DEPARTMENT OF THE ARMY
U.S. ARMY STRATEGIC DEFENSE COMMAND - HUNTSVILLE
POST OFFICE BOX 1500
HUNTSVILLE, ALABAMA 35807-3801

REPLY TO
ATTENTION OF

May 7, 1992

Environmental and
Engineering Office

TO WHOM IT MAY CONCERN:

Enclosed is the Final Environmental Impact Statement (EIS) for the Strategic Target System. The proposed action is to launch Strategic Target System vehicles from the Kauai Test Facility (KTF) on the island of Kauai and to establish land use controls over certain lands and waters adjacent to the launch site. Up to four vehicles would be launched each year in order to test nonnuclear elements of the Strategic Defense Initiative.

The EIS consists of the Draft EIS issued in February 1992 for agency and public review and the Final EIS, which responds to agency and public comments. The Final EIS is in three volumes. The first volume contains additions and revisions to the Draft EIS and responses to agency and public comments. For convenience, it also includes the executive summary from the Draft EIS as an appendix. The second and third volumes contain the transcript of the public hearing on the Draft EIS and exhibits and comment letters submitted by government agencies and the public.

The Strategic Defense Initiative Organization intends to issue a Record of Decision (ROD) at least 30 days after the Notice of Availability for the Final EIS is published. The ROD will describe the decision and will identify the alternatives that were considered, the alternative selected, and the alternative that was considered to be environmentally preferable. The ROD will identify and discuss all relevant factors in making the decision, including economic and technical considerations, agency mission, and considerations of national policy that were balanced in making the decision. The ROD will also indicate any mitigation measures that will be implemented to reduce environmental impacts, if required.

The point of contact is Mr. D. R. Gallien, Attention: CSSD-EN-V, Post Office Box 1500, Huntsville, Alabama 35807-3801.

Sincerely,

Daniel M. Prescott
Lieutenant Colonel, U.S. Army
Acting Deputy for Operations

Enclosure

FINAL
ENVIRONMENTAL IMPACT STATEMENT
FOR THE
STRATEGIC TARGET SYSTEM

Volume I

May 1992

U.S. Army
Strategic Defense Command

REPORT DOCUMENTATION PAGE

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This Environmental Impact Statement documents the results of an analysis of the potential for and magnitude of impacts from launch activities of the Strategic Target System from the Kauai Test Facility at the Pacific Missile Range Facility on the island of Kauai, Hawaii.

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Final

ENVIRONMENTAL IMPACT STATEMENT FOR THE STRATEGIC TARGET SYSTEM

Volume I

Responses to Comments and Changes to Draft EIS

U.S. Army Strategic Defense Command

May 1992

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Environmental Impact Statement (EIS) for the Strategic Target System program consists of the Draft EIS, released for public review in February 1992, and the Final EIS, released in June 1992. These documents were prepared in accordance with Council on Environmental Quality and Department of Defense regulations that implement the National Environmental Policy Act. The U.S. Army Strategic Defense Command (USASDC) is the lead agency for these documents and is the executing agent for the Strategic Target System.

The Draft EIS analyzed the environmental effects of the proposed action and alternatives. The proposed action is to launch Strategic Target System vehicles with experimental payloads into near space to simulate the reentry of intercontinental ballistic missiles and to establish land use controls over certain lands and waters adjacent to the launch site. The vehicles would be launched from the Kauai Test Facility at the U.S. Navy Pacific Missile Range Facility on the island of Kauai.

This Final EIS is organized in three volumes. Volume I contains the additions and revisions made to the Draft EIS in response to comments from the public and agencies. This volume also contains the Army response to substantive comments received during the 45-day comment period on the Draft EIS, whether or not they resulted in changes to the Draft EIS. Volume II contains the full transcript from the public hearing held during the public comment period as well as written comments handed in at the hearing. Volume III contains copies of all written comments on the Draft EIS mailed to the Army during the public comment period. The three volumes of the Final EIS together with the Draft EIS constitute the complete EIS.

The 45-day comment period began with the release of the Draft EIS for public review on 28 February 1992. Over 700 copies of the Draft EIS were distributed to the public, local media, and to federal, state, and local government agencies during the comment period.

A public hearing was held at Lihue on the island of Kauai on 24 March 1992. Recipients of the Draft EIS were informed of the date and place of the meeting. News releases and paid advertisements on radio, television, and in the print media publicized the hearing and the availability of the Draft EIS. A toll-free telephone number was established to receive requests for the Draft EIS and to preregister speakers at the hearing. In order to accommodate the volume of requests to provide testimony, the public hearing was continued on the following night, 25 March.

The public hearing opened with an explanation of the Strategic Target System and of the findings from the environmental analysis. Elected officials and members of the public then provided comments. Approximately 160 speakers made statements during the public hearing. Over 100 letters and other exhibits were submitted. By the close of the public comment period on 13 April, over 500 more letters were received.

Based on public and agency comments, the Draft EIS has been revised and responses have been prepared as reflected in Chapters 2 and 3 of this volume.

It is apparent that the comment period provided a public forum for issues beyond the scope of the EIS. All comments, regardless of their relationship to environmental issues, have been included in the Final EIS for consideration in reaching a decision on the proposed action and alternatives.

The Strategic Defense Initiative Organization (SDIO) will issue a Record of Decision later this year. The Record of Decision will explain the decision about the proposed action and the alternatives examined in the EIS, and it will describe any mitigation measures committed to as part of the decision.

TABLE OF CONTENTS

VOLUME I RESPONSES TO COMMENTS AND CHANGES TO THE DRAFT EIS

APPENDIX

TABLE OF CONTENTS (continued)

VOLUME II HEARING TRANSCRIPT

TABLE OF CONTENTS

VOLUME I RESPONSES TO COMMENTS AND CHANGES TO THE DRAFT EIS

APPENDIX

TABLE OF CONTENTS (continued)

VOLUME II HEARING TRANSCRIPT

TABLE OF CONTENTS (continued)

VOLUME III WRITTEN COMMENTS

CHAPTER 1
INTRODUCTION

CHAPTER 1

INTRODUCTION

The U.S. Army Strategic Defense Command (USASDC) is the lead agency for the Environmental Impact Statement (EIS) and is the executing agent for the Strategic Target System. The proposed action is to launch Strategic Target System vehicles with experimental payloads into near space to simulate the reentry of intercontinental ballistic missiles and to establish land use controls over certain lands and waters adjacent to the launch site. The vehicles would be launched from the Kauai Test Facility at the U.S. Navy Pacific Missile Range Facility on the island of Kauai.

1.1 FORMAT OF THE ENVIRONMENTAL IMPACT STATEMENT

The EIS for the Strategic Target System consists of the Draft EIS issued for review in February 1992 and this Final EIS, which responds to agency and public comments. For readers who may not have convenient access to the Draft EIS, the Executive Summary from the Draft EIS is included as an appendix to Volume I of the Final EIS.

The Final EIS is in three volumes. Volume I contains the additions and revisions to the Draft EIS and responses to the comments on the Draft EIS by government agencies and by the public. Volume II contains the transcript of the public hearing on the Draft EIS.

The responses to comments in Volume I are coded so that readers may find their way to the corresponding comments in Volumes II and III. All statements made at the public hearing are contained in Volume II and all exhibits and comment letters are contained in Volume III.

A large number of statements and letters either expressed general support for activities at the Pacific Missile Range Facility (PMRF), including the Strategic Target System, or protested the continuation of Strategic Defense Initiative (SDI) testing on Kauai. Statements and letters that commented on such issues as the role of PMRF or the value of continued SDI testing are included in the Final EIS even though they are not within the scope of the EIS. Responses indicate when comments resulted in additions or revisions to the Draft EIS.

1.2 PUBLIC NOTICE, PUBLIC AND AGENCY SCOPING, PUBLIC HEARING

The Department of Defense published in the *Federal Register* (25 November 1991) a Notice of Intent (NOI) to prepare an EIS for the Strategic Target System. The NOI also was mailed directly to interested public agencies and to individuals identified on a mailing list compiled during the preparation of the Environmental Assessment in 1990 and 1991. The NOI described the proposed action and requested written comments from public agencies and from the public.

Comments were also requested in separate meetings with the mayor of Kauai and with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the State of Hawaii Office of State Planning, the State of Hawaii Department of Land and Natural Resources, including the State Historic Preservation Division, and the State of Hawaii Department of Health.

To supplement requests for written comments from the public, a number of "citizen reviewers" were nominated by elected public officials and the U.S. Army Strategic Defense Command. The citizen reviewers met three times as a group and were available individually for information and advice. Citizen reviewers are listed below.

Citizen Reviewer	Nominated By
Suzanne Marinelli	Senator Akaka
Ronald K. Takamura	Senator Inouye
Earl A. Arruda	U.S. Representative Mink
Eric Honma	Governor Waihee
Clifford Arinaga	Mayor Yukimura
Reverend Kaleo Patterson	Mayor Yukimura
William Fernandes	Council Chairman Kouchi
David S. Nekomoto	Council Chairman Kouchi
Elizabeth Freeman	Strategic Defense Command
Aletha G. Kaohi	Strategic Defense Command

The citizen reviewers identified and discussed issues concerning specific environmental impacts, the EIS process, and the methodologies used to evaluate impacts. They also requested additional information and analysis.

The Draft EIS was filed with the Environmental Protection Agency on 21 February 1992 and was made available for public and agency review by 28 February 1992. The 45-day public comment period ended 13 April 1992. The public hearing was held at Lihue on the island of Kauai on 24 March 1992 and was continued on 25 March 1992 to accommodate the large number of preregistered speakers and to provide an opportunity for at-the-door speaker registration.

Statements and exhibits from the hearing have been organized into five broad categories: (1) Technical Program (e.g., booster reliability, schedule), (2) Environmental Impact, (3) the EIS Process, (4) Policy (e.g., the value to national security of continued SDI testing), and (5) Other. (The public hearing provided a forum for such "other" issues as the Hawaiian sovereignty movement and the effects of continued testing on conditions in the Marshall Islands.)

A breakdown of statements and exhibits by category is shown below.

Issue Area	Number of Comments	Percent of Total
Technical Program	62	5%
Environmental Impact	473	41%
EIS Process	60	5%
Policy	98	9%
Others	455	40%
Total	1148	100%

CHAPTER 2
ADDITIONS AND REVISIONS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

CHAPTER 2

ADDITIONS AND REVISIONS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

The following section contains additions and revisions to the Draft Environmental Impact Statement (Draft EIS). These modifications provide new information, clarify the analysis, or correct errors. These modifications appear in bold italic typeface.

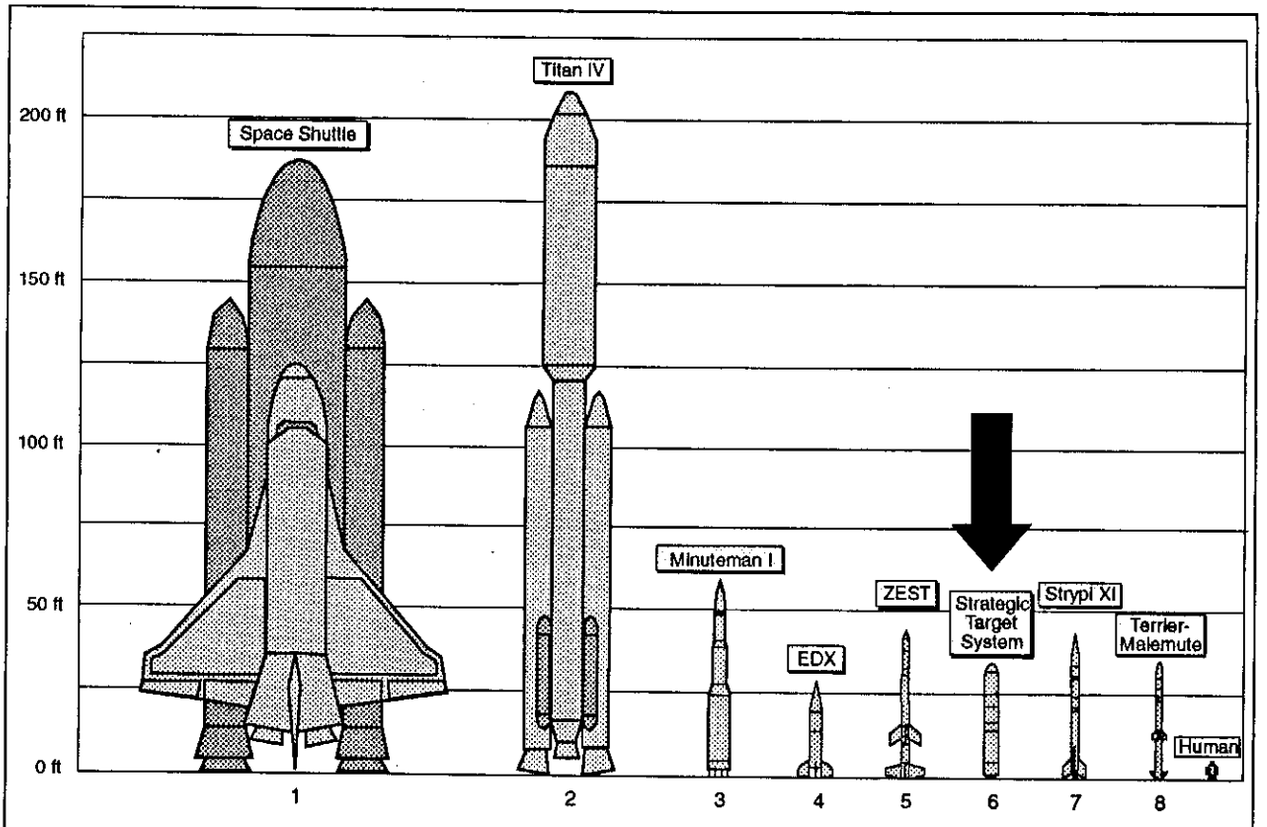
Page ES-1, para. 2, should read:

Vehicles would be launched from the Kauai Test Facility (KTF) at the U.S. Navy Pacific Missile Range Facility (PMRF) on the island of Kauai. The vehicles would be aimed toward points within range of the sensing and tracking stations at U.S. Army Kwajalein Atoll (USAKA). KTF has been the site of more than 300 rocket test launches since the facility was first established for that purpose in 1962. ***From January 1981 through September 1991, 499 sounding rockets, 574 drones, and 22 target missiles were launched from PMRF.***

Page 1-3, Section 1.3.1, should read:

The context for this Draft EIS is provided by a review of the recent Strategic Target System program environmental litigation. In July 1990, the USASDC published an Environmental Assessment (EA) for the Strategic Target System program. That EA covered all activities in the continental United States and Hawaii that would lead to launches of a Strategic Target System vehicle. A finding of no significant impact (FONSI) was issued in August 1990 by the U.S. Army and U.S. Navy. The FONSI was published in the Federal Register in August 1990. Following the review of all public comments, the commander of USASDC, Lt. General Robert D. Hammond, decided to proceed with the Strategic Target System project in October 1990, with the requirement that additional studies be conducted in the areas of liquid ***propellant*** transportation and the use of freon in the second-stage guidance system. The first launch was scheduled for March 1991.

Page 2-5, Figure 2-4: Figure has been revised as shown on page 2-2.



Name	1 Space Shuttle	2 Titan IV	3 Minute-man I	4 EDX	5 ZEST	6 Strategic Target System	7 Strypi XI	8 Terrier-Malemute
Height (ft)	184	204	60	29	44	34	43	35
Total weight (lbs)	4,432,667	2,102,800	69,481	14,200	15,301	36,577	14,500	3,605
Propellant weight (lbs)	2,667,000	1,246,500	59,028	11,657	10,104	30,541	10,555	2,345
Launch thrust (lbs)	6,525,000	4,800,000	220,000	44,000	128,700	75,000	110,310	76,000
Propellant type	Solid & liquid	Solid & liquid	Solid	Solid	Solid	Solid	Solid	Solid
GHA (ft) radius	***15,000***	***8,000***	***6,500***	***10,000***	***2,200***	***10,000***	***2,000***	***1,200***

The size of the ground hazard area (GHA) is dependent on many factors, including the type of booster and the area around the launch pad that can be cleared of people.

Figure 2-4. Strategic Target System launch vehicle comparison.

Page 2-7, Section 2.1.1.1, para. 2, should read:

The GTM exercise tests the function and operating concepts associated with the Strategic Target System. It is conducted by PMRF, *SNL*, and all support agencies. During the GTM launch exercise, PMRF will coordinate operational testing of voice and data communications circuits, radar sites, telemetry receiving and processing stations, command control, and flight termination systems at PMRF and all support sites.

Page 2-9, Section 2.1.1.2, para 5 introductory header should read:

First-Stage Booster. Not First-Stage Booster Reliability.

Page 2-10, Section 2.1.1.2, para. 2, introductory header should read:

Second-Stage Booster. Not Second-Stage Booster Reliability.

Page 2-12, Section 2.1.1.3, para. 5, should read:

Four transportation routes for nitrogen tetroxide have also been considered. These include (1) shipment on an exclusive-use, cargo aircraft (at this time, a waiver from DOT would be required for shipment by military or commercial carriers); (2) on a commercial cargo vessel from the continental United States to Oahu and, subsequently, to Port Allen, Kauai, and transfer to a landing craft for delivery to the beach at PMRF; (3) on a commercial cargo vessel from the continental United States to Oahu and transfer to a landing craft for sea transport to the beach at PMRF; and (4) on a commercial cargo vessel from the continental United States to Port Allen, Kauai, and overland on Route 50 to PMRF. ***The proposed alternative for the transport of oxidizer fuels is by commercial cargo vessel from the continental United States to Oahu and, subsequently, to Port Allen, Kauai, and transfer to a landing craft for delivery to the beach at PMRF.*** For more details regarding transportation of nitrogen tetroxide, see Section 4.10.

Page 2-16, Section 2.1.2.1, para. 4, should read:

The Strategic Target System vehicle contains a Flight Termination System (FTS), which allows the Missile Flight Safety Officer to terminate the vehicle's flight whenever safety requires it. The FTS in the vehicle consists of radio receivers that receive the flight termination signal and ignite flexible linear-shaped charges, which cut holes in the casings of the first-, second-, and third-stage rocket boosters. These holes allow a depressurization of the booster cases. ***On those missions that have a liquid propellant payload, the propellant tanks would have directional holes cut in them so that the propellants would mix and burn before impacting the ground.*** The Missile Flight Safety Officer can send a flight termination signal from ground and airborne flight termination transmitters.

Page 2-23, Figure 2-13: Figure has been revised as shown on page 2-4.

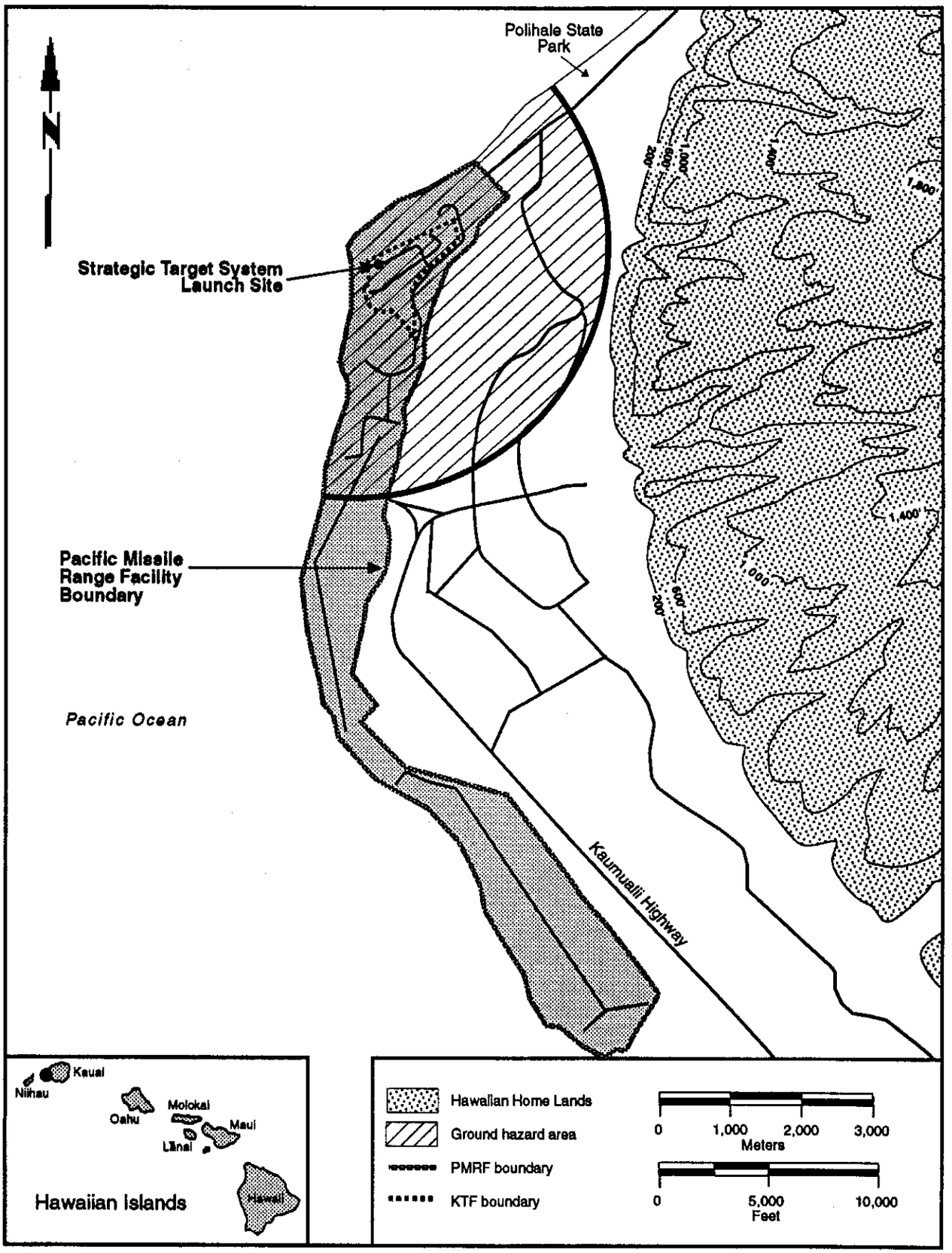


Figure 2-13. Strategic Target System ground hazard area.

Page 2-24, Section 2.1.2.3, para. 2, should read:

Surveillance of the uprange areas will be performed under established PMRF guidelines *(U.S. Navy 1990)*. Surface and aircraft surveillance radars will advise PMRF Range Control of any vessels and aircraft in the hazard areas or flight corridors. PMRF range aircraft are typically dispatched prior to a mission to verify clearance of controlled areas, and surface vessels will monitor waters directly offshore from PMRF.

Page 2-25, after para. 1, which ends: "...prior to a launch operation." add the following paragraph:

The range clearing operations would operate as follows:

1. *At three hours before launch, range personnel will enter the ground hazard area and notify people within the area that they must leave in sufficient time to be clear of the ground hazard area at t-20 minutes. Adequate personnel will be available to allow posting guards with people moving from the area to verify clearance prior to 20 minutes before launch.*

2. *The roads across the sugar cane fields would be monitored for traffic beginning approximately 3 hours prior to launch, and PMRF personnel will keep a count of all cars entering and leaving the area.*

3. *The affected portions of Polihale State Park and the waters adjacent to PMRF will be surveyed to ensure that all people in the area are identified.*

4. *Depending upon where the people in the ground hazard area are, PMRF personnel will ensure that people are leaving in sufficient time to exit the ground hazard area. If, for example, the people were in Polihale State Park, then PMRF personnel will begin to escort them from the park no later than 1.5 hours prior to launch to ensure the area can be verified clear by t-20 minutes. This is because it could take almost an hour for people on the beach to pack their belongings and move out of the ground hazard area.*

5. *The roads to Polihale State Park would be closed at least 30 minutes before launch. This would allow enough time for the last car to transit the ground hazard area before 20 minutes prior to launch.*

6. *In the event of a maintenance hold or weather delay that is determined prior to 30 minutes before launch, people in the ground hazard area would be notified that they may remain and that the area will not be closed. If a maintenance delay or weather hold occurs after approximately 30 minutes prior to launch, public access to the ground hazard area will already have been restricted. If the matter cannot be resolved quickly, then a decision will be made to reopen the area. The process would start again with range-clearing personnel advising the public of the new launch time. Each time access to the ground hazard area is restricted counts as a launch event for purposes of the Memorandum of Agreement or easement so the total number of events is limited.*

Page 2-25, Section 2.1.2.5, para. 1, should read:

With liftoff establishing flight time "zero," the vehicle performs a pitch maneuver after 2.18 seconds of vertical ascent. The ballistic momentum will carry the vehicle over the water ***after the pitch-over maneuver.*** The vehicle will clear the island of Kauai at 15 seconds into the flight at an altitude of 1,289 m (4,230 ft). Although the direction to the BOA near USAKA, 3,766 km (2,340 mi) away, is 255.5 degrees, the initial flight azimuth is 280 degrees to avoid an overflight of the inhabited island of Niihau, 29 km (18 mi) west-southwest of KTF (Figure 2-14). At 61.2 seconds, the vehicle has a velocity of 1,417 m/second (4,650 ft/second) at an altitude of 28,651 m (94,000 ft), and the surface range is 21 km (13 mi). The first-stage booster will burn until 61.3 seconds after liftoff when the second-stage booster will ignite. Ten to 20 seconds later, the guidance system initiates a downpitch maneuver to produce the desired trajectory. At the same time, another turn bends the ground track toward the target. For some missions, such as the second demonstration launch, the range safety function is transferred from PMRF to KMR just prior to third-stage ignition during the coast period. During second-stage burn, up to 42 L (11 gal) or 90 kg (198 lb) of freon (halon 2402) may be released into the booster plume over the entire second-stage flight path, to provide maneuvering capabilities for the booster. For the first demonstration launch, the third stage ignites at approximately 585 seconds. The first-stage booster impacts about 108 km (67 mi) west of KTF at 375 seconds. The second-stage booster impacts at 1,192 seconds, 2,609 km (1,621 mi) downrange of PMRF in the BOA (Figure 2-15). The spent third stage has an impact 426 km (265 mi) north of Roi-Namur Island, Kwajalein Atoll, in the BOA, at 1,230 seconds. The nose shroud impacts at 1,438 seconds, 2,618 km (1,627 mi) downrange of KTF in the BOA.

Page 2-26, Section 2.1.2.6, para. 2, should read:

A proposed Strategic Target System experiment payload will involve the venting of unburned ***hydrazine family fuel*** into space for the purpose of collecting sensor data (via satellite) regarding fuel vent phenomena. This particular experimental payload will consist of two canisters, each capable of releasing approximately 57 L (15 gal) of ***hydrazine family fuel,*** and associated venting instrumentation (e.g., to monitor flow rate, temperature, and vent pressure). During payload flight(s), fuel venting will be initiated at an altitude of approximately 300 km (186 mi), which is 80 to 90 km (50 to 56 mi) downrange from PMRF. A second venting will occur at an altitude of over 1,000 km (621 mi), 500 km (310 mi) downrange. Up to two payload flights are proposed for this fuel-venting experiment. The data obtained will depict the mechanisms involved in the subsequent actions of the uncontained fuels in space particularly: (1) the processes involved in the formation of a cloud of particles and vapor, (2) the rates of the associated chemical reactions, and (3) the resultant products. Similar experiments have been previously conducted by the U.S. Air Force for other programs (U.S. Air Force 1987).

Page 2-34, Section 2.2, para 1, should read:

The no action alternative would continue the development of the Global Protection Against Limited Strikes (GPALS) program but without the ability provided by the Strategic Target System program to gather critical actual flight test data. No shipments of boosters or liquid propellants would take place. There would be no assembly or checkout of a launch vehicle. The Strategic Target System vehicle would not be launched. No range safety operations or upgrades

would occur. No safety zone or easement would be established. ***The inability of PMRF to perform part of its research mission would make the installation potentially less valuable as an important national defense asset.***

Page 2-38, Section 2.3, Table 2-2: Table 2-2 has been revised as shown.

Table 2-2
Alternative launch site evaluation.

Location	Exclusionary Criteria			
	Safety	Mission	Treaty	Schedule/Cost
White Sands Missile Range, NM	x	x		
Vandenberg AFB, CA		x	x	
Poker Flat Research Range, AK		x	x	
Kauai Test Facility, HI				
Wake Island	x	x		
Johnston Island	x			
Midway Island	x		x	
Guam		x	x	x
USAKA, RMI		x		
Floating Barge			x	x
Fixed Ocean Platform			x	x

Note: Launching from Vandenberg AFB and Poker Flat Research Range is not restricted by treaty; however, boosters launched from these sites carrying test objects to the target area near USAKA would fall under the provisions of the START Treaty.

An x indicates the site was excluded for this specified criteria.

Page 3-15, Section 3.3.3, after para. 1, which ends "...to humans, plants, and animals," add the following paragraph:

Stratospheric ozone measurements taken above Hawaii by the National Oceanic and Atmospheric Administration in the summer of 1991 detected low ozone levels within patches of cloud from the Mt. Pinatubo eruption. The National Aeronautics and Space Administration has noted that the findings are preliminary and that causal relationships remain hypothetical (Horgan 1992; Schnell 1992).

Page 3-27, Section 3.5, para. 1, should read:

PMRF is located within an archaeologically and ethnographically sensitive area of Kauai. The region of influence for cultural resources includes the ground hazard area, launch safety zone, areas associated with the beach landing areas, and the liquid fuel transport route to KTF. This region, known as Mānā (Figure 3-7), has been identified in traditional Hawaiian religious cosmology as a *leina-a-ka-'uhane*. This term refers to the cliffs or seacoast promontories from which the spirits of the dead would plunge to enter the spiritual realm (Han et al. 1986; Kamakau 1968). The Nohili Dune area adjacent to where the Strategic Target System launch facility is located has been specifically cited in recorded Hawaiian oral literature as a burial area (Fornander [1917] 1974). ***The Nohili Dune is a traditional historic place and is eligible for inclusion in the National Register of Historic Places (Hawaii Department of Land and Natural Resources, letter dated March 16, 1992*** [Referenced in Chapter 4 of this volume]). Traditional Hawaiian mortuary practices indicate that human burials may be present in all sandy coastal beach areas such as those adjacent to the project location (Bennett [1931] 1985; Han et al. 1986; Kirch 1985; Te Rangi Hiora 1957; Flores and Kaohi 1991).

Page 3-30, Section 3.5.1, para. 2, should read:

Two surveys within and adjacent to the Strategic Target System launch installation have also been conducted at PMRF. These include a complete survey of the DOE/KTF (DOE and SNL 1990c) property and that of the EDX launch facilities (USASDC 1990f). ***An archaeological testing program conducted in both of these areas reflects a paucity of subsurface cultural material. No Strategic Target System project construction activities will occur in these areas. An intensive surface inspection of the areas where the Strategic Target System project operations are to take place did not yield evidence of any visible cultural material in those areas (USASDC 1991b, 1991c; DOE and SNL 1990c).***

Page 3-30, after para. 5, which ends "...in the areas examined." add the following paragraphs:

The Hawaii Department of Land and Natural Resources, State Historic Preservation Division (SHPD) has indicated that several cultural resource studies have occurred in the area of PMRF since the development of the initial EA for the Strategic Target System project (Hawaii Department of Land and Natural Resources, 1992, Historic Preservation Division. Letter dated March 16, 1992, from W. Paty to R.F. Shearer, USASDC Environmental and Engineering Office; see Consultation Section, Chapter 4, Volume 1). These reports (Droliet, pers. com. 1992; Yent 1991; Shun n.d.; Walker and Rosendahl 1990; Jones 1992; Leidemann and Kirhinsmi 1990; Smith

1990; Douglas 1990; and Schiltz n.d.) are chiefly composed of letter and monitoring reports (McMahon, pers. com. 1992). Droliet's 1991 study involved field verification of sites that had been previously identified on the U.S. Navy archaeological files map (U.S. Navy n.d.; Droliet, pers. com. 1992). Schiltz' undated report involved trench-excavation monitoring without any significant findings (Droliet, pers. com. 1992). Work by Yent (1991) involved a preliminary archaeological inventory survey of Polihale State Park. This survey was limited to the existing park area encompassing Polihale Ridge on the north, to the boundary of PMRF on the south (Yent 1991; Yent, pers. com. 1992). Listed below are the SHPD site numbers assigned to the inventoried sites with a brief description of each site. The Polihale sand dune comprises two parallel dune crests, referred to as the front (makai) dune and the back (mauka) dune. The area mauka of the dune has been levelled by roadways and sugar cane cultivation.

Sites within this area include:

50-30-01-0001 - Polihale Heiau (Bennett 1931). Site is located at the base of Polihale Ridge, just inland from the shoreline, and below the dry falls. Site is densely covered with koa haole and kiawe. Terraces of the structure are intact but subject to collapse from slopewash, talus, and high surf.

50-30-01-0002 - Housesites (Bennett 1931). Series of platforms and paved areas on the inland side of the park road to the south of Polihale Heiau. Densely overgrown with koa haole and kiawe.

50-30-01-1816 - Burial (Smith 1990). This burial was eroding on seaward face of the back dune and somewhat near the vicinity of the southernmost park pavilion.

50-30-01-1817 - Lithic scatter (1990). Scatter of basalt flakes and vesicular basalt cobbles with marine shells on the back dune surface. Located south of site 1816, scattered over an area approximately 50 m in diameter.

50-30-01-1818 - Cultural deposit. Two eroding cultural layers, separated by sterile sand layer, were noted in dune cuts (from 4-WD vehicles) in the northern portion of Polihale State Park. Deposits include firepit features, basalt flakes, and shell midden.

50-30-01-1819 - Cultural scatter. Five areas of scattered material on the back dune and located in the vicinity of the northern portion of Polihale State Park. All the areas are believed to be the same site but appear as separate areas because of dune erosion. Scatters include basalt flakes, vesicular basalt cobbles, hematite, coral, shell midden, and metal shrapnel. A cultural layer with firepit was noted.

50-30-01-1820 - Cultural scatter. Three areas of scattered material on a dune. Area A is a scatter of vesicular basalt cobbles, basalt flakes, coral, shell midden, cut pearlshell, and metal shrapnel on the dune surface. Areas B and C are eroding cultural layers exposed as a result of 4-WD activity on the dune.

50-30-01-1821 - Basalt scatter. Scatter of basalt cobbles between front and back dune near southern property line with Barking Sands. No shell or coral was found in association.

There are other known sites within the Polihale study area that are not currently in the state park. These sites include:

50-30-01-0003 - Housesite/Rockshelter (Bennett 1931). This rockshelter is located on the southern face of Polihale Ridge and is defined by a stacked-rock retaining wall/platform. Site corresponds to Bishop Museum site K-1 that was excavated in the late 1950s by Kenneth Emory of Bishop Museum.

50-30-01-0004 - Kapaula Heiau (Bennett 1931). This paved platform heiau is located on the north side of Kaulaula Valley above the base of the talus slope of Haeleele Ridge. The site was relocated in 1967 by Francis Ching.

50-30-01-0005 - Housesites (Bennett 1931). Paved and unpaved platforms located at the base of Lapa Ridge and continuing up the valleys on both sides of this ridge. At least one very complex structure is 70 by 25 feet. The sites were relocated by Ching (1974), including a small platform built in front of a cave shelter (Yent 1991).

Walker and Rosendahl's 1990 work is included in a previously cited U.S. Navy planning document (U.S. Navy 1991) within this EIS.

Jones' study (1992) at PMRF consisted of archaeological survey and subsurface testing in a 6-acre area proposed for the Hawaiian Air National Guard Forward Air Control Post Facility at Barking Sands. The project area is situated in the southern portion of the installation. Eighteen test trenches (10 meters in length) were excavated by backhoe in and adjacent to the project area. No cultural resources were observed during the testing and no human burials were uncovered. Results of this testing program suggest a low probability of cultural resources in that project area. A determination of "no effect" from construction impacts was made with a recommendation that a monitor be present during ground-disturbing activities within undisturbed areas of the project area (Jones 1992; Welch, pers. com. 1992).

Shun's study (n.d.) consisted of trench testing/monitoring for an antenna utility corridor in the southern portion of the installation. No cultural resource findings were made as a result of this study (Shun, pers. com. 1992).

Smith's report (1990) deals with the discovery, excavation, and reinterment of a single human burial within Polihale State Park (Smith 1990). An osteological examination of these remains concluded that they were ancient and of Polynesian origin (Douglas 1990).

Archaeological and paleontological survey work has been conducted by Leidemann and Kishinami (1990) and Kishinami (1991) in the Kawaiele dunes adjacent to the southeastern boundary of PMRF. The purpose of this survey was to examine surface and subsurface deposits for the presence of fossil bird bone and/or cultural remains. Very little paleontological or

cultural remains (a 1930 dime) were recovered as a result of the survey (Leidemann and Kishinami 1990). A later study of the same area notes that no archaeological or paleontological remains had been found but that such remains could still be uncovered during sand mining operations at this site (Kishinami 1991).

Page 3-41, Section 3.9, after para. 3, which ends "...at Pearl Harbor (DOE 1991a)." add the following paragraph:

In 1990 a preliminary assessment was performed at PMRF under the Defense Environmental Restoration Program (DERP). Three sites were identified for further investigation to determine if any contamination exists. These sites are outside the proposed construction area.

