-logical and hist-orical sites	Intermitt-ent mis-sile launches	Small town. About 3,400 employees
Eglin AFB	Attainment area, 2 PSD permits	5 releases, 2 NPDES permitted, 3 permits pending denial	9 threat-ened or endangered species	Services currently adequate	Permitted storage. Disposal at licensed commercial facilities	No conflicts	Wooded, lakes and streams	About 300 archeo-logical sites protected	Compliance with Air Force directive	Small town. About 6,000 employees

TABLE 2-1 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Hawaii										
U.S. Naval Pacific Missile Range Facility, Barking Sands, Kauai	Attainment area, no PSD permits	No NPDES permits	5 threat-ened or endangered species	Services currently adequate	Interim status treatment and stor-age; dis-posal at licensed commerical facilities	Potential conflicts with local use of beaches	Sea coast	Several unregis-tered sites	Inter-mittent missile launches	Rural. About 800 employees
Maryland										
Harry Diamond Laboratories	5 permits	1 permit recent violation of standards	No known threatened or endang-ered species	Waste water treatment problems	Part B permit pending	No known conflicts	Visual impact from antenna platforms	No sites	No noise problems	Rural. About 1,000 employees
Massachusetts										
Flectronic Systems Division	Attainment area	No permit required	No threat-ened or endangered species	Services currently adequate	None generated	No conflicts	Urban	None	Urban	Urban. About 5,000 employees
Nevada										
Nevada Test Site	In attain-ment for all standards	No releases	Several potential threatened or endang-ered species	Services currently adequate	RCRA Transpor-tation, Storage, Disposal Permit	No conflicts	Desert	Archeo-logical and hist-orical sites identi-fied	Inter-mittent short duration noise	Rural. About 8,000 employees

TABLE 2-1 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
New York										
Rome Air Development Center, Griffiss AFB	Air Shed Class II, attainment area	Several NPDES permits	Several threatened or endangered species	Services currently adequate	Facility in planning stage	No conflicts	Hills, agriculture and woodland	None known	Low noise level	Urban. About 8,000 employees
Republic of the Marshall Islands										
U.S. Army Kwajalein Atoll	Good ambient quality due to winds. Potential NOX exceedence from power plant	Permitted facilities at Kwajalein and Ebeye	2 threatened or endangered species	Water resources limited. Limited solid-waste disposal	Disposal by licensed commercial facilities	Potential conflicts	Flat, elongated terrain. Meck Island original features completely altered	Kwajalein, Roi-Namur registered historical sites	Intermittent missile launches	Densely populated islet. About 1,500 employees
Tennessee										
Arnold Engineering Development Center, Arnold AFS	2 PSD permits Attainment area	8 NPDES permitted releases	Several threatened and endangered species. 2 designated wetlands present	Services currently adequate	RCRA permit for storage in negotiation disposal by licensed commercial facilities	No conflicts	Rural, hills, wooded	None	Intermittent rocket engine and other tests	Rural/small town. About 4,000 employees

TABLE 2-1 (Continued).

ENVIRONMENTAL CONSIDERATIONS BY FACILITY

Test Facility	Air Quality	Water Quality Permits	Biological Resources	Infra-structure	Hazardous Waste	Land Use	Visual Setting	Cultural Resources	Noise	Socio-economics
Virginia										
Harry Diamond Laboratories	None required	None required	No known threatened and endangered species	Services currently adequate	No hazardous waste	No known conflicts	Gentle rolling hills	1 historic site	No noise problems	Rural/ suburban. 125 employees

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3. ENVIRONMENTAL CONSEQUENCES

This section summarizes the potential environmental consequences of tests conducted at each facility for each technology. The assessment of consequences is based on a comparison of the tests described in Section 1 (and summarized in Table 1-1) with the environmental considerations at the facilities (summarized in Table 2-1). The analysis also relies on previously published National Environmental Policy Act documentation that has been incorporated by reference.

Many of the tests for the Demonstration/Validation program would be conducted at contractor facilities. The contractors would be selected through the DoD procurement process and are required to meet all Federal, State, and local environmental laws and regulations necessary for facility operations, modifications, or construction. If the procurement process required the selected contractors to use Federal funds to conduct an activity with a potential for significant environmental consequences, an environmental analysis of the consequences of such activities would also be required of the contractor. This analysis would be utilized by DoD in completing an environmental assessment or environmental impact statement.

The approach used to complete the Environmental Assessment of the Demonstration/Validation program was described in Section 1. To assess the potential for and the magnitude of impacts from Demonstration/Validation at each government facility, a two-step methodology was utilized (Figure 3-1). The first step was the application of assessment criteria to identify activities with no potential for significant environmental consequences. Activities were deemed to have no significant environmental consequences if they met all of the following criteria (i.e., all "yes" answers):

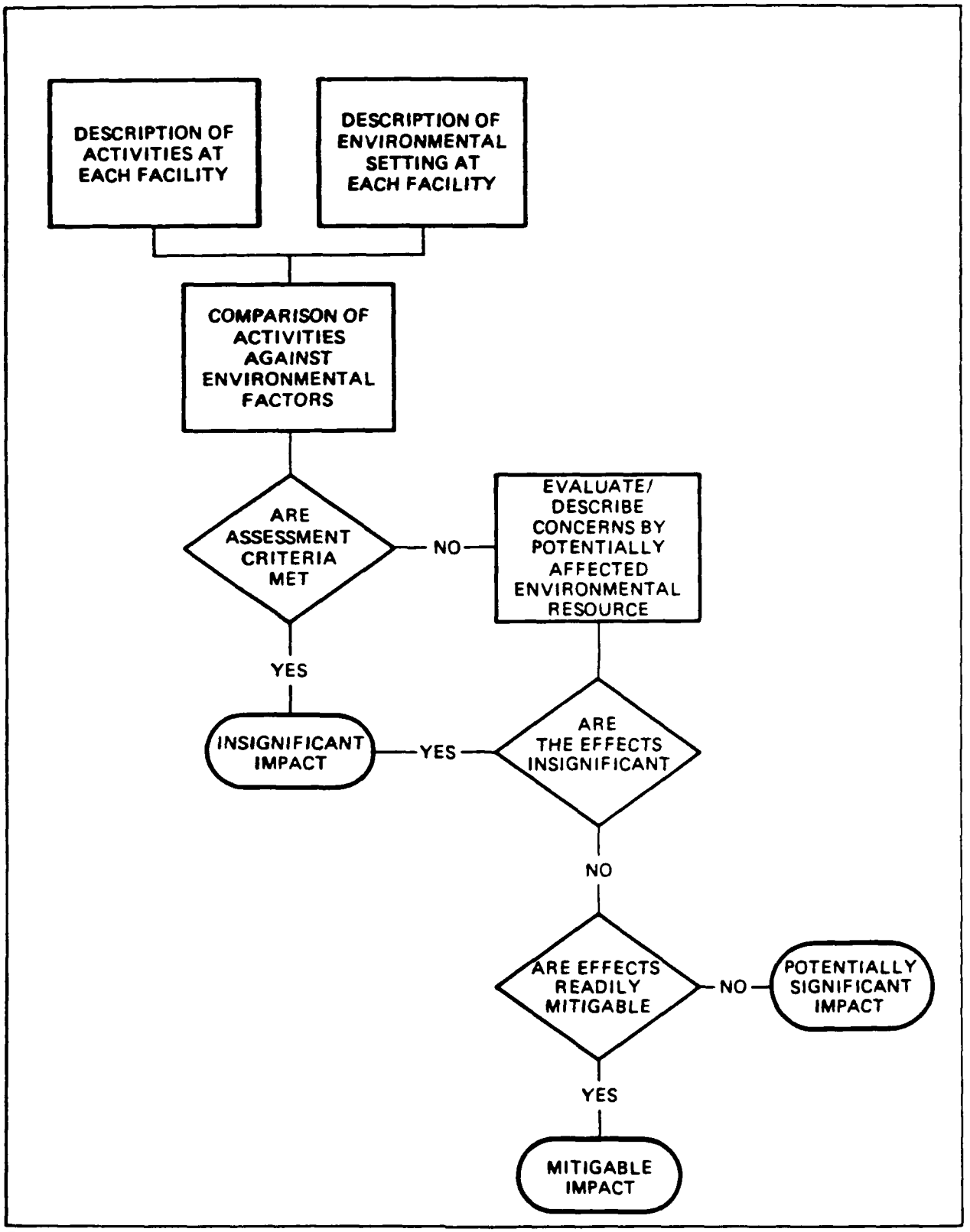
1. Are the facility and its infrastructure adequate for the proposed activity (i.e., can the tests be conducted without new construction, excluding minor modifications)?

2. Is current staffing at the facility adequate to conduct the test, excluding minor staff level adjustments?

3. Does the facility comply with existing environmental standards?

4. Are the resources of the surrounding community adequate to accommodate the proposed testing?

If a proposed test was determined to present a potential for impact (i.e., a "no" answer to any of the above questions), the second step was to evaluate the activity in the context of the following environmental considerations: air quality, water quality, biological resources, infrastructure, hazardous waste, land use, visual resources, cultural resources, noise, and socioeconomics. As a result of that evaluation, consequences were assigned to one of three categories: insignificant, mitigable, or potentially significant.



METHOD FOR ASSESSING
POTENTIAL ENVIRONMENTAL CONSEQUENCES

FIGURE 3-1

Environmental consequences were determined to be **insignificant** if, in the judgment of the analysts or as concluded in existing environmental documentation, no potential for significant environmental impacts exists. Consequences were deemed **mitigable** if concerns exist but it was determined that all potential consequences could be readily mitigated through standard procedures, or by measures recommended in existing environmental documentation. If serious consequences exist that could not be readily mitigated, the activity was determined to represent **potentially significant** environmental impacts.

The remainder of this section provides discussions of the potential environmental consequences for each location proposed for the Demonstration/Validation program. The impacts of the no-action alternative and irreversible and irretrievable commitments of resources that would accompany Demonstration/Validation are described at the end of this section.

The six Environmental Assessments prepared for the technologies proposed for Demonstration/Validation evaluate the consequences of activities associated with each technology independently of those associated with any other technology. However, an evaluation of the environmental consequences of Demonstration/Validation requires an analysis of cumulative consequences of multiple tests at a specific facility. This Program Summary evaluates the cumulative environmental consequences of the overall Demonstration/Validation for the six technologies described in Section 1.

3.1 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

This section identifies the cumulative environmental consequences of tests at each facility. The environmental consequences of Demonstration/Validation for each location are summarized in Table 3-1, presented at the end of this section. Facilities are arranged in those tables and in the following discussions by the State or country in which they are located.

3.1.1 Alabama

Advanced Research Center

The BM/C^3 tests to be conducted at the Advanced Research Center would involve computer simulations for determining processing speeds, data base sizing, and memory requirements. The Advanced Research Center has recently leased a new privately owned building (30). BM/C^3 testing would use 23 existing computers at the facility and would require the addition of 5 to 6 new computers (92). The existing staff of 70 people would perform the required computer simulations (135). Existing infrastructure and facilities are deemed adequate for the proposed BM/C^3 tests. Based on available data, the Advanced Research Center has been determined to be in compliance with all existing environmental regulations (136). Thus, insignificant impacts are anticipated from BM/C^3 activities at the facility.

3.1.2 California

Edwards Air Force Base

The Air Force Astronautics Laboratory at Edwards Air Force Base would host two types of lethality tests on the SBI homing subsystem. These include static tests to verify the control logic of the guidance system and motors, and tethered flight tests against movable or simulated targets. These types of tests are routinely performed at Edwards Air Force Base (74). SBI test activities would not require construction of new facilities, only the addition of computers and interior construction and modification of the facility. The exact location of these tests on Edwards Air Force Base has not been decided; the test facility would be either a small room or a shielded area covered with a safety net that would shield the test from wind and aid in the recovery of parts (75). Staffing levels are not expected to increase for SBI testing activities (74), and as a consequence no socioeconomic impacts are anticipated.

Since there would be no additional staff required and similar testing is currently in progress, existing infrastructure for Edwards Air Force Base is deemed sufficient to support the SBI test activities, and exceedances of applicable environmental regulations are not anticipated (74, 75).

Edwards Air Force Base is in compliance with the regulatory standards for air quality, water quality, and hazardous waste. The resources of the surrounding community are deemed adequate to accomplish the testing because it is within the scope of ongoing activities. The environmental consequences associated with Demonstration/Validation activities at Edwards Air Force Base are anticipated to be insignificant. The staff at Edwards Air Force Base has initiated procedures to determine if Air Force regulations require any environmental analysis of the proposed activity (76).

Vandenberg Air Force Base/Western Test Range

Vandenberg Air Force Base/Western Test Range would host Demonstration/Validation activities for the ERIS, GSTS, and possibly SSTS technologies. The ERIS flight test program would involve four to seven target launches of Minuteman I missiles from Vandenberg Air Force Base. The GSTS program would involve from three to nine target launches of Minuteman missiles. Launches for both programs could include dedicated targets and targets of opportunity. No new construction or additions to staff would be required for ERIS and GSTS. Minuteman launches are a continuation of activities that are within the operational limits of Vandenberg Air Force Base. Minuteman tests and operations are similar to those conducted for MX Missile development (83). A final environmental impact statement was prepared for the MX Missile Milestone II Decision (112). Copies of that document are available from the Public Affairs Office at Vandenberg Air Force Base.

The SSTS technology could also utilize Vandenberg Air Force Base if a west coast launch is selected. An SSTS space surveillance experiment would involve the launch of either a Titan IV or the Space Shuttle. Launch of a Titan IV would require modification of an existing Titan III launch facility or construction of a new facility designed specifically for the Titan IV. Launch of the Space Shuttle would require returning the Shuttle launch facility to full operational capability. Additional facilities may be required for either

Titan IV or Space Shuttle launches. An environmental impact statement addressing construction and operation for the Space Shuttle launch facility was prepared (113). An environmental impact statement is in preparation to address modification and operation of a Titan IV launch facility (15).

GSTS, ERIS, and SSTS would involve launches of targets from Vandenberg Air Force Base, which in turn would require activating the Western Test Range for each launch. The Western Test Range is activated 60 to 70 times per year. GSTS launches would not significantly affect range operations since they represent a relatively small increase in the number of times the range would be activated.

Applying the four assessment criteria against the test activities they would require indicates a potential for environmental effects because of (1) modification of a Titan III launch facility or new construction of a Titan IV facility, and (2) a possible increase in facility staffing. Thus, an assessment addressing each of the environmental considerations was completed and is presented below.

The Western Test Range was also assessed against the four assessment criteria. The result of this evaluation was a determination that the four criteria are met.

Air Quality

Vandenberg Air Force Base is currently in attainment for all Ambient Air Quality Standards. Air quality is monitored by stations onbase (96). Minuteman missile launches are clean burning with no acid deposition. Any emissions are dispersed immediately over the ocean and therefore do not contribute to onbase air quality degradation (83). Titan IV or Shuttle launches would have greater potential impacts on air quality and would possibly require emissions offsets (61, 83, 96).

Water Quality

National Pollution Discharge Elimination System permits are currently in place for 15 onbase sewage discharge locations (82). Water used in launch washdown operations is either collected, stored, and disposed as hazardous waste, or treated by the onbase sewage facilities (83). Continued Minuteman launch operations within the current schedule are not expected to affect water quality. Water quality concerns for a Titan IV launch will be addressed in the environmental impact statement in preparation for Titan IV launch facilities, and are anticipated to be insignificant (15).

Biological Resources

Seven federally listed threatened and endangered species are present on Vandenberg Air Force Base (106). A critical habitat for one of the endangered species is located near the Peacekeeper launch area, but launches of Minuteman and Titan missiles would not affect this area (106). The threatened and endangered species are subjected to vibration from launches and could be affected by catastrophic explosions (83). Vibration impacts are not considered significant and possible catastrophic explosions are unlikely; thus, Minuteman launch operations within the current schedule are not expected to

increase the biological impacts. Effects of a Titan IV launch on threatened and endangered species will be addressed in the Titan IV environmental impact statement in progress. Space Shuttle operations would be expected to produce slight transient impacts on threatened and endangered aquatic and terrestrial biota (113).