Page 3-45, Section 3.10.1, para. 1, should read:

PMRF Range Control Standard Operating Procedures (PMRF 1990) provides standard operating procedures for the safe conduct of range operations at PMRF. These procedures apply to all personnel involved in operations at PMRF. They provide for range surveillance, clearance, and air traffic control. The range control office is responsible for implementing range safety operational plans and range safety approvals for all test operations (PMRF 1990). *Out of all launches controlled by PMRF, there have been no accidents involving personal injury or property damage.*

Page 4-3, Section 4.1.1, para. 4, should read:

Offshore fault movements can generate tsunamis. Most tsunamis that could affect the Hawaiian Islands come from sources around the rim of the Pacific Ocean. Because of the great distances involved, there is generally ample warning of an approaching tsunami. Tsunami watch and warning conditions of readiness are addressed in PMRF Instruction 3140.4E (PMRF Inst. 3140.4E, 1986), *Warnings and Conditions of Readiness for Hazards or Destructive Weather/Tsunami.* Moreover, the Strategic Target System facilities, launch pad, missile assembly building, and liquid *propellant* storage facilities are outside the potential tsunami flood zone (Figure 3-1).

Page 4-4, Section 4.2, should read:

The quality of groundwater and surface water in the KTF areas of PMRF could potentially be affected by launch emissions, spills of toxic materials, or early flight termination. Impacts were evaluated using the intensity/context criteria described on pages 4-1 and 4-2. The region of influence for this resource includes KTF, the ground hazard area, the Mānā Plain, the beach landing areas on PMRF, the liquid *propellant* transportation route, and Niihau.

Page 4-7, Section 4.3.1.2, para. 4, should read:

Some Strategic Target System missions will carry payloads with liquid propellants attached to the system during the early flight phase. Early flight termination of a Strategic Target System

missile would result in the liquid *propellant* payload burning along with the solid-fuel components of the three booster stages. The liquid propellant payload would consist maximally of 57 L (15 gal) each of a hydrazine-type fuel (45 kg [99 lb]) and nitrogen tetroxide (82 kg [180 lb]). A conservative estimate indicates that the combustion products of a liquid payload would amount to approximately 1.1 percent of the solid-fuel combustion products (Table 4-2) (McDougle, pers. com. 1991) and, thus, would not significantly contribute to air quality impacts. ***Liquid payload propellants are carried on some, not all, Strategic Target System vehicles.***

Page 4-15, Section 4.3.1.2, para. 5, should read:

The acidification effects of the solid-fuel booster exhaust from Space Shuttle and Titan launches ***have*** been widely reported (Dreschel and Hall 1990; Schmalzer et al. 1985; Madsen 1981; Cour-Palais 1977). During each launch of the Space Shuttle, a ground cloud is formed mainly from the exhaust products of the solid-fuel boosters and deluge water from the sound suppression system. The two solid-fuel boosters contain a total of 997,900 kg (2,200,000 lb) of chemical propellant. The deluge system dumps 1,136,000 L (300,000 gal) of water onto the launch pad in a 20- to 25-second period. During the first 10 seconds of a launch, approximately 17,000 kg (37,000 lb) of hydrogen chloride and 28,000 kg (62,000 lb) of aluminum oxide are released. Acidity measurements have indicated that the pH is below 0.1 in some locations downwind from the ground cloud. Concentrations of aluminum oxide have been estimated at 17 g/m^3. In all cases, acute effects have been limited to areas near the launch pad where most of the deposition occurs. These effects have included alteration of the vegetation community structure and species composition, changes in soil structure and chemical characteristics, short-term depression of surface water pH, short-term alteration of water chemistry, and kills of small fish in nearby shallow water areas (Dreschel and Hall 1990). The Strategic Target System boosters contain a total of ***13,844 kg (30,477 lb)*** of solid fuel, which is about 1 percent of the Space Shuttle solid propellant. The Strategic Target System launch will not utilize a deluge water system; it is a dry launch. The potential for adverse acidification effects from Strategic Target System launches is far below that from the Space Shuttle, and no significant effects are expected. This potential is discussed in the sections on biological, soil, and water resources.

Page 4-19, Section 4.3.1.2, para. 1, should read:

The emissions calculated for the nine Space Shuttle, six Titan launch schedule can be used to put the estimate of the ozone depletion potential of the Strategic Target System program in perspective. The sum ozone depletion potential from the homogeneous chemical species produced by all current solid-propellant booster systems could be as high as 0.034 percent (Bennet et al. 1991). The annual Strategic Target System program of four launches per year would produce ozone-depleting species *that are* 0.001 of *those* from all current chemical propulsion systems globally. Compared with a schedule of nine Space Shuttle-six Titan program, it is estimated that the Strategic Target System program could result in an annual global ozone loss in the range of 0.00001 to 0.0001 percent. ***Localized effects of a rocket passing through the ozone column ("punching a hole in the ozone") are transitory. Three-dimensional modeling of Space Shuttle launches predicted locally increased chlorine levels in the stratosphere, and hence ozone destruction, that disperse within 30 days (Prather et al. 1990). The localized effects from the Strategic Target System would be much less and more transient***

since this launch vehicle is considerably smaller than the Space Shuttle. The point of entry into the stratosphere by the Strategic Target System launch vehicle is over the ocean, not over the landforms of Hawaii.

Page 4-20, Section 4.3.1.2, after para. 1, which ends "...on an annual basis." add the following paragraph:

Estimates of the quantitative relationship between stratospheric ozone depletion and skin cancer incidence range from 1 to 2 percent for malignant melanoma (Longstreth 1988) to 2.7 percent for nonmelanoma skin cancers (Kelfkins et al. 1990) for each 1 percent decrease in ozone. Higher values (5 to 6 percent) for nonmelanoma skin cancers have been published (National Research Council 1982; Kripke 1988). Many variables contribute to skin cancer risk, including skin pigmentation, life style, and latitude. Because the ratio of a 2-percent skin cancer increase to a 1-percent ozone decrease appears widely throughout the literature (Henriksen et al. 1990; Jones 1987), it was used in evaluating the potential human health effects from ozone depletion levels potentially attributable to the Strategic Target System program.

Page 4-20, Section 4.3.1.2., after para. 4, which ends "...activities of the program." add the following paragraph:

Title VI of the Clean Air Act Amendments of 1990 reflects the Montreal Protocol. The Strategic Target System program will comply with the Clean Air Act and all implemented regulations.

Page 4-21, Section 4.3.1.2, after para. 1, which ends "...stratospheric ozone levels." add the following paragraphs:

The U.S. Army Strategic Defense Command has investigated alternative fluids for the halon 2402 used in the thrust vector control system of the Strategic Target System second-stage booster (Allen et al. 1991). The leading alternative candidate, strontium perchlorate, was ruled out because of the possibility of an explosive reaction.

Investigations by the Department of Defense into alternative fluids for missile systems are continuing. As of December 1991, the U.S. Air Force identified about 10 candidate alternative substances for halon 2402 thrust vector control systems. Each would require either some modification or redesign of the system. No "drop-in replacement" has been identified. The modification or redesign requirements are now being investigated. The final report of this segment of the U.S. Air Force study is expected within 1-1/2 to 2 years. Actual engineering and testing could schedule development of a new thrust vector control system 3 to 5 years from now. This lengthy research and development timeline pushes toward and possibly extends beyond the 1996 target date set by Congress for implementation of the Strategic Defense Initiative program.

Summary of Impacts on Stratospheric Ozone. *The Strategic Target System launch vehicle has the potential to adversely impact stratospheric ozone levels from two sources, rocket exhaust emissions and the release of halon 2402, which is the thrust vector control fluid in the second-stage booster. The effect of rocket exhaust emissions on stratospheric ozone comes primarily from hydrogen chloride. The contribution to ozone depletion by other rocket exhaust emission*

products is negligible. The ozone-depleting potential of the hydrogen chloride emitted into the stratosphere by a Strategic Target System launch vehicle was compared to the ozone-depleting potential of all rocket programs worldwide. The rocket exhaust emissions from the Strategic Target System program could result in an annual global ozone loss in the range of 0.00001 percent to 0.0001 percent.

Particulate matter is also recognized as contributing to stratospheric ozone depletion. Natural sources of particulate matter include seasonal polar stratospheric clouds and volcanic eruptions. The Strategic Target System launch vehicle releases particulate matter into the stratosphere in the form of aluminum oxide. Because the state of scientific understanding of particulate matter and ozone depletion is incomplete, a quantitative estimate of the contribution of the Strategic Target System's aluminum oxide emissions to global ozone depletion cannot be made at this time.

In addition to the rocket emissions, the Strategic Target System launch vehicles will release halon 2402 at stratospheric altitudes. Halon 2402, a brominated fluorocarbon, is a known ozone-depleting substance. It is chemically related to chlorofluorocarbons and has a greater ozone-depleting potential. The annual release of 360 kg (794 lb) of halon 2402 by the Strategic Target System program would be equivalent to the release of 1,142 kg (2,518 lb) of CFC-11. Roughly one million tons of chlorofluorocarbons are released globally into the atmosphere every year (Rowland 1989). It has been estimated that 300,000 metric tons (330,000 tons) of chlorofluorocarbons annually rise to stratospheric altitudes (Bennet et al. 1990). The Strategic Target System addition of halon 2402 to the stratospheric burden of ozone-depleting substances is too small to estimate quantitatively the actual ozone-depletion results with the exception of the approximation presented on page 4-19 of the Draft EIS relative to potential health effects.

Page 4-22, Section 4.4, para. 1, should read:

Potential issues include loss of vegetation, disturbance of wildlife, and impacts to threatened or endangered species. The significance of impacts on these resources was evaluated using the intensity/context criteria described on pages 4-1 and 4-2. The region of influence used as a basis for the biological analysis includes the ground hazard area, the launch safety zone extending 6 km (3 nautical mi) offshore, areas associated with the beach landing area on PMRF, and the liquid propellants transport route to KTF.

Page 4-26, Section 4.4.1.3, para. 6, should read:

Impacts on the adder's tongue fern may occur if individuals are present in the areas where the liquid *propellant* storage pads, decontamination pad, and inert gas storage pad are constructed. With implementation of mitigation measures, the adder's tongue fern would not be significantly affected by construction-related activities.

Page 4-27, Section 4.4.1.3, para. 5, should read:

The proposed action is not expected to adversely affect the humpback whale (*Megaptera novaeangliae*). Proposed project activities would not significantly impact habitat for this species.

Noise from launch operations could startle humpback whales, but this effect would be of short duration and would not be expected to result in adverse effects. Impact from early terminated launch debris could result in impacts to the humpback whale. The probability of such an impact occurring is remote, with less than a 4.6 chance in 1 million (4.6×10^{-6}) if whales were present in the launch hazard zone. However, if the presence of the humpback whale is observed during prelaunch clearing surveys of the near-shore launch safety zone and the offshore launch hazard area *(refer to Section 2.1.2.3)*, the launch will be delayed, reducing the probability even more.

Page 4-30, Section 4.4.4.1, para. 2, should read:

Following an early flight termination, the impact area would be sampled to determine if any liquid propellants reached the ground. Any areas (soils) that contained ***residual liquid*** propellants would be removed and the area restored. Removed soils will be handled as hazardous waste and disposed of in accordance with current PMRF regulations.

Page 4-30, Section 4.4.4.3, para. 4, should read:

Prior to launch, the U.S. Navy will survey the first-stage booster impact areas and the launch safety zone *(refer to Section 2.1.2.3)*. Any whale or other sensitive species observed in this area will cause the launch to be delayed. This is a standard safety procedure at PMRF.

Page 4-31, Section 4.5, para. 1, should read:

Issues include construction impacts, intrusion on the dune area adjacent to the launch site, and cumulative impacts as a result of this project. The significance of impacts to cultural resources was evaluated using the intensity/context criteria described on pages 4-1 and 4-2. The region of influence for cultural resources includes the ground hazard area, the launch safety zone areas associated with the beach landing zones or PMRF, and the liquid ***propellants*** transportation routes to KTF.

Page 4-31, Section 4.5.1.2, para. 3, should read:

Booster exhaust from the Strategic Target System launches ***is*** not expected to affect the vegetation. Modeling of booster exhausts at a distance of 18 m (60 ft) from the launch stool (the perimeter fence line of the Strategic Target System launch facility) have indicated temperatures of 204°C (400°F). The exhaust temperatures would decrease with an increase in distance from the launch stool. The predicted temperatures at the fence line, where the dune vegetation begins, are not great enough to cause combustion. The duration of the sudden temperature increase (less than 3 seconds) could cause some temporary wilting of new-growth vegetation. Measures to avoid impacts on cultural resources can include the following.

- ***A portable blast deflector shield could be erected between the launch platform and the adjacent dune to minimize the potential for ignition of Kiawe vegetation.***

- *Vegetation can be sprayed with water prior to the launching of the Strategic Target System target vehicle in order to reduce the risk of ignition.*

- *Fire fighters would use a spray nozzle when possible rather than a directed stream. This will avoid erosional damage to sand dunes and prevent possible destruction or exposure of cultural resources that may be present in the dune area.*

- *SHPO Hawaii has indicated that the best mitigation for historic site protection, in case the vegetation on the dune should ignite, may be to allow a fire to burn itself out. (See consultation section, Chapter 4).*

- *Kiawe trees and brush within a 50-meter radius arc from the launch stool could be felled using chainsaws. This brush would be removed by nonmechanized means. However, a major drawback in implementing this fire-risk reduction technique would be that removal of the vegetation could potentially lead to degradation of the dune.*

Page 4-33, Section 4.5.3, para. 4, should read:

Through implementation of the appropriate preconstruction studies, *propellant* transport monitoring, consultation with the Hawaii SHPO, and by following U.S. Navy and PMRF guidelines, there will be no adverse cumulative effects to the cultural resources.

Page 4-33, Section 4.5.4, after para. 3, which ends "...Hawaiian priest (kahuna pule)." add the following paragraph:

All work in the immediate area where human remains are encountered would be stopped and no further disturbance would take place until the situation is fully assessed. Human remains would be covered and the site area stabilized. Consultation with all pertinent parties (KTF, DOE, U.S. Navy Archaeologists, SHPO, and appropriate Hawaiian groups) will be made to determine the appropriate form of mitigation (data recovery/preservation).

Page 4-33, para. 8, the first sentence should read:

The decision regarding final disposition of any human remains that may be encountered would be made in consultation with the above-mentioned agencies and individuals.

Page 4-34, after para. 1, which ends "...Preservation (36 CRF 800)." add the following paragraphs:

USASDC will take into account reasonable measures to protect the dune area behind the launch pad. If extensive burning of the dune vegetation should occur as a result of launch activities, fire fighters would be directed to use a spray nozzle whenever possible rather than a directed stream. This would prevent erosional damage and avert any possible destruction or exposure of cultural resources that may be present in the dune area.

Fire-suppression machinery (i.e., tracked bulldozer) will be utilized only in the event that a fire in the area presents itself as a threat to human health, safety, and structures. SHPO Hawaii has indicated that the best mitigation historic site protection in this case may be to allow a fire to burn itself out. (See consultation section, Chapter 4). In the event that extensive burning of dune vegetation should occur, a postburn archaeological survey would be conducted. These survey activities would be carried out in consultation with the SHPO and the U.S. Navy archaeologist. Should any cultural resources be discovered as a result of a postburn survey, a full or sample data recovery/research and documentation program (surface recovery and/or controlled excavation) would be implemented. The fire-suppression methods employed in case of an inadvertent brush ignition are solely at the discretion of the PMRF Fire Safety Chief.

Page 4-34, Section 4.6.1.1, para. 1, should read:

Potential impacts on land use could occur while the Strategic Target System booster is on the launch pad. During this time (an average of 14 days), all nonessential contractor, civilian, and military personnel as well as the public would be cleared from the explosive safety quantity-distance (ESQD) area. This ESQD area (Figure 4-1) would affect approximately 0.8 km (0.5 mi) of shoreline located within the PMRF Recreation Area 1. This area represents a small portion of the total beach—5.6 percent of the 14 km (9 mi) of beach along PMRF and 2.3 percent of the 35 km (22 mi) along western Kauai. *Figure 4-1A shows the area affected by restricted access in terms of its proximity and size relative to the overall availability of surrounding beach areas for recreational use.*

Page 4-36, Section 4.6.1.2, para. 1, should read:

Existing lands within the ground hazard area include PMRF and off-base lands. The off-base lands consist of 688 hectares (1,700 acres) of the 11,270-hectare (27,724-acre) state-owned land leased to the Kekaha Sugar Company for the production of sugar cane; 28 hectares (70 acres) of the 62-hectare (154-acre) Polihale State Park, which provides overnight camping (no campgrounds are within the ground hazard area) and day-use recreational activities (e.g., fishing and swimming); and 5,251 m (17,229 ft) of coastline along PMRF. In addition, the County of Kauai has designated the Nohili Dune area as a special treatment district because there are known paleontological remains. They also have classified the dunes as a scenic ecological area because of its native strand vegetation. Portions of the dunes would also be within the ground hazard area. Land uses within the off-base ground hazard area would continue except during launch operations, when the area would be verified clear for safety purposes approximately 20 minutes prior to each scheduled launch. PMRF personnel may enter the area up to three hours before a launch to post signs and to give notice to any people within the area of their need to leave. *See Section 2.1.2.3 for a discussion of range clearing operations.* Clearance would affect only 6 percent of the Kekaha Sugar Company leased land and interrupt transit to Polihale State Park and the beach access along PMRF. Therefore, current land use activities would continue and would be altered only temporarily by limiting travel and public access to these areas. These areas would be verified clear for a total of approximately 80 minutes per year for 10 years, with the potential for an additional 80 minutes per year to accommodate weather, maintenance, and technical delays.

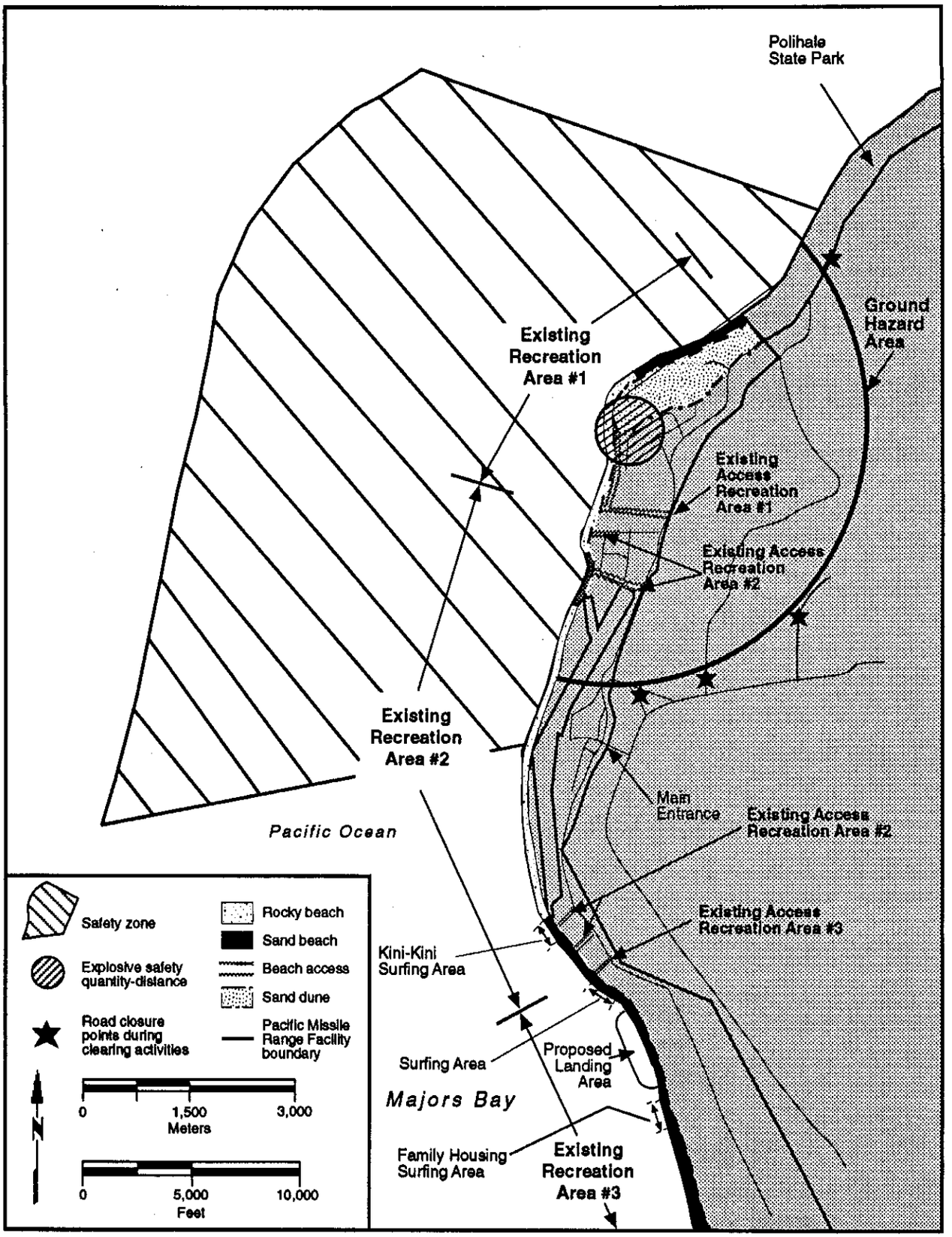


Figure 4-1A. Pacific Missile Range Facility recreational areas.

Page 4-44, Section 4.9.1, after para. 3, which ends "...during nonlaunch activities." add the following paragraph:

Under DERP, a site inspection of PMRF's three potential contamination sites was conducted in 1990 and a remedial investigation has been initiated. Because the three sites are outside the proposed construction areas, they will not interfere with proposed program activities. The program activities will not spread contamination or interfere with cleanup, if required.

Page 4-46, Section 4.9.1, para. 1, should read:

Hazardous waste will be collected, handled, and packaged in standard, DOT-approved containers labeled in accordance with 40 CFR 262, *Standards Applicable to Generators of Hazardous Waste, Pre-Transport Requirements,* and any special requirements needed by the disposal facility. Hazardous waste containers will be handled only by trained, certified personnel using appropriate protective gear and certified lifting equipment such as a properly equipped forklift, or a truck with a liftgate. ***Guidelines for the operation of the hazardous waste staging facility and personnel training requirements have been prepared in accordance with 40 CFR 262.34, 265.16 and the applicable sections of Subpart I of 40 CFR Part 265 (Kauai Test Facility [KTF] Hazardous Waste Transportation and Disposal Plan).***

Page 4-52, Section 4.10.1.3, after para. 2, which ends "...flight must be considered." add the following paragraphs:

Historically, flight termination action of a ballistic missile has never resulted in loss of life or serious damage to private property. If flight termination action occurs early in flight when the missile is still near the ground, there is little opportunity for debris to be scattered. The debris will fall within an area that is determined by the size, weight, and shape of the pieces; wind speed and direction; and velocity, altitude, attitude, and location of the vehicle at the time of termination.

Debris that is heavy or dense, such as nozzles, is less affected by winds or drag. Lighter, less dense pieces, such as panels or rocket skin, will have higher drag, will slow down more quickly, and will drift with the wind. From a lethality standpoint, the heavy, dense pieces will impact at a higher velocity and could cause the greater damage. In all cases, the Missile Flight Safety Officer will terminate the missile under conditions that will cause all debris to fall within the predetermined hazard area.

Page 4-52, Section 4.10.1.3, para. 4, should read:

The ESQD of 381 m (1,250 ft) surrounding the launch pad is calculated based on the equivalent explosive force of all propellant and flight termination system (FTS) components on the vehicle. Based on the hazard class of the propellant and FTS (1.1) and the combined weight of the propellant ***(13,844 kg [30,477 lb])*** and the weight of the FTS (0.45 kg [1.0 lb]), an ESQD of 381 m (1,250 ft) is sufficient to ensure that no inhabited structures or people will be threatened by a flight termination of the boosters. Therefore, in the event of termination of a booster, the 381-m (1,250-ft) ESQD would prevent any damage or injury to the surrounding area.

Page 4-52, Section 4.10.1.3, para 6, should read:

If the vehicle begins to stray from its preplanned course, the flight telemetry data, as well as tracking radars will detect the condition. The tracking computers will constantly plot the instantaneous impact point should the flight be terminated at that point. Since the Missile Flight Officer knows the booster should pitch over at 2.18 seconds, the anomaly will be immediately detected. The Missile Flight Safety Officer has from 2.18 seconds until 20 seconds to terminate the flight and still keep the debris pattern within the modified 10,000-foot ground hazard area.

Page 4-53, Section 4.10.1.3, after para. 5, which ends "...Kauai or Niihau." add the following paragraph:

The calculation of 97-percent overall system reliability combines the reliability of individual components. The components used in the calculation include ground support equipment, radio telemetry links, experimental payload components, missile flight components, etc. Not all of these are key flight components. The failure of a radio telemetry link may cause a gap in data collection but not necessarily a termination of the booster. The reliability of key flight components is far greater than 97 percent. For example, the reliability of the flight termination system is 99.9 percent. In order for a problem to occur that would require the termination of a flight, these key flight components with greater reliability would have to fail. The probability of key flight component and the flight termination system to fail simultaneously is extremely remote. Events that do not endanger human safety, such as failure of the shroud to deploy properly or failure to receive telemetry signals from a payload, are events that label a mission unsuccessful. But these events would pose no danger to humans or the environment and, in most cases, would occur far from populated areas.

Page 4-57, Section 4.10.1.5, para. 2, should read:

Hydrazines are all clear, colorless to slightly yellow liquids with an ammonia-like or "fishy" odor. They are toxic and corrosive to the skin. The combustion products are also toxic. The vapors may be easily ignited by a spark. The liquid is not shock sensitive. In contact with certain materials including iron oxides (rust), the liquid may autoignite at temperatures as low as 23°C (73°F). The flammability limit for hydrazines in air at atmospheric pressure is 2 to 97 percent by volume.

Page 4-58, Section 4.10.1.5, para. 1, should read:

Hydrazine-type liquid fuels present a very serious fire *and toxic vapor* hazard and *exhibit a relatively low evaporation rate.* Any fire that could heat the propellant would cause it to evaporate faster and increase the vapor hazard. Hydrazines are suspected human carcinogens. Hydrazine vapor concentrations above the ACGIH TLV may be irritating to the nose, throat, upper respiratory tract, and lungs. The vapors can also cause eye irritation, inflammation, swelling, redness, and discharge. Pulmonary edema and lung damage may occur. Damage may also

result to the liver, kidneys, and blood. Literature searches did not reveal any irreversible health effects from hydrazines resulting from levels of exposure below workplace exposure guideline levels.

Page 4-62, Section 4.10.1.9, para. 3, should read:

A draft transportation safety plan has been developed by NASA for USASDC for shipment of liquid propellants to Kauai. This plan includes the following measures.

- Truck shipments on Kauai will have trained escorts. Truck shipments on Kauai will only be made if unforeseen circumstances *prevent* shipment by other methods.
- All shipments will be scheduled to avoid peak traffic periods for roads and to avoid high-use times for harbors and known seasons for rough seas.
- A PMRF emergency response team will accompany all shipments on Kauai.
- Local fire and police, and local area state transportation officials will be notified in advance of shipments, and informed by experienced personnel (and trained, if necessary) of existing safety procedures to be used during transportation on Kauai.
- A PMRF emergency response team will be trained to handle liquid propellants.
- Notice of shipment to state and local officials.

Page 7-2, ADD:

U.S. DEPARTMENT OF ENERGY

Sandia National Laboratories
P.O. Box 969
Livermore, CA 94550

Page 7-3, ADD:

CONTRACTORS

Lockheed Missiles and Space Co.
1111 Lockheed Way
Sunnyvale, CA 94089

Page 7-4, ADD:

COUNTY AGENCIES

Office of the Mayor
4396 Rice Street
Lihue, HI 96766

Civil Defense Agency
4396 Rice Street
Lihue, HI 96766

Fire Department
4223 Rice Street
Lihue, HI 96766

Police Department
3060 Umi Street
Lihue, HI 96766

Public Works Department
3021 Umi Street
Lihue, HI 96766

Planning Department
4280 Rice Street
Lihue, HI 96766

Page 8-2, ADD:

Douglas, M.T. 1990. Report on a Human Skeleton from Polihale State Park, Kaua'i. On file at Hawaii State Historic Preservation Office, State Historic Site Division. Honolulu, Hawaii.

Page 8-4, ADD:

Droliet, R. 1992. Ogden Environmental. Personal communication. 16 April.

Eno, R.L. 1989. Memorandum from R.L. Eno, Sandia National Laboratories, to P.L. Walter, Sandia National Laboratories. Subject: Composition of STARS rocket motor exhaust. 20 July.

Page 8-5, ADD:

Horgan, J. 1992. Volcanic disruption. *Scientific American* 226 (3): 28-29.

Page 8-6, ADD:

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Page 9-2, DELETE:

CONTRACTORS

Lockheed Missiles and Space Company
1111 Lockheed Way
Sunnyvale, CA 94089

Page E-2, Table E-2, the second column heading should read:

SPEGL$^{(1)}$ not SPEGL$^{(1)}$X

Page E-2, Table E-3, title should read:

Trace II ***UDMH*** Spill Model Results of Spill. Not Trace II Spill Model Results of Spills.

CHAPTER 3
RESPONSES TO COMMENTS

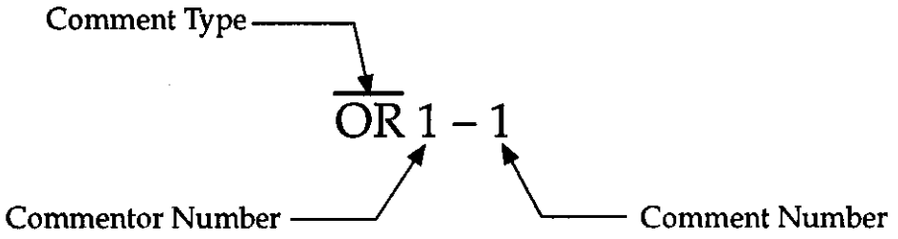
CHAPTER 3

RESPONSES TO COMMENTS

This chapter provides responses to comments received during the public comment period. The coding system used to identify corresponding comments and responses is described below. A summary table provides an overview of the commentors and issues, followed by the responses to comments.

3.1 COMMENT CODING

Comments (oral testimony, exhibits, and letters) on the Draft EIS were received during the public response period. Those comments that required a response have been coded by source and subject. The codes are used to track comments and responses by giving commentors and comments their own numbers. The code consists of three information fields as shown in the example below.



The first field consists of a two-letter code designating the source of the comment: OR for oral commentors, EX for exhibits, or WR for letters. The second field consists of a commentor number (1 to 157 for oral commentors, 1 to 111 for exhibits, or 1 to 511 for letters). The third field indicates the sequential number of the comment by individual commentor (i.e., first comment by OR1).

Responses to comments are in Section 3.3 of this chapter. The transcript from the public hearing appears in Volume II, Section 2.4. Codes in the left margin indicate the start of a new speaker. Codes in the right margin identify separate comments. Comments for exhibits (Volume III, Chapter 1) and letters (Volume III, Chapter 2) are coded the same way.

3.2 SUMMARY TABLE

The following summary table lists comments by issue and by commentor. The columns on the left side indicate the type of comment (oral, written, or exhibit) and the coded commentor number. The columns on the right side show the number of separate comments by issue area. Comments are listed only once, regardless of whether they appear in multiple forms (i.e., oral, exhibit, or written).

Comments are grouped according to issue areas. Issues were organized into five broad categories: (1) Technical Program (TP), (2) Environmental Impact, (3) Policy (PO), (4) the EIS Process (EP), and (5) Other.

The Environmental Impact category is broken into the following issue areas:

- GS - Geology and Soils
- WR - Water Resources
- AQ - Air Quality
- BR - Biological Resources
- CR - Cultural Resources
- LU - Land Use
- VR - Visual Resources
- NO - Noise
- HM - Hazardous Materials
- PS - Public Safety
- IN - Infrastructure
- SE - Socioeconomics

The Other category is broken into the following issue areas:

- HSS - Hawaiian Sovereignty Issue
- RMI - Republic of Marshall Islands Issue
- UNC - Unclassified

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
1	110		Yukimura, Joann, Mayor	1			3			1				1			1				
2	1		Yoshioka, Saburo, representing Rep. Bertha Kawakami & Rep. Ezra Kanoho	1													1	2			
3			Valenciano, Randal, Kauai Council Member																		1
4	2		Hazlett, Annelle, representing David Nekomoto														1				
5			Lundgren, Jack, MD														1				
6			Saunders, David P., Commander American Legion, Post 51																		1
7		410, 456	Field-Grace, Sondra														1		1	1	
8			Peterson, Glenn, representing Nuclear Free Pacific														1				
9	3		Stark-Wickman, Cynthia			1	1														
10			Scott, John				1							3		1	1	1			
11	4		Hanson, Jay, West Hawaii Sierra Club										1				1			1	1
12		229	Freeman, Elizabeth				1		1											2	
13			Eiser, Mary, representing Julian Riklon																	1	
14	5		Inouye, Robert																		1
15			Cochran, Randolph																		1
16			Nihi, Ben, representing IBEW Local 1260, Unit 1																		1
17		74	Harmony, Zacheriah Branch																1	1	
18		135	Jager, Fred														1	1		1	
19			Pomroy, Sharon															1	1	1	
20			Ulii-Castor, Charlene																		1
21			Carlson, Ken					1	1	1				1		1	2	1	1		
22	6		Stong, Richard														1				
23	7		Love, John																		1
24	8		Soto, Averiet													1	1				
25	9,49, 106		Irwin, Richard	9			3	1		2				1			3				
26			Crater, Sharon Sue																	1	
27			Slater, Gary				1									1	1				
28			Bouret, Mimsey, reading a letter from Adam J. Horowitz																	1	
29			Sample, Gary	2										1		2	2				
30			Magee, Linda														1				
31		106, 275	Andres, Tim				1										2				
32			Saunders, Cheryl Ann													1	1				
33			Robinson, Keith																		1
34		401	Benoit, Gary															1		2	
35			Salsburg, Harry, reading for Lenny Siegel (Pacific Studies Center and National Toxics Campaign Fund)				1						2					1			

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
36			Mitchell, Wendy, reading for Johnsay Riklon																	1	
37	10		Scamahorn, Elizabeth, League of Women Voters											1			2				
38			Hill, Khiyani				1										1	1		1	
39			Trask, Arthur														1				
40			Yamashita, Kathie																		1
41	77		Warren, Van													1	1		1		
42			Warren, Maelynn																		1
43			Fernandes, William, American Legion																		1
44			Fernandes, Russell																		1
45		314	Henriques, Eugene																		1
46			Nelson, Alice																		1
47	11		Gerardo, Sonny											1							
48			Meyer, Bob				1									1					
49			Stamler, Vickie				1							2		2		1			1
50			Marchino, Robert																		1
51		66, 196, 361	McBride, Brigid				2							2			1				
52		418, 432	Measel, Robert Jr.																	2	
53			Ishikawa, Robert														1				
54		132, 311	Granda, Melosa				1														
55			Williams, Dan				1							2							
56			Mahall, Enshurah											1			1	2		1	
57			Patts, John														2				
58		397	White, Mercedes											1		1		1		2	
59			Hau, William											1							
60			Dawson, Tai										1	1							
61			Anderson, Mark																		1
62			Fernandes, Billy, representative for Lehua Fernandes						1												
63		89	Kalamau, Lei, Aboriginal Native Hawaiian Association																1		
64		143, 493	Bain, Carol											2			1	1			
65	41		Kaaumoana, Nanette					1	2								4		1		
66	42		Kimball, Deborah, representing League of Women Voters of Hawaii														3		1		
67	43		Ziegler, Marjorie, Sierra Club Legal Defense Fund	1														2			
68	33,63		Lawshe, Jim											1							
69			Godinez, Micco							1											
70			Walker, Kathryn														1				
71			Jetty, Chas														1				
72	56	62, 231	Marinelli, Suzanne, Chair Kauai Sierra Club	1	1			1		1		1				1	1		1	1	

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
73			Kagawa, Ross, reading for Ronald Kouchi (Chair of Kauai County Council)																		1
74			Schavone, Tracy																		1
75	36		Honjiyo, William T.														1				
76	81		Cutcher, Kawika																		1
77	105		Parks, Andrew																		1
78		24	Dawson, Jim														1				
79		290, 427	Cowden, Felicia			1	2									1				1	
80	60	292	Star, Tim	1										1				1			
81	64	423	Jones, Ken				3										1			1	
82			Ibanez, Ingrid				1									1	2	1			
83	66		Arruda, Earl, representing Rep. Patsy Mink	2				1						3				2			
84			Thal, Karuna											1				1			
85			Shiebert, Todd											2							
86		215, 461	Neumann, Janet				2			1				1			1			1	
87		297	Mons, Marion	1			2									1	1	1		1	
88			Nunes, Wendell																	1	
89			Woodruff, Genora				2							1		1					
90		336	Batterman, Scott				1		1					2		1	1	1		1	
91			Hurd, Amy											1							
92			Maarewicz, Conrad				1										1				
93	62		Hager, Jim				1														
94			Tottorio, Leland													1	1				
95			Holi, William						1												
96	61		Schaefer, Brian					2													
97		368	Morton, Laka				1							1						1	
98		11	Shields, Ron														1				
99			Holley, Anson											1		1	1				
100		328, 438	Norris, Tom					9													
101		369	Layer, Robert																		1
102			Champler, Silas																		1
103	111		Patterson, Kaleo Rev.															3	2		
104			Batista, Bethann Pualani Chandler											1		1				2	
105			Deville, Emmet, reading for Dr. Michael Jones, University of Hawaii	1			1			1				1				1			
106			Goodwin, Gregory Imes																		1
107			Arinaga, Ester														1				
108		327	Arinaga, Clifford	2						4		1		21		3	2	4			
109	59		Aloo, Peter				1						1	2							
110	31	358, 460	Tuck, Carmela				1							1		1	1			1	
111			Simpson, Scott, reading for Stan Butler (Save the Whales International)														2				