Infrastructure

Evaluation of the effects on each of the infrastructure components is as follows:

- Electricity is currently supplied by the Pacific Gas and Electric Company power grid (83). Electrical demand is currently below capacity. Continued Minuteman launches within the current schedule and additional Titan or Shuttle launches to support SSTS would not increase electrical demand beyond capacity (34).

- Continued Minuteman launches within the current schedule would not increase solid waste volume (106). Additional staff required for Titan IV or Space Shuttle launch would increase solid waste volumes, which would be disposed at five offbase facilities with adequate capacity (33, 106).

- Sewage treatment at onbase and offbase facilities is within capacity. Continued Minuteman launches within the current schedule would not increase sewage volumes. Additional staff required for the launch of Titan IV or Space Shuttle would increase volumes, but these volumes are not expected to exceed sewage treatment facility capacity (33, 106, 112).

- Water is supplied by 10 onbase wells (106). Currently, water use in the region is overdrawing the two aquifers used for water supply. Increased staff would increase water consumption. Overall operations of Vandenberg Air Force Base are contributing to overdrawing the aquifers, and at current usage rates the aquifers could be depleted (106). The Draft Environmental Impact Statement, Mineral Resources Management Plan, states that concerted efforts to plan and enforce water management programs can prevent serious impacts to water supply (106).

- Transportation routes to the base are at or near capacity (106). Routes on base have excess capacity (106). Additionally, access routes to launch sites are restricted during launches (83). Increased staff would exacerbate the problems.

Hazardous Waste

Vandenberg Air Force Base has a short-term hazardous waste storage permit (61). Disposal is offbase by a licensed contractor (61). Continued Minuteman launches within the current schedule would not contribute increased volume or new types of hazardous waste. Additional hazardous wastes would be generated by Space Shuttle or Titan IV operations. It is anticipated that the additional hazardous waste would be handled by a contractor.

Land Use

Launch facilities for Minuteman, Titan IV, and Space Shuttle are consistent with land use guidelines outlined in the "Base Development Pattern" (114).

Visual Resources

Continued launching of Minuteman missiles from existing facilities would not affect present visual resources. Space Shuttle launch facilities have already been constructed. A Titan IV launch facility would either be a refurbished Titan III facility or a newly constructed Titan IV facility. No additional visual impacts are anticipated.

Cultural Resources

There are 600 known cultural resources, mostly archaeological sites, on Vandenberg Air Force Base (106). Two sites are on the National Register of Historical Places, but neither is adjacent to existing Minuteman or Space Shuttle launch facilities (106). One of the sites, the historical lighthouse at the south end of Vandenberg, is about 1 mile from the proposed Titan IV launch pad. Launches from the facility are not anticipated to affect the lighthouse.

Noise

There are no specific standards for noise levels, but noise generated by Minuteman launches is of short duration and high intensity within a remote area (83). Continued Minuteman launches would not contribute excessive noise. The Space Shuttle vehicle would be considerably larger than any other missiles currently launched from Vandenberg (113). Maximum noise levels at the launch site would reach 170 dB for a few minutes. Maximum noise levels in Lompoc and the cantonment area would be in the ranges of 115 to 120 dB. Noise levels in Lompoc and the cantonment area are not expected to result in serious health problems; however, some people may find this noise objectionable (112). The Titan IV, a smaller launch vehicle, would have less impact than the Shuttle.

Socioeconomics

No new staff would be required for continued Minuteman launches within the current schedule, and therefore no socioeconomic impacts are expected (93). Staffing requirements for Titan IV will be addressed in the environmental impact statement for Titan IV modification and operations.

Based upon available socioeconomic data for the supporting region, the use of Vandenberg Air Force Base for SSTS Demonstration/Validation Activities would not have a significant socioeconomic impact unless accompanied by substantial increases in staffing. This assessment is made in the wake of the recent curtailment of Space Shuttle activity at this facility, which has meant that much of the previously anticipated growth in the supporting region has not occurred. Reactivation of the Space Shuttle at Vandenberg, with its associated personnel, may have socioeconomic impacts.

As a result of the analyses of each of the environmental considerations, no potential significant impacts were identified related to GSTS and ERIS Minuteman launches. Environmental consequences associated with facility construction and operation for SSTS are deemed mitigable.

3.1.3 Colorado

National Test Facility

The National Test Facility would be used during Demonstration/Validation to conduct analyses and simulations for BSTS, GSTS, SSTS, ERIS, SBI, and BM/C^3 technologies. Environmental effects of construction and operation of the National Test Facility are presented in the "National Test Facility Environmental Assessment" (108). This environmental Assessment estimated that minor erosion during construction and minor impacts on air quality, ecology, groundwater supply, and vehicular traffic during operation would occur. It concluded that with the implementation of proposed mitigation measures, no significant impacts are anticipated. Copies of this environmental assessment may be obtained from the Public Affairs Office at Falcon Air Force Station.

Until the National Test Facility is constructed, the staff necessary to complete the tests would be located at existing facilities at Falcon Air Force Station. The environmental consequences of the proposed use of these existing facilities were addressed in a "Request for Environmental Impact Analysis," control number AFSPC 86-1 (115). The result of this request was an assessment that the interim National Test Facility qualified as a categorical exclusion in accordance with U.S. Air Force Categorical Exclusion 2x. This categorical exclusion states, "This is an administrative action utilizing interior space for personnel and computer equipment." Thus, no further environmental documentation is necessary. This categorical exclusion 2x refers to the environmental impact statement for the Consolidated Space Operations Center (111). Copies of this document may be obtained from the Public Affairs Office at Falcon Air Force Station.

Operation of the National Test Facility would require a significant increase in the staff at Falcon Air Force Station. The previously completed "National Test Facility Environmental Assessment" (108) predicted the creation of approximately 2,300 permanent onsite jobs, as well as a daily average of 400 visitors (because each visit is likely to last several days, visitors were counted as equivalent to employees). Including the visitors, the total maximum daily population would thus be increased by 2,700. On the assumption that only 10 percent of the daily population would be drawn from the local area, it was predicted that more than 2,400 families would relocate to the area.

Applying the four assessment criteria against the test activities and the facility construction they would require shows the potential for environmental effects related to the construction and operation of the National Test Facility, the proposed staffing requirements of the facility, and the resulting socioeconomic presence in surrounding communities. The assessment criteria for compliance with permits is met by the existing facilities. The results of the environmental assessment conducted for the National Test Facility are summarized below.

Air Quality

Current operations at Falcon Air Force Station are in attainment by Colorado standards. Once the National Test Facility is constructed, operations are predicted to add to an existing violation of the 1-hour and 8-hour carbon monoxide Federal standard from automobiles at the intersection of Petersen Boulevard and Highway 94 outside the base (108). This addition can be mitigated through the use of van pools and other conservation measures.

Water Quality

All discharges are in compliance with current permits (18). The environmental assessment for the National Test Facility predicts no significant impact on groundwater or surface water quality (108).

Biological Resources

No threatened or endangered species are identified in the vicinity of the National Test Facility (108). Impacts to biological resources were predicted to be insignificant (108).

Infrastructure

Evaluation of the effects on each of the infrastructure components is as follows:

- The electrical substation can be expanded to 25,000 kW with additional cooling equipment. The National Test Facility will require the addition of 13,000 kW, which could be accommodated by expansion of the substation (108).

- Solid waste is disposed of offsite in a licensed landfill. The amount of solid waste that would be generated by the National Test Facility has not been estimated, but it is anticipated to be a relatively small volume (18).

- Sewage treatment capacity is currently adequate but the construction of the National Test Facility requires an expansion of the capacity of the sewage treatment plant by 0.124 million gallons/day (108). The expansion could encroach on a flood plain. All impacts are anticipated to be mitigable (108).

- Construction and operation of the National Test Facility are projected to increase water requirements from 0.37 million gallons/day to 1.0 million gallons/day (108). Mitigation measures such as conservation, reuse, and drought-tolerant landscaping would reduce the projected water requirements to 0.5 million gallons/day (108). Additional mitigation measures would have to be implemented to prevent exceeding water supply.

- Transportation system capacity exceeds current traffic demands. The addition of the National Test Facility would create significant increases in vehicular traffic, but would be below design capacity; however, increased delays would occur at some intersections (108).

Hazardous Waste

Any hazardous waste would be disposed of in accordance with current applicable regulations (18, 20).

Land Use

There are no current land use or zoning conflicts (19). No conflicts are anticipated for the development and operation of the National Test Facility (108). Expansion of the sewage treatment plant could encroach on a flood plain. This impact can be mitigated through the use of standard flood control measures.

Visual Resources

The current visual landscape is a rolling agricultural grassland (108). The National Test Facility will have an insignificant additional impact on the visual resources because it will be adjacent to an existing building (108).

Cultural Resources

No cultural resources have been identified on the facility (108); therefore, impacts are anticipated to be insignificant.

Noise

Due to the administrative and industrial nature of the existing facilities on Falcon Air Force Station, impacts from construction and operation are anticipated to be insignificant (108).

Socioeconomics

Unemployment in El Paso County of 5.4 percent (8,800 persons) in 1984 and an adequate availability of housing indicate that the socioeconomic impacts of the growth resulting from construction and operation of the National Test Facility would be insignificant.

The environmental consequences associated with the construction and operation of the National Test Facility are mitigable by the measures described in the "National Test Facility Environmental Assessment" (108). No significant environmental consequences have been identified associated with the operation of the interim National Test Facility based on the "Request for Environmental Impact Analysis," control number AFSPC 86-1 (115).

3.1.4 Florida

Cape Canaveral Air Force Station/Eastern Test Range

Cape Canaveral Air Force Station would be used for one launch of the BSTS during Demonstration/Validation. SSTS may also utilize one launch. These launches would utilize the new Titan IV booster to place the test satellites in orbit. Support facilities at Patrick Air Force Base, the tracking facilities of the Eastern Test Range, and other support from the Air Force

Satellite Control Facility, the Consolidated Space Operations Center, and the MILSTAR satellite communications system would be utilized as needed. These activities are within the scope of operations at Cape Canaveral Air Force Station/Eastern Test Range.

Modification of Launch Complex 41 at Cape Canaveral will be required to accommodate Titan IV launches. Those modifications are in progress and will support several military space programs in addition to the proposed BSTS and SSTS programs (52). No new construction or modification of Eastern Test Range facilities would be required (22). The environmental consequences of the Titan IV Launch Complex construction and operation have been analyzed in "Environmental Assessment for the Complementary Expendable Launch Vehicle (CELV) Program at Cape Canaveral Air Force Station." Copies of this documentation may be obtained from the Public Affairs Office at Cape Canaveral Air Force Station.

No new staffing would be required to support Demonstration/Validation activities at Cape Canaveral or the Eastern Test Range. All Titan IV launches would be staffed with existing, permanent facility employees (52). Existing, permanent infrastructure support facilities for Launch Complex 41 are adequate to support Titan IV launch activities (52).

The result of applying the four assessment criteria against the test activities and the facility modifications they would require indicates the potential for environmental effects related to the modification of Launch Complex 41 at Cape Canaveral. Thus, a more detailed assessment addressing each of the environmental considerations for activities at Cape Canaveral was completed.

The other three assessment criteria are met. With no staff increases, there would be no additional pressure placed on the resources of the surrounding communities. In addition, the facilities at Cape Canaveral Air Force Station are currently in compliance with all permit requirements.

The Eastern Test Range was also assessed against the four criteria. The result of this evaluation was a determination that the four criteria are met.

The results of the assessment of each of the environmental considerations are presented below.

Air Quality

Cape Canaveral Air Force Station currently meets State and Federal air quality standards (55). Launches would affect air quality through the releases of perchlorates, which combine with the atmosphere to form hydrochloric acid. The specific impacts and mitigation through use of an oxidizer vapor scrubber are described in the environmental assessment for the Titan IV launch complex modification (52).

Water Quality

Current water discharges are permitted and monitoring shows no exceedances (55). Washdown deluge water used during launches runs off onto the ground and is not monitored, but the water that is collected on the launch platform

(30-40 percent of all washdown water) is tested and has been found to be clean enough for release. The impacts and mitigations are described in the environmental assessment for the Titan IV launch complex modifications (52).

Biological Resources

Threatened and endangered species are present in the area of Cape Canaveral (56). Any activities that may affect these threatened and endangered species must be reviewed and concurred with by the Fish and Wildlife Service as required by the Endangered Species Act of 1973. The project would not proceed if proper mitigation were not applied.

Infrastructure

Evaluation of the effects on each of the infrastructure components is as follows:

- Electricity is currently supplied by Florida Power and Light (87, 89). No increases in demand over current capacity would result from test activities (52). Portable generators may be used to supplement permanent power supplies during Titan IV launches (52).

- Solid waste is disposed offsite (55, 87, 89); additional increases that may result from test activities would be only a small part of the approximately 14,000 tons generated annually (55, 87, 89). Thus, consequences are anticipated to be insignificant.

- Sewage treatment is currently at 80 percent of capacity (87, 88, 89). As no staff increases are needed to support Demonstration/ Validation activities, potential increases in sewage generation rates are considered minor. Thus, consequences are anticipated to be insignificant.

- Water is currently purchased from the City of Cocoa (87, 90). Deluge water would be required for one or two launches. This would represent an insignificant increase in consumption.

- Transportation routes to Cape Canaveral Air Force Station are currently congested (89). However, since no additional staff would be required for Demonstration/Validation activities there would be no increase in the current congestion.

Hazardous Waste

The existing hazardous waste storage facility is adequate for the management of any additional hazardous waste generated by Demonstration/Validation activities (55).

Land Use

The modification of an existing launch platform would result in no conflict with land use as specified in the base comprehensive plan (56).

Visual Resources

The modification of the existing Launch Complex 41 would result in insignificant changes to the visual resources of the area.

Cultural Resources

Modification of the existing Launch Complex 41 would not result in disruption of undisturbed land. Thus, no impacts are anticipated on historical and archaeological sites.

Noise

There are no specific standards for noise levels; however, the Titan IV is less noisy than the Space Shuttle, which has been launched from the adjacent Kennedy Space Center with no significant impacts (63). Therefore, anticipated impacts are deemed insignificant.

Socioeconomics

No new staff are projected to support Demonstration/Validation activities. Thus, there would be no pressure on the housing and services provided by the surrounding communities. Socioeconomic impacts of Demonstration/Validation are anticipated to be insignificant.

The environmental consequences associated with BSTS and SSTS Demonstration/Validation activities at Cape Canaveral Air Force Station/Eastern Test Range are anticipated to be mitigable using the planned control measures (52).

Eglin Air Force Base

The Analysis and Strategic Defense Division of the Air Force Armaments Laboratory at Eglin Air Force Base would conduct analyses and simulations to assess the SBI homing subsystem performance requirements. The Division is currently conducting similar testing for another Air Force weapons project.

New equipment, including flight tables and scene generators, would be required at Eglin Air Force Base to accommodate the SBI analyses and simulations (72). The additional equipment would be housed in an already converted bay of an existing building (72). Staffing levels are not expected to increase for SBI test activities (72), and as a consequence no socioeconomic impacts are anticipated.

Since no additional staff would be required, existing infrastructure is deemed sufficient to support SBI test activities at Eglin Air Force Base. Testing would not increase electrical demand, and there would be no increase in waste generation rates (72).

Eglin Air Force Base is in compliance with regulatory standards for air quality, water quality, and hazardous waste. The facility currently has numerous operating wastewater treatment plants, two of which discharge to groundwater. Sampling has indicated potential exceedances of established standards (47). However, staff additions would not be required for SBI Demonstration/

Validation activities and those activities would not generate additional wastewater. Therefore, the potential for environmental consequences associated with SBI Demonstration/Validation activities at Eglin Air Force Base are anticipated to be insignificant.

Kennedy Space Center

A Space Shuttle vehicle from Kennedy Space Center may be used for the one launch of the SSTS during Demonstration/Validation. If this occurs, it would involve use of support facilities at Cape Canaveral Air Force Station, the tracking facilities of the Eastern Test Range, and numerous other communication and tracking facilities around the world. These activities are consistent with normal ongoing activities at Kennedy Space Center and the Eastern Test Range. Environmental documentation has been prepared prior to each Space Shuttle launch (57). If the Shuttle is used to support SSTS, it is anticipated that similar documentation would be prepared prior to launches. Copies of this documentation can be obtained from the Public Affairs Office at Kennedy Space Center.