Summary Table

Code				Comment Category																
					Environmental													Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
112			Jones, Roberta													1					
113	58		White, Emmaline																		1
114			Wilson, Susan														2				
115			Bailey, Victor														2				
116		263	Deal, Chad																		1
117		165	Oliver, Polli											1			1				
118		16	Heacock, Don					1	1								2			1	
119	57		White, Vernon Kalaukahili																		1
120		356	Taylor, Gabriella				1							1				1			
121			Rediger, Cliff																		1
122			Momohara, Dan														1				
123			Speed, Errol																		1
124	55	38	Aiwohi, Larry																		1
125	54		McGregor, Davianna MD					2	2						1	5		1	1		
126		87	Rogers, Nani														1		1		
127			Trembath, Healani																		1
128	27		Frazier, Frances Halia						2	2							1		1		
129	65		Kaopio, Kaleialii																		1
130	53	222	Chandler, Linda											3		2		1		1	
131		207	Chandler, Jeff														1		1	1	
132			Daly, Michael														1				
133	52		Riley, Joni, reading for Robert Bowman	2													2				
134		414	O'Donnell, Sally				1			1				1			1			1	
135		498	O'Donnell, Jim																		1
136			Niau, Sonny																1		
137			Mandeville, Christopher																	1	
138			Ducker, Foster	3				1						1		1					
139	47		Dobashi, Myron																		1
140	92		Martin, Rodney																		1
141			Star, Regina																	1	
142	48		Coll, Ed														1				
143	67		Donnell, Daniel														1				
144			Marston, Nani														1				
145			Wheeler, Jean																		1
146	51		Rita, D.M.																		1
147	50		Ruiz, Ginger																		1
148		366, 465	Partida, Alberto																	1	
149		64, 399, 433	Forester, Deborah											1					1	1	
150		312, 398	Zoidus, Ann					4													
151			Hashimoto, Jackie															1			
152			Wong, Byron																		1
153			Morgan, Candice																		1
154		396	Churchill, Luella																	1	
155			Cortisa, Rod														1				
156			Mahall, Ahmen																	1	

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
157		417, 488	Leach, Collin	1									1				1			2	
	12		Kawamura, Edward, President Kauai Veterans Council																		1
	13		Sussman, Michael																		1
	14		Kaopio, Matthew Jr.																		1
	15		Mulhall, Mary																		1
	16		Unreadable Name																		1
	17		Sussman, Gaetal				1														
	18		Coursey, Kyle																		1
	19		Langford, Amy																		1
	20		Langford, Rebecca																		1
	21		Dean, Sunshine																		1
	22		Wade, Shannon																		1
	23		Dean, Amanda																		1
	24		Gere, Una																		1
	25		Gere, Ken																		1
	26		Hazlett, Annelle														1				
	28	482	Jarvis, Barbara															1			
	29		Yost, Robin																		1
	30	416	Rosenfeld, Dale																		1
	32		Irwin, Joyce																		1
	34		Sherrow, Cat																		1
	35		Crawford, P.																		1
	37		Mossman, Vida																		1
	38		Swalurt, George																		1
	39		Molira, Rodney																		1
	40	508	Wyeth, Heuionalani														1			1	
	44		Hansen, Steve															1			
	45		Kouchi, Ronald																		1
	46		Kunze, Marc																		1
	68	114	Eiser, Mary				1			1				2				1		1	
	69	384	Gomez, Frank	1																1	
	70		Unsigned															1			
	71		Unsigned																		1
	72		Leone, Yolanda																		1
	73		Tomas, Sharon														1				
	74	13	Agustin, Candace																		1
	75	14	Woodyard, E.													1	1				
	76		Hughes, William C.																		1
	78		Correa, Maxine																		1
	79		Domingo, Raymond																		1
	80		Markowski, Mark M.																		1
	82		Ross, Richard																		1
	83		Visitacion, John D.																		1
	84		Kanna, George A.																		1
	85		Stevens, Scott W.														1				
	86		Makuaole, Sandra																		1
	87		Morikawa, Mugsy K.																		1
	88		Kuroiwa, Paul S.																		1
	89		Sakoda, Larry																		1

Summary Table

Code				Comment Category																
					Environmental													Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
	90		Fujiwara, Harvard A.																		1
	91		Santos, Carolina																		1
	93		Horibe, Harriet K.																		1
	94		Soto, Peggy																		1
	95		Banquel, Robert																		1
	96		Murayama, Robin R. K.																		1
	97		Chiba, Nelson Y.																		1
	98		Yadoo, Wesley K.																		1
	99		McKeown, Barry																		1
	100		Morris, Richard J.																		1
	101		Pelegrino, James D.																		1
	102	36	Chinen, Randy R.																		1
	103		Fujita, Guy																		1
	104		Mirowsky, Lawrence																		1
	107		Form letter number 1 (305 additional form letters received)																		1
	108		Form letter number 2 (178 additional form letters received)																		1
	109		Form letter number 3 (1,882 additional form letters received)																		1
		1, 349	Lester, Ruth Ann											1			1				
		2, 90	Jones, Michael	3			3			1				2				2			
		3	Velarde, Monica															1			
		4	Weir, Birdie O., Director J.F. Drake Memorial Learning Resources Center, Alabama A&M University																		1
		5	Mackey, Kathie L.	1																	
		6	Levine, Robert E.																1		
		7	Dente, Fred																		1
		8	Ball, Matthew M.	1			6									1	1				
		9	Rubenstein, Gary, Sierra Research				7														
		10	Burris, Samuel J.														1				
		12, 342, 421	Snyder, Maria C. M.D.																	1	
		15, 390	Merrimax, Francis	1																	
		17, 271, 335, 341	Francisca, Beth				1									1					
		18	Bentley, Charlene					1													
		19, 479	Freeman, Philip													1					
		20	Hutchings, Jennie																	1	
		21	Booth, Sharon																		1

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		22	Mesler, James																		1
		23	Livingston, Jana																		1
		25	Conway, Ralph Edward																		1
		26	Steward, Kathleen, The Hoku-Iwa Co. Ltd.				1									1			1		
		27, 118, 129	Dunn, Alison L.				1									1					
		28	Shapiro, Howard						1										1		
		29, 402, 474	Diamond, Caren F.				2	1						1						1	
		30	Chuan, Raymond L.							3											
		31, 190, 291, 343	Palmer, Pamela				1									1					
		32	Blake, Hartwell H.K.																		1
		33	Sato, Glenn H., Director, County of Kauai, Office of Economic Development	3			2	2		1			1	4				2			
		34	Kutaka, Vivian																		1
		35	Cosbey, Lin																		1
		37	Riedel, Suzanne											1							
		39, 119, 156, 347	Thomson, Joseph				1		1							1				1	
		40	Fleming, Charlene				1													1	
		41	Mark, Pattie Rae Van				1									1					
		42, 352	Price, Jana																	1	
		43, 331	Kelley, Mary Lu					1								1				1	
		44	Snyder, E.C.																		1
		45, 330, 437	Perrotta, Louis A. Jr.				1		1					1				1		1	
		46	Arata, Deborah																		1
		47	Kuhn, David																		1
		48, 357	Zanin, Maurizia				1							1				1		1	
		49, 391, 431	Churchill, John																	1	
		50	Unsigned																		1
		51, 353	English, Anne													1					
		52, 376	Swatek, Michael					1								1		1			

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		53, 348	de Deo, Edward MD				1									1					
		54	Takemoto, Tsugime																		1
		55, 109	Melendez, Deborah																		1
		56, 350	Sherman, Richard											1				1			
		57	Aulon, Anita Van											2							
		58	Lucas, Mary E.																		1
		59, 332	Doty, Kay											1							
		60	Parsons, Judith																		1
		61	Shea, Kate Harrington																		1
		63	Clause, Connie															1			
		65	Manini, Joseph Punilei Sr.																1		
		67	Paglinawan, Richard K.				2	1		4					1						
		68	Ellenburg, Chloe																		1
		69	Wilson, Kenny																		1
		70	Faye, Alan E. Jr.																		1
		71	Native Hawaiian Advisory Council												1				1		
		72, 334	Mehl, Helen				1	1	1					1		1					
		73	Macknowski, Robert																		1
		75, 159, 160	Addison, Josh				1									1					
		76	Steinwachs, Leslie																		1
		77	Ingram, Renee																		1
		78	Snyder, Fred																		1
		79, 480	Wagoner, Darcy																		1
		80	Martin, Mrs.																		1
		81, 333	Carpenter, Linda																		1
		82, 436	Korte, Gera					1													
		83	Kawane, Wallace M.																		1
		84	Barringer, Winona																		1
		85, 374	Mansfield, Becky																		1
		86	McCuistion, Laura																		1
		88	Gotje, Martin	2			1		1				1	1				1		1	
		91	Kurasahi, Steve																		1
		92	Minium, Flora																		1
		93	Oda, Ronald M.																		1
		94	Boury, Marilyn																		1
		95	McClelland-Cowan, Kathy																		1
		96	French, Sally																		1
		97, 161	Bambas, Yvette											1				1			

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		98	Farhot, Karime																		1
		99	Aoki, Candace Jo																		1
		100, 486	Flessa, Paul																		1
		101	Sivadas, Iraja																		1
		102	Hopkins, Kimberly																		1
		103	Muraoka, Rene																		1
		104	Rubio, Ralph																		1
		105, 363	Gailey, Susan																		1
		107	Winkler, James and Dorrie																		1
		108	Cook, Edd																		1
		110	Deranken, Marchelle																		1
		111	Guerra, Raquel																		1
		112	Kolder, Teri																		1
		113	Nakahara, Joyce																		1
		115	Gulliksen, Gary																		1
		116	Byrd, Jaime																		1
		117, 192	Kaauai-Anama, Nalani K.	1			1									1					
		120, 157	Williams, Valerie				1									1					
		121	Brow, Ben																		1
		122	Marty, Conrad							1											
		123	Nelson, Krija S.																		1
		124	Fehring, Bruce and Cyndee																	1	
		125	Medico, Jane																		1
		126	Bekeart, Dana																		1
		127	Diaz, Sofia																		1
		128	Rawlins, Debra																		1
		130	Graff, Phyllis D.																		1
		131	Luinn, Jeannie																		1
		133	Riklon, Julian																	1	
		134	Horowitz, Adam J.																	1	
		136, 458	Long, Lyn																		1
		137	Long, William																		1
		138	Smith, Drake																		1
		139	Butler, Stanley																		1
		140	Addison, Della																		1
		141	Kucera, Darris											1							
		142	Kucera, Richard																		1
		144	Salamonsen, P.J.																	1	
		145	Meorolt, David																		1
		146	Aki, Kaanohio Kalani																	1	
		147, 247	Offley, Caleb M.																		1
		148	Aguilar, Leonard																		1
		149	Illegible																		1
		150	Tokehan, Lee Ann																		1

Summary Table

Code				Comment Category																
					Environmental													Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		151	Guinivan, Thomas, U.S. Army Environmental Hygiene Agency			1	4					1		3	1						
		152	Solomon, Rebecca Eve																		1
		153	Cosbey, Bruce																		1
		154	Shanha, Michael																		1
		155	Rogers, Cassidy																		1
		158	McKibbin, Doug																		1
		162, 299	Hirata, Gerald M.														1	1			
		163, 178	Lo, Karl	1					1				1								
		164, 289	Lo, Catherine P.				1											1			
		166	Oliver, Dennis J.																		1
		167	Dennie, Jane																		1
		168	Henderson, Frank																		1
		169	Tomlinson, Jay																		1
		170	Dakin, Cheryl																		1
		171	Chandler, Lei																		1
		172	Miller, Bonnie																		1
		173	Winninger, Isabelle																		1
		174	Star, Ruby																		1
		175	Losefo, Pesio, Sister	1																	
		176	Stark, June B.																		1
		177	Templeton, Skip																		1
		179	Mandel, Laura																		1
		180	Jager, Diane																		1
		181	Bayudan, Emilio																		1
		182	Loomis, Jilda																	1	
		183	Mandel, Mark																		1
		184	de Treaux Nansel, Lisa																		1
		185	Tyler, Nancy R.N.				2							1							
		186	McKenna, Cynthia																		1
		187	Palting, Larry																		1
		188	Brenson, Eric																		1
		189	Gettier, Nanette				1			1				1						1	
		191, 362, 372	Bowman, Robert M., Lt. Col., Ph.D.	3								1		2				1			
		193	Gasaway, Asa																		1
		194, 511	Paty, William W.						5	3											
		195	DeChidif, Victor R.																	1	
		197, 248	Patula, Al				1									1					
		198	Rodarte, Sandra														1				
		199	Downey, Catherine																		1
		200	Petrich, Doris																		1
		201	Bruce, Eve																		1
		202	Sullivan, Leatrice																		1
		203	Connella, Marlene				1							1		1					

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		204	Granda, Sierra																		1
		205, 213	Granda, David																	1	
		206	Bajit, Leonides O.																		1
		208, 214	Granda, Marquita																		1
		209	Faye, L.A. Jr.														1				
		210	Granda, Cassidy																		1
		211	Miller, Mary Pat																	1	
		212	Dent, Orville	2		1								2		1	1				
		216	Coots, Michael																		1
		217	Bailey, Karla																		1
		218	Spencer, Shelly	1																	
		219	Bailey, John S.																		1
		220	Brower, Andrea																		1
		221	Brier, Laurel																		1
		223, 378	Cone, Debra Joyce													1					
		224	Brower, Robert																		1
		225	Rhodes, David																		1
		226	Christensen, Carl C.														1				
		227	Steidle, Karen																		1
		228	McBride, Bonnie																		1
		230	Riklon, Johnsay A.																	1	
		232	Stocker, Steven C.																		1
		233, 500	Matthews, Ann				1														
		234, 323	Makarewicz, Sienna											1							
		235	Makarewicz, Irene																		1
		236	Makarewicz, Roman																		1
		237	Cerchio, Salvatore, Moss Landing Marine Laboratories					3													
		238	Liha, Manisha	1																	
		239, 385	Bockwinkel, Susan T.																	1	
		240	Granda, Che																		1
		241	Blaich, Beryl																		1
		242	Foster, Jim																		1
		243	Frailey, Richele																		1
		244	Hudson, Joan																		1
		245	Fujiyoshi, Ronald S., Missionary United Church Board for World Ministries																	1	
		246	Bailey, James R.																		1
		249	Pickett, Thomas S.																		1
		250	Chun, Dennis																		1
		251, 463	Mayall, Hilary																		1
		252	Jones, Jullita																		1
		253	Garma, Marciana																		1

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		254	de Buhr, Evelyn																		1
		255	Nishihira, Amy C.	1			1														
		256	Boyce, Julia																		1
		257	Mariano, Ferdinand																		1
		258	Hoffmann, James PhD																		1
		259	Carbonel, Jess																		1
		260, 360	McHenry, Robert W.																		1
		261	Zerrille, Gary																		1
		262	Smockhoffmann, Sharon PhD																		1
		264, 477	Tillman, Ingrid															1		1	
		265	Riley, Joni																		1
		266	Pickett, Kathleen K.																		1
		267	LaFete, Soleille																		1
		268, 503	Ermrich, Svenja													1					
		269	Lewis, Dickie																		1
		270	Dawz, Michele Nalani				1									1					
		272	Pa, Cyndi																		1
		273	Friend, James																		1
		274	Frank, Deborah L.																		1
		276	Darnell, Eleanor																		1
		277	Nishimoto, Catherine and Brysone																		1
		278	Moore, Sally Jo																		1
		279	Dabancourt, Leonie																		1
		280	Morris, Patrice																		1
		281	Spinnler, Jesse																		1
		282	O'Hearn, Michelle																		1
		283	Kepner, Brandon W.																		1
		284	Rhodes, Heidi																		1
		285	de Mello, Lilian																		1
		286	Roversi, Lee																		1
		287	Schield, T.																		1
		288	Hiraoka, Bernice																		1
		293	Pearson, Mark																		1
		294	Rogers, Django																	1	
		295	Katahara, Glenn																		1
		296	Petrich, Alfred J.																		1
		298	Bailey, Nicole A.																		1
		300	Winn, Rosemary																		1
		301	Axtell, Marilyn				1							1							
		302	Doutt, Martha L.																		1
		303	Sadomiano, Francisco																		1
		304	Durkin, Patrick L.																		1
		305	Andres, Laurez																		1
		306, 307	Blaich, Gary L.				1														

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		308, 395, 489	Jones, Mary Mildrid																		1
		309	Fitzgerald, Frances	1																	
		310	Serle, Ranjana																		1
		313	Patterson, Kaleo, The Nohili Coalition	1	1		1	5	7	4					1	3		2			
		315	Stuart, Barbara P.										1	1			1				
		316	Lawrence, Randy																	1	
		317	Schutt, LaRae																		1
		318	Lee, Kekapa and Jackson, Norman W., United Church of Christ	1			1													1	
		319	Cervantes, Lisa																		1
		320	Cervantes, Jesse																		1
		321	Serle, Ronald																		1
		322	Blaich, Mehana																		1
		324	Blaich, Meleana																		1
		325	Kekahu, John K. III and Britton, John M.						1												
		326	Ziegler, Marjorie, Hawaii Audubon Society	7		1	8	18	1	3				6	1			1			
		329	Inouye, Daniel K.																		1
		337	Fernandez, Trista																		1
		338, 451	Viernes, Kathleen																	1	
		339	Unreadable																		1
		340	Grier, William																		1
		344	Ross, Lisa K.																		1
		345	Yialui, Lucie																		1
		346	Peragine, Lana											1							
		351	Love, Charley																		1
		354	Strard, Kathleen																		1
		355	Spillane, Patricia B.																		1
		359	Verrill, Lucille											1		1				1	
		364	Ridgeway, Lynn																		1
		365	Unsigned																		1
		367	Michaelsen, Lillian																	1	
		370, 485	Farwell, Heidi																	1	
		371	Salsburg, Harry																		1
		373	Jordan, Judy											1							
		375	Schlichter, Joseph																		1
		377	Bockwinkel, Nikki																	1	
		379	Archambault, L.J.																	1	
		380, 434	Unanian, Betty																	1	
		381, 471	White, Martin MD				1													1	
		382, 473	Shapiro, Dan					1												1	

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		383, 386	Hee, Marisha											2		1				1	
		387	Mentley, Lue																		1
		388, 429	Marcus, David																	1	
		389	Unanian, E.																	1	
		392	Oceana, Alia																		1
		393	Wiezbowski, Malika																	1	
		394	Benta, Margaret																	1	
		400	Mitchell, Wendy																	1	
		403	Soleysik, Steven R.																	1	
		404	Clair																		1
		405	Anderson, Niklas and O'Hearn, Michelle																		1
		406, 484	Keough, Kirby														1			1	
		407	Washburn, Carol Ann																	1	
		408	Poliatch, Karen Bacon																	1	
		409	Comini, Michael A.																	1	
		411	Paigge, Barbara Jean																		1
		412	Kaipaka, Marilyn Miki																	1	
		413	Dybbro, Dale M.																	1	
		415	Owen, Betty																	1	
		419, 467	Dybbro, M.E.																	1	
		420	Kneps, Christine																	1	
		422	Cowden, Charles Lee																	1	
		424	Read, Raymond C.																		1
		425	Mendleson, Merryl																	1	
		426	Wells, Gerard																	1	
		428	Browssard, Olivia																		1
		430	DeVille, Alia																		1
		435	Borofsky, Ameria																		1
		439	Friedman, D.																		1
		440	Post, Amy																		1
		441	Post, Wallis																		1
		442	Varaday, Larissa																		1
		443	Arreola, Carol																		1
		444	Guara, Mary																		1
		445	Lee Lee																		1
		446	Fernandez, Merideth Petro																		1
		447	Greenberg, Jan																		1
		448	Unsigned																		1
		449	Davis, Rhodes																		1
		450	Nichols, Lori																		1
		452	Schofield, Faye																		1
		453	Ovarton, L.																		1
		454	Sabbatini, Lola																		1
		455	Graham, Mary Frances																		1
		457	Masters, Mark																		1
		459	Weber, Pamela																		1

Summary Table

Code				Comment Category																	
					Environmental														Other		
OR	EX	WR	Commentor	TP	GS	WR	AQ	BR	CR	LU	VR	NO	HM	PS	IN	SE	PO	EP	HSS	RMI	UNC
		462	Browssard, Chris																	1	
		464	Leihitu-Pellin, Carolina																	1	
		466	Rossite, Don																	1	
		468	Knaps, Albiecht MD																	1	
		469	Anderson, Niklas																		1
		470	Harty, Janeen																		1
		472	Beckner, Derek																		1
		475	Manaker, Ray A.																		1
		476	Weber, Jonathan																		1
		478	Yukimura, Jiro and Jennie																		1
		481	Barnes, Charmaine F.																	1	
		483	Ka'iakapa, Patricia																		1
		487	Levine, Steven																		1
		490	Metteauca, Craig																		1
		491	Jacobsen, David																		1
		492	Soleysik, Steve and Linda																		1
		494	Ashburn, Kim																		1
		495	Lerner, S.																		1
		496	Harrison, John T. PhD, Environmental Coordinator, Univ. of Hawaii at Manoa	1			10	3	3					2			1	1		1	
		497	Alvarez, Patrick																		1
		499	Granda, Chia																		1
		501	Hilbonson, M.											1						1	
		502	Damron, Mark H.				1														
		504	Stayton, Susan					1								1		1			
		505	Furgeson, Suzanne Marie																		1
		506	Stokes, Debbie																		1
		507	Richardson, Lorraine													1					
		509	Morrow, Melissa																	1	
		510	Lewin, John				7							5							
			TOTAL	62	2	5	123	64	35	37	0	4	10	123	6	64	98	60	22	109	324

3.3 RESPONSES TO COMMENTS

This section provides responses to comments. The responses are organized by category, as discussed in Section 3.1. The responses are keyed to the comment codes. These comments appear in Volume II, Chapter 2, and Volume III, Chapters 1 and 2. Where comments have resulted in an addition or revision to the Draft EIS, the response states the section in the Draft EIS where the change is made. These changes can be found in Chapter 2 (Additions and Revisions to the Draft EIS) of this volume.

3.3.1 Public Hearing - Oral Comments

Response to comment OR1-1: The Council on Environmental Quality regulations, which govern the preparation of an EIS, require the agency to consider both the beneficial and detrimental effects including ecological, aesthetic, historic, cultural, economic, social, or health whether direct, indirect, or cumulative. The effects to be considered in the EIS do not include those related to national policy (40 CFR Part 1508.8). Issues of national policy are outside the scope of the EIS.

Response to comment OR1-2: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19. These changes discuss the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle.

Response to comment OR1-3: Air quality data for the period 1985 through 1987 are the most recent data available. The annual average for ambient levels of fine respirable particulate matter (PM_{10}) of the Lihue data was 22 $\mu g/m^3$ for each of those three years. The annual PM_{10} national ambient air quality standard (NAAQS), promulgated July 1, 1987, is 50 $\mu g/m^3$. The 24-hour PM_{10} NAAQS is 150 $\mu g/m^3$. No exceedances of the 24-hour PM_{10} NAAQS were recorded in Lihue from 1985 through 1987. The highest 24-hour value in this 3-year period was 48 $\mu g/m^3$ in 1985.

Data from monitoring stations on neighboring islands is generally not applicable to air quality levels at PMRF and KTF. Carbon monoxide and ozone are measured at urbanized locations. Sulfur dioxide is measured at undeveloped sites, but such sources as a refinery or a wastewater treatment facility are nearby. The annual average for ambient levels of sulfur dioxide at monitoring stations in Hawaii is less than 5 $\mu g/m^3$. The annual sulfur dioxide NAAQS is 80 $\mu g/m^3$. Nitrogen dioxide is not monitored in Hawaii. Sulfur dioxide is not emitted by the Strategic Target System vehicle.

A comprehensive survey of emission sources at PMRF and KTF, to include power sources, rocket launches, and vehicle traffic, has not been prepared. A reasonable evaluation of the Strategic Target System impacts on the air quality of the area was made (see Section 4.3 of the Draft EIS). Also see Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19.

Response to comment OR1-4: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for an update on the Department of Defense studies on the replacement of halon in thrust vector control systems.

Response to comment OR1-5: The halon is not used as a fuel but as part of the second-stage thrust vector control system for steering. See page 4-20 of the Draft EIS. Currently, there is no replacement for halon. The Army is keeping abreast of current studies and will evaluate possible alternatives as they become available.

Response to comment OR1-6: The portion of the coastline affected by the closure (explosive safety quantity-distance) imposed when the vehicle is on the launch pad is a small portion of Recreation Area #1 (see Draft EIS, Figures 3-9 and 4-1) on PMRF. While, on the whole, the beaches on PMRF are popular portions of the coastline, the small (~ 0.5 mile) stretch of beach affected by the 56-day-per-year closure has a history of more limited use. During a recent 3-year period, 11% of the people who signed in at the gate to use the beaches at PMRF said their destination was Recreation Area #1. Of these, 43% said they were going there to fish.

While this small portion of Recreation Area #1 would be closed an additional 944 hours each year (all of Recreation Area #1 is currently closed 2,610 hours per year), the rest of Recreation Area #1 would remain open and unaffected by the Strategic Target System (except when the ground hazard area is cleared just prior to launch), as would all of Recreation Area #2 and Recreation Area #3. Majors Bay is in Recreation Area #3.

Even when the 56-day-per-year closure is imposed, the public would still be able to pass along the beach between the northern and southern portions of Recreation Area #1 except when the ground hazard area is cleared just prior to launch.

An area of Polihale State Park (76 acres of the 154 acres in the park) and an area of the Kekaha Sugar Company leased cane fields (1,700 acres) would be verified clear for a period of 20 minutes, 4 times a year for 10 years as a result of the Strategic Target System program. Additionally, EDX and Vandal launches would result in the area being verified clear for a period of 20 minutes per launch for a total of 3 launches per year for EDX and 8 launches per year for Vandal. To accommodate potential delays due to maintenance and weather, an additional 15 launch events were considered in the determination of the potential for cumulative effects on land use, for a total of 30 potential launch events. This means that the area would be verified clear for a total of less than one day each year over a 10-year period.

All present and foreseeable-future activities that would affect land use were evaluated for cumulative impacts. Access to the Nohili Dune area of Barking Sands would be available through Polihale State Park except during actual launch events. In addition, the proposed Memorandum of Agreement and easement would ensure preservation of the area as open space for continued public use. This is consistent with state and local planning for the area.

A figure has been added to clarify the exact portion of Recreation Area #1 that would be closed for 56 days a year and its relationship to other beach areas of PMRF. This figure can be found in Chapter 2 of this volume.

Additional information on land use and restricted beach access can be found in the Draft EIS on pages 2-7 through 2-9, pages 2-16 through 2-23, pages 3-35 through 3-39, and pages 4-34 through 4-38.

Response to comment OR1-7: Road transportation will be used only if adverse conditions exist that will make it unsafe to leave the liquid propellant in place. Additionally, the harbor master and state and local transportation officials will be consulted prior to transporting liquid propellant by roads. Kauai County authorities have been consulted regarding transportation procedures and emergency plans for Strategic Target System hazardous materials on several different occasions. The transportation plans have been amended based on the results of those consultations. In July 1991 the Environmental Engineer for the USASDC met with the Kauai County Mayor, the Civil Defense Coordinator, and Fire Chief in two separate meetings. On December 6, 1991, PMRF, Sandia, and NASA personnel met with the Hazardous Materials Coordinator for Kauai County, the Kauai County Fire Chief, and the State Civil Defense Coordinator. Additional coordination meetings with county officials on this issue are planned.

The Draft EIS, which details the proposed transportation procedures in Section 4.10, has been given to Kauai County authorities and the general public along with requests for further comments and suggestions. The transportation of Strategic Target System hazardous materials will be in accordance with all applicable laws and safe transportation practices.

Response to comment OR2-1: The Council on Environmental Quality regulations for the preparation of an EIS require the agency to consider both beneficial and detrimental effects, including ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.

Response to comment OR2-2: If the activity changes significantly, supplemental environmental documents would be prepared. Related new activities would be tiered in a new analysis.

Response to comment OR2-3: Section 4.12.2 of the Draft EIS concludes that the selection of the no action alternative will continue existing activities at PMRF. The Draft EIS notes, however, that the no action alternative reduces PMRF's viability as an important national defense asset. This is because the Strategic Target System would represent the bulk of research and development activities at PMRF and KTF. The inability of PMRF to perform part of its research and development mission would make the base potentially less valuable as an important national defense asset.

Response to comment OR2-4: See Table 2-1 of the Draft EIS (page 2-31), which indicates how the program has already been modified due to public concerns and how mitigations have been incorporated based on the potential for significant impacts. Also listed are discretionary mitigations, which the decision maker may adopt into the program. If the action changes significantly, supplemental environmental documentation would be prepared. Related new activities would be tiered in a new analysis, as provided in 40 CFR Part 1508.28.

The comments by the public, both written and oral, will be presented to the decision makers, including the Director, SDIO. The Product Manager for the Strategic Target System, LTC Manguso, is one of the decision makers in the process, and he was present at all sessions of the public hearing.

Response to comment OR3-1: Thank you for commenting on the Draft EIS.

Response to comment OR4-1: See response to comment OR2-3.

Response to comment OR5-1: Federal government spending priorities are determined by Congress and are an issue of national policy. The effects to be considered in the EIS do not include those related to national policy (40 CFR Part 1508.8).

Response to comment OR6-1: Thank you for commenting on the Draft EIS.

Response to comment OR7-1: PMRF rests on ceded lands, which have either been conveyed to the United States for military use or are leased by the military from the state. Members of the Hawaiian sovereignty movement claim ceded lands for the Hawaiian people. The issue is outside the scope of the EIS. Strategic Target System activities will not involve the use of the lands designated as Hawaiian Home Lands.

Response to comment OR7-2: See response to comment OR5-1.

Response to comment OR8-1: National security is a policy issue. The effects to be considered in the EIS do not include those related to national policy (40 CFR Part 1508.8).

Response to comment OR9-1: Section 4.2 of the Draft EIS presents a detailed summary of impacts on water resources.

Response to comment OR9-2: The data that formed the basis for Table 2-3 "Summary of environmental impacts of the proposed action and no action alternative for the Strategic Target System program" are presented in Chapter 4, Environmental Consequences and Mitigations. Air quality is discussed in Section 4.3, pages 4-6 through 4-22. Whenever possible, air quality impacts were quantified. An example is the air dispersion modeling of pollutant concentrations at various distances from the missile launch. In some cases, quantification of effects is not possible. For example, the exact amounts of fugitive hydrocarbon emissions from parts cleaning are not yet known because the types and amounts of solvents are not yet known. But since the parts-cleaning operations will be minimal, the Draft EIS states that only small amounts of fugitive emissions of hydrocarbons are expected. The rocket exhaust emission products and halon 2402 are not known to be carcinogenic or mutagenic; thus, no chemical and molecular changes in exposed persons, animals, or plants are anticipated.

Response to comment OR10-1: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been changed to explain the procedures in more detail.

Response to comment OR10-2: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, and also see the Draft EIS, page 4-17, paragraph 3, for a discussion of the evaluation of significance for the issue of stratospheric ozone depletion.

Response to comment OR10-3: Section 3.12 of the Draft EIS acknowledges the importance of the tourist industry to Kauai's economy. Section 4.12 of the Draft EIS notes that a launch accident could affect the local economy. The remote possibility of an event that would require or involve flight termination over land is not expected to have a negative effect on tourism. Any impact of a terminated launch would be contained within the ground hazard area. Impacts would be short term because remedial actions would be initiated to restore the land to its original condition. Therefore, the risk of physically harming a tourist is remote as is the potential for any long-term visual signs of the event that might present a negative image for tourists.

The perception that the Strategic Target System is a threat to individual safety could deter some individuals from visiting Kauai. The chance of this type of perception significantly affecting tourism is considered remote. The low profile of PMRF/KTF operations limits this impact since most tourists are generally not aware of PMRF/KTF activities. The chances of a visitor being affected by a Strategic Target System launch is also remote. The closure of the ground hazard area is a very short duration and is not expected to significantly restrict access to the Polihale State Park, a tourist destination point. It is possible that the Strategic Target System launches could become a tourist attraction in themselves, thereby offsetting any negative perception caused by the inconvenience of the temporary access restriction to the beach.

Response to comment OR10-4: The chance of an accident is extremely remote. Its unlikely probability is based on the analysis of booster safety in Section 4.10.1.2 of the Draft EIS.

Response to comment OR10-5: NEPA requires rigorous explanation and objective evaluation of all reasonable alternatives. For alternatives that are eliminated from detailed study because they are not reasonable, NEPA requires the agency to discuss briefly the reasons for eliminating them (40 CFR.1502). The U.S. Army analyzed the range of alternatives against certain criteria to determine if the alternatives were reasonable. Among the alternatives looked at were new and remanufactured motors (see Draft EIS Section 2.3, pages 2-34 through 2-38). They were rejected for schedule, cost, technical, and treaty limitation reasons.

Response to comment OR10-6: See response to comment OR10-4.

Response to comment OR10-7: See response to comment OR2-3.

Response to comment OR11-1: See response to comment OR5-1.

Response to comment OR11-2: The potential environmental impacts of the Strategic Target System on Kwajalein Atoll, which is part of the independent sovereign Republic of the Marshall Islands, were assessed in Section 2.3.2.9 of the 1989 EIS, Proposed Actions at U.S. Army Kwajalein Atoll (USAKA). No potential for significant environmental impacts from Strategic Target System activities was identified. The USAKA EIS describes the socioeconomic conditions of the Marshallese in the Kwajalein Atoll in Section 3.10:

> In December 1988, 1,007 Marshallese were employed at USAKA ... Since the implementation of the Compact of Free Association in October 1986, efforts by USAKA, RMI [Republic of the Marshall Islands] and KALGOV [Kwajalein Atoll Local Government] officials have increased the number of jobs available for Marshallese employees ... In 1988, USAKA employment (including domestics) represented 52 percent of Marshallese employment at Kwajalein Atoll. (USAKA EIS, Section 3.10.1.)
>
> Up to 200 new housing units are being developed by KADA [Kwajalein Atoll Development Agency] on Gugeegu [north of and adjacent to Ebeye] and construction is targeted to be completed in late 1989 or early 1990. The housing project will replace 76 homes destroyed by Tropical Storm Roy in January 1988. The remaining new housing would replace the housing units identified by KADA and would help meet the need for additional housing. (USAKA EIS, Section 3.10.3.)

The U.S. Army Civil Action Team assisted in the preparation of Gugeegu Island for the housing project.

> The Compact of Free Association sets forth various grants and cash payments made by the United States for USAKA's use of the lands it occupies and the lagoon area it uses. The annual Compact payments include fixed payments plus payments that are adjusted for inflation (referred to as adjusted funds). Compact payments for 1988 totalled $42 million. (USAKA EIS, Section 3.10.4.)
>
> KADA was established by the RMI legislature and the Compact payments allocated to KADA are intended to benefit the Marshallese residents of Kwajalein Atoll. Improvements that have been funded by KADA funds include construction and operation of a new fuel-fired electrical generating plant and an associated desalination plant; construction of paved roads with curbs, gutters, and sidewalks; purchase and operation of a large, land-based, dragline dredge that created fill areas at the south end of Ebeye for a new park and at the north end to cover the solid waste landfill and to create a new area for housing ... KADA has started development of new housing on Gugeegu, and proposes to build a causeway to connect Ebeye and Gugeegu. (USAKA EIS, Section 3.10.4.)
>
> In 1986, USAKA initiated a program to bring Marshallese children from Ebeye to attend school at USAKA beginning with the kindergarten level. These students are selected by the local government in conjunction with USAKA and school personnel. In 1988 and 1989, there were five students each in grades K through 2. Eventually, Marshallese students will be placed in all grade levels." (USAKA EIS, Section 3.10.6.)

The 1989 USAKA EIS found there were no adverse socioeconomic impacts as a result of the environmental consequences of any SDI testing at USAKA, including tests of the Strategic Target System.

Response to comment OR11-3: The Council on Environment Quality regulations that govern the preparation of an EIS state:

> For purposes of complying with the Act [National Environmental Policy Act], the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary-cost benefit analysis and would not be when there are important qualitative considerations. (40 CFR Part 1502.23)

Since benefits of national defense contain inherently important qualitative considerations, a cost benefit analysis of the Strategic Target System would not be an appropriate analytical method.

Response to comment OR11-4: No radioactive material will be used on the Strategic Target System. A magnesium-thorium alloy, present in the first/second interstage, was analyzed in the EA and the Draft EIS under hazardous waste disposal. This alloy is not considered a radioactive material.

The test objects to be carried on board the Strategic Target System are not live warheads. None of the test objects will contain any source of ionizing radiation. None of the test objects will carry any amount of depleted uranium.

Response to comment OR12-1: See response to comment OR11-2.

Response to comment OR12-2: The Strategic Target System launch pad is adjacent to the Nohili Dunes. Program activities will not take place directly on the dunes. The only potential for disturbance to the dunes is a flight terminated immediately after a launch. If this occurs, procedures are in place to minimize potential disturbance. See Section 4.5 of the Draft EIS.

Response to comment OR12-3: See response to comment OR11-2.

Response to comment OR13-1: See response to comment OR11-2.

Response to comment OR14-1: Thank you for commenting on the Draft EIS.

Response to comment OR15-1: Thank you for commenting on the Draft EIS.

Response to comment OR16-1: Thank you for commenting on the Draft EIS.

Response to comment OR17-1: See response to comment OR7-1.

Response to comment OR17-2: See response to comment OR11-2.

Response to comment OR18-1: An EIS prepared independent of the agency responsible for the activity is inconsistent with the Council on Environmental Quality regulations implementing NEPA. NEPA, which governs the preparation of an EIS, requires the agency responsible for the activity to also be responsible for the preparation of the EIS. The Draft EIS was prepared by a government team of Army, Navy, SDIO, NASA, and DOE representatives, assisted by consultants. A team of headquarters-level government personnel reviewed the Draft EIS and participated in the final editing. A list of preparers is in Chapter 5 of the Draft EIS.

The Strategic Target System Draft EIS has been independently scrutinized by the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the U.S. National Marine Fisheries Service, the Hawaii Department of Land and Natural Resources, the Hawaii Department of Health, the Hawaii Office of State Planning, and throughout the comment process, the general public.

Response to comment OR18-2: See response to comment OR11-2.

Response to comment OR18-3: See response to comment OR5-1.

Response to comment OR19-1: A determination will not be made until all relevant information has been provided to the decision maker. The final decision has not been predetermined.

Response to comment OR19-2: See response to comment OR7-1.

Response to comment OR19-3: See response to comment OR11-2.

Response to comment OR20-1: Thank you for commenting on the Draft EIS.

Response to comment OR21-1: See response to comment OR10-3.

Response to comment OR21-2: See response to comment OR5-1.

Response to comment OR21-3: See response to comment OR2-4.

Response to comment OR21-4: The cultural significance of the Nohili Dunes is well recognized. A cultural and historical/ethnographical study of the Nohili and Mānā areas was undertaken as part of this EIS.

Response to comment OR21-5: See response to comment OR7-1.

Response to comment OR21-6: See response to comment OR1-7.

Response to comment OR21-7: The effects of potential spills associated with the transportation of hydrazines have been addressed in the Draft EIS. The potential for impacts to sensitive wildlife species from a spill of hydrazine-type fuels is addressed on page 4-27 of the Draft EIS. The impacts to wildlife and fish in general are expected to be similar. As in the case of sensitive wildlife species, no adverse effects are anticipated.

Response to comment OR21-8: See response to comment OR1-6.

Response to comment OR21-9: See response to comment OR5-1.

Response to comment OR22-1: Thank you for commenting on the Draft EIS.

Response to comment OR23-1: Thank you for commenting on the Draft EIS.

Response to comment OR24-1: See response to comment OR2-3.

Response to comment OR24-2: As presented in Section 3.12 of the Draft EIS, PMRF and KTF are major employers of skilled labor on the west side of Kauai. Based on operational hours, approximately 75 percent of PMRF's mission supports Fleet training. The remaining 25 percent of the PMRF mission supports research and development activities, the majority of which is in support of SDI-related programs. Almost all of the KTF mission supports research and development programs.

PMRF has 16 full-time government and contractor personnel working on the program. In addition, Sandia National Laboratories at KTF, which operates the Strategic Target System launch pad and launch operations building, employs 17 full-time personnel to keep the facility in operational condition. This represents 24 jobs at PMRF and KTF that are directly related to the Strategic Target System program.

Section 4.12 of the Draft EIS discusses the personnel required for Strategic Target System launches. Additional 45 program personnel would be on temporary (one month per launch) duty, thus creating minimal impact on both the island's economy and environment.

It is unlikely that the no action alternative would result in the immediate closure of PMRF or KTF. PMRF would continue to support Fleet training requirements. Personnel at PMRF and KTF that provide direct support to the Strategic Target System program would be assigned to other programs to the extent possible. The ability to replace the Strategic Target System with a program of similar scope might not be possible, however. This is because Strategic Target System testing represents the bulk of the research and development "business base" at PMRF and KTF in the foreseeable future. In an era of shrinking defense budgets, there are fewer programs to take the place of the Strategic Target System program, and there is increased competition among Department of Defense agencies for research and development of customers. A significant reduction in the volume of research and development business at PMRF and KTF would make it difficult for PMRF and KTF to justify maintaining the current level of their range support infrastructure. This in turn would reduce the attractiveness of PMRF and KTF as a valuable national research and development range.

Response to comment OR25-1: See response to comment OR8-1.

Response to comment OR26-1: See response to comment OR11-2.

Response to comment OR27-1: See response to comment OR10-3.

Response to comment OR27-2: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-19, which discusses transient local effects, and page 4-21, which discusses the annual effects of the Strategic Target System program on stratospheric ozone.

Response to comment OR28-1: See response to comment OR11-2.

Response to comment OR29-1: See response to comment OR24-2.

Response to comment OR29-2: Booster refurbishment, reliability, and the use of these motors are covered on page 2-9, Section 2.1.1.2 and page 4-48, Section 4.10.1.2 of the Draft EIS. Static firings and other tests have been performed and will be conducted periodically to validate the refurbishment process and to monitor aging characteristics.

Response to comment OR29-3: See response to comment OR5-1.

Response to comment OR29-4: See response to comment OR10-3.

Response to comment OR29-5: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-52, which has been changed to explain the procedures in greater detail.

Response to comment OR29-6: See response to comment OR29-2.

Response to comment OR29-7: See response to comment OR5-1.

Response to comment OR30-1: See response to comment OR5-1.

Response to comment OR31-1: See the Draft EIS, pages 4-17 through 4-21, and changes to the Draft EIS for a discussion on impacts to stratospheric ozone. Effects of stratospheric ozone reduction are summarized on page 4-19, paragraph 3, of the Draft EIS.

Response to comment OR31-2: See response to comment OR5-1.

Response to comment OR31-3: See response to comment OR5-1.

Response to comment OR32-1: See response to comment OR2-3.

Response to comment OR32-2: See response to comment OR24-2.

Response to comment OR33-1: Thank you for commenting on the Draft EIS.

Response to comment OR34-1: See response to comment OR18-1.

Response to comment OR34-2: See response to comment OR11-2.

Response to comment OR35-1: See response to comment OR10-5 and OR2-4.

Response to comment OR35-2: See Chapter 2, Additions and Revisions to the Draft EIS, Section 3.9 on page 3-41, and Section 4.9 on page 4-44, which have been changed. These three sites are outside the region of influence for the Strategic Target System and will not interfere with the proposed program activities. The program will not contribute any contamination or interfere with any proposed cleanup, if required.

Response to comment OR35-3: No munition contamination sites have been identified on KTF. The program will not contribute any contamination.

Response to comment OR35-4: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for an update of the Department of Defense studies on the replacement of halon in thrust vector control systems.

Response to comment OR36-1: See response to comment OR11-2.

Response to comment OR37-1: The Department of Defense has moved to take the lead among federal agencies in protecting the environment.

Response to comment OR37-2: See response to comment OR10-4.

Response to comment OR37-3: The Strategic Target System is a nonnuclear system. It is not used for satellite launches into space and will not launch any weapons into space or near space. It is not a weapon or a bomb.

Response to comment OR38-1: See the Draft EIS, pages 4-17 through 4-21, and Chapter 2, Additions and Revisions to the Draft EIS, pages 4-19 and 4-21, for a discussion on impacts to stratospheric ozone.

Response to comment OR38-2: See response to comment OR5-1.

Response to comment OR38-3: See response to comment OR11-2.

Response to comment OR38-4: See response to comment OR2-1.

Response to comment OR39-1: See response to comment OR2-3.

Response to comment OR40-1: Thank you for commenting on the Draft EIS.

Response to comment OR41-1: See response to comment OR5-1.

Response to comment OR41-2: See response to comment OR10-3.

Response to comment OR42-1: Thank you for commenting on the Draft EIS.

Response to comment OR43-1: Thank you for commenting on the Draft EIS.

Response to comment OR44-1: Thank you for commenting on the Draft EIS.

Response to comment OR45-1: Thank you for commenting on the Draft EIS.

Response to comment OR46-1: Thank you for commenting on the Draft EIS.

Response to comment OR47-1: See response to comment OR1-7.

Response to comment OR48-1: See response to comment OR10-3.

Response to comment OR48-2: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for a summary discussion on impacts to stratospheric ozone.

Response to comment OR49-1: See response to comment OR11-3.

Response to comment OR49-2: See responses to comments OR1-7 and OR11-4.

Response to comment OR49-3: See response to comment OR24-2.

Response to comment OR49-4: See Chapter 2, Additions and Revisions to the Draft EIS, pages 4-19 through 4-21, for additional detail on ozone impacts.

Response to comment OR49-5: See response to comment OR10-4.

Response to comment OR49-6: See response to comment OR10-3.

Response to comment OR49-7: "No significant impact," as used in this document, refers to any environmental effect that does not meet the threshold criteria for significance defined in CEQ Regulation 40 CFR 1508.27. See Draft EIS Section 4, pages 4-1 and 4-2.

Response to comment OR50-1: Thank you for commenting on the Draft EIS.

Response to comment OR51-1: See response to comment OR5-1.

Response to comment OR51-2: See response to comment OR10-4.

Response to comment OR52-1: See response to comment OR11-2.

Response to comment OR53-1: The schedule proposed in 1992 would include only two launches.

Response to comment OR54-1: See the Draft EIS, pages 4-17 through 4-21, and Chapter 2, Additions and Revisions to the Draft EIS, pages 4-19 and 4-21, for a discussion on impacts to stratospheric ozone.

Response to comment OR55-1: All launches will be conducted such that any debris from a terminated launch would be contained in the safety zones. These safety zones are described on pages 2-18 through 2-23 of the Draft EIS and would be cleared of people prior to launch. Wind direction and speed are considered in the establishment and use of the safety zone.

Response to comment OR55-2: If air monitoring during the first launch indicates that concentrations of air pollutants emitted by a Strategic Target System launch vehicle exceed applicable ambient air quality standards or public exposure guidelines, then a thorough evaluation of launch conditions will be undertaken to determine if the concentrations consititute significant new circumstances or information before subsequent launches are allowed to proceed.

Response to comment OR55-3: Experienced emergency personnel with up-to-date training will be part of the launch team. Training and equipment is being made available to PMRF, KTF, and Kauai County personnel, as needed.

Response to comment OR56-1: See response to comment OR19-1.

Response to comment OR56-2: See response to comment OR18-1.

Response to comment OR56-3: See response to comment OR11-2.

Response to comment OR56-4: See response to comment OR8-1.

Response to comment OR56-5: This comment refers to the liquid, hypergolic propellants that will be used in some of the Strategic Target System payloads. The Draft EIS states in Section 4.10.1.5, on page 4-58, and in Section 4.10.1.6, page 4-60, "Road transportation will be used only if adverse conditions exist that will make it unsafe to leave the liquid propellant in place. Additionally, the harbor master and state and local transportation officials will be consulted prior to transporting liquid propellants by road." The harbor master, in consultation with the USASDC on-scene representative and other Kauai authorities, will decide if sea conditions require the transportation of propellants over Kauai public roads. In all cases, local officials will be notified as far in advance as possible.

Response to comment OR57-1: See response to comment OR8-1.

Response to comment OR57-2: See response to comment OR5-1.

Response to comment OR58-1: See response to comment OR10-4.

Response to comment OR58-2: See response to comment OR18-1.

Response to comment OR58-3: See response to comment OR11-2.

Response to comment OR58-4: See response to comment OR10-3.

Response to comment OR59-1: These activities were described in the *Strategic Target System (STARS) Environmental Assessment* (USASDC 1990) in Sections 1.3.2 and 3.2, which is incorporated by reference into the Draft EIS.

Response to comment OR60-1: Section 4.2.1, page 4-5 of the Draft EIS states that in the event of a spill, the small amount of potentially toxic materials will be rapidly dispersed to nontoxic levels in the ocean.

Response to comment OR60-2: Scientists and engineers have tested and used these chemicals for over 50 years for rocket propellants and other applications. Their properties and hazards are well known. Equipment and procedures have been developed to handle these materials safely. With the proper precautions, they are safe to use.

Response to comment OR61-1: Thank you for commenting on the Draft EIS.

Response to comment OR62-1: Consultations with the Hawaii State Historic Preservation Officer have been ongoing since 1989, and measures have been developed to keep impacts to cultural resources to a minimum. These measures include continuing consultations, (see Chapter 4, Consultations, of this volume), archaeological monitoring, testing, wetting the dunes prior to launch, ensuring avoidance of areas with known burial sites, and initiating a cultural resources recovery program, if necessary. In addition, see Chapter 2, Additions and Revisions to the Draft EIS, pages 4-31 and 4-33.

The cultural significance of the Nohili Dunes is well recognized. A cultural and historical/ethnographical study of the Nohili and Mānā areas was undertaken as part of this EIS.

Response to comment OR63-1: See response to comment OR7-1.

Response to comment OR64-1: See response to comment OR2-3.

Response to comment OR65-1: See response to comment OR62-1.

Response to comment OR65-2: As stated on page 4-30 of the Draft EIS, if any whale or other sensitive species, including the Hawaiian monk seal, is observed in the first-stage impact areas or the launch safety zone, a launch will be delayed. This is a standard procedure at PMRF. If any green sea turtle nests are found in the beach areas where transport vehicles will be used, those nests will be avoided.

Response to comment OR65-3: See response to comment OR2-3.

Response to comment OR65-4: See response to comment OR21-4.

Response to comment OR65-5: See response to comment OR7-1.

Response to comment OR65-6: See response to comment OR1-1.

Response to comment OR65-7: The Missile Defense Act of 1991 set as a goal the deployment of a limited ballistic missile defense system at one or an adequate number of sites. The Strategic Defense Initiative Organization, in planning to meet this direction from Congress, is conducting siting studies for the system. Although various areas of the country are being assessed, no specific sites have been proposed or selected. In order to provide protection for Hawaii and Alaska, sites in those states would have to be considered. At this time, however, there is no plan or proposal to site any system except for the initial site, which will be in the continental United States.

Response to comment OR66-1: See response to comment OR5-1.

Response to comment OR66-2: Issues related to international treaty compliance are national policy concerns. The Council on Environmental Quality regulations, which govern the preparation of an EIS, state that "The effects to be considered in the EIS do not include those related to national policy" (40 CFR Part 1508.8).

Response to comment OR66-3: See response to comment OR5-1.

Response to comment OR66-4: See response to comment OR7-1.

Response to comment OR67-1: The U.S. Army Strategic Defense Command is preparing the Strategic Target System EIS in full compliance with the direction from Congress contained in the Fiscal Year 1992 Department of Defense Appropriations Act. The statement of the Sierra Club Legal Defense Fund that the Army takes the position that the EIS is immune from judicial review and that therefore the public's concerns and rights are not being safeguarded is not accurate. The Army has taken no such position.

Response to comment OR67-2: See response to comment OR10-5.

Response to comment OR67-3: See response to comment OR29-2.

Response to comment OR68-1: Thank you for commenting on the Draft EIS.

Response to comment OR69-1: See response to comment OR1-6.

Response to comment OR70-1: See response to comment OR5-1.

Response to comment OR71-1: See response to comment OR8-1.

Response to comment OR72-1: See response to comment OR5-1.

Response to comment OR72-2: See response to comment OR11-2.

Response to comment OR73-1: Thank you for commenting on the Draft EIS.

Response to comment OR74-1: Thank you for commenting on the Draft EIS.

Response to comment OR75-1: See response to comment OR2-3.

Response to comment OR76-1: Thank you for commenting on the Draft EIS.

Response to comment OR77-1: Thank you for commenting on the Draft EIS.

Response to comment OR78-1: See response to comment OR2-3.

Response to comment OR79-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for a summary discussion of impacts on stratospheric ozone.

Response to comment OR80-1: There was a launch failure at Cape Canaveral during the summer of 1991 with a "Red Tigress" mission, which used an ARIES booster system with no common components to a Strategic Target System missile. This launch failure occurred early in flight, and the Flight Safety Officer sent the termination signal after 23 seconds of flight, which still allowed all debris to fall within the debris impact area. The decision of when to send the flight terminate command on the Red Tigress mission and the size of its hazard area are not comparable to that of the Strategic Target System system. The launch danger area for the Red Tigress mission was 2,600 feet, which would be encompassed in the Strategic Target System hazard area.

A Minuteman I did not launch on a mission planned from Vandenberg Air Force Base, California, for the Ground Based Interceptor program. This did not require any flight termination action since motor ignition did not occur.

Response to comment OR80-2: The U.S. Navy retired the Polaris boosters in 1985. The British still use them. Mission reliability takes into account all mission hardware reliability from missile liftoff to splashdown. For example, a payload could fail to deploy properly, and the mission would be classified as not successful. However, this event would not impact human safety. In addition, see Chapter 2, Additions and Revisions to the Draft EIS, pages 4-52 and 4-53.

Response to comment OR80-3: See response to comment OR19-1.

Response to comment OR81-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15, 4-19, 4-20, and 4-21. These changes add specific information requested by other commentors and a summary discussion of impacts on stratospheric ozone.

Response to comment OR81-2: See response to comment OR11-2.

Response to comment OR81-3: See response to comment OR24-2.

Response to comment OR82-1: See response to comment OR10-3.

Response to comment OR82-2: See Chapter 2, Additions and Revisions to the Draft EIS, pages 4-19, 4-20, and 4-21. These changes add specific information requested by other commentors and a summary discussion of impacts on stratospheric ozone. The known effects of stratospheric ozone reduction are presented on page 4-19 of the Draft EIS.

Response to comment OR82-3: See response to comment OR18-1.

Response to comment OR82-4: See response to comment OR2-3.

Response to comment OR82-5: See response to comment OR1-1.

Response to comment OR83-1: See response to comment OR18-1.

Response to comment OR83-2: See response to comment OR56-5.

Response to comment OR83-3: The Draft EIS has been reviewed by the federal, state, and local resource agencies whose concerns include the protection of near-shore marine environments and the endangered, threatened, and other sensitive species. Their review of the Draft EIS includes those sections that describe the expected impacts and mitigations for those impacts. No resource agency has indicated that the assessment of impacts presented in the Draft EIS is inadequate nor has any agency determined that the mitigations incorporated in the Description of the Proposed Action and Alternatives or in Chapter 4 of the Draft EIS are inadequate (see Chapter 4, Consultations, of this volume).

Response to comment OR83-4: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-52, which has been changed to explain the procedures in more detail.

Response to comment OR83-5: See response to comment OR55-3.

Response to comment OR83-6: See response to OR29-2. In addition, liquid propellant is not used in the third stage. The third-stage motor is a newly developed solid propellant system. There are no reliability or safety issues associated with its development or use. Motor production dates are in phase with launches. The motors will be used well before the 5-year storage life expires. Reference the Draft EIS, pages 2-11 and 4-51, for additional information.

Response to comment OR83-7: See Chapter 2, Additions and Revisions to the Draft EIS, Section 3.10.1 on page 3-45, which states that there have been no personal-injury or property-damage accidents for launches controlled by PMRF.

Response to comment OR83-8: See response to comment OR49-7.

Response to comment OR84-1: See response to comment OR49-7.

Response to comment OR84-2: See response to comment OR10-4.

Response to comment OR85-1: With the proper precautions, hydrazines are safe to use and to transport. They have been used safely for over 30 years. The hydrazines are corrosive, but can be packaged safely in mild steel, stainless steel, aluminum, and polyethylene. Drums approved by U.S. Department of Transportation for the hydrazines are made of type 304 stainless steel and, except for physical damage, have an unlimited use cycle. Very light (thin-walled) stainless steel tanks are used on satellites and other flight vehicles to contain various types of hydrazines for 20 years or longer. No corrosion or thinning of the tank wall is expected over the lifetime of these vessels.

Response to comment OR85-2: See response to comment OR85-1.

Response to comment OR86-1: See response to comment OR5-1.

Response to comment OR86-2: See the Draft EIS, pages 4-19 and 4-20, and Chapter 2, Additions and Revisions to the Draft EIS, page 4-20, for a discussion of the potential impact on human skin cancer incidence by the stratospheric ozone depletion resulting from the Strategic Target System program.

Response to comment OR86-3: See response to comment OR1-6.

Response to comment OR86-4: There have been no reports of collapsing cliffs due to previous missile launches from KTF. Some of these missiles have higher thrust levels than the Strategic Target System boosters.

Response to comment OR86-5: See response to comment OR11-2.

Response to comment OR87-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for a summary discussion of impacts on stratospheric ozone.

Response to comment OR87-2: See response to comment OR1-1.

Response to comment OR87-3: See response to comment OR49-7.

Response to comment OR88-1: See response to comment OR11-2.

Response to comment OR89-1: See response to comment OR10-3.

Response to comment OR89-2: Air quality modeling indicates that air pollutant concentrations will not exceed ambient air quality standards or public exposure guidelines. Air quality will be monitored during the first launch. The public and nonessential mission personnel are excluded from the ground hazard area and will not be exposed to unhealthful levels of air pollutants.

Response to comment OR89-3: See the Draft EIS, page 4-19, which discusses the effects of stratospheric ozone reduction.

Response to comment OR89-4: See response to comment OR10-4.

Response to comment OR90-1: See response to comment OR1-7.

Response to comment OR90-2: See response to comment OR19-1.

Response to comment OR90-3: See response to comment OR8-1.

Response to comment OR91-1: See response to comment OR10-4.

Response to comment OR92-1: See the Draft EIS, page 4-19, which discusses the effects of stratospheric ozone reduction.

Response to comment OR92-2: See response to comment OR5-1.

Response to comment OR93-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for a summary discussion on the impacts to stratospheric ozone.

Response to comment OR94-1: See response to comment OR24-2.

Response to comment OR94-2: See response to comment OR2-3.

Response to comment OR95-1: If burial remains are found during any project activity, the procedures established by the Native American Graves Protection and Repatriation Act will be followed. See page 4-33 of the Draft EIS.

Response to comment OR96-1: See response to comment OR83-3. The comment extends to populations of species that are not currently protected by federal, state, or local law but which may represent a unique genetic resource. Many of these species have distributions that extend beyond Kauai and the Hawaiian Islands and in several instances are pantropical in distribution. No studies that would support the delineation of any of these species as unique genetic resources were found.

In addition, the populations of the listed species that would be affected by the project are thriving and are unlikely to be negatively affected by project activities. Of the species listed, the hinahina kahakai (*Nama sandwicensis*) has the most limited distribution and would be most vulnerable to losses of genetic diversity. Hinahina kahakai was not observed to grow in areas where the project would be likely to have significant impacts on its population on PMRF.

Response to comment OR96-2: During studies conducted for this project, no evidence was found that populations of indigenous Hawaiian plants would be extirpated from the PMRF or anywhere else by project activities.

Response to comment OR97-1: See response to comment OR10-4.

Response to comment OR97-2: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for a summary discussion on the impacts to stratospheric ozone.

Response to comment OR97-3: See response to comment OR11-2.

Response to comment OR98-1: Thank you for commenting on the Draft EIS.

Response to comment OR99-1: See response to comment OR24-2.

Response to comment OR99-2: See response to comment OR8-1.

Response to comment OR99-3: See response to comment OR10-4.

Response to comment OR100-1: See response to comment OR83-3. The National Marine Fisheries Service and the United States Fish and Wildlife Service concurred with the finding of no adverse effects to the humpback whale as addressed in the Biological Assessment (see Chapter 4, Consultations, of this volume).

The presence of recent increasing-trend data for the humpback whale off Kauai is noted. The increased trend in humpback whales observed in the Kauai Channel in recent years has occurred concomitantly with existing programs that include missile launches. If the existing programs have not had an adverse effect on the whales, it is unlikely that normal missile launches

associated with the Strategic Target System program would adversely affect humpback whale use in the project area. The probability of early terminated launch debris impacting a humpback whale would be remote despite the increasing trend of whales present in the launch hazard zone. As indicated in Chapter 4 of the Draft EIS (Section 4.4.1.3 on page 4-27 and Section 4.4.4.3 on page 4-30), if the presence of a humpback whale is observed during prelaunch clearing surveys of the near-shore launch safety zone and the offshore launch hazard area, the launch will be delayed.

Response to comment OR100-2: See response to comment OR100-1.

Response to comment OR100-3: See response to comment OR100-1.

Response to comment OR100-4: See response to comment OR100-1.

Response to comment OR101-1: Thank you for commenting on the Draft EIS.

Response to comment OR102-1: Thank you for commenting on the Draft EIS.

Response to comment OR103-1: See response to comment OR2-4.

Response to comment OR103-2: See response to comment OR7-1.

Response to comment OR103-3: See response to comment OR2-4.

Response to comment OR103-4: See response to comment OR7-1.

Response to comment OR103-5: See response to comment OR2-4.

Response to comment OR104-1: See response to comment OR24-2.

Response to comment OR104-2: See response to comment OR11-2.

Response to comment OR104-3: The safety zone requirement for the Strategic Target System launch is a corridor that extends 3 nautical miles out in the ocean and is approximately 6 nautical miles wide. The modified 10,000-foot Ground Hazard Area (GHA) extends from the launch site. It should be noted that missile debris will not encompass the entire modified 10,000-foot GHA under any circumstance.

Response to comment OR104-4: See response to comment OR11-2.

Response to comment OR105-1: See Chapter 2, Additions and Revisions to the Draft EIS on page 4-53, which has been changed to provide a more detailed discussion of system reliability.

Response to comment OR105-2: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-52, which has been changed to explain the procedures in greater detail.

Response to comment OR105-3: See response to comment OR49-7.

Response to comment OR105-4: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-20.

Response to comment OR105-5: See response to comment OR1-6.

Response to comment OR106-1: Thank you for commenting on the Draft EIS.

Response to comment OR107-1: See response to comment OR5-1.

Response to comment OR108-1: See response to comment OR18-1.

Response to comment OR108-2: See response to comment OR1-1.

Response to comment OR108-3: The planning for this program has been occurring since 1986, including the development of measures to ensure public health and safety; additionally, the basis of these safety measures is a product of experience over many years.

Response to comment OR109-1: See the Draft EIS, page 4-20, which discusses the ozone-depleting potential of halon 2402.

Response to comment OR109-2: The boosters would fall into the deep ocean. Although recovery is not practicable, as the Draft EIS concludes, spent boosters present no hazards to marine life or waters.

Response to comment OR110-1: See response to comment OR5-1.

Response to comment OR110-2: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19, for discussions of the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle.

Response to comment OR110-3: See response to comment OR10-3.

Response to comment OR110-4: See response to comment OR104-3. See also Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been changed to explain the procedures in more detail.

Response to comment OR110-5: See response to comment OR11-2.

Response to comment OR111-1: See response to comment OR1-1.

Response to comment OR111-2: See response to comment OR5-1.

Response to comment OR112-1: See response to comment OR10-3.

Response to comment OR113-1: Thank you for commenting on the Draft EIS.

Response to comment OR114-1: See response to comment OR65-7.

Response to comment OR114-2: See response to comment OR5-1.

Response to comment OR115-1: See response to comment OR5-1.

Response to comment OR115-2: See response to comment OR1-1.

Response to comment OR116-1: Thank you for commenting on the Draft EIS.

Response to comment OR117-1: See response to comment OR10-4.

Response to comment OR117-2: See response to comment OR2-3.

Response to comment OR118-1: As stated in Section 1.1 of the Draft EIS, the purpose of the Strategic Defense Initiative program is to determine the feasibility of a defense against ballistic missiles.

Response to comment OR118-2: See response to comment OR1-1.

Response to comment OR118-3: See response to comment OR11-2.

Response to comment OR118-4: See response to comment OR21-4.

Response to comment OR118-5: See response to comment OR83-3.

Response to comment OR119-1: Thank you for commenting on the Draft EIS.

Response to comment OR120-1: See response to comment OR1-7.

Response to comment OR120-2: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15, 4-19, 4-20, and 4-21 for an expanded discussion about impacts on stratospheric ozone.

Response to comment OR120-3: See response to comment OR18-1.

Response to comment OR121-1: Thank you for commenting on the Draft EIS.

Response to comment OR122-1: See response to comment OR2-3.

Response to comment OR123-1: Thank you for commenting on the Draft EIS.

Response to comment OR124-1: Thank you for commenting on the Draft EIS.

Response to comment OR125-1: See response to comment OR62-1.

Response to comment OR125-2: As stated in Section 4.11.1.4 of the Draft EIS, Strategic Target System program activities would require approximately 2,000 gallons of water per day for approximately 30 days during each period of launch activities. During these periods, this demand represents 1 percent of the current daily available water supply at PMRF. Water would be supplied through the Kekaha Sugar Company Mānā Well, Kauai Board of Water Supply, and the State of Hawaii. No significant impact on water quality is predicted.

Response to comment OR125-3: On page 4-28 of the Draft EIS, the potential impact of chemicals that may enter the marine environment as a result of flight termination debris is addressed. No toxic levels of ammonia, chlorine, or aluminum released from the solid fuels are expected and, therefore, no short- or long-term impact on marine vegetation is expected. Booster emissions are also not expected to have any significant impact on marine vegetation. On page 4-25, the Draft EIS concludes that low hydrogen chloride concentrations, infrequent exposures, and the historical lack of effects on plant life near the launch pad would result in no significant effect. The 20-minute average hydrogen chloride concentrations at the ocean would be even lower (less than 5.0 ppm). Impacts, if any, to seaweed populations would be short-term and insignificant.

Response to comment OR125-4: The potential for restricted access (up to 56 days per year) for beach fishing would be limited to a small portion (1.6 acres) of Recreation Area 1. Access to beach fishing would still be available on the remaining 8.4 acres of Recreation Area 1 as well as other beaches on the west side of the island. Restricted access, therefore, would not significantly affect subsistence fishing or the traditional lifestyle of fishermen. Since the over-water safety zone is of limited size, would only be in effect up to 105 hours per year, and fishermen working in the area would receive ample notification to use other waters, impacts to commercial fishing would be minimal. Also see response to comment OR1-6.

Response to comment OR125-5: See response to comment OR125-4.

Response to comment OR125-6: As stated on pages 2-32, 4-27, 4-28, and 4-30 of the Draft EIS, the first-stage booster impact area and the launch safety zone will be surveyed prior to launch. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have concurred with the analysis presented in the Draft EIS (see Chapter 4, Consultations, of this volume).

Response to comment OR125-7: See response to comment OR125-4.

Response to comment OR125-8: See response to comment OR125-4.

Response to comment OR125-9: Maps are not included in the Draft EIS in order to protect known sites.

Response to comment OR126-1: See response to comment OR2-3.

Response to comment OR126-2: See response to comment OR7-1.

Response to comment OR127-1: Thank you for commenting on the Draft EIS.

Response to comment OR128-1: See response to comment OR62-1.

Response to comment OR128-2: See response to comment OR1-6.

Response to comment OR128-3: See response to comment OR62-1.

Response to comment OR128-4: There is no plan to expand the activities beyond those described in the Draft EIS. The safety easement is intended to help preserve the open space and agricultural nature of the land adjacent to PMRF.

Response to comment OR129-1: Thank you for commenting on the Draft EIS.

Response to comment OR130-1: The relative worth of jobs versus the need for the program is beyond the scope of this environmental impact statement.

Response to comment OR130-2: See response to comment OR10-3.

Response to comment OR130-3: See response to comment OR1-7.

Response to comment OR130-4: See response to comment OR1-7.

Response to comment OR130-5: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been changed to explain the procedures in greater detail.

Response to comment OR131-1: See response to comment OR8-1.

Response to comment OR131-2: See response to comment OR11-2.

Response to comment OR131-3: See response to comment OR7-1.

Response to comment OR132-1: See response to comment OR5-1.

Response to comment OR133-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-53, which has been changed to provide a more detailed discussion of system reliability.

Response to comment OR133-2: See response to comment OR8-1.

Response to comment OR133-3: See response to comment OR5-1.

Response to comment OR133-4: See the discussion of alternatives in the Draft EIS, Section 2.3.

Response to comment OR134-1: See response to comment OR8-1.

Response to comment OR134-2: See response to comment OR1-6.

Response to comment OR134-3: See response to comment OR1-7.

Response to comment OR134-4: See the Draft EIS, pages 4-17 through 4-21, and Chapter 2, Additions and Revisions to the Draft EIS, pages 4-19 and 4-21, which discuss the impacts on stratospheric ozone.

Response to comment OR134-5: See response to comment OR11-2.

Response to comment OR135-1: Thank you for commenting on the Draft EIS.

Response to comment OR136-1: See response to comment OR7-1.

Response to comment OR137-1: See response to comment OR11-2.

Response to comment OR138-1: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been changed to explain the procedures in greater detail.

Response to comment OR138-2: Coral reef systems exist along the western shore of Kauai. If one considers the area inclusive of Polihale State Park to the mouth of the Waimea River, there are approximately 22 miles (116,000 feet) of shoreline. About 11,600 feet of coral reef have been mapped by the U.S. Geological Survey. In waters adjacent to PMRF, approximately 9,000 feet of coral reef are present and about 5,000 feet of reef would be within the ground hazard area. The size of any debris from a terminated Strategic Target System missile is very small compared to the extent of the coral reefs measured off western Kauai. The physical impact of a Strategic Target System missile would not damage a significant amount of reef habitat. The potential effects on the marine environment of solid-fuel products present in the Strategic Target System missile have been addressed on page 4-28 of the Draft EIS. The potential for the release of hydrazine-type fuels into the coral reef environment is so small that an extensive impact analysis of this unlikely event is not warranted.

Response to comment OR138-3: See Chapter 2, Additions and Revisions to the Draft EIS, where Figure 2-4 has been revised to show the ground hazard areas for each of the other rockets.

Response to comment OR138-4: Payload size is dependent on many factors and can vary from mission to mission. Typically the Strategic Target System payload will weigh between 400 to 600 pounds.

Response to comment OR138-5: The Council on Environmental Quality regulations, which govern the preparation of an EIS, state:

> For purposes of complying with the Act (National Environmental Policy Act), the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and <u>should not be</u> when there are important qualitative considerations. (40 CFR Part 1502.23 [emphasis supplied])

Since benefits of national defense contain inherently important qualitative considerations, a cost-benefit analysis would not be appropriate for the Strategic Target System.

Response to comment OR138-6: The history of the Polaris missile is not appropriate in the analysis of Strategic Target System reliability. The Strategic Target System uses some modified Polaris components as well as newly developed unique components. All Polaris components were requalified and certified per SNL standards as described in the Draft EIS.

Response to comment OR139-1: Thank you for commenting on the Draft EIS.

Response to comment OR140-1: Thank you for commenting on the Draft EIS.

Response to comment OR141-1: See response to comment OR11-2.

Response to comment OR142-1: See response to comment OR1-1.

Response to comment OR143-1: See response to comment OR8-1.

Response to comment OR144-1: See response to comment OR8-1.

Response to comment OR145-1: Thank you for commenting on the Draft EIS.

Response to comment OR146-1: Thank you for commenting on the Draft EIS.

Response to comment OR147-1: Thank you for commenting on the Draft EIS.

Response to comment OR148-1: Thank you for commenting on the Draft EIS.

Response to comment OR149-1: See response to comment OR11-2.

Response to comment OR149-2: See response to comment OR7-1.

Response to comment OR149-3: See response to comment OR10-4.

Response to comment OR150-1: See response to comment OR83-3. The National Marine Fisheries Service concurred with the finding of no adverse effects to the humpback whale or other sensitive wildlife species as addressed in the Biological Assessment (USASDC 1990) (see Chapter 4, Consultations, of this volume).

The importance of near-shore waters and the potential for human-related disturbance to humpback whales, particularly cow-calf pairs, is recognized. The presence of recent trend data for the humpback whale off Kauai is also noted. These data were unavailable at the time studies for the Draft EIS were conducted, but it has been subsequently obtained and considered. The probability of early terminated launch debris impacting a humpback whale would be exceedingly remote despite the potential for increased numbers of whales to be present in the launch hazard zone.

As indicated in Chapter 4 of the Draft EIS, if the presence of a humpback whale is observed during prelaunch clearing surveys of the near-shore launch safety zone and the offshore launch hazard area, the launch will be delayed. The prelaunch clearing surveys described in Chapter 2 of the Draft EIS are standard procedure at PMRF. These surveys are not expected to impact adversely the humpback whale or other sensitive wildlife species.

Vessel-to-whale approach limits are observed at PMRF, and activities are conducted in accordance with state and federal laws, including the Marine Mammal Protection Act of 1972 (federal), the Endangered Species Act of 1973 (federal), the Hawaii Revised Statutes (state), and the Hawaii Wildlife Plan (state).

Response to comment OR151-1: See response to comment OR19-1.

Response to comment OR152-1: Thank you for commenting on the Draft EIS.

Response to comment OR153-1: Thank you for commenting on the Draft EIS.

Response to comment OR154-1: Thank you for commenting on the Draft EIS.

Response to comment OR155-1: See response to comment OR2-3.

Response to comment OR156-1: See response to comment OR11-2.

Response to comment OR157-1: See response to comment OR2-3.

Response to comment OR157-2: Debris washing up on beaches comes from various sources, not necessarily from PMRF. However, after an exercise at PMRF, the beaches in the vicinity are surveyed for several days. Any debris found is picked up. The debris does not pose any hazard. PMRF ordnance personnel will respond to inquiries regarding debris on the beaches adjacent to PMRF. In the past, PMRF ordnance personnel also have responded to civil defense and other county agency calls elsewhere on Kauai to investigate items washing up on the beaches.

Response to comment OR157-3: Section 4.10 of the Draft EIS presents a detailed summary of cleanup of debris, if required.

Response to comment OR157-4: See response to comment OR11-2.

3.3.2 Public Hearing - Exhibit Comments

Response to comment EX1-1: See response to comment OR2-1.

Response to comment EX1-2: See response to comment OR2-2.

Response to comment EX1-3: See response to comment OR2-3.

Response to comment EX1-4: See response to comment OR2-4.

Response to comment EX2-1: See response to comment OR2-3.

Response to comment EX3-1: Thank you for commenting on the Draft EIS.

Response to comment EX4-1: See response to comment OR1-1.

Response to comment EX4-2: See response to comment OR11-2.

Response to comment EX4-3: See response to comment OR11-3.

Response to comment EX4-4: See response to comment OR11-4.

Response to comment EX5-1: Thank you for commenting on the Draft EIS.

Response to comment EX6-1: See response to comment OR8-1.