The existing facilities would be adequate for launching the Space Shuttle. It is expected that staff available for Space Shuttle launches would be adequate to support SSTS activities at Kennedy Space Center. The supporting infrastructure is also adequate for Space Shuttle launches. Kennedy Space Center is in compliance with applicable environmental standards (62, 64). Therefore, impacts of Demonstration/Validation activities at Kennedy Space Center are anticipated to be insignificant.

3.1.5 Hawaii

U.S. Naval Pacific Missile Range Facility at Barking Sands

ERIS flight tests may require targets launched from the U.S. Naval Pacific Missile Range Facility at Barking Sands, Kauai, Hawaii. Additional facilities would need to be constructed to launch these targets. These new facilities are a missile launch pad, a vertical access tower, an auxiliary equipment building, access roadways, and supporting utility systems.

The result of applying the four assessment criteria against the test activities and the facility construction they would require shows the potential for environmental effects related to the construction (103). Thus, a more detailed assessment addressing each of the environmental considerations was completed. The second criterion of adequate staffing is not met for construction or operation. Construction of new facilities would require additional staff probably obtained from the local area. Launching of missiles from the new facility would require approximately 40 to 60 additional staff from the mainland (103). The third and fourth assessment criteria regarding compliance with environmental standards and adequacy of community resources are met.

A "Preliminary Environmental Assessment, Kauai Test Facility, Barking Sands, Kauai, Hawaii" (103) was prepared for the construction and operation of the intermediate-range booster system facilities. Copies of this documentation are available from the Public Affairs Office at the U.S. Naval Pacific Missile Range Facility at Barking Sands.

The results of the environmental assessment conducted for the Kauai Test Facility at Barking Sands are summarized below.

Air Quality

The Pacific Missile Range Facility is in an attainment area and the facility has no Prevention of Significant Deterioration permitted emissions at the present time (80, 126). The proposed ERIS activities are expected to use missiles fired with solid fuel propellants which burn without noxious fumes and would not be expected to cause air quality problems (103). Hydrazine-nitrazine propellants may be used; their use would be subject to review relative to Army Safe Operating Procedures (103). Air quality impacts due to construction activities are readily mitigable with standard control measures.

Water Quality

The Pacific Missile Range Facility currently has no National Pollution Discharge Elimination System permitted effluents (80) and proposed operational activities are not expected to result in new effluents. Construction impacts on surface water are readily mitigable with standard control measures. Groundwater would be affected by increased infiltration due to clearing the land, but this effect is expected to be insignificant.

Biological Resources

Five threatened and endangered species may exist on the site in irrigation ditches and wetlands (103, 125). These habitats are at least 1/2 mile from new facilities and impacts on them are not likely. Potential construction impacts will be minimized by standard mitigation measures.

Infrastructure

- Peak daily electric demand is about 64 percent of capacity available from the Kauai Electric Company (80, 125). Anticipated usage of the modified facilities is not expected to exceed the available capacity.

- Solid waste is collected and disposed offbase by a contractor in a county facility (80, 125, 126). Proposed activities are not expected to exceed the contractor's capability and the county facility's capacity.

- Sewage disposal demand is about half of the capacity of the existing system (80). This system is expected to be adequate for the proposed action.

- Water demand is supplied from three sources and is less than the present capacity (80, 125); proposed activities are not expected to require more than the existing capacity.

- o Transportation to and from the base is via Highway 50, which is adequate for current needs; there is no traffic congestion. The onbase road network is being upgraded (80, 126). Proposed activities would not impact either access to the base or onbase transportation.

Hazardous Waste

The Pacific Missile Range Facility hazardous waste treatment and storage facilities are permitted under the interim status requirements of the Resource Conservation Recovery Act (80). There is no onbase hazardous waste disposal (80). Proposed activities may generate some additional hazardous waste but the quantity is expected to be insignificant.

Land Use

The Quantity Distance Arc for safe operation of the intermediate-range booster extends beyond the present boundary of the base (80). Negotiations are in progress with the State to ensure that the land use within this radial distance remains agricultural so that there would be no land use conflicts (81). A beach area is available for public use except during launches, when access to and use of the beach is prohibited (81, 103). Impacts on land use are anticipated to be mitigable.

Visual Resources

The launch pad is to be constructed in a grassland area near other existing launch facilities (103). The addition of the proposed facilities are not anticipated to create a significant visual impact.

Cultural Resources

There are no known historic or archaeological resources at or near the proposed facilities; some cultural resources have been identified on the base (103, 125). No impacts on these resources are anticipated.

Noise

Noise levels from past missile firing activities have not resulted in significant effects (80, 103, 126). The noise associated with the intermediate-range booster launches is predicted to be similar to that from previous launch activities.

Socioeconomics

Based upon available data on the population, civilian labor force, unemployment, housing, and income for the supporting region, as well as the emphasis of the Kauai economy upon tourism (with its frequent short-term influxes of people), use of the Pacific Missile Range Facility for ERIS Demonstration/Validation operations is unlikely to have a significant socioeconomic impact. This conclusion assumes a total of three ERIS launches (73) and follows the existing documentation (103) in assuming that each missile firing requires 40 to 60 people to be brought from the mainland for a period of several weeks,

with each spending an average of $150 per day while on Kauai (103). As suggested in the aforementioned environmental assessment (103), the socioeconomic consequences of such activities in a small island setting would be noticeable, but not necessarily significant.

As a result of the analysis of each environmental consideration, no potentially significant impacts have been identified. Therefore, the environmental effects of ERIS activities at the U.S. Naval Pacific Missile Range Facility at Barkings Sands are anticipated to be either insignificant or mitigable.

3.1.6 Maryland

Harry Diamond Laboratories

Demonstration/Validation test activities for ERIS and BM/C^3 at Harry Diamond Laboratories, Adelphi site, would involve testing hardened circuitry exposed to gamma radiation. The radiation chamber is used regularly on a year-round schedule. Tests are conducted three times per day, using the regular staff (2).

Due to priority status of the Strategic Defense Initiative program, previously scheduled tests would be rescheduled to accommodate testing of ERIS and BM/C^3 (1). Therefore, testing of ERIS and BM/C^3 components would not represent an increase in the number of tests run per year. Testing for the Strategic Defense Initiative Demonstration/Validation program would require minor staff level adjustments (1). However, the increase in staff is insignificant in the context of the 1,800 staff at the Adelphi site.

The result of applying the four assessment criteria against the test activities and their associated facilities shows no potential for environmental effects related to testing of ERIS and BM/C^3. This conclusion is based on the presence of adequate facilities, insignificant staff increases, compliance with environmental standards, and adequate resources in the surrounding community.

3.1.7 Massachusetts

Electronic Systems Division

BM/C^3 activities at the Electronic Systems Division would include administrative activities at Hanscom Air Force Base and analyses, simulations. and component/assembly testing using computers in the MITRE Corporation building. Approximately 75 Electronic Systems Division staff and 125 MITRE Corporation staff would be dedicated to BM/C^3 activities at the MITRE Corporation building (7). The BM/C^3 activities at the MITRE Corporation building and the Electronic Systems Division at Hanscom Air Force Base would not require additional facilities or infrastructure services. Based on available data it has been determined that the Electronic Systems Division is in compliance with all existing environmental regulations. It is anticipated that the environmental impacts of BM/C^3 activities performed by the Electronic Systems Division would be insignificant.

3.1.8 Nevada

Nevada Test Site

Demonstration/Validation activities for BM/C^3, SSTS, GSTS, and ERIS at the Nevada Test Site would include the exposure of components and assemblies to a nuclear environment. The dedicated use of the Nevada Test Site includes such activities (31) and Demonstration/Validation testing would take advantage of underground nuclear tests scheduled for other programs. No facility modifications are anticipated and no additional staff or infrastructure services would be necessary as a consequence of these activities. Also, the Nevada Test Site meets applicable environmental standards (134). Therefore, the environmental consequences of the activities related to BM/C^3, SSTS, GSTS, and ERIS Demonstration/Validation at the Nevada Test Site are expected to be insignificant.

3.1.9 New York

Rome Air Development Center

Rome Air Development Center would conduct BM/C^3 test activities that involve analyses, simulations, and component/assembly testing related to command, control, and communications architectures and integration. The facilities to be used already exist, but a 20 x 50-foot annex would be added to contain a small cryogenic chamber (69). The equipment that would be required to conduct the tests has yet to be chosen but a residual gas analysis machine, a phase-shifting interferometer, and a holographic camera have been purchased (69). About five staff would be required, an increase of 0.1 percent over the 7,700 military and civilian staff on base (69).

BM/C^3 testing would be scheduled for one test per month over the next 2 years; each test would take about 3 weeks for preparation and between 2 and 5 days to run (69).

The Rome Air Development Center is in compliance with all of their permit requirements. The resources of the surrounding community are adequate to accommodate the proposed testing. Staff additions and new construction would be minor. Thus, the impacts from Demonstration/Validation activities are anticipated to be insignificant.

3.1.10 Republic of the Marshall Islands

U.S. Army Kwajalein Atoll

Flight testing of SBI, ERIS, and GSTS would be performed at U.S. Army Kwajalein Atoll. This use of U.S. Army Kwajalein Atoll facilities is consistent with the current missions and operations of those facilities. However, upgrading existing facilities and constructing new facilities would be necessary at Meck, Roi-Namur, and Kwajalein Islands.

On Meck Island, a general refurbishment of infrastructure would be completed (5). An existing missile assembly building, silo, and launch equipment rooms would also be upgraded to accommodate the ERIS flight test. A new missile

assembly building, launch pad, and launch equipment rooms are planned for another program (5). It is anticipated that SBI would use these new facilities (86). Communication cables would be installed across the lagoon separating Meck and Roi-Namur Islands to allow synchronization of SBI launches (86). GSTS launch requirements have not been determined; the launch facilities would be selected after the GSTS Demonstration/Validation program has been further defined.

The potential environmental consequences of refurbishment and construction of launch facilities on Meck Island have been addressed in separate environmental analyses. The U.S. Army Corps of Engineers, Pacific Ocean Division, has prepared a record of environmental consideration for the upgrade of the existing missile assembly building, silo, launch equipment room, and infrastructure (5). A second record of environmental consideration was prepared for construction of a new missile assembly building, a launch pad, and launch equipment rooms on Meck Island (5). The result of both of the records of environmental consideration was Categorical Exclusion #7, as defined in Appendix A to Army Regulation 200-2 (5). This exclusion applies to "construction that does not significantly alter land use, provided the operation of the project when completed would not of itself have a significant environmental impact." Projects that fall into this category do not require additional environmental documentation. Copies of the record of environmental consideration are available from the Public Affairs Office, U.S. Army Strategic Defense Command, Huntsville, Alabama.

Existing facilities on Roi-Namur Island would be utilized for SBI target launches. The launch complex and missile assembly building currently at the proposed site would be suitable for supporting such a mission. It is anticipated that no significant modifications of the Roi-Namur launching facilities would be necessary to support SBI test activities. Construction of additional housing, a sewage treatment plant, and a water storage facility are planned by the U.S. Army to support continuing operations on the island (132). This construction is needed to upgrade existing deficiencies, and will occur regardless of the Strategic Defense Initiative Demonstration/Validation decision. Environmental consequences of these proposed construction activities on Roi-Namur Island have not been evaluated in previous documents.

Additional support personnel would be housed primarily at Kwajalein Island, which in turn will require support services and new housing. Current estimates call for an increase in staff and dependents associated with ERIS, GSTS, and SBI Demonstration/Validation of as many as 305 persons (12.5 percent) above the most recent available population figures for U.S. Army Kwajalein Atoll (2,432 persons on 30 June 1986) (46, 124). The total population would be below the highest population figure of nearly 6,000 people in 1972 (99). The relative demographic contributions of each of the three technologies vary for different years. Facility population is expected to increase by as many as 153 persons (6.3 percent) in a single year as a result of ERIS operations. SBI operations, on the other hand, are anticipated to generate an increase of up to 125 persons (5.1 percent) in a single year. Finally, facility population is expected to increase by as many as 87 persons (3.7 percent) in 1 year due to GSTS testing.

Housing requirements associated with ERIS and SBI flight testing include 42 permanent family houses, 211 bachelor quarters, and 40 transient quarters on

Kwajalein Island; and 34 permanent bachelor quarters on Roi-Namur Island (39). Housing requirements for GSTS have not been determined at this time. The environmental consequences of housing construction on the island of Kwajalein to support the ERIS and SBI programs have been analyzed in "Environmental Assessment for Family Housing Dwellings, FY 1987-1989 Phases" prepared by the U.S. Army Strategic Defense Command in 1986 (39). That study, which included evaluations of housing needs to support all Strategic Defense Initiative programs planned or proposed for U.S. Army Kwajalein Atoll, concluded that the proposed construction does not constitute a major Federal action having a significant effect on the quality of the human environment. Copies of the aforementioned Environmental Assessment for Family Housing may be obtained from the Public Affairs Office at the U.S. Army Strategic Defense Command in Huntsville, Alabama.

In addition to new housing, the following new construction on Kwajalein Island is planned: expansion of an existing power plant and a new desalinization facility. An environmental assessment was prepared on the construction and operation of the proposed power plant expansion "Environmental Assessment for Upgrade of Power Plant No. 1, Kwajalein Island, Marshall Islands, May, 1986" (35). That environmental assessment concluded that the proposed action will not constitute a major Federal action with potential for significant impact on the environment. Copies of this documentation are available from the Public Affairs Office listed above.

Approximately 4 miles north of Kwajalein Island lies Ebeye Island, the main concentration of Marshallese in Kwajalein Atoll, and for assessment purposes it is defined as the "surrounding community" for the military facility. Ebeye Island has the second-highest population of any island in the Republic of the Marshall Islands, approximately 8,000 people (a density of 66,316 people per square mile), many having migrated there from other islands in search of jobs at the U.S. Army Kwajalein Atoll installation. As a means of reducing population density, a causeway connecting Ebeye Island with adjacent habitable islands is planned (71). Until this anticipated redistribution of population occurs, the dense population of Ebeye Island will continue to place heavy demands upon both manmade and natural resources of the island.

The application of the assessment criteria indicates a potential for environmental impacts related to SBI, ERIS, and GSTS activities at U.S. Army Kwajalein Atoll. There are proposed facility modifications, additional staff requirements, and a lack of resources in the surrounding community. Thus, a more detailed assessment addressing each of the environmental considerations was completed. The results of the assessment of each of the environmental considerations are presented below.

Air Quality

Currently the U.S. Army Kwajalein Atoll has good ambient air quality attributable to strong tradewinds (119). However, 1979 estimates of emissions, especially from the power plant on Kwajalein Island, showed emissions approaching the limits of Federal standards for nitrogen oxide (NOx) (49). Increased staff would require increases in power generating capacity. The expanded power plant would have to meet major stationary source performance standards or obtain a waiver from the Marshall Islands government (49). The environmental assessment prepared for the power plant expansion concluded that

mitigation measures would be required (35). Possible mitigation measures include raising the stack height, increasing the velocity of the emissions to increase dispersion, using low-NOx engine design, combustion air cooling, fuel injection recharge, or engines designed to meet the Environmental Protection Agency's proposed New Source Performance Requirements. The proposed power plant expansion "can meet all National Ambient Air Quality Standards as well as nitrogen oxide if low NOx combustion and/or enhanced dispersion techniques are employed to reduce ambient impact by 28 percent" (12). Thus, this air quality concern is considered mitigable.

Water Quality

Available data from 1976 indicated that water quality was being degraded as a result of toxic metals leaching from a solid waste disposal site on Kwajalein Island used by U.S. Army Kwajalein Atoll operations (119). Subsequently a wall was constructed. The 1980 "Environmental Impact Assessment of U.S. Army Kwajalein Atoll Operations" noted that although the wall was installed on the ocean side of the Kwajalein Island landfill, a visual inspection in 1978 indicated direct leachate seepage to the ocean was occurring (119). The source of the leachate was considered to be waste oil or sewage tank pumpage that was dumped on the landfill. The landfill is presently used for disposal of construction waste, and Demonstration/Validation activities associated with SBI, ERIS, and GSTS are expected to continue this use. The composition of the leachate and the potential change in the rate of seepage as a result of the disposal of construction wastes are unknown.

Currently, sewage collected from facilities on the west side of Roi-Namur Island is pumped untreated through a pipe into Kwajalein Atoll Lagoon (132). The discharge of raw sewage into the lagoon has the potential to significantly impact water quality and is in violation of Clean Water Act standards (119). Unless mitigated by avoidance actions by the U.S. Army Kwajalein Atoll commander and the range users the increase in activities on Roi-Namur Island because of Strategic Defense Initiative activities would contribute additional untreated sewage to the lagoon. A wastewater treatment facility to provide secondary treatment before discharge is planned (132). Until this treatment facility is operational, impacts to water quality in the lagoon will continue and would be increased by any unmitigated Strategic Defense Initiative activities that begin prior to the operation of the treatment plant. In addition, consequences on water quality from increased population on Ebeye Island have not been evaluated in previous documents.

Without mitigating actions impacts to water quality caused by SBI, ERIS, and GSTS activities are potentially significant. Continued presence of leachate seepage from the Kwajalein Island landfill and potential mitigations, if any, are not documented. Water quality impacts from sewage discharges from Roi-Namur Island are mitigable if the planned sewage treatment plant is constructed or if the U.S. Army Kwajalein Atoll Commander initiates operational mitigation. These and other potential impacts will be addressed in an environmental impact statement to be prepared by the U.S. Army for continuing operations at Kwajalein Atoll prior to initiation of SBI, ERIS, or GSTS Demonstration/Validation flight test activities.

Biological Resources

Concrete used in housing and other facility construction may employ coral dredged from surrounding reefs. The construction needed to support activities associated with SBI, ERIS, and GSTS testing may cumulatively constitute a significant increase in the harvesting of coral if, as in the past, coral is used as a construction material. Extensive reef harvesting could result in degradation of the marine habitat (119). Coral harvesting can be accomplished in a manner that will ensure that critical habitats of marine biota are not degraded. Additional data collection and analysis will be required to identify positive and negative impacts of this activity at U.S. Army Kwajalein Atoll through the environmental impact statement investigations.

Several islands of the U.S. Army Kwajalein Atoll, including Roi-Namur Island, have beaches suitable for nesting sites of the endangered Hawksbill Turtle and the threatened Green Sea Turtle. No beaches suitable for turtle nesting have been identified on Kwajalein or Meck Islands (119). Construction and operation activities that take place on Roi-Namur Island should consider possible impacts to these potential nesting beaches. Degradation of marine water quality as discussed in the previous section could adversely impact marine biota. Consequences on biological resources from potential increased population on Ebeye Island have not been addressed in previous documents. Those potential impacts on biological resources will be addressed in the aforementioned environmental impact statement.

Infrastructure

The increased staffing and project activities associated with SBI, ERIS, and GSTS Demonstration/Validation are expected to increase the demands on infrastructure on Kwajalein and Roi-Namur Islands. Specific areas of consideration include electricity, solid waste, sewage treatment, water supply, and transportation. The aforementioned environmental impact statement will address appropriate mitigations for impacts from increased infrastructure requirements.

- Electricity demands associated with the population increase on Kwajalein Island resulting from SBI, ERIS, and GSTS would require increased generating capacity. A concern is the control of nitrogen oxide emissions from the power plant, which is mitigable as discussed earlier. The planned expansion of the power plant (132) should meet any increased electricity demands.

- Solid waste is currently disposed of by (1) burning combustible material, (2) dumping wet (biodegradable) waste and metal waste in the ocean, and (3) landfilling (119). Additional staff required for SBI, ERIS, and GSTS activities would increase the volume of solid waste, but this waste would be disposed of in onbase facilities with adequate capacity.

- Sewage treatment demands at the U.S. Army Kwajalein Atoll are expected to increase significantly as a result of the increase in inhabitants that would accompany SBI, ERIS, and GSTS testing. Such an increase in sewage treatment demands at Kwajalein Island is not anticipated to exceed the plant's existing capacity. However,

untreated sewage on the west side of Roi-Namur Island is currently pumped directly into the lagoon (132). Additional staff associated with SBI would increase the volume of untreated sewage. A new sewage treatment facility is planned at Roi-Namur Island (132) which would be designed to provide secondary treatment and have adequate capacity to meet all anticipated needs. The aforementioned Environmental Impact Statement will identify interim mitigation options until a planned treatment facility is constructed.

- Potable water is a limited resource on the islands of the Kwajalein Atoll (124). Water supplies on Kwajalein Island come from rainwater catchment and storage systems and groundwater lenses, although much of the groundwater is brackish. It is possible that increased demand resulting from Strategic Defense Initiative activities could increase withdrawal of groundwater. Overdraft of groundwater could potentially result in saltwater intrusion and long-term degradation of the available groundwater resources. Kwajalein is unique in that the command has total control over all lens wells and monitors the groundwater level. This complete control with feedback minimizes the possibility of overdrawing the groundwater. Before groundwater depletion were allowed to occur water rationing would be implemented or alternate sources of water would be utilized, such as importation. The increased demands for potable water that would result from SBI, ERIS, and GSTS activities would be accommodated through the planned construction of a desalinization system on Kwajalein Island, and construction of a holding tank on Roi-Namur Island. These planned mitigation measures are projected to be adequate to ensure sufficient potable water without degrading groundwater resources.

- Transportation on Kwajalein Island is predominantly by means other than automobiles. In 1986 there were only 300 cars for 13 miles of paved road (121). Transportation of employees to Kwajalein and Meck Islands from Ebeye Island is by ferry (50). Increases in the number of employees may necessitate increases in ferry capacity.

Hazardous Waste

The U.S. Army Kwajalein Atoll is preparing a Hazardous Waste Management Plan to comply with Army Regulation 420-47 (49). An increase in U.S. Army Kwajalein Atoll operations for SBI, ERIS, and GSTS programs may increase the volume of hazardous waste produced. The treatment, storage, and disposal of additional hazardous waste must be in compliance with the Hazardous Waste Management Plan.

Land Use

The islands that make up the U.S. Army Kwajalein Atoll are dedicated for use as a military installation. The use of this facility for launching missiles and monitoring flight tests is a continuation of an established land use. The long-term impacts on land use from continuing operations at U.S. Army Kwajalein Atoll will be addressed in the aforementioned environmental impact statement.

Visual Resources

The presence of the U.S. Army Kwajalein Atoll has significantly altered the visual resources of the islands by extensive development. The current visual resources would continue to be altered by the facility upgrades for SBI, ERIS, and GSTS activities. Those alterations are anticipated to have insignificant impacts.

Cultural Resources

Both Kwajalein Island and Roi-Namur Island are considered historically significant sites due to the activities which took place on the atoll during World War II. In addition, potential prehistoric sites have been discovered very recently on Kwajalein Island, some possibly as old as 2,000 years (49). As any excavation during construction activities has the potential for permanently destroying such cultural resources, those activities could have a potential impact. An archaeological survey would be conducted and appropriate mitigations developed during the preparation of the aforementioned environmental impact statement.

Noise

No data are available on noise levels associated with U.S. Army Kwajalein Atoll operations. Based on the distance between launching facilities on Meck Island and the nearest community (more than 10 miles), no significant noise impacts are anticipated from launches at Meck Island. Similarly, the launching of STRYPI target missiles from Roi-Namur Island are not expected to have significant noise impacts.

Socioeconomics

The economy of Ebeye Island relies heavily upon the people residing at the U.S. Army Kwajalein Atoll. Because of this dependence, changes in overall facility population associated with ERIS, GSTS, and SBI Demonstration/Validation operations could potentially have significant beneficial and adverse socioeconomic consequences--particularly in response to an anticipated increase in facility population of approximately 11 percent over the course of 1 year, and an anticipated decrease in facility population of approximately 9 percent over the course of another year (46). The socioeconomic concerns associated with the aforementioned increase in U.S. Army Kwajalein Atoll population are:

- The direct positive impact on the economy of Ebeye in terms of increased employment. Although some growth in employment in response to the increased population at the U.S. Army Kwajalein Atoll would be expected, the amount remains to be determined. The increase in employment would be complemented by the Job Corps Program recently implemented by the U.S. Army Kwajalein Atoll (132).

- The long-term social and economic effects of prolonged reliance of the Marshallese on Department of Defense activities and expenditures.

- The possible attraction of more Marshallese from other islands to already densely-populated Ebeye Island and islets immediately to the north, in response to the increase in relatively high paying jobs (guaranteed U.S. minimum wage). The potential negative impacts of such additional immigration would include:

  -- a further increase in the high Marshallese unemployment

  -- further pressure on housing and other infrastructure on Ebeye Island

  -- public health falling below already unsatisfactory levels

  -- disruption of the economic mechanisms, authority structure, and kin relationships which underlie the Marshallese sociocultural system.

The U.S. Army Kwajalein Atoll currently has a policy limiting the number of Marshallese they employ, which may minimize the amount of influx of people to Ebeye Island.

As a result of the analysis of each environmental consideration, potentially significant impacts were identified at the U.S. Army Kwajalein Atoll. In recognition of the need to avoid, minimize, and mitigate any potential adverse impacts on the environment of the Kwajalein Atoll the U.S. Army will prepare a comprehensive environmental impact statement addressing the continuing operations at the U.S. Army Kwajalein Atoll, which include the proposed Demonstration/Validation activities (133). The environmental impact statement will address the environmental concerns recognized in this Environmental Assessment and will identify appropriate mitigations.

3.1.11 Tennessee

Arnold Engineering Development Center

Environmental simulation testing would be conducted at Arnold Engineering Development Center for ERIS and SSTS. The ERIS tests would use several wind tunnels to test the guidance and control system. Wind tunnels are used regularly and this type of testing is considered routine. The specific wind tunnels used to test the ERIS have not been identified, but it is anticipated that the tunnels chosen would be adequate for the proposed testing and would not require significant modification. At present, most of the 3,700 contractor staff are dedicated to wind tunnel testing or maintenance of the tunnels (28). No additional staff or infrastructure modifications would be necessary. Therefore, the environmental consequences of ERIS testing at Arnold Engineering Development Center are anticipated to be insignificant.

Demonstration/Validation test activities for SSTS at the Arnold Engineering Development Center would involve simulation of space environments for satellite components and assemblies. This is a normal mission for the facility; however, because a space simulation chamber of the necessary size does not currently exist at Arnold Engineering Development Center, one would have to be constructed to accommodate SSTS testing. Additional facility staff would be required, particularly if a new chamber is built (27).

Applying the four assessment criteria against the test activities and the required facility modifications indicates a potential for environmental effects related to construction of a new space chamber and a potential increase in facility staffing. Thus, a more detailed assessment addressing each of the environmental considerations was completed and is presented below.

Air Quality

Currently, Arnold Engineering Development Center is located in an attainment area; there are 27 Prevention of Significant Deterioration permits with no violations (13, 41). Based on past regulatory compliance, no significant air quality impacts are expected from the operation of the space chamber. Potential construction impacts are mitigable by standard control measures.

Water Quality

There are eight National Pollutant Discharge Elimination System permits for Arnold Engineering Development Center; one permit violation has been identified (13, 24). This occurred at the main sewer and was caused by excessive infiltration that was not associated with space chamber operations. Based on past regulatory compliance, no significant water quality impacts are expected from the operation of the space chamber. Potential impacts of construction and operation of the new space chamber will be addressed in an environmental assessment to be prepared by Arnold Engineering Development Center when engineering design is 35 to 60 percent complete (25). At present, potential construction impacts appear mitigable by standard control measures.

Biological Resources

Three endangered species have been identified on the Arnold Engineering Development Center (26). The effect of space chamber operations on endangered species is anticipated to be insignificant. However, any activities that could potentially impact those species would require review and approval by the U.S. Fish and Wildlife Service as required by the Endangered Species Act of 1973, and would have to be addressed in the forthcoming environmental assessment.

Infrastructure

Evaluation of the effects on each of the infrastructure components follows:

- Electricity is currently supplied commercially; demand is less than 50 percent of the supply (60). As a result, the addition of one space chamber is not anticipated to increase demand beyond capacity.

- Solid waste is disposed onbase at one landfill contracted to the City of Tullahoma; it is estimated to be filled to capacity by December 1987 (60). The space chamber would not generate significant amounts of solid waste. Disposal of construction debris is expected to be addressed in the forthcoming environmental assessment; the impact is not expected to be significant.

- Sewage treatment is currently below capacity (9). Although staffing requirements for the space chamber are indeterminate at present (27), additional staff are not expected to cause exceedance of capacity.

- Water demand is currently below capacity (9). Consequently, the operation of one additional space chamber is not expected to exceed capacity.

- Transportation routes at the Arnold Engineering Development Center are below network capacity (41, 91). Although space chamber staffing is indeterminate at present (27), no significant impact is expected because of the rural setting and adequate road network.

Hazardous Waste

A storage facility at Arnold Engineering Development Center is currently awaiting Resource Conservation Recovery Act Part B public notification (13, 44). Based on the regulatory compliance history of the facility, continued compliance is anticipated for activities associated with the new space chamber.

Land Use

The new space chamber would be constructed adjacent to existing industrial development and would not conflict with existing land use. Land use is anticipated to be in compliance with the revised base master plan (13).

Visual Resources

Impacts to the visual resources of the area would be insignificant because the space chamber would be constructed within an industrial complex which is screened by forest (109).

Cultural Resources

There are no known or designated historical or archaeological sites at the Arnold Engineering Development Center (41).

Noise

Because noise generated within certain test areas of the Arnold Engineering Development Center is above prescribed safety levels, Office of Safety and Health Administration requirements apply. Construction and operation of a new space chamber is expected to increase the noise levels generated. However, noise outside the test areas is mitigated by (1) the facility's location in a large reservation 5 miles from the nearest community and surrounded by 6,000 acres of dense pine trees, (2) adequate mufflers for facility exhausts, and (3) selective scheduling of testing operations (27, 41).

Socioeconomics

Based upon available socioeconomic data for the supporting region of the Arnold Engineering Development Center, use of this facility for Demonstration/

Validation operations is unlikely to have a significant socioeconomic impact. Although population for the supporting region is below 100,000, it has experienced sustained, moderate growth over the past two decades. The civilian labor force has high unemployment and can absorb increased economic activity. Area housing has a vacancy rate capable of accommodating a moderate influx of population.

Environmental consequences associated with facility construction and operation are anticipated to be insignificant or mitigable, and will be further addressed in the environmental assessment prepared by Arnold Engineering Development Center.

3.1.12 Virginia

Harry Diamond Laboratories

Environmental impacts at Harry Diamond Laboratories, Woodbridge Research Facility, beyond those that result from normal operations would not be expected from BM/C^3 and ERIS testing. The electromagnetic pulse test facility is utilized on a regular basis, and involves all the permanent staff (77).

Due to the priority status of the Strategic Defense Initiative program, previously scheduled tests would be rescheduled to accommodate testing of the BM/C^3 and ERIS. Therefore, testing of BM/C^3 and ERIS components would not represent an increase in the number of tests run per year at the Woodbridge Research Facility, no staff increases would be anticipated, and adequate resources are available in the surrounding community.

The Woodbridge Research Facility is in compliance with environmental standards (36). Electromagnetic pulse test facilities are the subject of a civil action for failure to provide adequate and required National Environmental Policy Act environmental documentation on their electromagnetic pulse program (36). The staff at Harry Diamond Laboratories are currently in the process of preparing the required site-specific environmental documentation (36). Although testing associated with the BM/C^3 and ERIS programs would not significantly increase the regularly scheduled electromagnetic pulse testing at the Woodbridge Research Facility, mitigations, if any, cited in the environmental documentation in preparation must be adhered to in all electromagnetic pulse testing.

3.2 ENVIRONMENTAL CONSEQUENCES OF NO ACTION

If the no-action alternative is selected, no significant environmental consequences are anticipated. Concept Exploration would continue at currently staffed facilities with no changes in operations.