Response to comment EX7-1: Thank you for commenting on the Draft EIS.

Response to comment EX8-1: See response to comment OR2-3.

Response to comment EX8-2: See response to comment OR24-2.

Response to comment EX9-1: See Chapter 2, Additions and Revisions to the Draft EIS, page ES-1. This change clarifies the number of launches from PMRF since 1981.

Response to comment EX9-2: See response to comment OR2-3.

Response to comment EX9-3: A relative comparison of projected concentrations of booster combustion products and particulates with buring cane fields can only be analyzed in terms of cumulative effects on ambient air quality. No cumulative effects have been identified on ambient air quality.

Response to comment EX9-4: See response to comment OR1-6. Scheduling limitations on proposed Strategic Target System vehicle launches are program-specific. Each program must be evaluated individually for time of launch.

Response to comment EX9-5: When the second-stage motor is ignited, there is a large internal-pressure increase. This pressure causes the motor case to expand in all directions, including the forward and aft domes. In the forward dome, where the motor ignitor is located, the flexure of the case was not smooth. Rather, the motor dome retained its original shape for a certain time. Later, the dome "popped" to the expanded shape. This sudden transition is not desirable, and steps were taken during refurbishment to eliminate this phenomenon.

Response to comment EX9-6: Cross-linking in the propellant molecular structure means that finite-length polymer molecules were made into a single, much larger molecule with the addition of binders. As long as the binding material (such as hydroxyl terminated polybutadiene [HTPB]) remains intact, the propellant will never dissolve. However, if the binder breaks down, there is no "glue" to hold the molecules together.

Response to comment EX9-7: The Strategic Target System uses refurbished Polaris A3 second-stage boosters, which were numbered sequentially as they were manufactured. The Strategic Target System will use the most recently manufactured hardware, including motor boosters. Therefore, the Strategic Target System will only use second-stage boosters built after number B-810.

Response to comment EX9-8: Nitrogen tetroxide air shipments will always require a waiver, regardless whether they are prepackaged in a payload. Payloads with prepackaged hydrazine may be flown into PMRF. See Chapter 2, Additions and Revisions to the Draft EIS, Section 2.1.1.3 on page 2-12.

Response to comment EX9-9: See Chapter 2, Additions and Revisions to the Draft EIS, Section 2.1.1.3 on page 2-12, to clarify that the proposed action is Option 3.

Response to comment EX9-10: The Draft EIS states in Section 4.10.1.10, page 4-65, that NASA has developed evacuation and spill plans for liquid propellants based on 20 years of NASA experience.

Response to comment EX9-11: Radar tracking is backed up by telemetry data. In the event of a radar beacon failure, telemetry data will be used to maintain safety requirements. There is a single radar beacon on-board.

Response to comment EX9-12: The use of the blast shield is a possible mitigation, which will be determined by the decision maker in the Record of Decision.

Response to comment EX9-13: See response to comment OR2-3.

Response to comment EX9-14: Some Strategic Target System missions will carry payloads with liquid propellants. These payloads are attached to the system until deployed, which occurs downrange far from Kauai. The first such mission is not planned to occur until mid-1993. See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.3.1.2 on page 4-7, to clarify that the payload liquid propellants are carried on some, not all, Strategic Target System launches.

Response to comment EX9-15: See response to comment WR2-3, which discusses field verification and accuracy of the REEDM program.

Response to comment EX9-16: Ambient concentrations of carbon monoxide, particulate matter, and carbon dioxide from sugar cane burning have not been measured for the Strategic Target System Environmental Impact Statement.

Response to comment EX9-17: The prelaunch spraying of vegetation, a discretionary measure listed in Table 2-1 of the Draft EIS, will be evaluated by the decision maker. The Record of Decision will indicate whether this action will be incorporated in the proposed action to mitigate the possible impacts to vegetation described in Section 4.4.1.2 of the Draft EIS.

Response to comment EX9-18: See response to comment OR1-6 and Chapter 2, Additions and Revisions to the Draft EIS, page 2-25. No plans exist to increase closure of or limit vehicle access to the beach areas outside of the explosive safety quantity-distance or modified ground hazard area during the times stated in Sections 2.1.2.3 and 4.6.1 of the Draft EIS as proposed by the Strategic Target System program.

Response to comment EX9-19: See response to comment OR8-1.

Response to comment EX10-1: See response to comment OR37-1.

Response to comment EX10-2: See response to comment OR10-4.

Response to comment EX10-3: See response to comment OR8-1.

Response to comment EX11-1: See response to comment OR1-7.

Response to comment EX12-1: Thank you for commenting on the Draft EIS.

Response to comment EX13-1: Thank you for commenting on the Draft EIS.

Response to comment EX14-1: Thank you for commenting on the Draft EIS.

Response to comment EX15-1: Thank you for commenting on the Draft EIS.

Response to comment EX16-1: Thank you for commenting on the Draft EIS.

Response to comment EX17-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21. These changes, along with the Draft EIS discussion, pages 4-17 through 4-21, address the issue of ozone depletion.

Response to comment EX18-1: Thank you for commenting on the Draft EIS.

Response to comment EX19-1: Thank you for commenting on the Draft EIS.

Response to comment EX20-1: Thank you for commenting on the Draft EIS.

Response to comment EX21-1: Thank you for commenting on the Draft EIS.

Response to comment EX22-1: Thank you for commenting on the Draft EIS.

Response to comment EX23-1: Thank you for commenting on the Draft EIS.

Response to comment EX24-1: Thank you for commenting on the Draft EIS.

Response to comment EX25-1: Thank you for commenting on the Draft EIS.

Response to comment EX26-1: See response to comment OR2-3.

Response to comment EX27-1: See response to comment OR62-1.

Response to comment EX27-2: See response to comment OR7-1.

Response to comment EX27-3: See response to comment OR62-1.

Response to comment EX27-4: See response to comment OR5-1.

Response to comment EX28-1: See response to comment OR18-1.

Response to comment EX29-1: Thank you for commenting on the Draft EIS.

Response to comment EX30-1: Thank you for commenting on the Draft EIS.

Response to comment EX31-1: See response to comment OR5-1.

Response to comment EX31-2: See response to comment OR110-2.

Response to comment EX31-3: See response to comment OR10-3.

Response to comment EX31-4: See responses to comments OR10-1 and OR104-3.

Response to comment EX31-5: See response to comment OR11-2.

Response to comment EX32-1: Thank you for commenting on the Draft EIS.

Response to comment EX33-1: Thank you for commenting on the Draft EIS.

Response to comment EX34-1: Thank you for commenting on the Draft EIS.

Response to comment EX35-1: Thank you for commenting on the Draft EIS.

Response to comment EX36-1: See response to comment OR2-3.

Response to comment EX37-1: Thank you for commenting on the Draft EIS.

Response to comment EX38-1: Thank you for commenting on the Draft EIS.

Response to comment EX39-1: Thank you for commenting on the Draft EIS.

Response to comment EX40-1: See response to comment OR11-2.

Response to comment EX40-2: See response to comment OR5-1.

Response to comment EX41-1: See response to comment OR21-4.

Response to comment EX41-2: See response to comment OR7-1.

Response to comment EX41-3: See response to comment OR128-4.

Response to comment EX41-4: See response to comment OR65-7.

Response to comment EX42-1: See response to comment OR5-1.

Response to comment EX42-2: See response to comment OR66-2.

Response to comment EX42-3: See response to comment OR8-1.

Response to comment EX42-4: See response to comment OR7-1.

Response to comment EX43-1: See response to comment OR67-1.

Response to comment EX43-2: See response to comment OR10-5.

Response to comment EX44-1: The Director of SDIO is the final decision maker.

Response to comment EX45-1: Thank you for commenting on the Draft EIS.

Response to comment EX46-1: Thank you for commenting on the Draft EIS.

Response to comment EX47-1: Thank you for commenting on the Draft EIS.

Response to comment EX48-1: See response to comment OR1-1.

Response to comment EX49-1: See response to comment EX9-4.

Response to comment EX50-1: Thank you for commenting on the Draft EIS.

Response to comment EX51-1: Thank you for commenting on the Draft EIS.

Response to comment EX52-1: See response to comment OR8-1.

Response to comment EX52-2: See response to comment OR5-1.

Response to comment EX53-1: See response to comment OR11-2.

Response to comment EX53-2: See response to comment OR130-1.

Response to comment EX53-3: See response to comment OR10-3.

Response to comment EX53-4: See response to comment OR1-7.

Response to comment EX53-5: See response to comment OR1-7.

Response to comment EX53-6: See response to comment OR10-1.

Response to comment EX54-1: See response to comment OR62-1.

Response to comment EX54-2: See response to comment OR125-2.

Response to comment EX54-3: See response to comment OR125-3.

Response to comment EX54-4: See response to comment OR125-4.

Response to comment EX54-5: See response to comment OR125-4.

Response to comment EX54-6: See response to comment OR125-6.

Response to comment EX54-7: See response to comment OR125-4.

Response to comment EX54-8: See response to comment OR125-4.

Response to comment EX54-9: See responses to comments OR62-1 and OR125-9.

Response to comment EX54-10: See response to comment OR7-1.

Response to comment EX54-11: See response to comment OR24-2.

Response to comment EX54-12: See response to comment OR2-1.

Response to comment EX55-1: Thank you for commenting on the Draft EIS.

Response to comment EX56-1: See response to comment OR5-1.

Response to comment EX56-2: See response to comment OR11-2.

Response to comment EX57-1: Thank you for commenting on the Draft EIS.

Response to comment EX58-1: Thank you for commenting on the Draft EIS.

Response to comment EX59-1: See response to comment OR109-2.

Response to comment EX59-2: The appropriate analyses are provided in the Draft EIS in Sections 4.2, 4.3, 4.4, and 4.10.

Response to comment EX59-3: Discussion of public emergency plans are in the Draft EIS in Section 4.10.1.10, page 4-65, and the maximum amount of propellant stored is in Section 4.10.1.11, page 4-66.

Response to comment EX60-1: See response to comment OR80-1.

Response to comment EX60-2: See response to comment OR80-2.

Response to comment EX60-3: See response to comment OR19-1.

Response to comment EX61-1: See responses to comments OR83-3 and OR96-1.

Response to comment EX61-2: See response to comment OR96-2.

Response to comment EX62-1: See the Draft EIS, pages 4-17 through 4-21, and Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21.

Response to comment EX63-1: Comment noted.

Response to comment EX64-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-20. This addition discusses the range of estimates for the relationship between stratospheric ozone depletion and human skin cancers.

Response to comment EX64-2: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19. No data have been found on stratospheric ozone depletion—skin cancers studies particular to Hawaii. The 1:2 percent ratio generally applies to all latitudes.

Response to comment EX65-1: Thank you for commenting on the Draft EIS.

Response to comment EX66-1: See response to comment OR18-1.

Response to comment EX66-2: See response to comment OR56-5.

Response to comment EX66-3: See response to comment OR83-3.

Response to comment EX66-4: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been changed to explain the procedures in greater detail.

Response to comment EX66-5: See response to comment OR55-3.

Response to comment EX66-6: See response to comment OR83-6.

Response to comment EX66-7: See response to comment OR83-7.

Response to comment EX66-8: See response to comment OR49-7.

Response to comment EX67-1: Thank you for commenting on the Draft EIS.

Response to comment EX68-1: See response to comment OR2-4.

Response to comment EX69-1: The programmed number of launches from KTF (including non-Strategic Target System launches) between May 1992 and the end of calendar year 1993 is four.

Response to comment EX70-1: See response to comment OR49-7.

Response to comment EX71-1: Thank you for commenting on the Draft EIS.

Response to comment EX72-1: Thank you for commenting on the Draft EIS.

Response to comment EX73-1: See response to comment OR5-1.

Response to comment EX74-1: Thank you for commenting on the Draft EIS.

Response to comment EX75-1: See response to comment OR138-5.

Response to comment EX75-2: See response to comment OR5-1.

Response to comment EX76-1: Thank you for commenting on the Draft EIS.

Response to comment EX77-1: See response to comment OR7-1.

Response to comment EX78-1: Thank you for commenting on the Draft EIS.

Response to comment EX79-1: Thank you for commenting on the Draft EIS.

Response to comment EX80-1: Thank you for commenting on the Draft EIS.

Response to comment EX81-1: Thank you for commenting on the Draft EIS.

Response to comment EX82-1: Thank you for commenting on the Draft EIS.

Response to comment EX83-1: Thank you for commenting on the Draft EIS.

Response to comment EX84-1: Thank you for commenting on the Draft EIS.

Response to comment EX85-1: See response to comment OR2-3.

Response to comment EX86-1: Thank you for commenting on the Draft EIS.

Response to comment EX87-1: Thank you for commenting on the Draft EIS.

Response to comment EX88-1: Thank you for commenting on the Draft EIS.

Response to comment EX89-1: Thank you for commenting on the Draft EIS.

Response to comment EX90-1: Thank you for commenting on the Draft EIS.

Response to comment EX91-1: Thank you for commenting on the Draft EIS.

Response to comment EX92-1: Thank you for commenting on the Draft EIS.

Response to comment EX93-1: Thank you for commenting on the Draft EIS.

Response to comment EX94-1: Thank you for commenting on the Draft EIS.

Response to comment EX95-1: Thank you for commenting on the Draft EIS.

Response to comment EX96-1: Thank you for commenting on the Draft EIS.

Response to comment EX97-1: Thank you for commenting on the Draft EIS.

Response to comment EX98-1: Thank you for commenting on the Draft EIS.

Response to comment EX99-1: Thank you for commenting on the Draft EIS.

Response to comment EX100-1: Thank you for commenting on the Draft EIS.

Response to comment EX101-1: Thank you for commenting on the Draft EIS.

Response to comment EX102-1: Thank you for commenting on the Draft EIS.

Response to comment EX103-1: Thank you for commenting on the Draft EIS.

Response to comment EX104-1: Thank you for commenting on the Draft EIS.

Response to comment EX105-1: Thank you for commenting on the Draft EIS.

Response to comment EX106-1: Thank you for commenting on the Draft EIS.

Response to comment EX107-1: Thank you for commenting on the Draft EIS.

Response to comment EX108-1: Thank you for commenting on the Draft EIS.

Response to comment EX109-1: Thank you for commenting on the Draft EIS.

Response to comment EX110-1: See response to comment OR1-1.

Response to comment EX110-2: See response to comment OR1-2.

Response to comment EX110-3: See response to comment OR1-3.

Response to comment EX110-4: See response to comment OR1-6.

Response to comment EX110-5: Road transportation will be used only if adverse conditions exist that will make it unsafe to leave the liquid propellant in place. Additionally, the harbor master and state and local transportation officials will be consulted prior to transporting liquid propellant by roads. Kauai County authorities have been consulted regarding transportation procedures and emergency plans for Strategic Target System hazardous materials on several different occasions. The transportation plans have been amended based on the results of those consultations. In July 1991 the Environmental Engineer for the USASDC met with the Kauai County Mayor, the Civil Defense Coordinator, and Fire Chief in two separate meetings. On December 6, 1991, PMRF, Sandia, and NASA personnel met with the Hazardous Materials Coordinator for Kauai County, the Kauai County Fire Chief, and the State Civil Defense Coordinator. Additional coordination meetings with county officials on this issue are planned.

Response to comment EX111-1: Thank you for commenting on the Draft EIS.

3.3.3 Comment Letters

Response to comment WR1-1: See response to comment OR5-1.

Response to comment WR2-1: See response to comment OR105-1.

Response to comment WR2-2: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been changed to explain the procedures in more detail.

Response to comment WR2-3: A discussion of the air dispersion models used in the Strategic Target System Draft EIS is presented in Section 4.3.1.2, pages 4-7 to 4-10. As pointed out in that discussion, two selected models, TRPUF and REEDM, serve two different purposes.

TRPUF is a gaussian puff model developed by Trinity Consultants, Inc., to be used on an IBM-PC. This model is based on the EPA puff model (Trinity Consultants, Inc. 1990). The EPA PUFF model is one of the air toxics dispersion models imbedded in the EPA TSCREEN, a Model for Screening Toxic Air Pollutant Concentrations (USEPA 1990). Therefore, TRPUF is a screening model. A screening model incorporates simplifying assumptions about the air pollution source, meteorological and topographical conditions, and the chemical and physical behavior of the dispersing plume. Using these assumptions, a screening model provides a preliminary estimation of the air quality impacts of a pollution source at receptor locations. TRPUF was chosen as a screening model because of its application to emission sources that are characteristically brief in duration.

If a screening model indicates a potential problem, then additional modeling, specifically designed for a particular application, is performed. REEDM is a specific model with a proven utility in predicting emissions dispersion from rocket launches. Field measurements at Kennedy Space Center and Vandenberg Air Force Base have verified REEDM predictions as discussed in the references cited on page 4-10 of the Draft EIS.

> Comparisons of the REEDM program isopleth predictions and ground observations show general qualitative agreement in terms of direction of the cloud path and magnitude of deposition. The exception to this is the near-field deposition area.... This area is impacted before the cloud rises to stabilization height. [Chloride deposition was one to two orders of magnitude higher than REEDM predicted.] ... Deposition can not always be visually detected as far downfield as the model predicts. (Schmalzer et al. 1986)
>
> Present modeling [NASA multilayer diffusion model (REEDM description)] appears capable of providing reasonable assessment of effluent impact with a limited measurement program. The model was generally within a factor of 10 for maximum HCl concentration. For particulates, the model was consistently high.... (Cour-Palais 1977)

In the *Supplement to the Environmental Assessment* (U.S. Army Strategic Defense Command 1991), REEDM, version 1.02, was used to model a meteorological scenario of 2 m/s (4.4 mph). Computer models are frequently updated and improved. An improved version of REEDM, version 7.02, was used to model a meteorological scenario of 1 m/s (2.2 mph) wind speed for the Draft EIS. Modeling at a wind speed of 1 m/s (2.2 mph) is standard air dispersion modeling procedure. The later version of REEDM calculated higher pollutant concentrations than did the earlier version of REEDM. Slower wind speeds will generally yield higher pollutant concentration predictions. Neither the earlier nor the improved version of REEDM predicted an exceedance of ambient air quality standards or public exposure guidelines.

Because air dispersion modeling is a predictive tool, an air monitoring program is planned for the first launch as a possible mitigation measure, which will be determined by the decision maker in the Record of Decision. Air monitoring results would be compared with the model results. These ambient air monitoring results would also provide some basic information about background concentrations of air pollutants in the PMRF vicinity.

Response to comment WR2-4: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21. This change provides an update of Department of Defense efforts to find a suitable replacement for halon in thrust vector control systems. The thrust vector control system is an integral component of the second-stage booster. It is not a vent experiment.

Response to comment WR2-5: See Sections 4.10.1.5 through 4.10.1.12 of the Draft EIS and response to comment OR56-5.

Response to comment WR2-6: See response to comment OR2-1.

Response to comment WR2-7: See response to comment OR49-7.

Response to comment WR2-8: Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21. Potential impacts are evaluated in reference to the intensity/context criteria discussed on pages 4-1 and 4-2 in the Draft EIS. The procedure for determining the level of significance of the impact of the Strategic Target System program on the global atmosphere is discussed on page 4-17, paragraph 3 of the Draft EIS.

Response to comment WR2-9: See response to comment OR1-6.

Response to comment WR3-1: See response to comment OR2-1.

Response to comment WR4-1: Thank you for commenting on the Draft EIS.

Response to comment WR5-1: See responses to comments OR10-5 and OR133-4.

Response to comment WR6-1: See response to comment OR7-1.

Response to comment WR7-1: Thank you for commenting on the Draft EIS.

Response to comment WR8-1: See responses to comments OR24-2 and EX54-11.

Response to comment WR8-2: Extensive testing by performing static firings of motors exhibiting "case-to-insulation separation" showed that ballistic motor performance was not affected by this anomaly. This was explained through studies performed by the booster developer, which were reviewed by the Strategic Target System Program Office and the missile integrator SNL.

Response to comment WR8-3: For an expanded discussion of air dispersion modeling, see the response to comment WR2-3.

Aluminum oxide was considered for two reasons. First, concentrations of aluminum oxide are used to evaluate the impact of the Strategic Target System combustion products on ambient particulate matter levels. Second, the issue of a possible link of aluminum oxide to Alzheimer's disease was raised during the scoping process (Draft EIS, page 1-8, Table 1-1).

The statement that aluminum oxide has no significant toxic effects to humans is based on occupational health, animal, epidemiological, selected population, and medical studies. A comprehensive review of aluminum and Alzheimer's disease that was conducted for the NASA document cited on page 4-12 of the Draft EIS (NASA 1990) supports this statement. "Significant" was used in this context because aluminum oxide is considered an inert, nuisance particulate (American Conference of Governmental Industrial Hygienists 1990).

Response to comment WR8-4: Transportation routes from the continental United States to Hawaii are outside of the defined region of influence for air quality impacts. Emissions from airplanes or ships that transport for the Strategic Target System program would not be different from those of other regular transportation sources. Because the numbers and types of vehicles and vehicle-miles traveled (VMT) that would be associated with the 45 temporary support personnel cannot be identified, it is not possible to quantify the increased emissions due to increased vehicle traffic associated with these personnel.

Response to comment WR8-5: Impacts are considered not significant if quantities of emissions from Strategic Target System activities are small in the context of other identified man-made air pollution sources. It is not because there exists a greater contributor to global ozone depletion than the Strategic Target System program that the impact assessment is deemed not significant. Rather, it is the existence of contributors 100,000 times greater (i.e., industrial

chlorofluorocarbons) and 1,000 times greater (i.e, all current chemical propulsion systems globally) that leads to the conclusion of an insignificant emission level.

The Strategic Target System program is not being presented as having no impacts. The conclusion is that the contribution of the program to total annual global ozone depletion is not significant in the context of all other identified man-made air pollution sources.

Response to comment WR8-6: The statement "Plant species appear to be sufficiently adaptable so that food crop yields will be maintained" was drawn from *Causes and Effects of Stratospheric Ozone Reduction: An Update* (National Research Council 1982).

Response to comment WR8-7: See changes to the Draft EIS, page 4-21, for a summary discussion of the effects of rocket exhaust emissions and halon on stratospheric ozone.

Response to comment WR8-8: Estimates of the human health effects of the program were limited to the United States because the Strategic Target System Environmental Impact Statement is responding to the National Environmental Policy Act.

Response to comment WR8-9: See response to comment OR5-1.

Response to comment WR9-1: See response to comment OR1-3.

Response to comment WR9-2: Construction activities will require only minor earth moving. Total area of three shelters and one storage area is less than 1,200 ft^2. The four areas are not contiguous. The small quantities of fugitive dust that might be generated would remain in the immediate vicinity and would not impact the public. The construction equipment to be used will depend on the selected contractor. It is likely that a diesel-powered backhoe with a blade will be used. Dust will probably be controlled by applying water as needed.

Response to comment WR9-3: Industrial solvents will be used in very limited quantities, if they are used, for hand-applied parts and equipment-cleaning procedures.

Response to comment WR9-4: Transportation routes from the continental United States to Hawaii are outside of the defined region of influence for air quality impacts. Emissions from airplanes or ships that transport equipment for the Strategic Target System program would not be different from those of other regular transportation sources along the regular routes between the two locations.

Response to comment WR9-5: The State of Hawaii Department of Health Permit to Operate the two 300-KW diesel generators at KTF limits combined total operation to 4,000 hours annually. This limit applies to the equipment, not to a particular program associated with the facility. Operating at this upper limit, the generators would emit in one year about 5.35 tons of carbon monoxide, 2.36 tons of hydrocarbons, 24.9 tons of nitrogen oxides, 1.65 tons of sulfur oxides, and 1.77 tons of particulate matter.

Response to comment WR9-6: Because the numbers and types of vehicles and vehicle-miles-traveled (VMT) that would be associated with the 45 temporary support personnel cannot be identified, it is not possible to quantify the increased emissions due to increased vehicle traffic

associated with these personnel. However, these increased emissions would not cause an exceedance of ambient air quality standard.

Response to comment WR9-7: Nitrogen oxides are not included in the list of emissions from Strategic Target System boosters (Eno 1989).

Response to comment WR10-1: See response to comment OR5-1.

Response to comment WR11-1: Thank you for commenting on the Draft EIS.

Response to comment WR12-1: See response to comment OR11-2.

Response to comment WR13-1: Thank you for commenting on the Draft EIS.

Response to comment WR14-1: See response to comment OR138-5.

Response to comment WR15-1: Thank you for commenting on the Draft EIS.

Response to comment WR16-1: The Strategic Defense Initiative is developing technologies related to missile defense.

Response to comment WR16-2: See response to comment OR62-1.

Response to comment WR16-3: See response to comment OR11-2.

Response to comment WR16-4: See response to comment OR83-3.

Response to comment WR17-1: Thank you for commenting on the Draft EIS.

Response to comment WR18-1: See responses to comments OR83-3, OR100-1, and OR150-1.

Response to comment WR19-1: See response to comment OR10-3.

Response to comment WR20-1: See response to comment OR11-2.

Response to comment WR21-1: Thank you for commenting on the Draft EIS.

Response to comment WR22-1: Thank you for commenting on the Draft EIS.

Response to comment WR23-1: Thank you for commenting on the Draft EIS

Response to comment WR24-1: Thank you for commenting on the Draft EIS

Response to comment WR25-1: Thank you for commenting on the Draft EIS.

Response to comment WR26-1: The Strategic Target System program is not being presented as having no adverse effect on the environment. The environmental consequences of the proposed action are discussed in Chapter 4 of the Draft EIS. Air quality effects are discussed in Section 4.3, pages 4-6 through 4-22. See Chapter 2, Additions and Revisions to the Draft EIS,

pages 4-15, 4-19, 4-20, and 4-21, which have been changed to present the air quality information more clearly. Air quality modeling of launch vehicle emissions did not predict exceedances of national ambient air quality standards or applicable public exposure guidelines. So, ground level air quality impacts are considered not significant. Calculations of the quantities of emissions of the Strategic Target System program and the effects on climatological warming and stratospheric ozone depletion indicate that they are small in the context of other identified man-made air pollution sources. So, these global scale impacts are considered not significant.

Response to comment WR26-2: See response to comments OR21-4 and OR7-1.

Response to comment WR26-3: See response to comment OR24-2.

Response to comment WR27-1: Thank you for commenting on the Draft EIS.

Response to comment WR28-1: See response to comment OR62-1.

Response to comment WR28-2: See response to comment OR7-1.

Response to comment WR29-1: See response to comment OR11-2.

Response to comment WR29-2: Potential impacts to Niihau were evaluated and determined to be not significant. Niihau is outside of all safety areas and the region of influence for Strategic Target System activities.

Response to comment WR29-3: See response to comment OR83-3. The National Marine Fisheries Service and the United States Fish and Wildlife Service concurred with the finding of no adverse effects to the humpback whale as addressed in the Biological Assessment (see Chapter 4, Consultations, of this volume).

As indicated in Sections 4.4.1.3 and 4.4.4 of the Draft EIS, if the presence of a humpback whale in observed during prelaunch clearing surveys of the near-shore launch safety zone and the offshore launch hazard area, the launch will be delayed. Prelaunch clearing surveys as described on page 2-32 of the Draft EIS are standard procedure at PMRF.

Response to comment WR29-4: Upper atmosphere wind data indicate that winds to an altitude of at least 4,000 ft have an easterly component; that is, they blow out of the east. Above 4,000 ft to about 60,000 ft, winds have a westerly component.

The Kokee area of Kauai is situated at elevations above 3,200 ft and is located over 4.5 mi northwest of the Kauai Test Facility. The complexity of the terrain between KTF and the Waimea Canyon and Kokee State Parks will induce highly variable wind conditions. This variability favors pollutant dispersion.

Air quality modeling indicated that pollutant concentrations from a launch would be low. See Section 4.3.1.2 of the Draft EIS, pages 4-7 to 4-17. The potential effects of launch emissions on vegetation are discussed in Section 4.4.1.2, pages 4-23 to 4-25. No significant effects are anticipated. The air quality of the Kokee State Park will not be threatened by the Strategic Target System program.

Response to comment WR30-1: Negotiations are currently ongoing with the state of Hawaii concerning the Memorandum of Agreement (MOA). The MOA should be finalized in the next few months.

Response to comment WR30-2: Negotiations are currently underway concerning the proposed easement with the state of Hawaii. The easement should be finalized early in 1993.

Response to comment WR30-3: The U.S. Army will notify the state of Hawaii seven days prior to each scheduled launch requiring exercise of the easement. The state of Hawaii will be notified before clearance of the area is required as stated in the Draft EIS on pages 2-24 and 4-37.

Response to comment WR31-1: See response to comment OR24-2.

Response to comment WR32-1: Thank you for commenting on the Draft EIS.

Response to comment WR33-1: All comments and responses are incorporated into the Final EIS, as required by NEPA. The Final EIS is made available to agencies and the public.

Response to comment WR33-2: Figure 2-4 of the Draft EIS has been modified. The age of the boosters used in the sounding rocket launches is less than five years. The age of the Aries boosters used in the EDX program is between 20 to 30 years.

Response to comment WR33-3: PMRF firemen are on-site at all times and are trained to respond to spill of fluids normally handled at PMRF. They will be trained to respond to hypergolic propellant spills prior to arrival of propellants on the island.

Response to comment WR33-4: As noted on pages 3-41 and 4-66 of the Draft EIS, operations at KTF will fall under the PMRF Spill Prevention Control and Countermeasures Plan and the Installation Spill Contingency Plan. PMRF personnel trained to respond to propellant spills will be available at all times along with NASA White Sands Test Facility personnel during propellant-handling operations to respond to any liquid propellant spill if it should occur. These personnel will take prompt action to limit the extent and mitigate any spill including the removal and disposal of any contaminated soil. There should be no long-term effects of a spill.

Figure 4-10 of the Draft EIS illustrates the maximum extent of any unmitigated spill of 55 gallons of liquid propellant at KTF. The actual area involved would depend on the wind direction and speed. As noted in Appendix E of the Draft EIS, wind speed above 0.86 mph would result in dispersal of the vapors in a shorter distance. The area of potential influence does not include any residential communities. All propellant-handling activities will be performed by NASA White Sands Test Facility trained personnel to take corrective action to mitigate any spill.

As noted in Section 4.10.1.9 of the Draft EIS, transportation of the liquid propellants will be accompanied by personnel trained and equipped to take corrective action in the event of a spill. If a spill were to occur during transportation, the guidance provided by Department of Transportation publication 5800.5, *1990 Emergency Response Guidebook*, would be followed.

Response to comment WR33-5: The vapor cloud concentration profiles shown in Appendix E of the Draft EIS refer to human exposure. Data is not readily available to evaluate the effects of exposure on animals. However, exposure to low-level vapor concentrations above the Short

Term Exposure Limit (STEL) of 1 ppm of nitrogen dioxide should be similar to humans in that it could cause eye and nose irritation and yellowing of the skin. Higher vapor concentration or liquid exposure could cause permanent injury, primarily in the form of burns to human tissue or the pulmonary tract. Data on vapor concentration necessary to compile a table of exposure level and its effects on humans are not available. Experimentation to obtain human exposure data is illegal.

A project spill-response plan and the draft propellant transportation plan have requirements for hypergolic propellant spill mitigation. In addition, detailed procedures for transportation of the propellants will be developed and will include the mitigation actions to take in the event a spill occurs. These procedures will be coordinated with Kauai County authorities. Coordination of the draft propellant transportation plan has occurred and is continuing.

Response to comment WR33-6: Please see response to comment OR1-3, which discusses air quality data from Lihue and other islands and the applicability of this data to the PMRF and KTF area.

A background level of carbon monoxide is assumed to be 0.2 ppm, which is a figure obtained from the literature. See the notes in Table 4-3 on page 4-11 of the Draft EIS. Background levels of particulate matter in the PMRF area are not known. Even if the annual average of fine respirable particulate matter for Lihue (22 $\mu g/m^3$) is used as a background level - and this applicability is questionable - air quality modeling indicates that the Strategic Target System missile launches would not cause exceedances of the 24-hour national ambient air quality standard for particulate matter. Carbon monoxide and particulate matter are the only criteria pollutants emitted by the Strategic Target System launch vehicle.

Response to comment WR33-7: The affected biological environment is described, as directed by the National Environmental Policy Act, in Section 3.4 of the Draft EIS. Biological surveys for the Draft EIS are described in the Biological Assessment (USASDC 1990). The National Marine Fisheries Service and the U.S. Fish and Wildlife Service concurred with the finding of no adverse effects to sensitive species as addressed in the Biological Assessment (see Chapter 4, Consultations, of this volume).

Response to comment WR33-8: The proposed action and alternatives are described in Chapter 2 of the Draft EIS. Any additional activities not included in Chapter 2 would require further documentation.

Response to comment WR33-9: As stated on page 2-1 of the Draft EIS, the Strategic Target System consists of a maximum of four launches per year for 10 years.

Response to comment WR33-10: Transportation of the liquid propellants from Port Allen to PMRF, if required, will be coordinated with Kauai officials, whose counsel would determine the best time of day for transportation of the propellants. Transportation of propellants on continental U.S. highways by common carrier has occurred for over 25 years without any spill according to information provided by the Department of Transportation. As noted in the Draft EIS, any highway transportation of liquid propellants would be coordinated with local officials and accompanied by personnel trained to mitigate spills.

Response to comment WR33-11: The proposed timetable for launches is that they begin this year and continue at a maximum of four launches per year for 10 years. No launches could be conducted until the EIS process is completed.

Response to comment WR33-12: The quantity of propellant that may be present on Kauai will be adequate to support up to four launches per year. Transportation of the propellants by sea will be made only during the calm-sea months. As noted on page 4-66 of the Draft EIS, a maximum of 110 gallons of either nitrogen tetroxide or UDMH would be present at KTF although only 55 gallons will be transported at any one time. This will permit delivery of additional propellant, if required, late in the calm-sea period to support launches during the winter months.

Response to comment WR33-13: Ozone depletion on a global scale is discussed on pages 4-17 through 4-21 of the Draft EIS. See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19, for a discussion of the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle.

Response to comment WR33-14: As stated on page 4-38, Section 4.6.3, of the Draft EIS, the maximum total closure time of the safety zone area would be for 105 hours per year for all known and reasonably foreseeable activities at PMRF and KTF. This equates to less than 5 days per year. A notice to mariners is broadcast such that the maximum delay encountered would be a period of 3 1/2 hours. To date, excellent communication and coordination between PMRF and the tour boat industry has resulted in no significant delays due to launches.

Response to comment WR33-15: All relevant county agencies were contacted directly as part of the scoping process, and all county officials were invited to attend scoping meetings. See Chapter 2, Additions and Revisions to the Draft EIS, page 7-4, which has been changed to indicate county agencies contacted in preparation of this EIS.

Response to comment WR34-1: Thank you for commenting on the Draft EIS.

Response to comment WR35-1: Thank you for commenting on the Draft EIS.

Response to comment WR36-1: Thank you for commenting on the Draft EIS.

Response to comment WR37-1: Sections 4.10.1.1 through 4.10.1.3 of the Draft EIS describe flight reliability and determination issues.

Response to comment WR38-1: Thank you for commenting on the Draft EIS.

Response to comment WR39-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15, 4-19, 4-20, and 4-21, which expand on the discussion of the effect on stratospheric ozone which is on pages 4-17 through 4-22 of the Draft EIS.

Response to comment WR39-2: See response to comment OR11-2.

Response to comment WR39-3: See response to comment OR62-1.

Response to comment WR40-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21. Potential impacts are evaluated in reference to the intensity/context criteria discussed on pages 4-1 and 4-2 of the Draft EIS. The procedure for determining the level of significance on the impact of the Strategic Target System program on the global atmosphere is discussed on page 4-17, paragraph 3 of the Draft EIS.

Response to comment WR40-2: See response to comment OR11-2.

Response to comment WR41-1: The Strategic Target System would not be the largest single source of ozone depletion. The relative contribution of the program in the context of other identified man-made air pollution sources is discussed on pages 4-17 through 4-21 of the Draft EIS. See Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21, which also address the issue of ozone depletion. See also the response to comment WR8-5.

Response to comment WR41-2: See response to comment OR10-3.

Response to comment WR42-1: Thank you for commenting on the Draft EIS.

Response to comment WR43-1: Thank you for commenting on the Draft EIS.

Response to comment WR44-1: Thank you for commenting on the Draft EIS.

Response to comment WR45-1: See response to comment OR11-2.

Response to comment WR46-1: Thank you for commenting on the Draft EIS.

Response to comment WR47-1: Thank you for commenting on the Draft EIS.

Response to comment WR48-1: See response to comment OR18-1.

Response to comment WR48-2: See response to comment OR11-2.

Response to comment WR48-3: See response to comment OR10-1 and page 4-23, Section 4.4.1.2 of the Draft EIS.

Response to comment WR48-4: A discussion of bromine-stimulated ozone depletion is given on page 4-20, paragraph 5 of the Draft EIS. For more detailed information, the commentor is referred to the following citations listed in that text: World Meteorological Organization 1990; McElroy et al. 1986; Anderson et al. 1989; Ko et al. 1989.

Response to comment WR49-1: Thank you for commenting on the Draft EIS.

Response to comment WR50-1: Thank you for commenting on the Draft EIS.

Response to comment WR51-1: Thank you for commenting on the Draft EIS.

Response to comment WR52-1: Thank you for commenting on the Draft EIS.

Response to comment WR53-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19. These changes discuss the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle.

Response to comment WR53-2: See response to comment OR10-3.

Response to comment WR54-1: Thank you for commenting on the Draft EIS.

Response to comment WR55-1: Thank you for commenting on the Draft EIS.

Response to comment WR56-1: Thank you for commenting on the Draft EIS.