3.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Development of the six technologies through the Demonstration/Validation phase would result in irreversible and irretrievable commitment of resources such as electronic components, various metallic and nonmetallic structural materials, fuel, and labor. This commitment of resources is not different from those necessary for many other aerospace research and development programs, and is similar to the activities that have been carried out in previous aerospace programs over the past several years.

TABLE 3-1.
CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Test Location	Test Facility	Technology	RESOURCE									
			Air	Water	Biological Resources	Infra-Structure	Hazardous Waste	Land Use	Visual Resources	Cultural Resources	Noise	Socio-economics
Alabama	Advanced Research Center	Cumulative	N	N	N	N	N	N	N	N	N	N
California	AF Astronautics Laboratory, Edwards AFB	Cumulative	N	N	N	N	N	N	N	N	N	N
California	Vandenberg AFB/ Western Test Range	Cumulative	M	M	M	M	N	N	N	M	N	M
Colorado	National Test Facility, Falcon AFS	Cumulative	M	N	N	M	N	N	N	N	N	M
Florida	Cape Canaveral AFS/ Eastern Test Range	Cumulative	M	M	M	N	N	N	N	N	N	N
Florida	Eglin AFB	Cumulative	N	N	N	N	N	N	N	N	N	N

Key:
N = No significant consequences
M = Mitigable consequences
PS = Potentially significant consequences

TABLE 3-1 (Continued).
CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Test Location	Test Facility	Technology	RESOURCE: Air	Water	Biological Resources	Infra-Structure	Hazardous Waste	Land Use	Visual Resources	Cultural Resources	Noise	Socio-economics
Florida	Kennedy Space Center	Cumulative	N	N	N	N	N	N	N	N	N	N
Hawaii	U.S. Naval Pacific Missile Range Facility, Barking Sands, Kauai	Cumulative	M	N	M	N	N	M	N	N	N	N
Maryland	Harry Diamond Laboratories, Adelphi	Cumulative	N	N	N	N	N	N	N	N	N	N
Massachusetts	Electronic Systems Division, Hanscom AFB	Cumulative	N	N	N	N	N	N	N	N	N	N
Nevada	Nevada Test Site	Cumulative	N	N	N	N	N	N	N	N	N	N
New York	Rome Air Development Center, Griffiss AFB	Cumulative	M	M	N	N	N	N	N	N	N	N

Key: N = No significant consequences
M = Mitigable consequences
PS = Potentially significant consequences

TABLE 3-1 (Continued).
CUMULATIVE ENVIRONMENTAL CONSEQUENCES

Test Location	Test Facility	Technology	RESOURCE									
			Air	Water	Biological Resources	Infra-Structure	Hazardous Waste	Land Use	Visual Resources	Cultural Resources	Noise	Socio-economics
Republic of the Marshall Islands	Kwajalein Missile Range	Cumulative	M	PS	PS	M	N	N	N	M	N	PS
Tennessee	Arnold Engineering Development Center, Arnold AFS	Cumulative	M	M	N	N	N	N	N	N	M	M
Virginia	Harry Diamond Laboratories, Woodbridge	Cumulative	N	N	N	N	N	N	N	N	N	N

Key:
N = No significant consequences
M = Mitigable consequences
PS = Potentially significant consequences

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4. LIST OF PREPARERS

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Bateman, Richard L.	PhD	Water Resources	Facility Description
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Brukner, Doris	BS	Earth Resources	Facility Description
Carnes, George	MSEE	Electrial Engineering	Project Description
Chapline, Robert L., Jr.	AA	Business Management	Facility Description
Cogswell, John C.	MS/MBA	Systems Engineering	Project Description
Davis, Rodney J.	PhD	Environmental Science	Environmental Analysis
Eckstein, David	BA	Environmental Hydrology	Facility Description
Enfield, Susan E.	BA	Technical Editing	Editing
Englehart, Richard W.	PhD	Nuclear Engineering	Project Description
Faust, John	BA	Physics	Project Description
Gale, Nathan	PhD	Socioeconomics	Facility Description Environmental Analysis
Golden, Bruce L.	MA	Earth Resources	Technical Director
Gorenflo, Larry	PhD	Socioeconomics, Cultural Resources	Facility Description Environmental Analysis

Name	Degree	Expertise	Responsibility
Hallahan, Ed	MS	Operations Research	Project Description
Hastings, Tom	MS	Resource Management	Environmental Coordination, Environmental Analysis
Hazelwood, Doug	BS	Environmental Engineering	Facility Description, Environmental Analysis
Hemming, William	MSEE	Systems Engineering	Project Description
Higman, Sally L.	MPI/MA	Land Use, Socioeconomics	Environmental Analysis
Hokanson, Sarah A.	MS	Earth Resources	Facility Description
Jennings, Anne B.	BS	Earth Resources	Facility Description
Jordan, Julie M.	MPA	Transportation	Environmental Analysis
Joy, Edd V.	BA	Land Use	Project Description Environmental Analysis
Koerner, John	MA	Geography, Visual Resources	Environmental Analysis Reviewer
Lam, Robert	BA	Industrial Arts, Drafting	Graphics
Messenger, Salinda	MS	Ecology	Facility Description
Miller, Jim	MS	Earth Resources	Reviewer
Milliken, Larry	BS	Earth Resources	Project Description
Morelan, Edward A.	MS	Earth Resources	Facility Description

Name	Degree	Expertise	Responsibility
Morrison, Al	MSEE, MPA	Electrical Engineering, Public Administration	Project Description
Navecky, Dave	MS	Water Resource Management	Facility Description
Niehaus, Robert D.	PhD	Socioeconomics	Facility Description, Environmental Analysis
Rothenberg, Martha	BA	Technical Editing	Editing
Schinner, James R.	PhD	Terrestrial Ecology	Environmental Analysis
Schweitzer, Eric	MURP	Urban Planning, Utilities	Environmental Analysis, Environmental Coordination
Septoff, Michael	MS	Air quality, Meteorology, Noise	Environmental Analysis

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5. PERSONS/AGENCIES CONTACTED

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Consolidated Space Operations Center
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Los Angeles AFS, CA 90009-2960

Space and Missile Test Organization
HQ SAMTO/XP
Vandenberg AFB, CA 92437-5000

Western Space and Missile Center
6595 MTG/XR
Vandenberg AFB, CA 92437-5000

Rome Air Development Center
RADC/DE
Griffiss AFB, NY 13441-5000

Environmental Coordinator for Host Base
1 STRAD/ET
Vandenberg AFB, CA 92437-5000

Eastern Space and Missile Center
ESMC/XR
Patrick AFB, FL 32925-5000

Launch Support Environmental Coordinator
6555 ASTG/LF
Cape Canaveral AFS, FL 32925-5000

Interim National Test Facility Environmental Planning Office
HQ AFSPACECOM/DE
Peterson AFB, CO 80914-5000

Arnold Engineering and Development Center
Environmental Planning Office
AEDC/DE
Arnold AFS, TN 37289-5000

BSTS Program Office
HQ SD/CNB
P.O. Box 92960
Los Angeles AFS, CA 90009-2960

Air Force Satellite Control Facility Environmental Coordinator
AFSCF/DE
Onizuka AFS, CA 94088-3430

SBI Program Office
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Los Angeles AFS, CA 90009-2960

Environmental Planning Office
HQ AD/DE
Eglin AFB, FL 32542-5000

Air Force Astronautics Laboratory
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U.S. DEPARTMENT OF THE ARMY

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U.S. Army Strategic Defense Command
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Harry Diamond Laboratory
Adelphi, MD 20782

ERIS Program Office
Huntsville, AL 35801

Advanced Research Center
Huntsville, AL 35801

U.S. DEPARTMENT OF THE NAVY

U.S. Naval Pacific Missile Range
Barking Sands
Kauai, HI 96752-0128

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SELECTED ENVIRONMENTAL CHARACTERISTICS ADVANCED RESEARCH CENTER				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	45,000 square feet	135
		BASE FACILITIES	Administration building with offices; computers (13 VAX 11780s, 6 VAX 8800, 2 Aliant FX8s, 2 Convex C1) connected to a Cray computer on the first floor in the Strategic Defense Command Bldg. on Wynn Drive	29, 135
		TEST FACILITIES	Computer simulation facilities; center is a computing test bed for complex programs a focal point effort for the SDI project	130
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	None on facility	136
		VISUAL RESOURCES	Located in developed urban area with nice landscaping	135
		SPECIAL STATUS	No State or federally listed endangered species	136
		NOISE	No noise associated with computer simulation or facility	135
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Total 70	135
		PAYROLL	Funded by U.S. Army Strategic Defense Command, Huntsville, Alabama	30
		HOUSING	None on facility	135

SELECTED ENVIRONMENTAL CHARACTERISTICS ADVANCED RESEARCH CENTER (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	1,500 kW service, supplied by Huntsville Utilities	135
		SOLID WASTE	Service supplied by BFI Corporation	135
		SEWAGE TREATMENT	Service supplied by Huntsville Utilities	135
		TRANS-PORTATION	Access from U.S. 72 and Hwy. 20 (currently being connected with I-565); traffic gets heavy at rush hour times but keeps moving	135
		WATER SUPPLY	Supplied by Huntsville Utilities, considered sufficient; closed cooling system.	135
PERMIT STATUS		AIR	No permits required for current building use or future operations.	136
		WASTE WATER	No permits required for current building use or future operations.	136
		HAZARDOUS WASTE	No permits required for current building use or future operations.	136
ADDITIONAL ENVIRONMENTAL INFORMATION	No Environmental Assessment available for building.			136
COMMENTS	The Advanced Research Center recently occupied a new facility, which is leased, privately owned building. There are no current figures for electricity, sewage, solid waste, and water usage.			135

SELECTED ENVIRONMENTAL CHARACTERISTICS EDWARDS AIR FORCE BASE				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	301,000 acres	42
		BASE FACILITIES	Landing site for Air Force Flight Test Center missions on Roger Dry Lake, high altitude flight corridor which traverses Base, USAF Test Pilot School	42
		TEST FACILITIES	Rocket propulsion laboratory, avionics and weapons test facilities	42
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Mining activity in the surrounding desert region, but none on Edwards Air Force Base	110
		VISUAL RESOURCES	The base is located in a remote desert area characterized by gently undulating alluvial fans, dry lake beds, and prominent high features, such as ridges, hills, and buttes.	110
		SPECIAL STATUS	Special status plants and animals found in the vicinity of Edwards Air Force Base which are candidates for Federal protection include: Desert Cymopterus, Mojave Spine Flower, Desert Tortoise, and Mojave Ground Squirrel. Approximately 400 prehistoric archaeological sites on base.	110
		NOISE	Ground-based and airborne sources affect the ambient noise levels which are typical of the rural area of Edwards Air Force Base. Frequent flight testing adds intermittent, single event noises. Noise sources, sound propagation, and community acceptance not problems.	110, 116
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Government and contractor civilians = 8,281, military = 4,859 (1987; for Edwards Air Force Base)	42
		PAYROLL	$304 million (1987; for Edwards Air Force Base)	42
		HOUSING	Officer = 534, NCO = 3241, Transient = 218, Mobile home units = 164 (1987; for Edwards Air Force Base)	42

SELECTED ENVIRONMENTAL CHARACTERISTICS EDWARDS AIR FORCE BASE (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	1984 average daily demand = 41 kWh. Yearly consumption represents 56% of substation capacity. Supplied by Southern California Edison and the Western Area Power Administration	116
		SOLID WASTE	Onbase landfill disposal space is being rapidly exhausted. Only inhouse domestic trash is disposed onbase; contractor waste is disposed offbase; future inhouse domestic trash will be disposed offbase or in new facility onbase.	32
		SEWAGE TREATMENT	Onbase facility capacity = 1.25 million gallons/day. Rocket Propulsion Laboratory has a separate wastewater treatment and sewage system. Maximum sewage flow = 1.1 million gallons/day for the peak summer season.	116
		TRANS-PORTATION	Access to Edwards Air Force Base via SR 14, SR 58, and US 395. Mainline railroad service to north and west of base.	110
		WATER SUPPLY	Demand for potable water is 4.5 million gallons/day; supplied by nine wells with a capacity of 12.5 million gallons/day.	110, 116
PERMIT STATUS		AIR	Located within the Southeast Desert Air Basin; Kern County portion is unclassified or in attainment for all pollutants; San Bernardino County portion is in non-attainment for ozone, unclassified for total suspended particles, and in attainment for other pollutants.	110
		WASTE WATER	Wastewater is discharged into holding ponds; no existing NPDES permits.	17
		HAZARDOUS WASTE	Disposal at licensed commercial facilities in central California	110
ADDITIONAL ENVIRONMENTAL INFORMATION			Environmental Assessment for construction and operation of Beryllium Propellant Facility, 1987; Environmental Impact Statement, Small Intercontinental Ballistic Missile Program, 1986; Environmental Assessment for SDI work at the Air Force Astronautics Lab in progress	74
COMMENTS			The Air Force Astronautics Laboratory is located on Edwards Air Force Base. Data derived is for Edwards Air Force Base. SDI testing to be conducted at Air Force Astronautics Laboratory will not use any propellants or facilities that have not been used in the past.	75

SELECTED ENVIRONMENTAL CHARACTERISTICS VANDENBERG AIR FORCE BASE				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	98,400 acres	3
		BASE FACILITIES	45-bed hospital, 6 onbase electrical power plants, 6,000-acre cantonment area, 35 missile launch sites, 15,000-foot runway	3, 106
		TEST FACILITIES	Missile assembly buildings, missile launch pads, missile control building, tracking stations	106
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Proven onbase oil and gas reserves	106
		VISUAL RESOURCES	North Vandenberg is characterized by natural landforms consisting of rolling hills interrupted by canyons and valleys. The central cantonment area consists of residential, administrative, and industrial structures. The inland portion of south Vandenberg landscape varies from gently rolling hills to steep, sloping terrain. The coastal portion of north and south Vandenberg includes steep bluffs and canyons, rocky shorelines and promontories, beaches, river outlets, and sand dunes.	106
		SPECIAL STATUS	Over 600 known cultural resources exist on base, most of which are archaeological sites. Two sites listed on National Register of Historical Places. Federally listed endangered species include: California Brown Pelican, California Least Tern, Least Bell's Vireo, American Peregrine Falcon, and Unarmored Threespine Stickleback. Threatened species include the Southern Sea Otter and the Guadalupe Fur Seal. There are no federally listed endangered or threatened plants. 5,125 acres are designated by the U.S. Fish and Wildlife Service as wetlands. The Base also contains 35 miles of coastline, 166 miles of streams, 9,000 acres of dune habitat, and 4,200 acres of woodland.	106
		NOISE	North Vandenberg area affected by missile launches, maintenance activities, and traffic. Noise levels in cantonment area typical of residential area. South Vandenberg affected by launch facilities, traffic, and the Southern Pacific Railroad. Noise monitoring network onbase. Measured noise levels in vicinity of launch facilities range from L_{dn} 44 to L_{dn} 69, with maximum L_{dn} 120.	106
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Military = 3,971 Civilian = 1,487 Contractor = 7,913 (1987)	42
		PAYROLL	Military and civilian $157 million; contractors $244 million (1987)	42
		HOUSING	Officers = 511; NCO = 1,567; Transient = 400; 172 mobile trailer spaces, (1987)	42

SELECTED ENVIRONMENTAL CHARACTERISTICS
VANDENBERG AIR FORCE BASE (Continued)

				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Peak daily demand = 558,900 kWh; peak daily capacity = 580,000 kWh; supplied by PG&E power grid.	34, 83
		SOLID WASTE	Volume = 25,000 tons/year, capacity = 95,000 tons/year; disposed at five offsite facilities by private contractor. Three of five facilities expected to have adequate space to year 2000.	33, 106
		SEWAGE TREATMENT	Design capacity of offsite facility (serving the city of Lompoc, unincorporated areas surrounding Lompoc, and Vandenberg) is 5 million gallons/day. Onsite system treats waste from cantonment area with a capacity of 3 million gallons/day. Total sewage produced in 1986 by Vandenberg AFB was approximately 1 million gallons/day.	33, 106, 112
		TRANS-PORTATION	Road network on base has considerable excess capacity. Road network leading to base near or at capacity. Access to launch sites restricted several hours prior to launch.	89, 106
		WATER SUPPLY	10 potable wells on base supply all Vandenberg's water needs. 1,497 million gallons produced in 1986. Potable water wells and an additional 24 monitoring wells are regularly sampled. All have acceptable water quality, except for two wells in the Santa Ynez field which show excessive chromium and pesticide levels.	33, 106
PERMIT STATUS		AIR	Permits in place authorize onbase construction and operations from the Air Pollution Control District. North county portion of Santa Barbara County, which contains Vandenberg, is currently in attainment of air quality standards. Three PSD monitoring stations onbase.	61, 83, 96
		WASTE WATER	NPDES permits in place for 15 onbase sewage discharge locations	82
		HAZARDOUS WASTE	Approximately 500 tons generated per year; disposed at offsite facility by private contractor. Vandenberg has a short-term hazardous waste storage permit.	61
ADDITIONAL ENVIRONMENTAL INFORMATION			Recent (1987) Draft EIS on oil and gas exploration at Vandenberg. Existing EIS documents (1983, 1978) for MX missile and space shuttle launches from Vandenberg. EIS in progress for Titan IV launch facilities and operations.	106, 112, 113, 115, 117
COMMENTS			Missile launches have relatively little impact on air quality. Many base operations and programs were restricted in anticipation of Space Shuttle launches. Since the program has been suspended, the large amounts of offset allow for more potential emissions.	96

SELECTED ENVIRONMENTAL CHARACTERISTICS NATIONAL TEST FACILITY				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	640 acres	3
		BASE FACILITIES	Administrative offices, communications network	108
		TEST FACILITIES	Advanced communications network capabilities	108
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	None on facility	19
		VISUAL RESOURCES	Region consists of gently rolling plains characterized by semiarid grasslands used for agricultural grazing; Falcon Air Force Station is considered developed, as high-technology buildings and support facilities dominate the landscape.	108
		SPECIAL STATUS	None on facility	19
		NOISE	Current ambient noise level is 40 L_{dn}, which is below acceptable limits.	18
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Military = 895, Active Duty; Civilian = 2,088 (1987, at Falcon Air Force Station)	45
		PAYROLL	$0.9 Million (1987; Civilian payroll, at Falcon Air Force Station)	42, 129
		HOUSING	Officer = 106; NCO = 384; Transient = 130; (1987; at Peterson Air Force Base, no known housing at Falcon Air Force Station)	42

SELECTED ENVIRONMENTAL CHARACTERISTICS NATIONAL TEST FACILITY (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Peak daily demand = 6,100 kWh for Consolidated Space Operations Center; Capacity = 15,000 kW; can be expanded to 25,000 kW	108
		SOLID WASTE	Disposed offsite at licensed landfill by private contractor	18
		SEWAGE TREATMENT	Design capacity = 0.069 millon gallons/day; designed to support 2,300 Base personnel	108
		TRANS-PORTATION	Access to Falcon AFS provided by State Highway 94 and Enoch Road. Current traffic at Enoch Road = 1,550 vehicles/day, capacity 11,300 vehicles/day. Current traffic at SH 94 = 3,500 vehicles/day, capacity 16,000 vehicles/day.	108
		WATER SUPPLY	The Cherokee Water District contract with Falcon Air Force Station limits delivery of water to 0.479 million gallons per day. Existing peak water demands at the installation are estimated at 0.409 million gallons per day.	108
PERMIT STATUS		AIR	Attainment by Colorado standards (Falcon AFS is located outside the Colorado Springs non-attainment areas for carbon monoxide and total suspended particulates)	18
		WASTE WATER	NPDFS Permit is in place for wastewater that is discharged offbase into lagoons.	18
		HAZARDOUS WASTE	Potential Hazardous Wastes: electrolytes, sodium hydroxide, sodium sulphide, dichlorodiflouromethane, sulfur dioxide, SSP-55 all in very small amounts; offsite disposal by Defense Reutilization Management Office	18, 20
ADDITIONAL ENVIRONMENTAL INFORMATION	No environmental compliance plan available. The Base Master Plan is being developed and is expected to be completed in June 1988; there are no land use or zoning conflict issues. Current EA: National Test Bed Program, 1987; Final Environmental Impact Statement, Consolidated Space Operations Center, January, 1981			19, 108
COMMENTS	National Test Facility has categorical exclusion as stated in document 813 (control # AFSPC 86-1) dated 8-12-86. Data is for Falcon Air Force Station, unless otherwise noted.			115, 13"

SELECTED ENVIRONMENTAL CHARACTERISTICS CAPE CANAVERAL AIR FORCE STATION				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	16,000 acres	118
		BASE FACILITIES	All housing, recreational, and support facilities are located at Patrick Air Force Base 15 miles to the south. Cape Canaveral Air Force Station contains the Air Force Space Museum, range control center, and missile launch and support facilities.	118
		TEST FACILITIES	Complete assembly and launch facilities for ballistic missiles and space launch vehicles, and storage and dispensing station for fuels and oxidisers.	118
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Commercial fishing offshore; no natural resource development on base	56
		VISUAL RESOURCES	Located on barrier island bounded by the Banana River on the west and the Atlantic Ocean to the east. The barrier island is approximately 10 miles wide at Cape Canaveral Air Force Station, and relief is generally less than 12 feet, with occasional dunes 12 to 24 feet high. Natural features include lagoons, beaches, dunes, and native vegetation.	120
		SPECIAL STATUS	Seven historical and archaeological sites on National Register of Historical Places. 21 additional sites eligible for list. Federally listed endangered species include: Wood Stork, Manatee, Green Turtle, Leatherback Turtle, Brown Pelican, and Bald Eagle. Federally listed threatened species include the Peregrine Falcon, Loggerhead Turtle, Eastern Indigo Snake, and American Alligator. The beach at Cape Canaveral Air Force Station is considered a habitat of special significance by the Base. The Banana River is designated outstanding by the State of Florida.	56
		NOISE	No exceedances	55
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Military = 4,494; Civilian = 1,640 (1987, For Patrick Air Force Base)	42
		PAYROLL	$190.6 million (1987; for Patrick Air Force Base)	42
		HOUSING	Officer = 168; NCO = 1,408 (1987; for Patrick Air Force Base)	42

SELECTED ENVIRONMENTAL CHARACTERISTICS CAPE CANAVERAL AIR FORCE STATION (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Average daily demand = 383 kWh; Peak hour demand = 50,000 kW; supplied by offbase plant operated by Florida Power and Light Company	87, 89
		SOLID WASTE	14,000 tons generated in FY 1986; disposed at offsite facility in Brevard County as of January 1987. Onsite facility used only for construction debris.	55, 87, 89
		SEWAGE TREATMENT	Capacity = 983,000 gallons/day; current use is approximately 80% of capacity. Facility is onbase government-owned and operated.	87, 88, 89
		TRANS-PORTATION	Cape Road is the main road in and out of Cape Canaveral AFS, and is quite congested. Indefinite plans are to widen road from south entrance to industrial portion of Cape Canaveral AFS.	89
		WATER SUPPLY	Consumption = 2.27 million gallons/year, purchased by contract from the City of Cocoa.	87, 90
PERMIT STATUS		AIR	Air shed classification II; attainment of air quality standards; several boiler permits with the state of Florida	55
		WASTE WATER	NPDES permit for several canals from one monitored outfall; Monitoring of canal surface water shows no exceedances.	55
		HAZARDOUS WASTE	84 tons generated for FY 1986 with no violations; storage facility with RCRA permit; munitions detonation facility with interim status.	55
ADDITIONAL ENVIRONMENTAL INFORMATION	Existing Base Comprehensive Plan. Two separate Environmental Assessments in progress for two new launch facilities. Environmental Assessment for Complementary Expendable Launch Vehicle (CELV) at Cape Canaveral.			20, 56
COMMENTS	The data presented on this table summarize conditions for Cape Canaveral AFS, and do not include data for Patrick AFB unless otherwise noted.			

SELECTED ENVIRONMENTAL CHARACTERISTICS EGLIN AIR FORCE BASE				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	464,980 acres on land	128
		BASE FACILITIES	28 ranges used for research, development, and testing; additional 44,000 square miles in the Gulf of Mexico used in range activities	128
		TEST FACILITIES	50,000-foot-long speed test track, Radar Target Scatter facility, Central Inertial Guidance Test Facility, Armament Development Test Facility	42
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Eglin AFB Natural Resources Management Progam harvests and markets forest products; interest in possible oil reserves on base, but currently no development.	116
		VISUAL RESOURCES	Location is characterized by gently rolling terrain that is heavily wooded and interspersed by many lakes and streams; natural features include coastal plains and sand hills.	116
		SPECIAL STATUS	Approximately 300 archaeological sites on base; none listed on National Register of Historical Places, but 34 sites have been nominated. Two federally listed endangered species, the Okaloosa Darter and Red-Cockaded Woodpecker, and one threatened species, the Eastern Indigo Snake, inhabit the Eglin area. Additional threatened or endangered species which may be permanent or migratory inhabitants include the Peregrine Falcon, Bald Eagle, Brown Pelican, Wood Stork, Florida Everglade Kite, and Bachman's Warbler.	116
		NOISE	No community annoyance problems are known to exist; aircraft traffic runways designed to comply with Air Force directives.	116
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Military = 10,972, civilian = 3,982, contractor = 1,378 (1987)	42
		PAYROLL	$382 Million (1987)	42
		HOUSING	Officer = 263, NCO = 2,072, Transient = 88, trailer spaces = 227, (1987)	42

SELECTED ENVIRONMENTAL CHARACTERISTICS EGLIN AIR FORCE BASE (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	System 1984 peak demand = 1,400 MW; capacity = 1,900 MW. Supplied by Gulf Power System, which serves Florida Panhandle.	116
		SOLID WASTE	Volume generated in 1986 was 24,057 tons Class I waste, and 50,770 tons Class II (construction debris). Disposal is offbase at a county facility.	66
		SEWAGE TREATMENT	Sewage generated by Eglin Air Force Base is treated by six municipal facilities; total capacity of six facilities = 3.2 million gallons/day; current use = 2.7 million gallons/day.	116
		TRANS-PORTATION	Four main east-west routes and three north-south routes access the base. State Highway 85 is the main road to the base and is currently being widened. Mainline railroad service operates on northern border of base.	116
		WATER SUPPLY	Potable water supply capacity = 8.8 million gallons/day. Average daily demand = 4.6 million gallons/day.	116
PERMIT STATUS		AIR	Located within Air Quality control Region No. 5, and is in attainment of air quality standards; two PSD permits, one for the asphalt plant, one for incinerator.	59, 116
		WASTE WATER	Five operating wastewater plants, three have permits pending denial for having an inadequate operations and maintenance manual and groundwater contamination.	59, 128
		HAZARDOUS WASTE	Have RCRA Part B permit, no compliance problems; disposal at out-of-state facilities; no commercial facilities exist in Florida.	59, 116
ADDITIONAL ENVIRONMENTAL INFORMATION	Master Plan is out of date, but a revised version is currently in progress. Recent Environmental Assessment for 1986 Bold Eagle Exercise; nearly same data as for 1984 Bold Eagle Exercise Environmental Assessment. Additional Environmental Assessments prepared for construction and road easements.			66
COMMENTS	Proposed SDI work requires no additional staffing or construction of facilities.			72

SELECTED ENVIRONMENTAL CHARACTERISTICS KENNEDY SPACE CENTER				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	140,000 acres	64
		BASE FACILITIES	Administrative and engineering office buildings, recreational area, emergency power generating plant, Visitors Center, rocket booster assembly and refurbishment facilities.	62, 64
		TEST FACILITIES	Space transportation vehicles, expendable launch vehicles, remote sensing facilities, laser advanced communication development, launching facilities (39A, 39B) orbiter processing facilities, shuttle landing facilities	62, 64
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	No known natural resource development onbase.	62
		VISUAL RESOURCES	Bordered on west by the Indian River, a brackish-water lagoon, and on the east and south by Cape Canaveral Air Force Stateion. The Banana River lies between Merritt Island and Cape Canaveral Air Force Station, and contains the submerged land included as part of Kennedy Space Center. The terrain is flat and only a small part of the total acreage is developed.	62, 122
		SPECIAL STATUS	Federally listed endangered species include: Atlantic Green Turtle, Leatherback Turtle, Atlantic Hawksbill Turtle, Atlantic Ridley Turtle, Dusky Seaside Sparrow. Federally listed threatened species include: American Alligator, Eastern Indigo Snake, Atlantic Salt Marsh Water Snake, and Piping Plover. Space Center habitats include 29,000 acres of wetlands and 56,000 acres of open waters. There are 28 archaeological and historical sites present on the Center. Launch Complex 39 is listed in the National Register of Historical Places.	62, 64
		NOISE	Ambient level appreciably lower than EPA recommended level of 70 decibels. Observer and security zones are located on a basis of 115 decibel maximum for visitor protection during vehicle launches.	62, 64
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Total = 1400, few military, approximately 200 civilian; remaining staff are contractor employees.	138
		PAYROLL	Contractor payroll = $750 million	138
		HOUSING	None	138

SELECTED ENVIRONMENTAL CHARACTERISTICS KENNEDY SPACE CENTER (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Average daily consumption for 1978 = 520,000 kWh Daily capacity currently sufficient for facility needs. Generated offsite by the Florida Power and Light Company.	62, 64
		SOLID WASTE	Volume produced in 1985 = 26,000 cubic yards; Capacity = 600,000 cubic yards. Disposal method: Class II sanitary landfill onsite with onsite treatment and recovery; offsite disposal of hazardous waste, radioactive waste	62
		SEWAGE TREATMENT	Design capacity = 797,000 gallons/day; current use = 233,100 gallons/day. Kennedy Space Center maintains permits for 16 onsite domestic waste treatment plants.	62
		TRANS-PORTATION	211 miles of roadway; approximately 40 miles of rail track provide heavy freight transport from the Florida East Coast rail line; 19.3 miles of maintained channel provide access from Port Canaveral to Kennedy Space Center.	62
		WATER SUPPLY	Average daily demand in 1978 = 407,000 gallons. Daily capacity currently sufficient for facility needs. Purchased under contract with the Air Force from the City of Cocoa.	64
PERMIT STATUS		AIR	Within attainment of air quality standards. Although never exceeding standards, ozone has the most consistently high level of the monitored pollutants.	62
		WASTE WATER	Two NPDES outfall permits	64
		HAZARDOUS WASTE	Onsite treatment and recovery facilities for freon, hydrocarbons, mercury, and silver. RCRA Permit Part B, three storage facilities, tank, hypegolic propellant incineration, and chemical waste treatment facility.	62, 64
ADDITIONAL ENVIRONMENTAL INFORMATION	Environmental Resources Document (Nov. 18, 1986); Environmental Impact Statements for the Kennedy Space Center Center (October 1979); Environmental Statement for the National Aeronautics and Space Administration, Office of Space Science, Launch Vehicle and Propulsion Programs (July 1973). Environmental documentation is prepared for all Space Shuttle launches.			57, 62, 64, 65
COMMENTS				

SELECTED ENVIRONMENTAL CHARACTERISTICS U.S. NAVAL PACIFIC MISSILE RANGE FACILITY, BARKING SANDS				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	584 acres, 200 yards wide, 7 miles long	78
		BASE FACILITIES	361 total structures; 222 habitable buildings; two Navy-maintained 6,000 x 150 foot runways; fuel farm; telephone vault; missile assembly building; WWVH transmitter facility; recreation center	78, 103
		TEST FACILITIES	Kauai test launch facility (Sandia) - MACH II and MACH III missiles (undergoing upgrade); PMRF launch facility (NAVY) - BQ and MQM missile types; Kokole Point Launch Facility	79, 103
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Agriculture (sugar cane), beach front (shoreline), conservation lands (existing forest and water reserve zones), large apiary	103
		VISUAL RESOURCES	Located on the seaward margin of the Broad Mana Coastal Plain of Kauai; characterized by open areas, sand dunes, and filled-in wetland planted with sugar cane; lies within the rainshadow of Mount Kawaikini and Waialeale.	103
		SPECIAL STATUS	Threatened and endangered species include the Hawaiian Hoary Bat, American Coot, Common Moorhen, Black-necked Stilt, and possibly Hawaiian Duck. All are common to irrigation ditches and wetlands. Public beach recreational facility (40 feet back from shoreline); small graveyard with remains of past inhabitants of Mana Village. Several unregistered archaeological and historic sites located within base boundaries, none in area of Kauai Test Facility.	103, 125
		NOISE	Within standards of air installation compatible-use zone; noise from IRBM firings will be similar to that from present firings.	80, 103
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Civilian = 100 Military = 130 Contractor = 600	78
		PAYROLL	Data not available	
		HOUSING	Housing available on facility.	80