Response to comment WR57-1: Section 4.10.1.5 through 4.10.1.12, pages 4-57 through 4-64 of the Draft EIS describe the transportation and handling of liquid propellants following procedures developed and improved by various governmental agencies and contractors over the last 30 years. These propellants have been handled safely for over 30 years. Public health and safety would not be at risk from transport of the liquid propellants.

Response to comment WR57-2: See response to comment OR1-7. The Army has consulted with Kauai Public Safety staff on this project.

Response to comment WR58-1: Thank you for commenting on the Draft EIS.

Response to comment WR59-1: Thank you for commenting on the Draft EIS.

Response to comment WR60-1: Thank you for commenting on the Draft EIS.

Response to comment WR61-1: Thank you for commenting on the Draft EIS.

Response to comment WR62-1: Thank you for commenting on the Draft EIS.

Response to comment WR63-1: See response to comment OR18-1.

Response to comment WR64-1: See response to comment OR11-2.

Response to comment WR65-1: See response to comment OR7-1.

Response to comment WR66-1: Neither of the rocket launches referred to by the commentor were Strategic Target System vehicles or Polaris A3 boosters. The safety area for the Strategic Target System includes a 5.6-mi^2 hazard area and a 198-mi^2 area over water.

Response to comment WR66-2: See pages 4-20 and 4-21 of the Draft EIS for a discussion of the potential environmental effects of the halon 2402 (Freon 114B2) release from the second stage of the Strategic Target System launch vehicle.

Response to comment WR66-3: Aluminum oxide and hydrochloric acid will not be in the payload of the Strategic Target System launch vehicle. These are known combustion products of the rocket exhaust. The human health and environmental effects of aluminum oxide and hydrogen chloride are discussed on pages 4-7 to 4-17 and pages 4-24 to 4-26 of the Draft EIS.

No persuasive scientific evidence has been published to support the hypothesis of a direct causal role of aluminum in the development of Alzheimer's disease. No link has been demonstrated between aluminum oxide and Alzheimer's disease. Modeled ambient concentrations of hydrogen chloride from a launch indicated that the public would not be exposed to harmful levels.

Experimental release of hydrazine-family fuel is planned for up to two Strategic Target System flights. See page 2-26 of the Draft EIS. The location of the release outside the earth's atmosphere will not pose a threat to plants, animals, or humans.

Response to comment WR67-1: As shown on page 2-23, Figure 2-13 of the Draft EIS, the Strategic Target System activities, including the ground hazard area do not affect lands designated as Hawaiian Home Lands. See also response to comment OR7-1.

Response to comment WR67-2: See responses to comments OR1-6, WR30-1, and WR231-3.

Response to comment WR67-3: Response to comment OR125-2.

Response to comment WR67-4: See response to comment OR1-6. In addition, the cumulative closure time used in the ZEST Environmental Assessment was taken from a draft KTF environmental document. This document was overly conservative in its use of 30 days for vertical launch preparation and the possibility of three launch pads in use simultaneously. The Draft EIS correctly describes Strategic Target System launch preparations lasting an average of 14 days per launch for a total of 56 days per year.

Response to comment WR67-5: See response to comment OR 1-6.

Response to comment WR67-6: Transplantation of the plant is an effective mitigation measure to protect the species, as noted by the U.S. Fish and Wildlife Service, Honolulu and Department of Interior Headquarters, Washington D.C. (see Chapter 4, Consultations, of this volume).

Response to comment WR67-7: Hydrogen sulfide is not an exhaust emission product of the Strategic Target System launch vehicle. Hydrogen chloride is a combustion product of the solid fuel used in this system. Mitigation measures to reduce hydrogen chloride emissions would require another solid fuel and another launch vehicle. See Section 2.3, pages 2-34 to 2-38 of the Draft EIS for a discussion of alternative boosters.

Response to comment WR67-8: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.3.1.2, on page 4-20.

Response to comment WR68-1: Thank you for commenting on the Draft EIS.

Response to comment WR69-1: Thank you for commenting on the Draft EIS.

Response to comment WR70-1: Thank you for commenting on the Draft EIS.

Response to comment WR71-1: See response to comment OR7-1.

Response to comment WR72-1: As discussed in Section 4.4.1.3 of the Draft EIS, no impacts to these marine mammals are expected as a result of launches. Resource agencies having oversight responsibilities have concurred with these findings (see Chapter 4, Consultations, of this volume).

Response to comment WR72-2: There is no evidence to indicate that Strategic Target System launch activities would have any adverse effect on the image of Kauai or would lessen Kauai's attractiveness to tourists. This conclusion is based on two factors. First, the analysis in the Draft EIS did not identify any significant impacts to visual, natural, or biological resources as a result of the proposed action.

Second, rockets have been launched from KTF and PMRF for over 30 years. KTF has launched over 300 rockets and PMRF has launched over 800 rockets. Tourism on Kauai has grown from over 470,000 visitors in 1971 to over 1.2 million visitors in 1991. Because the Strategic Target System program does not represent a significant increase in launch activity or change in the character and mission at KTF/PMRF, no changes in the image of Kauai is anticipated as a result of the Strategic Target System program.

Response to comment WR73-1: See Table 2-2 of the Draft EIS.

Response to comment WR74-1: Thank you for commenting on the Draft EIS.

Response to comment WR75-1: Thank you for commenting on the Draft EIS.

Response to comment WR76-1: Thank you for commenting on the Draft EIS.

Response to comment WR77-1: Thank you for commenting on the Draft EIS.

Response to comment WR78-1: Thank you for commenting on the Draft EIS.

Response to comment WR79-1: Thank you for commenting on the Draft EIS.

Response to comment WR80-1: Thank you for commenting on the Draft EIS.

Response to comment WR81-1: Thank you for commenting on the Draft EIS.

Response to comment WR82-1: Thank you for commenting on the Draft EIS.

Response to comment WR83-1: Thank you for commenting on the Draft EIS.

Response to comment WR84-1: Thank you for commenting on the Draft EIS.

Response to comment WR85-1: Thank you for commenting on the Draft EIS.

Response to comment WR86-1: Thank you for commenting on the Draft EIS.

Response to comment WR87-1: Thank you for commenting on the Draft EIS.

Response to comment WR88-1: The Strategic Target System launch pad is located adjacent to the Nohili Dunes. See response to comment OR62-1.

Response to comment WR88-2: See response to comment OR11-2.

Response to comment WR88-3: See Section 2.3 of the Draft EIS for a discussion of the Minuteman I alternative.

Response to comment WR88-4: See pages 4-17 to 4-21 of the Draft EIS. The text discusses several studies of the stratospheric effects of all chemical propulsion systems and bromine-stimulated ozone depletion. Several citations on both topics are provided.

Response to comment WR88-5: The refurbishment of Strategic Target System boosters was assessed in the Strategic Target System Environmental Assessment in June 1990. Rocket fuel cannot be replaced in Strategic Target System boosters. The boosters will be disposed of if necessary in compliance with applicable federal and state requirements.

Response to comment WR88-6: None of the Strategic Target System activities that have the potential to impact the environment are classified.

Response to comment WR88-7: The impact of the Strategic Target System payload in the Broad Ocean Area is addressed in the USAKA EIS. Other aspects of launch flight activities are addressed in Sections 4.2.1 and 4.4.1 of the Draft EIS. Other materials associated with missile launches are metallic or inert materials which would have no significant effect on marine life. A complete analysis of the ocean's capacity to assimilate debris from rocket launches is outside the scope of the EIS.

Response to comment WR88-8: Sections 2.1.2.1 through 2.1.2.6 and pages 2-16 through 2-26 of the Draft EIS describe the Strategic Target System vehicle flight safety considerations, which include a discussion of the Notice to Mariners. It is unlikely that any flight would be terminated following second-stage burnout. In the unlikely event of a flight termination at this point, most of the debris would burn up upon reentry and, together with the low density of ships in the open ocean, the probability of impact is highly unlikely.

Response to comment WR89-1: Thank you for commenting on the Draft EIS. See response to comment OR24-2.

Response to comment WR90-1: Minuteman I boosters have been used in the past to launch experiments similar to those that will be carried aboard the Strategic Target System. The short supply of Minuteman I boosters led to the development of the Strategic Target System. Minuteman I is defined as a "former" type of ICBM by the START Treaty. This means it was no longer deployed as an operational ICBM at the time of the signing of the START Treaty. Minuteman II and Minuteman III are considered existing types of ICBMs by the START Treaty. This means that they both were deployed at the time of the signing of the START Treaty. Minuteman III is an operational system and not available for R&D launches. In order for the Minuteman I and Minuteman II boosters to be suitable for Strategic Target System, the booster front ends would have to be modified to accommodate multiple RV test objects. Article III, para. 4a, of the START Treaty restricts the number of RVs carried by an existing type of ICBM to the number attributed to it by the treaty. Minuteman II is attributed to just one.

Minuteman III is attributed with three. The START Treaty will not permit Minuteman II to carry more than one RV and Minuteman III not more that three. Neither limit would be suitable for the Strategic Target System requirements. Minuteman I, as a former ICBM, is not attributed with any specific RV count in the START Treaty. Modifications to Minuteman I to permit it to carry multiple RVs would make it a "new" type of ICBM. This would subject the new ICBM to all the restrictions of the START Treaty, which would greatly impede the Strategic Target System testing program. Agreed Statement 29 of the START Treaty exempts the refurbished Polaris A-3 booster (modified with an extra stage) from the START restrictions when it is used only for R&D purposes. The Strategic Target System, however, is still subject to the INF Treaty. There is no similar exemption for Minuteman I.

Response to comment WR90-2: See response to comment WR90-1.

Response to comment WR91-1: Thank you for commenting on the Draft EIS.

Response to comment WR92-1: Thank you for commenting on the Draft EIS.

Response to comment WR93-1: Thank you for commenting on the Draft EIS.

Response to comment WR94-1: Thank you for commenting on the Draft EIS.

Response to comment WR95-1: Thank you for commenting on the Draft EIS.

Response to comment WR96-1: Thank you for commenting on the Draft EIS.

Response to comment WR97-1: See response to comment OR49-7.

Response to comment WR97-2: Section 4.10.1.3 of the Draft EIS has been amended to include a more detailed discussion on system reliability.

Response to comment WR98-1: Thank you for commenting on the Draft EIS.

Response to comment WR99-1: Thank you for commenting on the Draft EIS.

Response to comment WR100-1: Thank you for commenting on the Draft EIS.

Response to comment WR101-1: Thank you for commenting on the Draft EIS.

Response to comment WR102-1: Thank you for commenting on the Draft EIS.

Response to comment WR103-1: Thank you for commenting on the Draft EIS.

Response to comment WR104-1: Thank you for commenting on the Draft EIS.

Response to comment WR105-1: Thank you for commenting on the Draft EIS.

Response to comment WR106-1: Thank you for commenting on the Draft EIS.

Response to comment WR107-1: Thank you for commenting on the Draft EIS.

Response to comment WR108-1: Thank you for commenting on the Draft EIS.

Response to comment WR109-1: Thank you for commenting on the Draft EIS.

Response to comment WR110-1: Thank you for commenting on the Draft EIS.

Response to comment WR111-1: Thank you for commenting on the Draft EIS.

Response to comment WR112-1: Thank you for commenting on the Draft EIS.

Response to comment WR113-1: Thank you for commenting on the Draft EIS.

Response to comment WR114-1: See response to comment OR1-6 and OR125-4.

Response to comment WR114-2: Section 2.1.2.1, page 2-16 of the Draft EIS describes flight safety issues.

Response to comment WR114-3: See Section 2.1.1.2 of the Draft EIS for a discussion of rocket motor reliability and Section 2.1.2.2, which describes the ground hazard area. The ground hazard area is a modified 10,000-foot arc covering 5.6 mi^2.

Response to comment WR114-4: Potential impacts to stratospheric ozone depletion are evaluated in reference to the intensity/context criteria discussed on pages 4-1 and 4-2 of the Draft EIS. Impacts are considered not significant if effects of emissions, environmental impacts, or human health effects from Strategic Target System activities are not severe in the context of other identified man-made air pollution sources. See pages 4-20 and 4-21 for a discussion of the freon (halon) release by the Strategic Target System program.

Response to comment WR114-5: See response to comment OR11-2.

Response to comment WR115-1: Thank you for commenting on the Draft EIS.

Response to comment WR116-1: Thank you for commenting on the Draft EIS.

Response to comment WR117-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR117-2: See response to comment OR24-2.

Response to comment WR117-3: Missile launching facilities in the continental United States exist at Cape Canaveral, FL, White Sands Missile Range, NM, and Vandenberg Air Force Base, CA. The land area associated with the coastline facilities in Florida and California are less than 50 miles inland. All three facilities contain populated areas within short distances from the launch pads. The communities of Titusville and Cape Canaveral, FL, are within 3 miles and Lompoc, CA, is within 6 miles of the respective launch pads. The nearest town to the Strategic Target System launch facility is Kekaha, which is 8 mi away. The modified 10,000-ft arc is considered sufficient ground hazard area to protect the public health and safety (see Chapter 2, Additions and Revisions to the Draft EIS, Figure 2-4). The MOA and the safety easement will allow for sufficient control over the area, such that fencing will not be required.

Response to comment WR118-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR118-2: See response to comment OR24-2.

Response to comment WR119-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR119-2: See response to comment OR24-2.

Response to comment WR120-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR120-2: See response to comment OR24-2.

Response to comment WR121-1: Thank you for commenting on the Draft EIS.

Response to comment WR122-1: Thank you for your comment. Refer to OR1-6.

Response to comment WR123-1: Thank you for commenting on the Draft EIS.

Response to comment WR124-1: See response to comment OR11-2.

Response to comment WR125-1: Thank you for commenting on the Draft EIS.

Response to comment WR126-1: Thank you for commenting on the Draft EIS.

Response to comment WR127-1: Thank you for commenting on the Draft EIS.

Response to comment WR128-1: Thank you for commenting on the Draft EIS.

Response to comment WR129-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR129-2: See response to comment OR24-2.

Response to comment WR130-1: Thank you for commenting on the Draft EIS.

Response to comment WR131-1: Thank you for commenting on the Draft EIS.

Response to comment WR132-1: Thank you for commenting on the Draft EIS.

Response to comment WR133-1: See response to comment OR11-2.

Response to comment WR134-1: See response to comment OR11-2.

Response to comment WR135-1: Thank you for commenting on the Draft EIS.

Response to comment WR136-1: Thank you for commenting on the Draft EIS.

Response to comment WR137-1: Thank you for commenting on the Draft EIS.

Response to comment WR138-1: Thank you for commenting on the Draft EIS.

Response to comment WR139-1: Thank you for commenting on the Draft EIS.

Response to comment WR140-1: Thank you for commenting on the Draft EIS.

Response to comment WR141-1: See Section 4.10.1.3 of the Draft EIS for a discussion of several accident scenarios.

Response to comment WR142-1: Thank you for commenting on the Draft EIS.

Response to comment WR143-1: USASDC has had an ongoing dialogue with the public concerning information on the Strategic Target System program. The Public Affairs Office at PMRF will issue statements, probably in the form of press releases, on program launches.

Response to comment WR143-2: Section 4.9, page 4-44, of the Draft EIS discusses the handling of hazardous materials and waste. Hazardous waste that cannot be recycled will be shipped off-island for disposal.

Response to comment WR144-1: See response to comment OR11-2.

Response to comment WR145-1: Thank you for commenting on the Draft EIS.

Response to comment WR146-1: See response to comment OR11-2.

Response to comment WR147-1: Thank you for commenting on the Draft EIS.

Response to comment WR148-1: Thank you for commenting on the Draft EIS.

Response to comment WR149-1: Thank you for commenting on the Draft EIS.

Response to comment WR150-1: Thank you for commenting on the Draft EIS.

Response to comment WR151-1: The decision whether air quality will be monitored during the first launch will be determined by the decision maker in the Record of Decision. An ambient air-sampling protocol has been drafted by the U.S. Army Environmental Hygiene Agency for approval by the Strategic Defense Command. Sampling methods will be in accordance with or equivalent to standard EPA methodology.

Response to comment WR151-2: All liquid propellant loading and off-loading operations would be conducted by personnel trained in the handling of these propellants. Area monitoring is an integral part of such activities. Off-loading of the liquid propellants would be dictated by the situation encountered during a failure to launch.

Response to comment WR151-3: Section 4.9, page 4-44, of the Draft EIS discusses hazardous materials and waste. Hazardous waste will not be stored at the decontamination pad. They will

be transported to the existing PMRF hazardous waste accumulation area for disposal within 90 days. Spill containment is provided at the accumulation facility.

Response to comment WR151-4: There are no data available on chloride levels for surface waters for periods prior to the initiation of missile launches at PMRF. The diked agricultural ponds are all in different geological/soils substrate and area at higher elevations, near the base of the cliffs, than is the water resource sample locations. These ponds are continuously being refilled from wells and/or runoff from the adjacent cliffs, which may explain the differences in chloride levels. In addition, the water resource site (the Mānā pond) is an excavated pond and is considerably below the normal ground surface in the area.

Response to comment WR151-5: An annual national ambient air quality standard for carbon monoxide has not been established. The 8-hour national ambient air quality standard for carbon monoxide is 9 ppm (10,000 $\mu g/m^3$). The annual national ambient air quality standard for sulfur dioxide , 0.03 ppm (80 $\mu g/m^3$), is an arithmetic mean.

Response to comment WR151-6: The intent of statement on page 3-41, paragraph 2 of Draft EIS was not to compare day-night averages with single-event levels, but to show an example of comparison between a noise level 75 dB(A) value and the garbage disposal noise level of approximately 77 dB(A).

Response to comment WR151-7: The tank and leach field were designed to support populations including the launch pad staff described in the Draft EIS. Sections 3.12 and 4.12.1 of the Draft EIS identify the number of personnel involved in the proposed action.

Response to comment WR151-8: All activities excluding transportation of the liquid propellants are performed on concrete containment areas and thus preclude contamination of groundwater. Any spill that occurred during transportation or flight termination over land will be handled on a case-by-case basis by personnel trained in the handling of these materials.

Response to comment WR151-9: Air dispersion modeling input and output files are part of the Administrative Record of the EIS.

Response to comment WR151-10: The TRPUF results are not direction specific. In the commentor's terminology, they would be "concentric distance radials." The REEDM data in the Draft EIS apply to conditions over land. So the REEDM results, too, are "concentric distance radials" over land.

Response to comment WR152-1: Thank you for commenting on the Draft EIS.

Response to comment WR153-1: Thank you for commenting on the Draft EIS.

Response to comment WR154-1: Thank you for commenting on the Draft EIS.

Response to comment WR155-1: Thank you for commenting on the Draft EIS.

Response to comment WR156-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR156-2: See response to comment OR24-2.

Response to comment WR157-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR157-2: See response to comment OR24-2.

Response to comment WR158-1: Thank you for commenting on the Draft EIS.

Response to comment WR159-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR159-2: See response to comment OR24-2.

Response to comment WR160-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR160-2: See response to comment OR24-2.

Response to comment WR161-1: See response to comment OR49-7. See the introduction to Chapter 4 of the Draft EIS for a discussion of significance criteria.

Response to comment WR161-2: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-53, which has been amended to include a more detailed discussion of system reliability.

Response to comment WR162-1: See response to comments OR49-7 and OR10-5. See Section 2.3 of the Draft EIS for a discussion of the alternative sites and boosters for this program.

Response to comment WR162-2: See response to comments OR2-3 and OR24-2.

Response to comment WR163-1: The 30 years of tests discussed in the Draft EIS refer to the Department of Energy sounding-rocket launches that have occurred since 1962. No Strategic Target System launches have occurred.

Response to comment WR163-2: There will be no hazardous materials stored on Hawaiian Home Lands in support of Strategic Target System launches.

Response to comment WR164-1: See response to comment OR18-1.

Response to comment WR164-2: Potential impacts to stratospheric ozone are evaluated in reference to the intensity/context criteria discussed on pages 4-1 and 4-2 of the Draft EIS. The procedure for determining the level of significance on the impact of the Strategic Target System program on the global atmosphere is discussed on page 4-17, paragraph 3. See pages 4-20 and 4-21 of the Draft EIS for a discussion of the freon (halon) releases by the Strategic Target System program.

Response to comment WR165-1: Thank you for commenting on the Draft EIS.

Response to comment WR166-1: Thank you for commenting on the Draft EIS.

Response to comment WR167-1: Thank you for commenting on the Draft EIS.

Response to comment WR168-1: Thank you for commenting on the Draft EIS.

Response to comment WR169-1: Thank you for commenting on the Draft EIS.

Response to comment WR170-1: Thank you for commenting on the Draft EIS.

Response to comment WR171-1: Thank you for commenting on the Draft EIS.

Response to comment WR172-1: Thank you for commenting on the Draft EIS.

Response to comment WR173-1: Thank you for commenting on the Draft EIS.

Response to comment WR174-1: Thank you for commenting on the Draft EIS.

Response to comment WR175-1: The Strategic Target System will land in the broad ocean area north of Kwajalein Atoll and not in the lagoon or on any islands. There are no nuclear weapons or nuclear components in the payload.

Response to comment WR176-1: Thank you for commenting on Draft EIS.

Response to comment WR177-1: Thank you for commenting on the Draft EIS.

Response to comment WR178-1: See response to comment WR163-1.

Response to comment WR178-2: See response to comment OR62-1.

Response to comment WR178-3: See response to comment WR163-2.

Response to comment WR179-1: Thank you for commenting on the Draft EIS.

Response to comment WR180-1: Thank you for commenting on the Draft EIS.

Response to comment WR181-1: Thank you for commenting on the Draft EIS.

Response to comment WR182-1: See response to comment OR11-2.

Response to comment WR183-1: Thank you for commenting on the Draft EIS.

Response to comment WR184-1: Thank you for commenting on the Draft EIS.

Response to comment WR185-1: See response to comment WR66-3. It discusses hydrogen chloride and aluminum oxide emissions and the issue of Alzheimer's disease.

Response to comment WR185-2: Section 4.10.1.5 through 4.10.1.12 of the Draft EIS fully explain the hazards associated with the liquid propellants and which have been safely used in the

industry for over 30 years. In addition, Section 4.10.1.12 of the Draft EIS describes the distances and concentrations that might be expected if the full quantity of propellants were spilled.

Response to comment WR185-3: See pages 4-20 and 4-21 of the Draft EIS for a discussion of the freon (halon) releases of the Strategic Target System program. See also changes to the Draft EIS for these pages for a discussion of a summary of the impacts on stratospheric ozone.

Response to comment WR186-1: Thank you for commenting on the Draft EIS.

Response to comment WR187-1: Thank you for commenting on the Draft EIS.

Response to comment WR188-1: Thank you for commenting on the Draft EIS.

Response to comment WR189-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of the freon (halon) releases of the Strategic Target System program. See also changes to the Draft EIS for these pages for a discussion of a summary of the impacts on stratospheric ozone.

Response to comment WR189-2: The ground hazard area, which is the land area around the launch pad beyond which no debris will fall even in the event of a flight termination, for the Strategic Target System is a modified 10,000-ft arc, which has a land area of approximately 5.6 mi^2, not 10,000 ft^2. No rocket system launched by the United States has a ground hazard area of 600 mi^2 as shown in Figure 2-4 (modified). The launch hazard area, which is the safety zone along the ground missile track from lift-off to splash-down, for the Strategic Target System is approximately 198 mi^2 in a direction toward Kwajalein Atoll.

Response to comment WR189-3: After the Kwajalein Atoll was recaptured from the Japanese by U.S. military forces and the populace was released from their forced labor situation, several hundred Marshallese were moved to Ebeye from Kwajalein Island.

Response to comment WR189-4: See response to comment OR1-6.

Response to comment WR190-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR190-2: See response to comment OR24-2.

Response to comment WR191-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-53, which has been changed to provide a more detailed discussion of system reliability.

Response to comment WR191-2: The Strategic Target System vehicle is a three-stage, solid-propellent rocket. The original Polaris is a two-stage rocket. The Strategic Target System would not fit physically inside a Polaris submarine.

Response to comment WR191-3: See Section 2.3 of the Draft EIS for a discussion of how treaty limitation affects the alternatives.

Response to comment WR192-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR192-2: See response to comment OR24-2.

Response to comment WR192-3: See response to comment WR117-3.

Response to comment WR193-1: Thank you for commenting on the Draft EIS.

Response to comment WR194-1: Although the Draft EIS is correct in stating that the verified clear time is 20 minutes and that the total verified clear time for Strategic Target System is 80 minutes per year, the actual time the public access to the area would be restricted would be somewhat longer. In the case of road closure, the time would be approximately 30 minutes. In the case of members of the public in the state park, the time from which they would begin leaving the area would be approximately 1.5 hours before the launch, but the actual time they could not be within the ground hazard area would be approximately 30 minutes. It should be noted that people in the state park will merely be moving to another part of the park and will not be asked to leave the park, only the ground hazard area. The exact areas affected by the range-clearing activities are shown in Figure 2-13 of the Draft EIS. In addition, see Chapter 2, Additions and Revisions to the Draft EIS, Section 2.1.2.3 on page 2-25.

Response to comment WR194-2: If a maintenance delay or weather hold occurs after approximately 30 minutes prior to launch, public access to the ground hazard area will already have been restricted. If the matter cannot be resolved quickly, then a decision will be made to reopen the areas. The process would start again with range-clearing personnel advising the public of the new launch time. Each time access to the ground hazard area is restricted counts as a launch event for purposes of the MOA or easement so the total number of events is limited.

Response to comment WR194-3: See Chapter 2, Additions and Revisions to the Draft EIS, Section 2.1.2.3 on page 2-25 for a discussion of range clearing operations. In addition, see Section 4.6.3 of the Draft EIS.

Response to comment WR195-1: See response to comment OR11-2.

Response to comment WR196-1: See response to comment WR66-1.

Response to comment WR196-2: See response to comment WR66-2.

Response to comment WR196-3: See response to comment WR66-3.

Response to comment WR197-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR197-2: See response to comment OR24-2.

Response to comment WR198-1: See response to comment OR37-3.

Response to comment WR199-1: Thank you for commenting on the Draft EIS.

Response to comment WR200-1: Thank you for commenting on the Draft EIS.

Response to comment WR201-1: Thank you for commenting on the Draft EIS.

Response to comment WR202-1: Thank you for commenting on the Draft EIS.

Response to comment WR203-1: Road transportation is not the proposed activity; nevertheless, such transportation was assessed in the Strategic Target System EA, which concluded that no health or safety problems would occur. In addition, see response to comment OR56-5.

Response to comment WR203-2: See pages 4-7 through 4-17 of the Draft EIS for a discussion of the ground level effects of emissions from Strategic Target System launches in the vicinity of PMRF and KTF.

Response to comment WR203-3: See response to comment WR72-2.

Response to comment WR204-1: Thank you for commenting on the Draft EIS.

Response to comment WR205-1: See response to comment OR11-2.

Response to comment WR206-1: Thank you for commenting on the Draft EIS.

Response to comment WR207-1: Thank you for commenting on the Draft EIS.

Response to comment WR208-1: Thank you for commenting on the Draft EIS.

Response to comment WR209-1: The number of actual launches associated with the SDI program has not changed. The number of launches per year is dependent upon whether the operations are conducted under the easement or the MOA. The number of launches allowed by the easement is up to four Strategic Target System launches per year for 10 years, and three EDX launches per year for 3 years. The Navy Vandal launches make up the remaining eight launches per year and require only a 6,000-ft ground hazard area. The 15 additional events were placed in the easement to accommodate weather holds and maintenance delays. Your compensation concern will be addressed during the easement appraisal and negotiation process.

The Memorandum of Agreement, which allows up to four Strategic Target System launches and 15 Navy Vandal launches a year, will govern closures prior to completion of the easement process. The schedule for each launch will be given to the state and to Kekaha Sugar Company as far in advance as possible. This will allow Kekaha Sugar Company to plan its planting, managing, and harvesting activities so they are not in conflict with launches. Adjustments in launch days can also be made by the Army and the Navy.

Response to comment WR210-1: Thank you for commenting on the Draft EIS.

Response to comment WR211-1: See response to comment OR11-2.

Response to comment WR212-1: Section 2.1.1.2, page 2-7, of the Draft EIS describes the reliability of the vehicle, and Section 2.1.2, page 2-15, of the Draft EIS discusses flight and ground safety.

Response to comment WR212-2: See response to comment WR185-2.

Response to comment WR212-3: For a discussion of alternative launch sites, see Section 2.3 of the Draft EIS.

Response to comment WR212-4: The Strategic Target System is capable of delivering test objects with ICBM-like reentry conditions. The program manager for the test objects will determine what reentry conditions are required for each launch.

Response to comment WR212-5: See response to comment WR72-2.

Response to comment WR212-6: Fisheries and marine environments will not be significantly affected by a spill of rocket fuel. See Section 4.2.2 of the Draft EIS.

Response to comment WR212-7: No money has been spent on public relations campaigning; further, this type of activity would be prohibited by law.

Response to comment WR213-1: Thank you for commenting on the Draft EIS.

Response to comment WR214-1: Thank you for commenting on the Draft EIS.

Response to comment WR215-1: The environmental consequences of the proposed action are discussed in Chapter 4 of the Draft EIS. Air quality effects are discussed in Section 4.3, pages 4-6 through 4-22. Air quality modeling of launch vehicle emissions did not predict exceedances of national ambient air quality standards or applicable public exposure guidelines. These standards were established by public health agencies to protect public health and the environment. Launch vehicle emissions will not adversely impact public health and the environment.

Response to comment WR216-1: Thank you for commenting on the Draft EIS.

Response to comment WR217-1: Thank you for commenting on the Draft EIS.

Response to comment WR218-1: Strategic Target System vehicles carry no nuclear weapons, and the payload has no nuclear components.

Response to comment WR219-1: Thank you for commenting on the Draft EIS.

Response to comment WR220-1: Thank you for commenting on the Draft EIS.

Response to comment WR221-1: Thank you for commenting on the Draft EIS.

Response to comment WR222-1: The introduction to Chapter 4 of the Draft EIS discusses the significance criteria used for analysis of environmental impacts.

Response to comment WR223-1: Thank you for commenting on the Draft EIS.

Response to comment WR224-1: Thank you for commenting on the Draft EIS.

Response to comment WR225-1: Thank you for commenting on the Draft EIS.

Response to comment WR226-1: The Army, the Navy, DOE, and SDI will comply with all applicable federal, state, interstate, and local requirements with regard to launch activities at PMRF and KTF. The Draft EIS contains the conclusion that no applicable state law will be violated due to Strategic Target System or other launching activities.

Response to comment WR227-1: Thank you for commenting on the Draft EIS.

Response to comment WR228-1: Thank you for commenting on the Draft EIS.

Response to comment WR229-1: See response to comment OR11-2.

Response to comment WR229-2: See pages 4-17 through 4-21 of the Draft EIS for discussions of the impacts on stratospheric ozone by the Strategic Target System program. See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15, 4-19, 4-20, and 4-21 for an expansion of this discussion and a summary of the impacts on stratospheric ozone.

Response to comment WR229-3: See response to comment OR62-1.

Response to comment WR230-1: See response to comment OR11-2.

Response to comment WR231-1: The importance of near-shore waters and the potential for human-related disturbance to humpback whales, particularly cow-calf pairs, is recognized. The increase in humpback whales, including the presence of cow-calf pairs, observed in the Kauai Channel in recent years has occurred concomitantly with existing programs that include missile launches. If the existing programs have not had an adverse effect on the whales, it is unlikely that normal missile launches associated with the Strategic Target System program would adversely affect humpback whale use in the project area.

Response to comment WR231-2: See response to comment OR7-1.

Response to comment WR231-3: The draft easement in the Draft EIS in Appendix C is related to three programs: the Strategic Target System, Exoatmospheric Discrimination Experiment, and Navy Vandal; the number of launches planned on an annual basis are four, three, and eight, respectively. Moreover, there are 15 additional backup uses of the easement for purposed of maintenance and technical delays and to accommodate weather (see Draft EIS, Section 2.1.2.3). The planned duration for the easement is 10 years (see Draft EIS, Section 3.1.2.3). There is no plan to expand the activities beyond those described in the Draft EIS.

The safety easement is intended to help preserve the open space and agricultural nature of the land adjacent to PMRF. These uses would be compatible with the proposed rocket launches. The Memorandum of Agreement is necessary to cover the time period until the easement could take effect in late 1993, since congressional authorization is needed. The value of the easement is currently being appraised by the Navy. Although the planned time for the easement is 10 years, the appraiser has been asked to value different time periods so that economics of scale and time are taken into account.

Response to comment WR231-4: As noted on page 3-41, paragraph 4 of the Draft EIS, the nearest on-base housing area is located approximately 5 miles south of KTF. In the past, noise concerns have not been an issue.

Response to comment WR231-5: See response to comments OR10-3 and WR72-2.

Response to comment WR231-6: Figure 2-4 of the Draft EIS has been revised to reflect ground hazard areas for the comparison rockets.

Response to comment WR231-7: The map of the 100-year tsunami flood zone on page 3-5 of the Draft EIS is based on specific information taken from the Federal Emergency Management Agency (FEMA) flood zone map for the Island of Kauai. The information is the definitive data for insurance and other purposes and, as such, was used as the basis for the analysis in the Draft EIS.

Response to comment WR232-1: Thank you for commenting on the Draft EIS.

Response to comment WR233-1: Thank you for commenting on the Draft EIS.

Response to comment WR234-1: Section 4.10 of the Draft EIS provide a detailed discussion of potential accident scenarios as well as procedures for the transport of liquid propellants.

Response to comment WR235-1: Thank you for commenting on the Draft EIS.

Response to comment WR236-1: Thank you for commenting on the Draft EIS.

Response to comment WR237-1: The importance of near-shore waters and the potential for human-related disturbance to humpback whale is recognized. The presence of recent distribution data for the humpback whale off Kauai is also noted. The increase in humpback whales observed in the Kauai Channel in recent years has occurred concomitantly with existing programs that include missile launches. If the existing programs have not had an adverse effect on the whales, it is unlikely that normal missile launches associated with the Strategic Target System program would adversely affect humpback whale use in the project area. The probability of early terminated launch debris impacting a humpback whale would be remote despite the potential of increased numbers of whales present in the launch hazard zone.

Response to comment WR237-2: As indicated in Chapter 4 of the Draft EIS if the presence of a humpback whale is observed during prelaunch clearing surveys of the near-shore launch safety zone and the offshore launch hazard area, the launch will be delayed. Prelaunch clearing surveys as described in Chapter 2 of the Draft EIS are standard procedure at the Pacific Missile Range Facility (PMRF).

Response to comment WR237-3: Activities at the PMRF are conducted in accordance with applicable state and federal wildlife laws, including the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973. See response to comment OR83-3. In addition, the National Marine Fisheries Service and the United States Fish and Wildlife Service concurred with the finding of no adverse effects to the humpback whale or other sensitive wildlife species as addressed in the Biological Assessment (USASDC 1990) (see Chapter 4, Consultations, of this volume).

Response to comment WR238-1: See response to comment WR189-2.

Response to comment WR239-1: Thank you for commenting on the Draft EIS.

Response to comment WR240-1: Thank you for commenting on the Draft EIS.

Response to comment WR241-1: Thank you for commenting on the Draft EIS.

Response to comment WR242-1: Thank you for commenting on the Draft EIS.

Response to comment WR243-1: Thank you for commenting on the Draft EIS.

Response to comment WR244-1: Thank you for commenting on the Draft EIS.

Response to comment WR245-1: See response to comment OR11-2.

Response to comment WR246-1: Thank you for commenting on the Draft EIS.

Response to comment WR247-1: Thank you for commenting on the Draft EIS.

Response to comment WR248-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR248-2: See response to comment OR24-2.

Response to comment WR249-1: Thank you for commenting on the Draft EIS.

Response to comment WR250-1: Thank you for commenting on the Draft EIS.

Response to comment WR251-1: Thank you for commenting on the Draft EIS.

Response to comment WR252-1: Thank you for commenting on the Draft EIS.

Response to comment WR253-1: Thank you for commenting on the Draft EIS.

Response to comment WR254-1: Thank you for commenting on the Draft EIS.

Response to comment WR255-1: See response to comment WR189-2.

Response to comment WR255-2: The air dispersion modeling of ground level air quality impacts included an early flight termination on the launch pad at the Kauai Test Facility. If a flight termination occurs at any altitude along the trajectory path, regardless of wind direction, ground level air quality impacts will be less than those presented in the modeling analysis. Air quality modeling results indicate that emission levels of hydrogen chloride and aluminum oxide resulting from a flight termination will not result in a significant adverse impact on the health of the public.

Response to comment WR256-1: Thank you for commenting on the Draft EIS.

Response to comment WR257-1: Thank you for commenting on the Draft EIS.

Response to comment WR258-1: Thank you for commenting on the Draft EIS.

Response to comment WR259-1: Thank you for commenting on the Draft EIS.

Response to comment WR260-1: Thank you for commenting on the Draft EIS.

Response to comment WR261-1: Thank you for commenting on the Draft EIS.

Response to comment WR262-1: Thank you for commenting on the Draft EIS.

Response to comment WR263-1: Thank you for commenting on the Draft EIS.

Response to comment WR264-1: See response to comment OR18-1.

Response to comment WR265-1: Thank you for commenting on the Draft EIS.

Response to comment WR266-1: Thank you for commenting on the Draft EIS.

Response to comment WR267-1: Thank you for commenting on the Draft EIS.

Response to comment WR268-1: Thank you for commenting on the Draft EIS.

Response to comment WR269-1: Thank you for commenting on the Draft EIS.

Response to comment WR270-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR270-2: See response to comment OR24-2.

Response to comment WR271-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR271-2: See response to comment OR24-2.

Response to comment WR272-1: Thank you for commenting on the Draft EIS.

Response to comment WR273-1: Thank you for commenting on the Draft EIS.