SELECTED ENVIRONMENTAL CHARACTERISTICS
U.S. NAVAL PACIFIC MISSILE RANGE FACILITY, BARKING SANDS (Continued)

				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Peak daily demand = 1,350 kWh; peak daily capacity = 2,100 kWh; service supplied by Kauai Electric Company	80, 125
		SOLID WASTE	Domestic refuse from military activity approximately 182 tons/year; disposed of in offsite landfill operated by the County of Kauai	80, 125
		SEWAGE TREATMENT	Design capacity = 90,000 gallons/day, includes leach fields, septic tanks, two treatment plants, leach ponds Current use = 43,000 gallons/day	80
		TRANS-PORTATION	Highway 50 is access to facility; one road on base narrows to one lane, currently being upgraded; Navy maintains two runways	80, 126
		WATER SUPPLY	Daily demand = 300,000 gallons/day; Daily capacity = 500,000 gallons/day; service supplied by Kauai Board of Water Supply, Kaehaha Sugar Company, and the State of Hawaii; water chlorinated before use.	80, 125
PERMIT STATUS		AIR	In attainment area; no PSD permits; however, use of hydrazine-nitracine motor for IRRM could present handling, storage, and transportation problem	80, 126
		WASTE WATER	No NPDES permits for facility	80
		HAZARDOUS WASTE	RCRA Part B - Interim status; have treatment and storage but no disposal with regard to OTTO fuel waste	80
ADDITIONAL ENVIRONMENTAL INFORMATION			No overall environmental compliance plan available; existing Pacific Missile Range Facility Base Master Plan, Sept. 4, 1986; Preliminary EA, Kauai Test Facility, U.S. Naval Pacific Missile Range Facility, 1986	103, 126
COMMENTS			-- Quantity Distance Arc extends beyond base boundary onto state land; land use is "non-conflicting" agricultural; base currently negotiating with state to lease land to cover quantity distance arc problem. -- Base has cleared public beach for past 25 years before and during firings; base currently negotiating with Army Corps of Engineers to extend jurisdiction to surf zone to make clearings legal.	81 81

SELECTED ENVIRONMENTAL CHARACTERISTICS
HARRY DIAMOND LABORATORIES

				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	Adelphi: 137 acres Woodbridge: 579 acres	36, 97
		BASE FACILITIES	Adelphi: Admin. bldgs., circuit board lab, machine shop, explosive handling, storage and processing bldg., cobalt 60 bldg., world's largest x-ray facility Woodbridge: Electromagnetic pulse tester, disassembly bldg., 5 main admin. bldgs., 5 small bldgs.	1, 36, 97, 98
		TEST FACILITIES	Adelphi: X-ray facility (can hold Army tank), radiation testing, nuclear hardening test Woodbridge: Nuclear hardening tests	36, 97, 98
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Adelphi: Timber, natural trout stream (Paint Branch Creek) Woodbridge: Timber	36
		VISUAL RESOURCES	Adelphi: Forested, rural setting in suburban housing development. Woodbridge: Gentle rolling hills with one timber stand, on peninsula surrounded by Marumsco Creek and the Potomac River; antenna platforms create a visual impact on the horizon--they cannot be screened.	36, 97, 98
		SPECIAL STATUS	Adelphi: No known threatened or endangered species or cultural resources on facility. Woodbridge: No known threatened and endangered species on facility, Bald Eagle sighted, wildlife refuge borders north side of facility. Approximately 150 acres classified as wetlands, tidal marsh, and/or swamp. One recorded state historical site (graveyard).	36, 97, 98
		NOISE	No noise impacts in any of the sites. Woodbridge site has a minimum 200 foot buffer zone.	36, 98
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	40 military, 1,797 civilian	77
		PAYROLL	$53 million	77
		HOUSING	Adelphi: None on facility; Woodbridge: Nine family housing units that are owned by Ft. Belvoir	77, 97

SELECTED ENVIRONMENTAL CHARACTERISTICS HARRY DIAMOND LABORATORIES (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Adelphi: Current demand = 6,900 kW, Current capacity = 22,400 kW, service supplied by the Potomac Electric Power Company and six standby generators. Woodbridge: Current demand = 366 kW, Current capacity = 10,000 kW	2, 36, 97, 98
		SOLID WASTE	Adelphi: Disposed offsite by contractor. Woodbridge: Disposed offsite through private contractor.	36, 97, 98
		SEWAGE TREATMENT	Adelphi: Current use = 120,000 gallons/day. Washington Suburban Sanitary Commission restricts volume received to maximum total average daily volume of 60,000 gallons; peak daily volume not to exceed twice that amount. 100,000 gallon storage tank on facility prevents exceedances. Woodbridge: Service supplied by Occoquan Woodbridge Sanitary District. Current demand does not exceed capacity.	36, 37, 97, 98
		TRANS-PORTATION	Adelphi: Two road entrances to facility, traffic becomes heavy at shift times. Woodbridge: Rural roads, no traffic; railroad could block emergency road route.	36, 97, 98
		WATER SUPPLY	Adelphi: Current use is 120,000 gallons/day. Water is purchased from the Washington Suburban Sanitary Commission, which does not guarantee the delivery of any specific pressure or quantity of water to the facility; no problems with water supply since 1973. Woodbridge: Supplied by Occoquan Woodbridge Sanitary District	36, 98
PERMIT STATUS		AIR	Adelphi: Five current air permits for smoke stacks from the boiler plants; permits only enacted when burning No. 2 heating oil; State controlled, no violations. Woodbridge: No air permits required for facility.	36
		WASTE WATER	Adelphi: Have one NPDES permit for oil/water interceptor; has compliance problems with heavy rains due to water table rise. Woodbridge: No NPDES permits.	36
		HAZARDOUS WASTE	Adelphi: Has a hazardous waste storage facility with Part A on file. Part B was submitted 3 years ago, still pending. Wastes currently controlled by an open-ended consent order. Woodbridge: No hazardous waste.	36
ADDITIONAL ENVIRONMENTAL INFORMATION	Analyses of Existing Facilities/Environmental Assessment: Harry Diamond Laboratories, Adelphi; Woodbridge Research Facility. Final EIS, Formation of U.S. Army Electronic Research and Development Command, August 1976			97, 98
COMMENTS	- Fire protection water hydrant system is inadequate at Woodbridge; may be subject to water pressure fluctuation problems at Adelphi site; - The Foundation on Economic Trends has filed suit on DoD for inadequate NEPA documentation for the Electromagnetic Pulse Tester; Harry Diamond Laboratories currently in process of upgrading documentation.			36, 97, 98, 127

SELECTED ENVIRONMENTAL CHARACTERISTICS *ELECTRONIC SYSTEMS DIVISION*				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	Administrative offices located on Hanscom Air Force Base (846 acres). Computers housed in MITRE Corporation office building (69,154 sq ft.), 1/2 mile from base.	7, 43, 139
		BASE FACILITIES	Facilities at Hanscom Air Force Base include electronic research and development laboratories, administration buildings, recreation area, housing; no flying missions; Computer system located in MITRE Corp. building	7, 43, 68
		TEST FACILITIES	Research and development in terrestrial, atmospheric, and space environments, early warning systems, satellite tracking, radar, computer communication systems	7, 21, 43
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Hanscom AFB and the MITRE Corporation building are located in a suburban area with no natural resource development.	7, 22
		VISUAL RESOURCES	Facilities are located approximately 17 miles from Boston, in a level tree-lined surburban/industrial area. The MITRE Corp. building is a single-story brick building.	7, 8, 43
		SPECIAL STATUS	No endangered species or special habitat; no known cultural resources.	7, 22
		NOISE	Both Hanscom AFB and the MITRE Corp. building comply with current noise regulations.	7, 21
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Hanscom Air Force Base: Civilian = 3,100; Military = 2,100 (1987) MITRE Corp. building: Electronic Systems Division employees = 75; MITRE Corp. employees in support of the Electronic Systems Division = 75-125	7, 42
		PAYROLL	$160 million (1987, for Hanscom Air Force Base)	42
		HOUSING	Officer = 387; NCO = 472; Transient = 784 (1987, for Hanscom Air Force Base)	42

SELECTED ENVIRONMENTAL CHARACTERISTICS ELECTRONIC SYSTEMS DIVISION (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS *(Continued)*	INFRASTRUCTURES	ELECTRICITY	Peak daily demand: 16,900 kW; Peak daily capacity: 20,217 kW (for Hanscom Air Force Base). Boston Edison Power will supply the MITRE Corp. building with 277/480 volt service	7, 21
		SOLID WASTE	Volume = 179 tons/month diposed of in offsite landfills by contractor, M.J. Connelly Co. Reliable Rubbish Co. will serivce the MITRE Corp. building.	7, 16, 21
		SEWAGE TREATMENT	Sewage treatment for both Hanscom Air Force Base and the Mitre Corp. building provided by the Massachusetts Waste Resource Authority; average use for Hanscom Air Force Base is 1 million gallons/day.	21, 62, 80
		TRANS-PORTATION	City streets and Interstate 95 (about one mile away) access facility Currently suffers from local congestion at rush hours.	8, 21, 84
		WATER SUPPLY	At Hanscom Air Force Base the water supply daily demand is one million gallons/day. All water comes from Quabbin Reservoir, by way of Lexington. The MITRE Corporation building is serviced by the Massachusetts Water Resource Authority.	8, 21, 22
PERMIT STATUS		AIR	Attainment area; no PSD permits required for current building use and future operations.	8, 21
		WASTE WATER	At Hanscom Air Force Base an NPDES permit is in place with no currrent violations. No permits required for the MITRE Corp. building operations.	8, 21
		HAZARDOUS WASTE	At Hanscom Air Force Base the waste is taken offbase; no permits exist. No permits required for the MITRE Corp. building operations.	8, 21
ADDITIONAL ENVIRONMENTAL INFORMATION	At Hanscom Air Force Base the current base Master Plan will be updated in July 1987. Two additions to the Electronic Systems Division Building on Hanscom Air Force Base are covered by Categorical Exclusion. Most recent EA: Installation Restoration Program, Phase IV-A, Hanscom Air Force Base, Area 1, Environmental Assessment. Environmental Assessment, 164 family housing units, 1986. No environmental documentation for the MITRE Corp. building available.			8, 22, 23
COMMENTS	The equipment and staff which will be housed in the MITRE Corporation building (32 Hartwell Rd) by August 1987, are currently located at MITRE Corp. building D.			139

SELECTED ENVIRONMENTAL CHARACTERISTICS NEVADA TEST SITE				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	864,000 acres	134
		BASE FACILITIES	Dedicated to underground nuclear testing, development and testing of nuclear explosives for peaceful applications, and testing of weapons effects	45, 102
		TEST FACILITIES	Facilities for underground testing of nuclear devices and exposure of components to nuclear radiation	102, 134
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Low-grade uranium and geothermal resources are found in general area, but are not currently considered economical.	102
		VISUAL RESOURCES	Located in a desert area with gently rolling topography dissected by ephemeral streams; landscape has been affected by underground blasting.	102
		SPECIAL STATUS	No federally listed threatened or endangered species listed; however, there are several candidate species. Archaeological and historical sites have been identified, but none are listed on the National Register of Historical Places.	31, 101, 102
		NOISE	Uninhabited desert, intermittent short duration noise from onsite tests	31
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Approximately 8,000, mostly civilians	134
		PAYROLL	Data not available	
		HOUSING	Limited housing onsite	134

SELECTED ENVIRONMENTAL CHARACTERISTICS NEVADA TEST SITE (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Peak daily load = 37 MW; will need to upgrade capacity in the next 4-5 years	134
		SOLID WASTE	Permitted disposal onsite	134
		SEWAGE TREATMENT	Currently three ponds in use	134
		TRANS-PORTATION	700 miles of road onsite, 300 miles are paved. Funding for upgrading is available. Network is within capacity.	134
		WATER SUPPLY	Demand = 1.2 million gallons/day; capacity = 2.4 million gallons/day; supplied by 17 onsite wells.	101
PERMIT STATUS		AIR	Within attainment of all National Ambient Air Quality Standards	101
		WASTE WATER	No release of effluent to streams; no permits	101, 134
		HAZARDOUS WASTE	TSD facility with RCRA Part B permit to handle new wastes	101
ADDITIONAL ENVIRONMENTAL INFORMATION	Final Environmental Impact Statement, Nuclear Test Site, ERDA-155, September 1977			31
COMMENTS	Underground testing is conducted in the Pahute Mesa, Ranier Mesa, Yucca Flat, and Frenchman Flat areas of Nevada Test Site.			31

SELECTED ENVIRONMENTAL CHARACTERISTICS ROME AIR DEVELOPMENT CENTER				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	3,896 acres	3
		BASE FACILITIES	Administration and laboratory buildings which house Rome Air Development Center, 70-bed hospital, air field, PX, theaters, church, recreational facilities; home of 24th Air Division and a tank squadron	3, 94
		TEST FACILITIES	Research and development for Command, Control, Communications, and Intelligence; communications, surveillance, intelligence data handling; information system technology; artificial intelligence (for Rome Air Development Center)	3
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	No natural resources development on base.	12
		VISUAL RESOURCES	Located within an area of generally flat topography with no dominant hills and with small towns, agriculture, and woodland within 1 mile.	38, 70
		SPECIAL STATUS	The Gingseng & the Globe Flower are federally listed threatened and endangered plant species; the Indiana Bat, the Bald Eagle, and the Artic Peregrine Falcon are federally listed threatened and endangered animals. No known cultural resources.	10, 38
		NOISE	Community development is limited to areas of low noise and safety impacts as defined by the Air Installation Compatible Use Zones (AICUZ). Predominant noise sources are aircraft activity, offbase traffic, neighborhood activities, and wind in the trees. Maximum noise range due to aircraft is 60-85 L_{dn} onbase.	10, 38
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Civilian = 3,204 Military = 4,523 (1987, for Griffiss Air Force Base)	42
		PAYROLL	$267.0 million (1987, for Griffiss Air Force Base)	42
		HOUSING	Officer = 169 NCO = 566 Transient = 109 (1987, for Griffiss Air Force Base	42

SELECTED ENVIRONMENTAL CHARACTERISTICS ROME AIR DEVELOPMENT CENTER (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Peak daily demand = 217,000 kWh Peak daily capacity = 15,000 kW	11
		SOLID WASTE	Volume = 146,000 cubic yards, carried offbase by contractor to county facility. Small solid waste disposal area is in operation but is used only for disposal of construction operation and maintenance waste.	10, 11, 38
		SEWAGE TREATMENT	Sent offsite to City of Rome Sewer Authority, Rome, New York. Base equals 5% of total input into system.	10, 12
		TRANS-PORTATION	5 roads access area, high-volume capacity/low-volume use; one railroad with heavy freight capacity runs once a month	10, 12
		WATER SUPPLY	Demand = 1.06 million gallons/day Capacity = 18.72 million gallons/day	11, 107
PERMIT STATUS		AIR	In attainment area Air Shed classification is estimated at II. Air emissions are in compliance with existing permit requirements.	10, 11
		WASTE WATER	Base has several NPDES permits with no violations.	10
		HAZARDOUS WASTE	No facility on base, but one currently in planning stage, currently waste is shipped offsite.	10, 11
ADDITIONAL ENVIRONMENTAL INFORMATION			Most recent EA for Central Heat Plant Project, Griffiss AFB, New York, September 1981. No specific environmental document exists for the Rome Air Development Center. No environmental compliance plan available. Base Master Plan is being developed, existing plan is 10 years old.	12, 38, 54
COMMENTS			Rome Air Development Center is located on Griffiss AFB. Data derived is for Griffiss AFB unless otherwise noted. Facilities to be used for RM/C already exist with the exception of a 20 x 50-foot annex that will be added to contain a small cryogenic chamber. Environmental documentation for addition has been prepared.	69, 95

SELECTED ENVIRONMENTAL CHARACTERISTICS U.S. ARMY KWAJALEIN ATOLL				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	Approximately 100 component islands in Kwajalein Atoll, total land area = 3,584 acres; Kwajalein Island = 768 acres, Roi-Namur = 419 acres, Meck Island = 55 acres; lagoon = 75 x 15 miles	67, 99, 119
		BASE FACILITIES	Marine terminal facilities, storage warehouses, power plants, underground power distribution system, 6,800 x 250 foot runway, air terminal, deepwater fuel pier, fuel farm, mechanical and electrical repair shops, administrative office space, barracks and dormitory, hospital, schools	99
		TEST FACILITIES	Tracking radar, optical instrumentation, telemetry facilities, multiple launch facilities	99
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Coconut harvest and operation of fisheries. Mineral deposits of limited quantity within the Marshall Islands, but non-existent on Kwajalein Atoll.	67, 71
		VISUAL RESOURCES	Most of the islands are elongated in shape, flat, and rise no more than 15 feet above sea level. Original surface features of Meck Island have been completely altered.	119, 122
		SPECIAL STATUS	One endangered species, the Hawksbill Turtle and one threatened species, the Green Sea Turtle, may nest on the following islands under U.S. Army control or partial control: Roi-Namur, Legos, Ningi, Ennylabegan, Ennugarret, and Omelek. Turtles have been observed at southwestern end of Kwajalein Island, feeding off food-wastes dumped daily into oceans. No forest preserves established; existing parks and sanctuaries either privately owned or operated by the local state authorities. The entire islands of Kwajalein and Roi-Namur are listed as historical battlefields on the National Register. All actions (i.e., construction) must conform to Army Regulation 420-40, which considers the National Historical Preservation Act.	49, 67, 99, 122
		NOISE	No data available on noise levels for U.S. Army Kwajalein Atoll activities	34
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	There are approximately 2,600 total non-indigenous persons residing at U.S. Army Kwajalein Atoll facilities (2,350 on Kwajalein Island and 250 on Roi-Namur).	121, 124, 131
		PAYROLL	Data not available	
		HOUSING	519 Family Housing Units (Permanent & Trailer); 1,202 Barracks & Dormitory Beds; 150 Transient (1984; note that additional housing construction is currently underway)	121, 124

SELECTED ENVIRONMENTAL CHARACTERISTICS U.S. ARMY KWAJALEIN ATOLL (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURE	ELECTRICITY	Electricity on Kwajalein supplied by diesel generators; Peak load: Kwajalein = 9960 kW; Ennylabegan = 350 kW; Roi-Namur = 5300 kW. Capacity: Kwajalein = 5.2 million kWh; Ennylabegan = 217,000 kWh; Roi-Namur = 2.7 million kWh; Meck 795 kW.	119, 121
		SOLID WASTE	Metal wastes transported by barge to authorized dumping site 21 miles west of the Kwajalein Atoll. Other wastes incinerated within EPA standards or placed in sanitary landfills. Wet waste dumped into ocean off Kwajalein Island. Past problem with seepage from landfill into the shorewaters.	48, 49, 119
		SEWAGE TREATMENT	Sewage treatment plant on Kwajalein Island is designed to treat an average design flow of 0.45 mg/liter and remove 85% to 90% of suspended solid and 75% to 85% biochemical oxygen demand. After 90% of solids are removed, the total effluent is 450,000 gallons/day. Roi Namur has five pumping stations served by a septic tank and a leach field on the island's east side. No sewage treatment facilities exist on the west side of Roi-Namur. Untreated sewage is currently collected from the bachelor's quarters and dining facilities and pumped via a 12-inch main directly into the Kwajalein Atoll Lagoon. Residents are restricted from using these areas for health concerns and there is a potential for contamination of the island's freshwater supply.	119, 121, 132
		TRANSPORTATION	Sea transportation network provides inter-island movement of cargo and passengers, and logistical support from the major governmental centers to all inhabited outer islands. On Kwajalein Island, there are 13 miles of paved road, 300 vehicles; no vehicular congestion. Workers from Ebeye are brought over by ferry. Air transportation available on Kwajalein Island.	50, 67, 99, 121
PERMIT STATUS		WATER SUPPLY	Inhabited islands have rainwater catchment systems, none of which supplies enough potable water for the area's needs. Salt water is used in sewers and for fire fighting. Underground lenses of fresh water can provide in excess of 50 million gallons per year on Kwajalein Island, and 8 million gallons per year on Roi-Namur. Groundwater resources on other islands unknown. Water consumption from all sources on Kwajalein Island = 272,580 gallons/day, Roi-Namur = 25,309 gallons/day, Ennylabegan = 2,629 gallons/day. Portable desalination units are being brought to the U.S. Army Kwajalein Atoll to cover needs until desalination plant is built on Kwajalein in FY 1991. Droughts in recent years have resulted in inadequate water supply for the existing populations on Kwajalein and Roi Namur Islands. In emergency situations, water from Kwajalein Island is barged to Roi-Namur.	50, 119, 121, 132
		AIR	Air pollution currently not a problem due to the constant tradewinds, the island's low profile, and lack of constraining factors. Air pollutants are generated from transportation, range operations, power plant generators, dust, and waste incineration. Power plant generators are the major source for particulates, sulphur, oxides, and nitrogen oxides. 1979 estimates of power plant emissions showed emissions approaching the limits of EPA standards for nitrogen oxide.	50, 67, 119

SELECTED ENVIRONMENTAL CHARACTERISTICS U.S. ARMY KWAJALEIN ATOLL (Continued)			REFERENCE NO.
PERMIT STATUS (Continued)	WASTE WATER	Water quality standards may be violated as a result of toxic metal leaching from a solid waste disposal site used by U.S. Army Kwajalein Atoll operations.	41, 49, 67
	HAZARDOUS WASTE	Known hazardous wastes on Kwajalein: PCBs, solvents, asbestos, hydrazine fuel. When hydrazine fuel is used, someone is brought in specifically to handle the associated problems; no known violations; has a hazardous waste management plan implemented to comply with Army Regulation 420-47. All toxic metals are returned to the United States for disposal.	49, 132
ADDITIONAL ENVIRONMENTAL INFORMATION	EIA, Internal Operations, 1974; EIA, Kwajalein Missile Range Operations, 1980; EA, Family Housing Dwellings, 1986; EA, Missile Impacts, Illegini Island, 1977 Environmental Consideration, ERIS, Meck Island, 1986; Environmental Consideration, HEDI, Meck Island, 1986; Environmental Consideration, AOA, 1985; Environmental 124 Consideration, TIR, 1987; EA Power Plant upgrade, Kwajalein Island, 1987		5, 35, 53, 58, 119, 112, 124
COMMENTS	- U.S. operations on the Kwajalein Atoll must comply with all NEPA standards. However, there is no formal permitting procedure or monitoring. It is the responsibility of the user agency to make sure standards are met. - Any reentry debris from Western Test Range activities that land in the Kwajalein Lagoon are required to be removed in compliance with the "clean bottom" policy.		50 4

SELECTED ENVIRONMENTAL CHARACTERISTICS ARNOLD ENGINEERING DEVELOPMENT CENTER				REFERENCE NO.
PHYSICAL CHARACTERISTICS	FACILITIES	SIZE	39,081 acres (Arnold AFS); main laboratory is a 3,000-acre fenced compound.	41, 109
		BASE FACILITIES	3,000 acre fenced main laboratory area, 6,000-foot airstrip, test and administration buildings, recreation areas, 4,000 acre Wood's Reservoir	109
		TEST FACILITIES	40 aerodynamic and propulsion wind tunnels, 11 rocket and turbine engine test cells, 4 ballistic and impact ranges, 2 arc heaters and 4 space environment chambers	105
	ENVIRONMENTAL CONDITIONS	NATURAL RESOURCES	Wood cutting permits are sold to general public for cutting firewood in designated areas. The Wildlife Management Program restocks fish in Wood's Reservoir. Recreational facilities for Air Station personnel and general public available at Reservoir. 1,400 acres are under sharecropper permits with local farmers.	41, 109
		VISUAL RESOURCES	The Air Force Station is located within a rural area characterized by gentle hills, 30,000 acres of hardwood forest, and the 4,000-acre Wood's Reservoir. The research area is screened by pine forest along the access road.	41, 109
		SPECIAL STATUS	Federally listed endangered species: Gray Bat, Indiana Bat, Red-Cockaded Woodpecker. There are two designated wetland areas, no designated historical or archaeological sites.	26, 41, 109
		NOISE	Work at Arnold Engineering Development Center creates noise in excess of safety levels within the test areas. The noise problems are minimized by a 6,000-acre dense pine plantation around AEDC, the location of the site 5 miles from the nearest town, selective scheduling of operations, and mufflers for facility exhausts.	13, 41, 109
OPERATIONAL CHARACTERISTICS	SOCIOECONOMICS	STAFFING	Civilian = 307, Military = 163, Contractor = 3,779 (1986)	6
		PAYROLL	Air Force = $16.0 million; Contractor = $232 million (1986)	6
		HOUSING	Officer = 24, NCO = 16, Transient = 47 (1986)	6

SELECTED ENVIRONMENTAL CHARACTERISTICS ARNOLD ENGINEERING DEVELOPMENT CENTER (Continued)				REFERENCE NO.
OPERATIONAL CHARACTERISTICS (Continued)	INFRASTRUCTURES	ELECTRICITY	Daily consumption = 250,000 kWh, Daily capacity = 600,000 kWh; supplied by the Tennessee Valley Authority	60
		SOLID WASTE	One landfill on base, contracted to the city of Tullahoma, will reach capacity by December 1987. Future disposal sites to be determined by contractor.	60
		SEWAGE TREATMENT	Design capacity for main plant = 2.89 million gallons/day Current use = 0.21 million gallons/day	9
		TRANS-PORTATION	Interstate 24 and other Federal and State highways provide access to the site. Traffic has been no problem.	41, 91
		WATER SUPPLY	Demand = 1.07 million gallons/day Capacity = 2.75 million gallons/day	9
PERMIT STATUS		AIR	27 current PSD permits; the ambient air quality of the area is within attainment of air quality standards.	13, 41
		WASTE WATER	Eight current NPDES permits; one violation in December 1986 for excessive infiltration.	13, 24
		HAZARDOUS WASTE	A TSD facility; total hazardous waste generated 119,000 pounds; submitted RCRA Part B in August 1985 and is awaiting public notification. Minor corrective actions will be required for prior, non-groundwater contaminating releases.	13, 44
ADDITIONAL ENVIRONMENTAL INFORMATION			Environmental Compliance Plan currently under development; Base Master Plan currently under revision; Existing EA; formal EA for AEDC Operations, revision of February 1977, currently undergoing another revision; EA for Elk Resource Recovery Facility, AEDC; 1984 Environmental Quality Program, Arnold AFS; Environmental Statement, National Guard Use of AEDC, April 1972; Environmental Impact on Noise from the Proposed AEDC High Reynolds Number Tunnel, March 1973.	13, 41
COMMENTS			Test Facility for SSTS is still in the design phase; the environmental group at Arnold has been tasked with writing the required EA.	25

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FINDING OF NO SIGNIFICANT IMPACT

STRATEGIC DEFENSE INITIATIVE ORGANIZATION
U.S. DEPARTMENT OF DEFENSE

AGENCY: Department of Defense

ACTION: Decision to conduct Demonstration/Validation tests of the following technologies:

- o Boost Surveillance and Tracking System (BSTS)
- o Space-based Surveillance and Tracking System (SSTS)
- o Ground-based Surveillance and Tracking System (GSTS)
- o Space-Based Interceptor (SBI)
- o Exoatmospheric Reentry Vehicle Interception System (ERIS)
- o Battle Management/Command and Control, and Communications (BM/C^3)

BACKGROUND: Pursuant to Council on Environmental Quality Regulations for implementing the procedural provisions of the National Environmental Policy Act of 40 CFR Parts 1500-1508, and Department of Defense (DoD) Directive on Environmental Effects in the United States of DoD Actions, the DoD has conducted an assessment of the potential cumulative environmental consequences of Demonstration/Validation testing.

SUMMARY: Demonstration/Validation of the technologies would involve four types of tests: analyses, simulations, component/assembly tests, and flight tests. The locations of test activities for the Demonstration/Validation of each of the technologies is presented in the following table:

TECHNOLOGY TESTS BY FACILITY

FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C[3]
Alabama						
Advanced Research Center						A,S,C
California						
Edwards Air Force Base				C		
Vandenberg Air Force Base/ Western Test Range		F[1]	F[2]		F[2]	
Colorado						
National Test Facility, Falcon Air Force Station	A,S	A,S	A,S	A,S	A,S	A,S,C
Florida						
Cape Canaveral Air Force Station/Eastern Test Range	F	F[1]				
Eglin Air Force Base				A,S,C		
Kennedy Space Center		F[1]				
Hawaii						
U.S. Naval Pacific Missile Range Facility at Barking Sands					F[3]	
Maryland						
Harry Diamond Laboratories, Adelphi site					C	C

Key: A - Analyses
S - Simulations
C - Component/Assembly Tests
F - Flight Tests

(1) Possible satellite launch site
(2) Dedicated target launch site
(3) Possible dedicated target launch site

TECHNOLOGY TESTS BY FACILITY

FACILITY	TECHNOLOGY					
	BSTS	SSTS	GSTS	SBI	ERIS	BM/C[3]
Massachusetts						
Electronic Systems Division, Hanscom Air Force Base						A,S,C
Nevada						
Nevada Test Site		C	C		C	C
New York						
Rome Air Development Center, Griffiss Air Force Base						A,S,C
Republic of the Marshall Islands						
U.S. Army Kwajalein Atoll			F	F	F	
Tennessee						
Arnold Engineering Development Center, Arnold Air Force Station		S,C			C	
Virginia						
Harry Diamond Laboratories, Woodbridge site					C	C
Contractors						
Lockheed Missiles and Space Company	A,S,C				A,S,C	
Grumman Aerospace Company	A,S,C					
Contractor		A,S,C	A,S,C,	A,S,C		A,S,C

Key: A - Analyses
S - Simulations
C - Component/Assembly Tests
F - Flight Tests

To determine the potential for significant environmental impacts of Demonstration/Validation activities, the magnitude and frequency of the tests that would be conducted at proposed test locations were compared to the current activities at those locations.

To assess impacts, the activity was evaluated in the context of the environmental considerations for air, water, biological resources, infrastructure, hazardous waste, land use, visual resources, cultural resources, noise, and socioeconomics. As a result of that evaluation, consequences were assigned to one of three categories: insignificant, mitigable, or potentially significant.

Environmental consequences were determined to be insignificant if no serious concerns existed regarding potential impacts of the potentially affected area. Consequences were deemed mitigable if concerns existed but it was determined that all of those concerns could be readily mitigated through standard procedures or by measures recommended in existing environmental documentation. If serious concerns were identified that could not be readily mitigated, the activity was determined to represent potentially significant consequences.

FINDING: No significant impacts would result from analyses, simulations, or component/assembly testing of any of the technologies. However, a potential for significant impacts resulting from flight testing was found at U.S. Army Kwajalein Atoll in the Marshall Islands. In recognition of the need to avoid, minimize, and mitigate any potential adverse impacts on the environment of the Kwajalein Atoll, the U.S. Army will prepare a comprehensive environmental impact statement addressing the continuing operations at the U.S. Army Kwajalein Atoll, which include the proposed Demonstration/Validation activities. The environmental impact statement will address the environmental concerns recognized in this Environmental Assessment and will identify appropriate mitigations. No significant impacts would result from flight testing at any of the other locations.

FURTHER INFORMATION: A copy of the Demonstration/Validation Program Summary Environmental Assessment, July 1987, is available from:

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Dated 31 July 1987

James L. Graham, Jr.
Colonel, USAF
Director, Systems Engineering