Response to comment WR274-1: Thank you for commenting on the Draft EIS.

Response to comment WR275-1: Thank you for commenting on the Draft EIS.

Response to comment WR276-1: Thank you for commenting on the Draft EIS.

Response to comment WR277-1: Thank you for commenting on the Draft EIS.

Response to comment WR278-1: Thank you for commenting on the Draft EIS.

Response to comment WR279-1: Thank you for commenting on the Draft EIS.

Response to comment WR280-1: Thank you for commenting on the Draft EIS.

Response to comment WR281-1: Thank you for commenting on the Draft EIS.

Response to comment WR282-1: Thank you for commenting on the Draft EIS.

Response to comment WR283-1: Thank you for commenting on the Draft EIS.

Response to comment WR284-1: Thank you for commenting on the Draft EIS.

Response to comment WR285-1: Thank you for commenting on the Draft EIS.

Response to comment WR286-1: Thank you for commenting on the Draft EIS.

Response to comment WR287-1: Thank you for commenting on the Draft EIS.

Response to comment WR288-1: Thank you for commenting on the Draft EIS.

Response to comment WR289-1: See page 4-20 of the Draft EIS and Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21 for discussions of the freon (halon) releases of the Strategic Target System program.

Response to comment WR290-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-21, for a summary discussion of impacts on stratospheric ozone.

Response to comment WR290-2: No significant effects are expected for any water supplied for either Kauai or Niihau (see Section 4.2.1, pages 4-4 and 4-5 of the Draft EIS).

Response to comment WR290-3: See response to comment OR10-3.

Response to comment WR290-4: See response to comment OR11-2.

Response to comment WR291-1: See pages 4-20 and 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR291-2: See response to comment OR24-2.

Response to comment WR292-1: Thank you for commenting on the Draft EIS.

Response to comment WR293-1: Thank you for commenting on the Draft EIS.

Response to comment WR294-1: See response to comment OR11-2.

Response to comment WR295-1: Thank you for commenting on the Draft EIS.

Response to comment WR296-1: Thank you for commenting on the Draft EIS.

Response to comment WR297-1: The "launch safety area" is based on the explosive potential of the vehicle and flight safety criteria, not the size of the surrounding land mass.

Response to comment WR297-2: See response to comment OR10-3.

Response to comment WR297-3: See pages 4-17 through 4-21 of the Draft EIS for discussions of the impacts on stratospheric ozone by the Strategic Target System program. See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15, 4-19, 4-20, and 4-21 for an expansion of this discussion and a summary of the impacts on stratospheric ozone. See pages 4-21 to 4-22 of the Draft EIS for a discussion of air quality mitigation measures.

Response to comment WR297-4: See response to comment OR11-2.

Response to comment WR298-1: Thank you for commenting on the Draft EIS.

Response to comment WR299-1: See response to comment OR49-7. See Section 2.3 of the Draft EIS for a discussion of alternatives.

Response to comment WR300-1: Thank you for commenting on the Draft EIS.

Response to comment WR301-1: See pages 4-17 through 4-21 of the Draft EIS for a discussion on impacts on stratospheric ozone. See changes to these pages of the Draft EIS for further discussion of the issue and a summary of impacts on stratospheric ozone.

Response to comment WR301-2: See response to comment OR56-5.

Response to comment WR302-1: Thank you for commenting on the Draft EIS.

Response to comment WR303-1: Thank you for commenting on the Draft EIS.

Response to comment WR304-1: Thank you for commenting on the Draft EIS.

Response to comment WR305-1: Thank you for commenting on the Draft EIS.

Response to comment WR306-1: Thank you for commenting on the Draft EIS.

Response to comment WR307-1: Although this comment was postmarked after the close of the comment period, USASDC has a policy of considering all comments and responding in the Final EIS when possible. The air quality analysis of the potential air quality impacts of Strategic Target System launch vehicle emissions accounted for winds blowing over land. For a discussion of that analysis see pages 4-7 through 4-17 of the Draft EIS. Air dispersion modeling predicted that launches will not result in exceedances of ambient air quality standards or applicable public exposure guidelines.

Response to comment WR308-1: Thank you for commenting on the Draft EIS.

Response to comment WR309-1: Although this comment was postmarked after the close of the comment period, USASDC has a policy of considering all comments and responding in the Final EIS when possible. The Strategic Target System is nonnuclear.

Response to comment WR310-1: Thank you for commenting on the Draft EIS.

Response to comment WR311-1: Thank you for commenting on the Draft EIS.

Response to comment WR312-1: See response to comments WR231-1, WR237-1, and WR237-3. The importance of near-shore waters and the potential for human-related disturbance to humpback whales, particularly cow-calf pairs, is recognized.

Response to comment WR312-2: See response to comment WR237-2.

Response to comment WR312-3: See response to comment WR237-2.

Response to comment WR312-4: See response to comment WR237-2.

Response to comment WR313-1: All scoping issues raised were considered in the preparation of the Draft EIS. Also see responses to comments OR7-1 and WR67-1.

Response to comment WR313-2: See response to comment OR125-2.

Response to comment WR313-3: See response to comment OR83-3. See response to comment OR96-1.

Response to comment WR313-4: See response to comment OR96-2.

Response to comment WR313-5: Native plant use is discussed in the ethnographic study. No impacts are expected to seaweed. Other than during launches, there will be no change in current accessibility of the area.

Response to comment WR313-6: See response to comment OR83-3. In addition, the United States Fish and Wildlife Service concurred with the finding of no adverse effects to sensitive plant species as addressed in the Biological Assessment (USASDC 1990).

Response to comment WR313-7: The affected biological environment and consequences from the proposed action to the biological environment are described in the Draft EIS as directed by the National Environmental Policy Act. No potential impacts to fish populations from the proposed action have been identified. Therefore, neither fish populations or subsistence fishing are addressed in the Draft EIS. See response to comment OR83-3.

Response to comment WR313-8: As stated on pages 2-32, 4-27, 4-28, and 4-30 of the Draft EIS, the first-stage booster impact area and the launch safety zone will be surveyed prior to launch. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have concurred with the analysis presented in the Draft EIS (see Chapter 4, Consultations, of this volume).

Response to comment WR313-9: See response to comment OR83-3. In addition, the National Marine Fisheries Service and the United States Fish and Wildlife Service concurred with the finding of no adverse effects to sensitive wildlife species as addressed in the Biological Assessment (USASDC 1990).

Response to comment WR313-10: See response to comment OR1-6.

Response to comment WR313-11: Concurrence with the Army's determination of no adverse effects has been made by the State Historic Preservation Office with conditions that the Strategic

Defense Command take into account traditional properties as per NPS Bulletin #38. See response to comment OR125-9. No trails were identified during the cultural resources study.

Response to comment WR313-12: Figure 2-5 of the Draft EIS shows the area encompassed by the Explosive Safety Quantity-Distance (ESQD).

Response to comment WR313-13: See page 2-32, paragraphs 3 and 4 of the Draft EIS.

Response to comment WR313-14: Access is permitted to areas of PMRF just as in the past.

Response to comment WR313-15: See response to comment OR95-1.

Response to comment WR313-16: As stated on pages 2-33 and 4-33 of the Draft EIS, if any human burials are discovered as a result of ground-disturbing activities, the remains will be treated in accordance with the Native American Graves Protection and Repatriation Act (see Chapter 4, Consultations, of this volume). In addition, see Chapter 2 of this volume for additional information included in Section 4.5.4.

Response to comment WR313-17: See response to comments OR7-1 and WR67-1. All Strategic Target System activities occur outside the area of Hawaiian Homelands.

Response to comment WR313-18: No overflight of these islands by Strategic Target System vehicles will occur, nor will rocket emissions affect the islands of Niihau, Kaula, or Lehua.

Response to comment WR313-19: See Section 4.12 of the Draft EIS.

Response to comment WR313-20: See Section 2.2 of the Draft EIS for a discussion of the No Action Alternative. See response to comment OR24-2.

Response to comment WR313-21: Comment concerns were elicited through public availability sessions, use of citizen reviewers, public hearings, and the comment period.

Response to comment WR313-22: See response to comment WR231-7.

Response to comment WR313-23: See Section 2.1.2.2 of the Draft EIS.

Response to comment WR313-24: See response to comment WR29-4 for a discussion of upper atmosphere winds and Kokee State Park.

Response to comment WR313-25: No native speaker requested translation of the EIS into Hawaiian. Because of its technical nature, the EIS does not translate accurately into the Hawaiian language.

Response to comment WR314-1: Thank you for commenting on the Draft EIS.

Response to comment WR315-1: The Strategic Target System is nonnuclear.

Response to comment WR315-2: See response to comment WR143-2.

Response to comment WR315-3: See Sections 4.4 of the Draft EIS and response to comment OR83-3.

Response to comment WR316-1: See response to comment OR11-2.

Response to comment WR317-1: Thank you for commenting on the Draft EIS.

Response to comment WR318-1: Although this comment was postmarked after the close of the public comment period, USASDC has a policy of considering all comments and responding in the Final EIS when possible. See Section 2.1.2 of the Draft EIS for a discussion of flight termination system and range safety operations and Section 4.10.1.3 for discussion on launch activities.

Response to comment WR318-2: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19. These changes discuss the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle.

Response to comment WR318-3: See response to comment OR11-2.

Response to comment WR319-1: Thank you for commenting on the Draft EIS.

Response to comment WR320-1: Thank you for commenting on the Draft EIS.

Response to comment WR321-1: Thank you for commenting on the Draft EIS.

Response to comment WR322-1: Thank you for commenting on the Draft EIS.

Response to comment WR323-1: See Section 4.10 of the Draft EIS contains a discussion of possible accident scenarios during launch as well as procedures used for the transport of liquid propellants.

Response to comment WR324-1: Thank you for commenting on the Draft EIS.

Response to comment WR325-1: Although this comment was postmarked after the close of the public comment period, USASDC has a policy of considering all comments and responding in the Final EIS when possible. See response to comment OR21-4.

Response to comment WR326-1: Cumulative impacts are discussed in the Draft EIS, to the extent known. There are no other "STARS" programs.

Response to comment WR326-2: The procedures have been published and reviewed by Kauai officials. The procedures to be implemented are based on over 20 years of experience handling liquid propellants.

Response to comment WR326-3: As noted in the Draft EIS, field surveys of potential impact areas were conducted as part of the Strategic Target System compliance process with the National Environmental Policy Act and Endangered Species Act. In addition, recent available literature on studies conducted on the adjacent to PMRF were also reviewed. Potential impacts on threatened and endangered and otherwise sensitive plant and wildlife species are addressed

in Section 4.4.1.3 on pages 4-26 through 4-28 of the Draft EIS. Potential mitigations are described in Section 4.4.4.3 on page 4-30 of the Draft EIS. Potential impacts are always evaluated in the context of general, local, statewide, and global distributions.

Response to comment WR326-4: The tooling required to manufacture boosters is much more complex and is more extensive than the tooling required to refurbish the Strategic Target System first-stage booster. The refurbishment of the first-stage booster principally involves the addition of case material around the circumference of the motor case. This is a much easier task than manufacturing a booster from scratch. Note that the tooling required to refurbish the boosters was not original tooling from the Polaris program.

Response to comment WR326-5: The history of Polaris A3P missiles was used in determining the necessary modifications (i.e., motor refurbishment) and component replacement with newly developed Strategic Target System unique components (i.e., navigation system). See also response to comment OR138-6.

Response to comment WR326-6: The processes used to evaluate the boosters have been widely used to evaluate the new and old boosters to ensure the solid-fuel motors are safe to fire.

Response to comment WR326-7: Section 2.1.1.2, page 2-11 of the Draft EIS notes that the statistical data was inadequate to address third-stage motor reliability.

Response to comment WR326-8: Third-stage boosters, known as Orbus-1, are manufactured in small quantities and only as required. Thus, the motors required for the later flights will not be manufactured until they are scheduled. Each motor will be flown before the end of its 5-year storage life.

Response to comment WR326-9: Payloads flown on Minuteman III boosters are precluded from transmitting encrypted information because of limitations in the START Treaty. However, since the Strategic Target System is not a weapon delivery system, its payloads are specifically allowed in the START Treaty to encrypt telemetered data.

Response to comment WR326-10: See response to comments WR33-5 and WR326-2.

Response to comment WR326-11: See response to comment WR326-10. Additional procedures will be prepared, as required, and reviewed by the appropriate KTF and PMRF safety organizations.

Response to comment WR326-12: Section 4.10.1.12 of the Draft EIS characterizes the spill of the liquid propellants.

Response to comment WR326-13: Launch azimuths were determined based on flight safety criteria and performance criteria. A direct path from KTF to the impact point north of USAKA would require the missile to overfly the island of Niihau. Since this is not acceptable and taking into account safety margin zones along the flight trajectory gave the appropriate launch azimuths.

Response to comment WR326-14: See Figures 3-8, 3-9, and 3-10 of the Draft EIS.

Response to comment WR326-15: The results of the similar experiments conducted previously by the U.S. Air Force were discussed in the Environmental Assessment, Chemical Release Experiments (U.S. Air Force 1987) as noted on page 1-5 of the Draft EIS. This report is included in the Administrative Record for this Final EIS and will be available for review at the Lihue Public Library. Up to two tests of this nature would occur during the program. The reason for these tests are stated in Section 2.1.2.6, page 2-26, of the Draft EIS.

Response to comment WR326-16: See response to comment WR313-8.

Response to comment WR326-17: See pages 4-23 through 4-25 of the Draft EIS for a discussion of the potential impacts of launch emissions on the vegetation at the Kauai Test Facility and the adjacent region of influence. The most significant potential impact to sugar cane and other vegetation is fire damage in the unlikely event of an early flight termination.

Response to comment WR326-18: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19. These changes discuss the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle. An emission inventory of all ozone-depleting substances on the island of Kauai is beyond the scope of the Strategic Target System environmental impact statement.

Response to comment WR326-19: An emission inventory of all carbon dioxide sources on the island of Kauai is beyond the scope of the Strategic Target System environmental impact statement.

Response to comment WR326-20: See pages 4-4 to 4-5 of the Draft EIS for a discussion of the potential impacts to water resources. No significant change will occur in surface waters as a result of the proposed launches of the Strategic Target System boosters or as a result of early flight termination. Fish kills are not anticipated.

Response to comment WR326-21: The air quality analysis of the potential air quality impacts of Strategic Target System launch vehicle emissions accounted for winds blowing over land. For a discussion of that analysis see pages 4-7 through 4-17 of the Draft EIS. Air dispersion modeling predicted that launches will not result in exceedances of ambient air quality standards or applicable public exposure guidelines.

Response to comment WR326-22: A water deluge system, which floods a missile launch pad area primarily for noise suppression, will not be used for the Strategic Target System launches. Water deluge systems are used for large launch vehicles, like the Space Shuttle. The prelaunch spraying of vegetation, a discretionary measure listed in Table 2-1 of the Draft EIS, will be evaluated by the decision maker. The Record of Decision will indicate whether this action is incorporated in the proposed action. Soils in the area are constantly subjected to sea spray. Groundwater is brackish. Any spraying of vegetation before a Strategic Target System launch would not adversely impact soil or groundwater quality.

Response to comment WR326-23: Lead is not an exhaust emission product of the Strategic Target System launch vehicle.

Response to comment WR326-24: Figures 3-3 and 3-4 in the Draft EIS show sampling sites for field surveys conducted in May 1991. These field surveys were conducted in order to assess the

potential effect of hydrogen chloride on the environment around KTF. Plant, soil, and water samples were taken and the results are presented in Tables 3-1 and 3-2 of the Draft EIS.

Response to comment WR326-25: Air dispersion modeling results for the Strategic Target System are presented in Tables 4-3 and 4-5 of the Draft EIS.

Response to comment WR326-26: Vegetation, wildlife, and threatened and endangered species surveys were conducted in July 1989, and in November, January, and February 1990 for the Strategic Target System project. In addition, a biological assessment was also prepared in accordance with Section 7(c) of the Endangered Species Act of 1973, as amended. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service provided consultation concerning the possible effects of the proposed program. Both agencies concurred with the findings of no adverse effects to threatened or endangered species as a result of the proposed project (see Chapter 4, Consultations, of this volume).

Response to comment WR326-27: The winter occurrence at Kauai and distribution of humpback whales in the Hawaiian Islands was considered during the preparation of the Draft EIS. A review of the data provided by researchers from Moss Landing does not change the finding of the Biological Assessment. Additional discussions with the National Marine Fisheries regarding this "new" data does not change their biological opinion that the proposed project will not adversely affect whales in the waters between Kauai and Niihau. The evaluation of potential impacts was made in the context of local, state, and regional (i.e., North Pacific) distributions. See response to comment WR231-1.

Response to comment WR326-28: Surveys for green sea turtles in the waters off PMRF were conducted in 1990. Potential impacts on sea turtle nesting at PMRF from the proposed action are addressed on page 4-28 and potential mitigations are described on page 4-30 of the Draft EIS. No potential impacts to green sea turtle foraging and nesting habitat from the proposed action have been identified. Concurrence on the finding of no adverse effects to green sea turtles was made by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (see Chapter 4, Consultations, of this volume).

Response to comment WR326-29: Potential impacts to sensitive species were evaluated in the context of general, local, statewide, and global distributions. With the exception of one green sea turtle nest discovered on PMRF beaches in 1985, there has been no other documented use of the terrestrial PMRF area by green sea turtles. Potential impacts on sea turtle nesting at PMRF from the proposed action are addressed on page 4-28 and potential mitigations are described on page 4-30 of the Draft EIS. In the event that green sea turtle nests are documented to occur on the beaches of PMRF, appropriate measures to protect the nests and hatchlings will be developed in coordination with the National Marine Fisheries Service (see Chapter 4, Consultations, of this volume).

Response to comment WR326-30: In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) provided consultation concerning the possible effects of the proposed action on federal threatened and endangered species. The list of federally threatened and endangered wildlife species potentially present or confirmed within the study area provided by the USFWS and NMFS did not include the hawksbill sea turtle.

Response to comment WR326-31: The noise monitoring plan is being developed and will be implemented by Sandia National Laboratories. Monitoring stations will be placed at specific distances from the launch site, but the exact locations have not been selected. The monitoring plan will be designed to detect the attenuation of the noise from the launch pad to a distance of about 8 miles.

Some startle effects on water fowl may occur, however, since the individuals are expected to realight quickly there would be no long-term effects. The potential effects on the endangered water fowl were discussed in the Biological Assessment under Section 7 of the Endangered Species Act. The determination of no adverse effect on these species was concurred with by the U.S. Fish and Wildlife Service (see Chapter 4, Consultations, of this volume).

Response to comment WR326-32: There is no indication that launch emissions will affect fertility of water bird eggs or hatchling success. There is no suitable nesting habitat in the immediate vicinity of the launch pad.

Response to comment WR326-33: Water quality samples were taken from a number of sites in the area. These sites and the analyses are discussed in the Draft EIS (Sections 3.2 and 4.2). Water quality in the agricultural drainage canals and wildlife pond is not expected to change as a result of the proposed Strategic Target System launches. Air quality analysis as it relates to launch emissions is documented in Section 4.3. Potential effects of a chemical spill are also addressed in Section 4.10.1.2 of the Draft EIS.

Response to comment WR326-34: Your comment has been noted.

Response to comment WR326-35: See Section 3.4.3.2, page 3-23 of the Draft EIS.

Response to comment WR326-36: Although the Laysan albatross is protected under the Migratory Bird Treaty Act, it is not a threatened or endangered species. The biological resources sections of the Draft EIS focus on threatened and endangered species. Any Laysan albatross that are in the area during a launch may be startled by the sudden noise. Experience indicates that behavior patterns will return to normal quickly. See Sections 3.4.2, 4.4.1.1, and 4.4.3 of the Draft EIS.

Response to comment WR326-37: Foraging behavior of the Hawaiian hoary bat is described on page 3-26 of the Draft EIS. Occurrence of the Hawaiian hoary bat at PMRF has not been documented. Potential impacts to this species are described on page 4-27 of the Draft EIS.

Response to comment WR326-38: Your comment has been noted.

Response to comment WR326-39: The Hawaiian hoary bat is considered an endemic subspecies of the Hawaiian islands.

Response to comment WR326-40: Approximately 75 percent of the transplant of *Ophioglossum concinnum* was successful as determined by a survey in 1991. *O. concinnum* is a Federal Category 1 species. Its occurrence is documented in the Draft EIS and the Biological Assessment. The U.S. Fish and Wildlife Service did not require any mitigation for this species (see Chapter 4, Consultations, of this volume).

Response to comment WR326-41: Normal launch activities would not significantly impact the native strand vegetation. Evaluations of the potential for impacts on any species or habitat is made in the context of local, regional, state, and other appropriate contexts.

Response to comment WR326-42: Your comment has been noted.

Response to comment WR326-43: The location of construction sites for Strategic Target System support facilities was constrained by the hazard zones established in accordance with Department of Defense Standard 6.055.9. The site is in an area previously subjected to extensive land-disturbing activities. The existing Strategic Target System launch and prelaunch facilities were constructed in accordance with the Preliminary Environmental Assessment Intermediate Range Booster System (IRBS) facilities (SNL 1986). Steps taken to minimize construction impacts on cultural resources are discussed on pages 4-31, 4-33, and 4-34 of the Draft EIS.

Response to comment WR326-44: See Draft EIS page 3-1.

Response to comment WR326-45: See Draft EIS Figure 3-7, Figure 3-8, and Figure 3-9.

Response to comment WR326-46: See response to comment OR125-2.

Response to comment WR327-1: See response to comment OR18-1.

Response to comment WR327-2: Documents are incorporated by reference to avoid the "overload" of information to which the comment refers.

Response to comment WR327-3: See response to comment OR10-5.

Response to comment WR327-4: Cost and schedule was one of four major exclusionary criteria for the selection of alternatives to the Strategic Target System. Although cost and schedule alone did not eliminate potential alternatives, cost and schedule did support the elimination of unreasonable alternatives. Alternatives that were not able to support launches within the time frame to meet the objectives of the Missile Defense Act of 1991 were eliminated. The analysis of environmental considerations only applied for reasonable alternatives (i.e., alternatives which met all exclusionary criteria).

Response to comment WR327-5: See response to comment OR66-2.

Response to comment WR327-6: The statement in the Draft EIS is based on detailed information provided by the motor manufacturers and is in the administrative record.

Response to comment WR327-7: See response to comment WR327-6. Additional information on the status test program is in the administrative record.

Response to comment WR327-8: See response to comment WR327-7.

Response to comment WR327-9: See Section 2.1.2.4 of the Draft EIS.

Response to comment WR327-10: Sections 2.1.2 and 4.10.1 of the Draft EIS describe safety measures taken to limit effects to the ground hazard area.

Response to comment WR327-11: See response to comment WR327-10.

Response to comment WR327-12: Operational parameters are such that early termination effects are limited to this ground hazard area.

Response to comment WR327-13: See response to comment OR1-6.

Response to comment WR327-14: See response to comment OR1-6.

Response to comment WR327-15: Sections 2.1.2.1, 2.1.2.4, and 4.10.1.3 of the Draft EIS describe the condition of early flight termination. Dispersal of unburned liquid propellants would be significantly less than that indicated in the Draft EIS due to the limit quantity in the vehicle.

Response to comment WR327-16: See Section 4.10.1.3 of the Draft EIS.

Response to comment WR327-17: See response to comment WR326-15.

Response to comment WR327-18: The mitigation plan includes a monitoring program where applicable, as required by 40 CFR 1505.2.

Response to comment WR327-19: See Sections 4.10.1.5 through 4.10.1.12 of the Draft EIS. See response to comment WR33-4.

Response to comment WR327-20: See response to comment WR67-1.

Response to comment WR327-21: See response to comment OR1-6.

Response to comment WR327-22: See responses to comments OR7-1 and WR67-1.

Response to comment WR327-23: See response to comments WR327-12 and WR327-15.

Response to comment WR327-24: Refer to Section 4.10.1.3 of the Draft EIS.

Response to comment WR327-25: Details of these tests were made available in the Administrative Record for the Strategic Target System Environmental Assessment and will be included in the Environmental Impact Statement Administrative Record. These documents will be available for review in the Lihue Public Library.

Response to comment WR327-26: See response to comment WR327-25.

Response to comment WR327-27: Additional information on the solid-fuel motors is in the administrative record.

Response to comment WR327-28: As stated on page 2-16, Section 2.1.2.1 of the Draft EIS, flight termination will involve the use of redundant high-precision instrumentation, including redundant flight termination transmitters. Accident Scenario Three on page 4-53 of the Draft EIS discusses the termination procedures associated with a pitch back over the island.

Response to comment WR327-29: See Chapter 2, Additions and Revisions to the Draft EIS, Section 4.10.1.3 on page 4-52, which contains an expanded discussion on reliability.

Response to comment WR327-30: See response to comment WR327-29.

Response to comment WR327-31: See response to comment OR56-5.

Response to comment WR327-32: A trained PMRF action team would be dispatched to handle any material from a flight termination event safely and in accordance with applicable federal requirements and in an environmentally sound manner. The data in Figure 4-10 refer to the personnel safety issue of exposure to vapors of the liquid propellants. The data are based on the assumption that 55 gallons of propellant were spilled and no corrective action taken, as noted in Section 4.10.1.12.

Response to comment WR327-33: Section 3.12 of the Draft EIS discusses the importance of the tourism and agricultural industries to Kauai's economy. Government employment is also an important component of the economy; PMRF is the largest federal employer on the island.

Response to comment WR327-34: The $.9 million is based on the per diem of the 45 temporary-duty personnel involved in each Strategic Target System launch. The 45 personnel would be required for 30 days up to four times per year. The current government per diem for Kauai is $160. Per diem is exclusive of rental car and travel expenses and any incidental personal expenses. The multiplier effect of these expenditures is not included but has a positive economic effect.

Response to comment WR327-35: See response to comment OR10-3.

Response to comment WR328-1: See response to comments OR38-3 and OR100-1.

Response to comment WR328-2: The presence of recent distribution data for the humpback whale off Kauai is noted. This data was unavailable at the time studies for the Draft EIS were conducted, but it has been subsequently obtained and considered. The probability of early terminated launch debris impacting a humpback whale would be remote despite the potential of increased numbers of whales present in the area. See response to comment WR326-28.

Response to comment WR328-3: See response to comment WR328-2.

Response to comment WR328-4: See response to comment WR328-2.

Response to comment WR328-5: See response to comment OR150-1.

Response to comment WR328-6: No significant increases in boat traffic from implementation of the proposed action are expected. Boat traffic associated with the proposed action would be infrequent (only several times per year). Vessel-to-whale approach limits are observed at the

PMRF and activities are conducted in accordance with state and federal laws, including the Marine Mammal Protection Act of 1972.

Response to comment WR328-7: See responses to comments WR237-3 and OR83-3.

Response to comment WR329-1: Thank you for commenting on the Draft EIS.

Response to comment WR330-1: See response to comment OR56-5.

Response to comment WR330-2: See pages 4-7 through 4-21 of the Draft EIS for discussions of the impacts on stratospheric ozone by the Strategic Target System program. See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15, 4-19, 4-20, and 4-21 for an expansion of this discussion and a summary of the impacts on stratospheric ozone.

Response to comment WR330-3: See response to comment OR11-2.

Response to comment WR330-4: See response to comment OR21-4.

Response to comment WR330-5: The use of quantitative figures and tables is extensive throughout the Draft EIS, as appropriate.

Response to comment WR331-1: Sections 3.4 and 4.4 of the Draft EIS provide a detailed discussion of the plant and animal life around the site and potential effects from program activities. The analysis found that there would be no adverse effects on biological resources in the area, and government agencies having resource oversight have concurred with this finding (see Chapter 4, Consultations, of this volume).

Response to comment WR331-2: See response to comment OR11-2.

Response to comment WR331-3: See response to comment OR10-3.

Response to comment WR332-1: See response to comments WR57-1 and WR151-2.

Response to comment WR333-1: Thank you for commenting on the Draft EIS.

Response to comment WR334-1: See response to comment WR72-1.

Response to comment WR334-2: See response to comment OR21-4.

Response to comment WR334-3: Potential impacts to air quality are discussed on pages 4-6 through 4-22 of the Draft EIS.

Response to comment WR334-4: See response to comment WR72-2.

Response to comment WR334-5: See responses to comments WR57-1 and WR151-2.

Response to comment WR335-1: See pages 4-20 to 4-21 of the Draft EIS for a discussion of bromine-stimulated ozone depletion.

Response to comment WR335-2: See response to comment OR24-2.

Response to comment WR336-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 4-20 and 4-21. Potential impacts are evaluated in reference to the intensity/context criteria discussed on pages 4-1 and 4-2. The procedure for determining the level of significance of the impact of the Strategic Target System program on the global atmosphere is discussed on page 4-17, paragraph 3.

Response to comment WR336-2: See response to comment OR62-1.

Response to comment WR336-3: See response to comment OR11-2.

Response to comment WR336-4: See Section 4.10 in the Draft EIS.

Response to comment WR336-5: See response to comment OR10-3.

Response to comment WR336-6: See response to comment OR8-1.

Response to comment WR337-1: Thank you for commenting on the Draft EIS.

Response to comment WR338-1: See response to comment OR11-2.

Response to comment WR339-1: Thank you for commenting on the Draft EIS.

Response to comment WR340-1: Thank you for commenting on the Draft EIS.

Response to comment WR341-1: Thank you for commenting on the Draft EIS.

Response to comment WR342-1: See response to comment OR11-2.

Response to comment WR343-1: Thank you for commenting on the Draft EIS.

Response to comment WR344-1: Thank you for commenting on the Draft EIS.

Response to comment WR345-1: Thank you for commenting on the Draft EIS.

Response to comment WR346-1: See Section 4.10 of the Draft EIS.

Response to comment WR347-1: Thank you for commenting on the Draft EIS.

Response to comment WR348-1: Thank you for commenting on the Draft EIS.

Response to comment WR349-1: See response to comment WR327-12.

Response to comment WR350-1: See response to comment OR18-1.

Response to comment WR350-2: Sections 4.1 through 4.8 of the Draft EIS describe ecological related activities.

Response to comment WR351-1: Thank you for commenting on the Draft EIS.

Response to comment WR352-1: See response to comment OR11-2.

Response to comment WR353-1: See response to comments, OR10-3 and WR72-2.

Response to comment WR354-1: Thank you for commenting on the Draft EIS.

Response to comment WR355-1: Thank you for commenting on the Draft EIS.

Response to comment WR356-1: Sections 4.10.1.5 through 4.10.1.12, pages 4-57 through 4-64 of the Draft EIS describe the transportation and handling of liquid propellants following procedures developed and improved by various governmental agencies and contractors over the last 30 years. These propellants have been handled safely for over 30 years.

Response to comment WR356-2: See pages 4-17 through 4-21 of the Draft EIS for discussions of the impacts on stratospheric ozone by the Strategic Target System program. See pages 3-15, 4-19, 4-20, and 4-21, Additions and Revisions to the Draft EIS, for an expansion of this discussion and a summary of the impacts on stratospheric ozone.

Response to comment WR356-3: See response to comment OR18-1.

Response to comment WR357-1: See response to comment WR356-1.

Response to comment WR357-2: See response to comment OR11-2.

Response to comment WR358-1: See response to comment OR110-2.

Response to comment WR358-2: See response to comment OR110-4.

Response to comment WR358-3: See response to comment OR11-2.

Response to comment WR359-1: Section 4.10.1 of the Draft EIS describes activities associated with public safety. The size of the Strategic Target System as described in Section 2.1 precludes the need for an island-wide evacuation plan. An evacuation plan for the area of influence based on a NASA-developed liquid propellant evacuation plan will be prepared by KTF/PMRF.

Response to comment WR359-2: See response to comment OR10-3.

Response to comment WR359-3: See response to comment OR11-2.

Response to comment WR360-1: Thank you for commenting on the Draft EIS.

Response to comment WR361-1: See response to comment WR66-1.

Response to comment WR361-2: See response to comment WR66-2.

Response to comment WR361-3: See response to comment WR66-3.

Response to comment WR362-1: Thank you for commenting on the Draft EIS.

Response to comment WR363-1: Thank you for commenting on the Draft EIS.

Response to comment WR364-1: Thank you for commenting on the Draft EIS.

Response to comment WR365-1: Thank you for commenting on the Draft EIS.

Response to comment WR366-1: See response to comment OR11-2.

Response to comment WR367-1: See response to comment OR11-2.

Response to comment WR368-1: Thank you for commenting on the Draft EIS.

Response to comment WR369-1: Thank you for commenting on the Draft EIS.

Response to comment WR370-1: See response to comment OR11-2.

Response to comment WR371-1: Thank you for commenting on the Draft EIS.

Response to comment WR372-1: Booster reliability issues are discussed in Section 2.1.1, page 2-6 of the Draft EIS. Section 4.10.1.3, page 4-51 discusses flight termination factors.

Response to comment WR372-2: Section 4.3.1.2, page 4-7 of the Draft EIS describes the air quality impacts of the combustion products produced by the solid-fuel booster motors.

Response to comment WR372-3: Sections 3.8 and 4.8 address the noise impacts and mitigating measures to protect essential personnel required for the launch.

Response to comment WR372-4: Your comment has been noted.

Response to comment WR373-1: See response to comment WR359-1.

Response to comment WR374-1: Thank you for commenting on the Draft EIS.

Response to comment WR375-1: Thank you for commenting on the Draft EIS.

Response to comment WR376-1: See response to comment OR18-1.

Response to comment WR376-2: Potential impacts of the proposed action on sensitive species are described in Section 4.4.1.3 of the Draft EIS. Potential mitigations for impacts to sensitive species are described in Section 4.4.4.3 of the Draft EIS. No significant, nonmitigable impacts to sensitive species were identified in the Draft EIS. See response to comment OR83-3.

Response to comment WR376-3: See response to comments OR10-3 and WR72-2.

Response to comment WR377-1: See response to comment OR11-2.

Response to comment WR378-1: See response to comment OR24-2.

Response to comment WR379-1: See response to comment OR11-2.

Response to comment WR380-1: See response to comment OR11-2.

Response to comment WR381-1: See pages 4-7 through 4-17 of the Draft EIS, which discuss the ground level air quality effects of a Strategic Target System launch. Potential effects on biological resources are discussed in Section 4.4 of the Draft EIS, pages 4-22 through 4-30.

Response to comment WR381-2: See response to comment OR11-2.

Response to comment WR382-1: See response to comment OR11-2.

Response to comment WR383-1: See Section 4.10 of the Draft EIS.

Response to comment WR383-2: See response to comment OR10-3.

Response to comment WR384-1: See response to comment OR11-2.

Response to comment WR385-1: See response to comment OR11-2.

Response to comment WR386-1: See Section 4.10 of the Draft EIS.

Response to comment WR386-2: See response to comment OR10-3.

Response to comment WR386-3: See response to comment OR11-2.

Response to comment WR387-1: Thank you for commenting on the Draft EIS.

Response to comment WR388-1: See response to comment OR11-2.

Response to comment WR389-1: See response to comment OR11-2.

Response to comment WR390-1: Section 2.3 of the Draft EIS presents a discussion of alternative launch locations analyzed for the Strategic Target System program.

Response to comment WR391-1: See response to comment OR11-2.

Response to comment WR392-1: Thank you for commenting on the Draft EIS.

Response to comment WR393-1: See response to comment OR11-2.

Response to comment WR394-1: See response to comment OR11-2.

Response to comment WR395-1: Thank you for commenting on the Draft EIS.

Response to comment WR396-1: See response to comment OR11-2.

Response to comment WR397-1: See response to comment OR11-2.

Response to comment WR398-1: Thank you for commenting on the Draft EIS.

Response to comment WR399-1: See response to comment OR11-2.

Response to comment WR400-1: See response to comment OR11-2.

Response to comment WR401-1: See response to comment OR11-2.

Response to comment WR402-1: See response to comment OR11-2.

Response to comment WR403-1: See response to comment OR11-2.

Response to comment WR404-1: Thank you for commenting on the Draft EIS.

Response to comment WR405-1: Thank you for commenting on the Draft EIS.

Response to comment WR406-1: See response to comment OR11-2.

Response to comment WR407-1: See response to comment OR11-2.

Response to comment WR408-1: See response to comment OR11-2.

Response to comment WR409-1: See response to comment OR11-2.

Response to comment WR410-1: See response to comment OR11-2.

Response to comment WR411-1: Thank you for commenting on the Draft EIS.

Response to comment WR412-1: See response to comment OR11-2.

Response to comment WR413-1: See response to comment OR11-2.

Response to comment WR414-1: Thank you for commenting on the Draft EIS.

Response to comment WR415-1: See response to comment OR11-2.

Response to comment WR416-1: Thank you for commenting on the Draft EIS.

Response to comment WR417-1: See response to comment OR11-2.

Response to comment WR418-1: See response to comment OR11-2.

Response to comment WR419-1: See response to comment OR11-2.

Response to comment WR420-1: See response to comment OR11-2.

Response to comment WR421-1: See response to comment OR11-2.

Response to comment WR422-1: See response to comment OR11-2.

Response to comment WR423-1: See response to comment OR11-2.

Response to comment WR424-1: Thank you for commenting on the Draft EIS.

Response to comment WR425-1: See response to comment OR11-2.

Response to comment WR426-1: See response to comment OR11-2.

Response to comment WR427-1: See response to comment OR11-2.

Response to comment WR428-1: Thank you for commenting on the Draft EIS.

Response to comment WR429-1: Thank you for commenting on the Draft EIS.

Response to comment WR430-1: Thank you for commenting on the Draft EIS.

Response to comment WR431-1: See response to comment OR11-2.

Response to comment WR432-1: See response to comment OR11-2.

Response to comment WR433-1: Thank you for commenting on the Draft EIS.

Response to comment WR434-1: Thank you for commenting on the Draft EIS.

Response to comment WR435-1: Thank you for commenting on the Draft EIS.

Response to comment WR436-1: See responses to comments OR83-3, OR96-1, and OR100-1. In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (USFWS) provided consultation concerning the possible effects of the proposed action on federal threatened and endangered plant species. The list of federally threatened and endangered plant species potentially present or confirmed within the study area was provided by the USFWS. These species were addressed in the Draft EIS (see Chapter 4, Consultations, of this volume).

Response to comment WR437-1: Thank you for commenting on the Draft EIS.

Response to comment WR438-1: See response to comment OR83-3.

Response to comment WR439-1: Thank you for commenting on the Draft EIS.

Response to comment WR440-1: Thank you for commenting on the Draft EIS.

Response to comment WR441-1: Thank you for commenting on the Draft EIS.

Response to comment WR442-1: Thank you for commenting on the Draft EIS.

Response to comment WR443-1: Thank you for commenting on the Draft EIS.

Response to comment WR444-1: Thank you for commenting on the Draft EIS.

Response to comment WR445-1: Thank you for commenting on the Draft EIS.

Response to comment WR446-1: Thank you for commenting on the Draft EIS.

Response to comment WR447-1: Thank you for commenting on the Draft EIS.

Response to comment WR448-1: Thank you for commenting on the Draft EIS.

Response to comment WR449-1: Thank you for commenting on the Draft EIS.

Response to comment WR450-1: Thank you for commenting on the Draft EIS.

Response to comment WR451-1: Thank you for commenting on the Draft EIS.

Response to comment WR452-1: Thank you for commenting on the Draft EIS.

Response to comment WR453-1: Thank you for commenting on the Draft EIS.

Response to comment WR454-1: Thank you for commenting on the Draft EIS.

Response to comment WR455-1: Thank you for commenting on the Draft EIS.

Response to comment WR456-1: Thank you for commenting on the Draft EIS.

Response to comment WR457-1: Thank you for commenting on the Draft EIS.

Response to comment WR458-1: Thank you for commenting on the Draft EIS.

Response to comment WR459-1: Thank you for commenting on the Draft EIS.

Response to comment WR460-1: Thank you for commenting on the Draft EIS.

Response to comment WR461-1: Thank you for commenting on the Draft EIS.

Response to comment WR462-1: See response to comment OR11-2.

Response to comment WR463-1: Thank you for commenting on the Draft EIS.

Response to comment WR464-1: See response to comment OR11-2.

Response to comment WR465-1: See response to comment OR11-2.

Response to comment WR466-1: See response to comment OR11-2.

Response to comment WR467-1: See response to comment OR11-2.

Response to comment WR468-1: See response to comment OR11-2.

Response to comment WR469-1: Thank you for commenting on the Draft EIS.

Response to comment WR470-1: Thank you for commenting on the Draft EIS.

Response to comment WR471-1: Thank you for commenting on the Draft EIS.

Response to comment WR472-1: Thank you for commenting on the Draft EIS.

Response to comment WR473-1: See response to comments OR83-3 and OR100-1.

Response to comment WR474-1: See response to comment OR11-2.

Response to comment WR475-1: Thank you for commenting on the Draft EIS.

Response to comment WR476-1: Thank you for commenting on the Draft EIS.

Response to comment WR477-1: See response to comment OR11-2.

Response to comment WR478-1: Thank you for commenting on the Draft EIS.

Response to comment WR479-1: Thank you for commenting on the Draft EIS.

Response to comment WR480-1: Thank you for commenting on the Draft EIS.

Response to comment WR481-1: See response to comment OR11-2.

Response to comment WR482-1: Thank you for commenting on the Draft EIS.

Response to comment WR483-1: Thank you for commenting on the Draft EIS.

Response to comment WR484-1: See response to comment OR37-3.

Response to comment WR485-1: Thank you for commenting on the Draft EIS.

Response to comment WR486-1: Thank you for commenting on the Draft EIS.

Response to comment WR487-1: Thank you for commenting on the Draft EIS.

Response to comment WR488-1: Thank you for commenting on the Draft EIS.

Response to comment WR489-1: Thank you for commenting on the Draft EIS.

Response to comment WR490-1: Thank you for commenting on the Draft EIS.

Response to comment WR491-1: Thank you for commenting on the Draft EIS.

Response to comment WR492-1: Thank you for commenting on the Draft EIS.

Response to comment WR493-1: See response to comment OR18-1.

Response to comment WR494-1: Thank you for commenting on the Draft EIS.

Response to comment WR495-1: Thank you for commenting on the Draft EIS.

Response to comment WR496-1: The Council on Environmental Quality regulations, which govern the preparation of this EIS, require that cumulative impacts (the incremental impact of any other past, present, or reasonably foreseeable-future actions) be addressed. Cumulative impacts associated with the EDX program are discussed in the appropriate resource sections of Chapter 4 of the Draft EIS.

Response to comment WR496-2: Surveys were conducted. See Section 3.5.1, page 3-28 of the Draft EIS.

Response to comment WR496-3: A mitigation program, including monitoring, avoidance of sites, and controlled excavation was presented in the Draft EIS.

Response to comment WR496-4: Consultations have been undertaken with the SHPO (see Chapter 4, Consultations, of this volume). All mitigating actions will be carried out as specified in Section 4.5.4 of the Draft EIS.

Response to comment WR496-5: See pages 4-20 to 4-21 of the Draft EIS, which discuss the freon releases of the Strategic Target System launch vehicles. The Draft EIS estimated that the annual release of 360 kg (794 lb) of halon 2402 represents 0.0004 percent of the annual total stratospheric chlorofluorocarbon burden globally (300,000 metric tons/330,000 tons) (Bennet et al. 1991). Annually about one million tons of ozone-depleting substances are released worldwide (Rowland 1990). If, as the commentor states, the annual release of halon 2402 by the Strategic Target System program were approximately 0.05 percent of the annual worldwide chlorofluorocarbon release rate, then only about 720 metric tons (792 tons) of ozone-depleting substances would be released annually worldwide.

Because there are no natural destructive mechanisms for chlorofluorocarbons, any amounts of ozone-depleting substances released at ground level will eventually drift up to the stratosphere. The high altitude release of halon 2402 by Strategic Target System launch vehicles is different from the typical releases of ozone-depleting substances by industrial, commercial, and residential sources. However, the chemical reactions of ozone depletion do not differ according to the release point of the agent.

Response to comment WR496-6: For a discussion of the human health effects due to changes in the earth's stratospheric ozone layer, see pages 4-19 to 4-21 of the Draft EIS. See also Chapter 2, Additions and Revisions to the Draft EIS, pages 4-19 through 4-21 for additional discussions. The Draft EIS presents an extensive, conservative analysis of the impact of primary concern, the incidence of both nonmelanoma and melanoma human skin cancers. The analysis concludes that impacts on human health from the Strategic Target System activities are small in the context of other identified man-made air pollution sources. Having examined the issue of primary concern and concluded that the level of impact was not significant, analyses of numerous secondary issues, about which scientific comprehension is less extensive, is unwarranted. The Draft EIS adequately addresses the potential effects of stratospheric ozone depletion attributable to the Strategic Target System program.

Response to comment WR496-7: The potential impacts of launch-related noise on avifauna are described on page 4-26 of the Draft EIS. Due to the distance of endangered forest bird habitat

from the launch site, local wind patterns, and the topography of the land in the area, launch-related noise and emissions are not expected to impact endangered forest bird habitat. Launch-related noise is described and discussed in Section 4.8 of the Draft EIS.

Response to comment WR496-8: Mitigation measures for potential impacts to *Ophioglossum concinnum* are described in Section 4.4.4.3 of the Draft EIS.

Response to comment WR496-9: See response to comment WR326-40.

Response to comment WR496-10: Potential impacts to air quality from an early flight termination were assessed by air dispersion modeling. The modeling provided the background data for the analysis discussed on pages 4-7 through 4-17 of the Draft EIS. Section 4.10, Public Health and Safety, discusses early flight termination scenarios.

Response to comment WR496-11: The air quality analysis accounted for winds blowing over land. Air dispersion modeling predicted that emissions from a flight termination event would not exceed ambient air quality standards or applicable public exposure guidelines. See pages 4-7 through 4-17 of the Draft EIS. The vehicle flight safety procedures described in Section 2.1.2 of the Draft EIS will be in place to protect public health and safety.

Response to comment WR496-12: The downwind distance of 3,000 m was selected for display in Tables 4-3 and 4-5 of the Draft EIS because that distance approximates the modified ground hazard area radius of 10,000 ft.

Response to comment WR496-13: See page 2-26 of the Draft EIS, which references the 1987 U.S. Air Force *Environmental Assessment, Chemical Release Experiments.*

Response to comment WR496-14: See response to comment WR356-1.

Response to comment WR496-15: Page 4-53 of the Draft EIS has been changed to contain a more detailed discussion of system reliability.

Response to comment WR496-16: See responses to comments OR55-1 and OR80-1. In the Aries failure, a Missile Flight Safety Officer allowed the missile to fly for 23 seconds before giving a destruct command based on the safety area available there.

Response to comment WR496-17: See response to comment WR2-3.

Response to comment WR496-18: See response to comment WR2-3.

Response to comment WR496-19: See response to comment WR2-3.

Response to comment WR496-20: See response to comment OR11-2.

Response to comment WR496-21: The number of Vandal and EDX launches is included in both the EA and the Draft EIS for the Strategic Target System. Cumulative impacts were calculated and are discussed when they are significant.

Response to comment WR496-22: See Chapter 2, Additions and Revisions to the Draft EIS, page 20, which references the Montreal Protocol and the Clean Air Act Amendments of 1990. The determination of significance for closure of Recreation Area 1 is discussed in response to comment OR1-6.

Response to comment WR497-1: Thank you for commenting on the Draft EIS.

Response to comment WR498-1: Thank you for commenting on the Draft EIS.

Response to comment WR499-1: Thank you for commenting on the Draft EIS.

Response to comment WR500-1: See the Draft EIS, pages 4-17 through 4-21, and changes to the Draft EIS, for a discussion of impacts on stratospheric ozone.

Response to comment WR501-1: Section 2.1.1.2 of the Draft EIS discusses the reliability of the solid stages and Section 4.10.1.3 describes launch activities include flight termination.

Response to comment WR501-2: See response to comment OR11-2.

Response to comment WR502-1: See Chapter 2, Additions and Revisions to the Draft EIS, pages 3-15 and 4-19. These changes discuss the current stratospheric ozone levels above Hawaii and potential effects from a Strategic Target System launch vehicle.

Response to comment WR503-1: See response to comment OR10-3.

Response to comment WR504-1: Although this comment came in after the close of the public comment period, USASDC has a policy of considering all comments and responding in the Final EIS when appropriate. See response to comment OR18-1.

Response to comment WR504-2: See response to comment OR10-3.

Response to comment WR504-3: See responses to comments OR83-3 and WR376-2.

Response to comment WR505-1: Thank you for commenting on the Draft EIS.

Response to comment WR506-1: Thank you for commenting on the Draft EIS.

Response to comment WR507-1: See response to comment OR24-2.

Response to comment WR508-1: See response to comment OR11-2.

Response to comment WR508-2: See response to comment OR5-1.

Response to comment WR509-1: See response to comment OR11-2.

Response to comment WR510-1: Section 4.10 of the Draft EIS discusses flight termination activities. Flight termination effects would be contained within the ground hazard area. Most of the solid and liquid propellants would be consumed in such an event.

Response to comment WR510-2: Section 4.10.1, page 4-47 of the Draft EIS addresses the dispersion from spills of the liquid propellants. The section includes a discussion of the hazards to humans and steps taken to minimize public exposure. The handling of hazardous waste materials is discussed in Section 4.9, page 4-44.

Response to comment WR510-3: See pages 4-7 through 4-17 of the Draft EIS for discussions of the ground level air quality effects of a Strategic Target System launch. Aluminum oxide emissions are discussed on pages 4-12 through 4-14. No other heavy metal compounds will be emitted by the launch vehicle. Hydrogen chloride emissions are discussed on pages 4-14 through 4-17. No other corrosive acidic or alkaline compounds will be emitted by the launch vehicle.

Response to comment WR510-4: See pages 4-7 through 4-10 of the Draft EIS and the response to comment WR2-3. These discussions describe the air pollution dispersion models, the meteorological conditions, and the assumptions used in determining the air quality impacts of the Strategic Target System launches.

Response to comment WR510-5: See Tables 4-3 and 4-5 of the Draft EIS, which present 1-hour average concentrations of pollutants predicted by air dispersion modeling.

Response to comment WR510-6: See Tables 4-3 and 4-5 of the Draft EIS, which present ambient concentrations of pollutants out to a distance of 10,000 m (32,800 ft). Concentrations for 3,000 m, the modified ground hazard area radius from which the public and unauthorized personnel will be cleared at launch time, are presented. The nearest residence is beyond the maximum distance of the models.

Response to comment WR510-7: See pages 4-66 through 4-67 and Appendix E of the Draft EIS for an assessment of the emissions and air quality impacts resulting from a liquid propellant spill. See pages 4-7 through 4-17 for discussions of the ground level air quality effects of a Strategic Target System launch, including as assessment of the emissions and air quality impacts from an early flight termination event.

Response to comment WR510-8: The first, second, and third stages of the Strategic Target System launch vehicle use solid propellant. Some experimental payloads may also require liquid propulsion systems. The air quality assessment on pages 4-7 through 4-17 of the Draft EIS considers the impacts resulting from the solid propellants and liquid payloads of the launch vehicle.

Response to comment WR510-9: See pages 4-7 through 4-17 of the Draft EIS for discussions of the ground level air quality effects of a Strategic Target System launch. These discussions include the health risks associated with air quality impacts.

Response to comment WR510-10: The transportation plan includes notification of the appropriate state and local officials.

Response to comment WR510-11: See response to comments WR151-8 and WR356-1.

Response to comment WR510-12: Section 4.8 of the Draft EIS presents estimates of noise levels generated by the launch of a Strategic Target System vehicle. As shown in Figure 4-4 on page

4-43 of the Draft EIS, the peak single event noise level in Kekaha (the nearest off-base residential area at 8 miles) would measure 69 dB(A). The average day-night level would measure L_{dn} 30 dB(A).

Response to comment WR511-1: See Chapter 2, Additions and Revisions to the Draft EIS, page 3-27.

Response to comment WR511-2: See Chapter 2, Additions and Revisions to the Draft EIS, page 3-30.

Response to comment WR511-3: See Chapter 2, Additions and Revisions to the Draft EIS, page 3-30, paragraph 5.

Response to comment WR511-4: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-31, Section 4.5.1.2.

Response to comment WR511-5: See Chapter 2, Additions and Revisions to the Draft EIS, page 4-33, Section 4.5.4.

CHAPTER 4
CONSULTATIONS

CHAPTER 4

CONSULTATIONS

This chapter contains the letters received from other federal agencies as part of the intergovernmental review process. In addition, letters were received as part of the consultation process required by the Endangered Species Act, Section 7, and the National Historic Preservation Act, Section 106. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service concur in finding no adverse impact from the Strategic Target System. The Hawaiian State Historic Preservation Office concurs with a determination of no adverse effect as determined by the Draft EIS. Other agencies reviewing the document included the Hawaii Department of Land and Natural Resources, the U.S. Environmental Protection Agency, the Hawaii Department of Health, and the Hawaii Office of State Planning.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Office
P.O. Box 50167
Honolulu, Hawaii 96850

March 27, 1992

Mr. Randy Gallien
Environmental and Engineering Office
U.S. Army Strategic Defense Command
P.O. Box 1500
Attention: CSSD-EN
Huntsville, Alabama 35807-3801

Dear Mr. Gallien:

This responds to Robert F. Shearer's February 5, 1992 request for our review of the Draft Environmental Impact Statement for the Strategic Target System (STARS DEIS). We have completed our review of the project and have visited the site at the Kauai Test Facility on the island of Kauai. Our comments follow.

1. We concur with the DEIS's characterization of the wildlife and plant resources at KTF. Further, we agree that the construction and operation of the STARS facility will have essentially no impact on any endangered or threatened species.

2. While the Candidate, Category 1 plant Ophioglossum concinnum is found in the vicinity of the launch site, removing the plants from harms way through transplantation elsewhere on Kauai is an effective way of both protecting many of the individual plants and testing the techniques of transplanting this species. Recent data collected indicate that the plant may be much more numerous and wide-spread than originally believed; it is possible that we may not proceed with proposing this plant for listing as endangered or threatened. We will notify you of our decision in this regard as soon as a determination has been made (later this year).

3. After an inspection of the proposed Majors Bay fuel landing area, and in consideration of the infrequent and controlled landings of marine craft anticipated there, we do not believe fuel deliveries related to the STARS program will affect any listed, proposed, or candidate species under this Service's jurisdiction.

Thank you for the opportunity to comment on the DEIS.

Sincerely,

William R. Kramer
Acting Field Supervisor
Pacific Islands Office

cc: BFA (ERT) (Attn: Peterson)
Regional Director, FWS, Region 1, Portland, OR (Attn: ARD-FWE)

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

ER 92/198

APR 21 1992

Mr. Randy Gallien
Environmental and Engineering Office
U.S. Army Strategic Defense Command
P.O. Box 1500
Huntsville, Alabama 35807-3801

Dear Mr. Gallien:

The Department of the Interior has reviewed the draft environmental impact statement (DEIS) for the Strategic Target System (System) and has the following comments.

Our U.S. Fish and Wildlife Service (Service) concurs with the characterization of the wildlife and plant resources at the Kauai Test Facility. Further, our Service agrees that the construction and operation of the System's facility would have essentially no impact on any endangered or threatened species.

While the Candidate, Category 1 plant, Ophioglossum concinnum, is found in the vicinity of the launch site, removing the plants from harm through transplantation elsewhere on Kauai is an effective way of both protecting many of the individual plants and testing the techniques of transplanting this specie. Recent collected data indicate that the plant may be much more numerous and widespread than originally believed; it is possible that our Service may not proceed with proposing this plant for listing as endangered or threatened. Our Service will notify you of a decision in this regard as soon as a determination has been made later this year.

After an inspection of the proposed Majors Bay fuel landing area, and in consideration of the infrequent and controlled landings of marine craft anticipated there, our Service does not believe fuel deliveries related to the System program would affect any listed, proposed, or candidate species.

Thank you for the opportunity to comment on the DEIS.

Sincerely,

Jonathan P. Deason
Director
Office of Environmental Affairs

1 MAY 92 13:44

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Blvd., Ste. 4200
Long Beach, California 90802

April 1, 1992 F/SW033:ETN

Robert F. Shearer
Chief, Environmental
and Engineering Office
U.S. Army Strategic Defense Command
P.O. Box 1500
Huntsville, AL 35807-3801

Dear Mr. Shearer:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the U.S. Army Strategic Defense Command (USADC) Strategic Target System and provided the following comments for your consideration and in fulfillment of the requirements of Section 7 of the Endangered Species Act of 1973.

In July 1990 the National Marine Fisheries Service (NMFS) reviewed an Environmental Assessment of the Strategic Target System and concurred with its findings that the project as designed and proposed would not likely adversely affect listed species under the jurisdiction of the NMFS provided that certain monitoring and safeguard standards were included in the missile launch and fuel handling protocols. The subject DEIS includes some program revisions and an analysis of the potential effects on humpback whales (Megaptera novaeangliae), Hawaiian monk seals (Monachus schauinslandi), and green turtles (Chelonia mydas). These effects primarily involve transport of liquid fuel containers via landing craft from Port Allen, Kauai to the beach at the Pacific Missile Range Facility and transfer to trucks or other suitable transport vehicles.

In addition to conducting surveys for green turtle nests from May through August caution should be exercised during the beaching of the landing craft in the event that turtles are found in the nearshore waters in the vicinity of the landing site. With the inclusion of the mitigative measures and monitoring requirements described in the DEIS we reaffirm our earlier conclusion that the proposed project will not likely adversely affect humpback whales, Hawaiian monk seals, or green turtles. This concludes the informal Section 7 consultation process for this project. Consultation must be reinitiated if new information becomes available revealing effects of the project on listed species that were not previously considered, the project is subsequently modified in a manner that causes an effect to listed species that was not considered, or if a new species or critical habitat is designated that may be affected by the project.

Please contact Mr. Eugene T. Nitta, Pacific Area Office directly (808/955-8831) if you have any questions regarding this consultation.

Sincerely,

E. C. Fullerton
Regional Director

cc: F/SWO33 - Nitta

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

APR 23 1992

Randy Gallien
U.S. Army Strategic Defense Command
CSSD-EN-V
P.O. Box 1500
Huntsville, AL 35807

Dear Mr. Gallien:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the **LAUNCH OF STRATEGIC TARGET SYSTEM VEHICLES FROM THE KAUAI TEST FACILITY, PACIFIC MISSILE RANGE FACILITY, ISLAND OF KAUAI, HAWAII.** Our comments are provided pursuant to the National Environmental Policy Act, the Council on Environmental Quality's Regulations for Implementing the NEPA (40 CFR 1500-1508), and Section 309 of the Clean Air Act. We appreciate the individual extension which you gave to EPA to provide comments on the document until April 24, 1992.

The proposed action is to launch nonnuclear payloads (test objects and experiments) from the Kauai Test Facility through near space on a suborbital trajectory in order to support data gathering and research and development activities for the Strategic Defense Initiative Program. The flights would conclude near Kwajalein Atoll, Republic of the Marshall Islands.

The DEIS considered two alternatives. The No Action Alternative includes the ongoing activities at the Kauai Test Facility and the Pacific Missile Range Facility. The Proposed Action includes the construction of flight support facilities and the launch of Strategic Target System vehicles. As many as four launches per year would occur over a 10-year period, not including the first two demonstration launches.

We have classified this DEIS as Category LO-1, Lack of Objections -Adequate Information (see enclosed "Summary of Rating Definitions and Follow-Up Action"). Although EPA has a lack of objections with the proposed project, we believe that the proposed project offers an ideal opportunity for implementation of the Pollution Prevention Act of 1990 (PPA [42 U.S.C. 13101]). The PPA states that:

APR 20 1992

"pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner."

According to the Council on Environmental Quality (CEQ), pollution prevention refers to the application of decisions or techniques that avoid or minimize "undesirable changes in the physical, chemical or biological characteristics of our air, land, and water that may or will harmfully affect human life or that of other desirable species..." (Environmental Quality, 21st Annual Report, CEQ, 1990, page 81).

We strongly encourage the Department of Defense to implement a wide variety of pollution prevention measures for the proposed action and other ongoing activities at the facility. Such measures may include energy and water conservation, solid waste recycling, reduction in the use of hazardous materials, hazardous waste minimization and solid waste recycling. Appropriate commitments to implement pollution prevention measures should be included in the project's Record of Decision.

We appreciate the opportunity to comment. Please send us two copies of the Final Environmental Impact Statement. If you have any questions, please call me or David Tomsovic of my staff at 415-744-1569.

Sincerely,

Deanna M. Wieman

Deanna M. Wieman, Director
Office of External Affairs

Enclosure: 1

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION*

Environmental Impact of the Action

APR 2 5 1992

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

In effect since October 1984

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

REF-HP:STY

Robert F. Shearer
Chief, Environmental and Engineering Office
Department of the Army
USASDC-Huntsville
P.O. Box 1500
Huntsville, Alabama 35807-3801

DOC NO: 4712
LOG NO: 1809W

Dear Mr. Shearer:

SUBJECT: Draft- E.I.S. for the Strategic Target System
(February 1992) U.S. Army SDC
KTF-PMRF
Mana, Waimea, Kaua'i

Thank you for submitting the DEIS on your Strategic Target System project on February 21, 1992. The pad is already in place, and the additional infrastructure which will be built will include a possible subsurface fiber optic line and a few buildings. The area has already had its land surface extensively disturbed, and archaeological work to date indicates no significant historic sites are present.

Thus, as the federal agency responsible for this project your DEIS should make a effect determination on significant historic sites. As we did in your EA, we would agree with your "no adverse effect" determination on significant historic sites if all project elements that will disturb relatively unaltered land surfaces will undergo subsurface testing prior to construction to cover the possibility of sites being present and if significant historic sites are found, then appropriate mitigation will occur in accordance with your contingency plan.

We do have some comments and corrections in reviewing this DEIS:

1. Under Section 3.5 Cultural Resources, page 3-27, the Nohili Dune which is a traditional historic place, is eligible for inclusion in the National Register of Historic Places. Your wording should reflect the dunes as traditional cultural property. The Nohili Dune is located just behind the launch pads at KTF.

This has been discussed in the EA for STARS and EDX (USASDC) and should be stated in this section. We are reviewing the draft document on this traditional cultural property now.

2. On page 3-28, archaeological testing has occurred in various areas within KTF, and some deposits were found near bore holes #3 and #4. We do not use the wording "negligible subsurface findings". Should this project have impact in this area, additional archaeological subsurface testing would be done to determine the extent of the deposits.

3. Under this section, additional archaeological reports have been done which should be synthesized and included in the FEIS. The reports are: Droliet (1991?), Yent (1991), Shun (n.d.), Walker and Rosendahl (1990), Jones (1992), Leidemann and Kirhinsmi (1990), Smith (1990), Douglas (1990), and Schiltz (n.d.).

4. Under Section 4.5 Cultural Resources, page 4-30, your DEIS mentions Fire (4.5.1.2), but nothing is mentioned about what will be done if a fire does occur in the dune area. Previous fires at KTF were extinguished by dousing the sand on top of the fire, this practice should be avoided. The best mitigation for historic site protection may well be to let the fire burn itself out. The FEIS should describe mitigative fire control measures during a fire. We agree with the postburn archaeological survey.

   All discoveries should be treated under NAGPRA, unless an MOA (the PMRF's draft Burial Treatment Plan) is signed. You should be aware under NAGPRA, all work in the area must cease for 30 days, and a letter written immediately from the Base Commander to the OHA and Hui Malama I Na Kapuna O Hawaii Nei.

You have set-up a contingency plan for mitigation should significant historic sites or burials be discovered. This is not in accordance with NAGPRA. We believe the following steps should be included in the plan:

1. All work in the area would be stopped, no further disturbance should take place until the situation is assessed. Human remains should be covered and the site area stabilized.

2. Consultation with all pertinent parties (KTF, DOE, U.S. Navy Archaeologists, SHPO, and appropriate Hawaiian groups) shall occur to determine the appropriate form of mitigation (data recovery/preservation).

If you have any questions regarding this matter, please contact Ms. Nancy McMahon our staff archaeologist for the County of Kaua'i at 587-0006.

Very truly yours,

WILLIAM W. PATY
Chairperson and State
Historic Preservation Officer

cc: Rob Hommon, US Navy Archaeologist
OHA (fax)
Kaua'i Island Burial Council
Tirzo Gonzalez, Advance Science Inc.
Advisory Council, Western Region

NM:sty

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:OCEA:SKK

APR 13 1992

FILE NO.: 92-549
DOC. ID.: 509

Deputy Commander
U.S. Army Strategic Defense Command
ATTN: CSSD-EN-V (D.R. Gallien)
P.O. Box 1500
Huntsville, Alabama 35807-3801

Dear Sir:

SUBJECT: Draft Environmental Impact Statement (DEIS) for the Strategic Target System Program, Pacific Missile Range Facility, Kekaha, Kauai, Hawaii - TMK: various

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the submitted DEIS for the Strategic Target System and have the following comments. Also attached are comments from the State Department of Health.

Office of Conservation and Environmental Affairs Comments:

Under Section 4.6.1.1 covering flight preparation, potential impacts on land use could occur while the Strategic Target System Booster is on the launch pad. During this time (an average of 14 days), all nonessential contractor, civilian and military personnel as well as the public would be cleared from the explosive safety quantity-distance (ESQD) area. This ESQD area would affect approximately .5 mile of shoreline located within the PRMF Recreation Area 1. This represents 2.3 percent of beach area on along western Kauai.

Launches (4 per year) associated with the STARS Program would result in the closure of Recreation Area 1 for an additional 56 days per year. This represents an increase of 11 percent, from 30 percent (current percentage of days closed due to flight prep.) to 41 percent per year.

Actual launch/flight activity will affect 688 off-base hectares (1,700 acres) of state-owned land leased to the Kekaha Sugar Company for the production of sugar cane and 154 acres of Polihale State Park.

Land uses within the off-base ground hazard area would continue except during launch operations, when the area would be verified clear for safety purposes approximately 20 minutes prior to each scheduled launch. PRMF personnel may enter the area up to three hours before launch to post signs and to give notice to any people within the area of their need to leave. Clearance would affect only six percent of the Kekaha Sugar Company leased land and interrupt transit to Polihale State Park and the beach along PRMF.

The DEIS reports that access to Polihale State Park will be temporarily closed for a minimum of 20 minutes and up to 40 minutes per launch. In addition to STARS launch activities, these clearing/closure procedures, combined with similar activities for other PMRF/KTF and EDX program launches, could result in a total time of fifteen (15) hours per year that the area would be verified clear.

Also, as indicated in the submitted report, a memorandum of agreement (MOA) is being developed among PRMF, the Hawaii Department of Land and Natural Resources, and the Kekaha Sugar Company. This agreement would allow PRMF security forces to request that the area be verified clear of all nonessential personnel for approximately 20 minutes for each flight. Also, PRMF would notify the State in advance of clearance.

According to the DEIS, the calculated impact of missile launch activities on access to Polihale Beach Park and PRMF beaches would be equal to 80 minutes per year, with the potential for an additional 80 minutes per year to accommodate weather, maintenance, and technical delays, in which the area would be verified clear. We believe this underestimates the actual impact of launching operations on public use and access. If you add the time required for clearance activities preceding each launch, the impacts become more pronounced (3 hours/launch + 4 launches per year = 720 minutes per year).

Furthermore, it is assumed that delays associated with maintenance, weather, and/or technical related problems, would be only 20 minutes per launch. However, given the uncertainty of environmental variables affecting each launch, this assumption is questionable.

The DEIS is satisfactory from the standpoint of aquatic resources and values as well as flora and fauna. However, we are still quite concerned over the potential impact of launch/flight activities on public access to Polihale State Park and shoreline areas adjacent to PRMF. We question the reported closure/clearance periods and estimated launch delays (20 minutes respectively). It seems as though the actual time (launch window) necessary to safely and successfully conduct launch/flight activities would be somewhat longer. A more thorough/systematic discussion of launch/flight activities, including clearance activities, potential delays, and the exact areas to be affected should be conducted. Moreover, these launch/flight/clearance activities must be discussed in light of their cummulative/comprehensive impact on public use of the affected areas.

Also, our Department's Historic Sites section has responded directly to the DOD (refer to attached letter from HPD).

Thank you for your cooperation in this matter. Please feel free to call me or Sam Lemmo at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

John P. Keppeler II

for WILLIAM W. PATY

Attachment

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

September 26, 1990

In reply, please refer to:
EPHSD
2-170

Mr. Randy Gallien, USASDC CSSD-EN
106 Wynn Drive
P.O. Box 1600
Huntsville, Alabama 35807-3801

Dear Mr. Gallien:

Subject: Comments on the Revised Preliminary Final Environmental Assessment for the Strategic Target Systems (STARS)

Thank you for allowing us to review and comment on the subject document. We provide the following comments:

Air Pollution

The Environmental Assessment should provide as an appendix a detailed discussion on the air quality impact analysis. As a minimum, the following areas should be addressed:

1. The air pollution dispersion models and the meteorological conditions used in determining the air quality impacts should be clearly described along with any deviations or assumptions.

2. Since each launching is a limited-term event, the impacts should be determined for a shorter averaging period. A 1-hour average concentration is preferable to the 8-hour average concentration as reported.

3. The impact is calculated for a distance of 3,000 meters from the launch pad. The impact should be calculated for maximum concentration at or beyond the property line and also at the nearest residence.

4. The assessment of the emissions and the air quality impacts resulting from a liquid fuel spill, a launch pad explosion, and an early launch termination should be conducted.

5. It is not clear whether only solid propellant boosters will be used or whether liquid propellant may be used as an alternative. The air quality assessment should consider the impacts resulting from all the various types of boosters that might be employed.

6. Health risks associated with air quality impacts should be discussed. At a minimum, the impact results with threshold limit values adjusted with an appropriate safety factor should be compared. It would also be important to discuss long-term effects associated with repeated exposures to potential air pollutants including carcinogenic effects. Worse case and most likely case scenarios should be considered.

Solid and Hazardous Waste

The report does address our concerns related to the generation and proper management of hazardous waste.

Hazard Evaluation and Emergency Response

1. The transportation safety plan for Hydrazine and Nitrogen tetroxide shipments should include the notification of both the State Civil Defense Agency and the Kaual County Civil Defense Agency.

2. For spills occurring during fueling/defueling of Hydrazine and Nitrogen tetroxide: "washing down to dilute concentrations" is not the best method for clean-up of these chemicals. Using sand or other absorbent material is the method of choice. Water spray should be used to control vapors (DOT 1990 Emergency Response Guidebook).

Otherwise, this report has adequately addressed the toxicological and health related aspects of the chemicals involved.

Noise

The Environmental Assessment contains no information on projected noise levels from STARS vehicles, therefore, the potential noise impacts on residential communities cannot be assessed.

The report indicates that noise impacts would not be significant since the noise is a one-time event, launches will not be simultaneous and the nearest noise sensitive area (residential), off base, is eight miles from the launch site. However, single events with noise levels significantly above the ambient levels will result in disturbances in terms of annoyances. This environmental assessment must include an analysis on the potential noise levels at the various communities that may be affected.

Sincerely,

Bruce S. Anderson

BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

cc: Office of State Planning, Attention: John Nakagawa

OFFICE OF STATE PLANNING
Office of the Governor
MAILING ADDRESS: P.O. BOX 3540, HONOLULU, HAWAII 96811-3540
STREET ADDRESS: 250 SOUTH HOTEL STREET, 4TH FLOOR
TELEPHONE: (808)587-2846, 587-2800
FAX: Director's Office 587-2848
Planning Division 587-2824

Ref. No. P-2946

April 15, 1992

Mr. Robert F. Shearer, Chief
Environmental and Engineering Office
Department of the Army
U.S. Army Strategic Defense-Huntsville
P.O. Box 1500
Huntsville, Alabama 35807-3801

Dear Mr. Shearer:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency for Proposed Revisions to the Strategic Target System (STARS) Program, Pacific Missile Range Facility, Kauai, Hawaii (FC/90-031)

The STARS Program at the Pacific Missile Range Facility (PMRF) was previously approved for CZM consistency on October 2, 1990, (copy enclosed). Proposed revisions to the STARS Program, which are subject to CZM approval, include: (1) transporting liquid propellants to Oahu by commercial cargo vessel and subsequently to Port Allen, Kauai, by cargo ship and transfer to the beach at PMRF by military landing craft; (2) additional mitigation to protect whales and monk seals by delaying launches, if any, is observed during prelaunch surveys of the waters and beach areas of the launch safety zone and the launch hazard area; and, (3) establishment of an overwater launch safety zone extending three nautical miles form the PMRF coastline.

The STARS Program proposal with revisions and mitigation measures, as described in the Draft Environmental Impact Statement (DEIS) dated February 1992, remains consistent to the maximum extent practicable with Hawaii's CZM Program, predicated on the following conditions.

1. The conditions prescribed in the previous CZM consistency approval, dated October 2, 1990, still apply.

2. Shipments of liquid propellants, i.e., hydrazines and nitrogen tetroxide, on land or in waters off Kauai, shall be accompanied by an emergency response team trained and equipped to handle liquid propellants.

3. Notice of shipment of liquid propellants shall be given to the County of Kauai Planning Department, the State Departments of Transportation, Health, and Land and Natural Resources, and the Office of State Planning.

4. Beach areas where liquid propellant transport vehicles will land and move across the beach to the roads on PMRF shall be surveyed for green sea turtles and nests in accordance with the mitigation proposed in the DEIS, Section 4.4.4.3, Page 4-30. After a specific landing area has been determined, a trainer observer under the supervision of the Environmental Office and in coordination with the National Marine Fisheries Service (NMFS), will conduct daily surveys for the green sea turtle during the nesting season, May through August. Turtles and nests are to be avoided by transport vehicles.

5. To protect cultural resources during beach transport of liquid propellants, the mitigation proposed in the DEIS shall be adhered to. Section 4.5.1.3 of the DEIS prescribes that prior to beach transport activities, a cultural resource survey of the affected area be done. If any cultural resources are found, these areas are to be avoided during transport. An archaeologist shall be present during transport. Should any unknown cultural resource be uncovered, consultation with the State Historic Preservation Office shall be conducted.

6. Prior to any launch, the waters and beach areas of the launch safety zone and launch hazard area shall be surveyed for the presence of whales or monk seals. If any whales or monk seals are observed in these areas, the launch will be delayed until cleared.

7. Notice of closing the overwater launch safety zone shall be given to the public, the County of Kauai Planning Department, the State Departments of Transportation, Health, and Land and Natural Resources, and the Office of State Planning.

CZM consistency approval is not an endorsement of the project nor does it convey approval with any other regulations administered by any State or County agency.

Thank you for your cooperation in complying with Hawaii's CZM Program. If you have any questions, please call our CZM office at 587-2878.

Sincerely,

Harold S. Masumoto

Harold S. Masumoto
Director

Enclosure

cc: U.S. National Marine Fisheries Service, Pacific Area Office
U.S. Fish and Wildlife Service, Pacific Islands Office
Department of Land and Natural Resources, OCEA
Department of Transportation
Department of Health
Planning Department, County of Kauai

Ref. No. P-1287

October 2, 1990

Colonel Arnold H. Gaylor
Deputy for Operations
U.S. Army Strategic Defense Command-
Huntsville
P.O. Box 1500
Huntsville, Alabama 35807-3801

Attention: Randy Gallien
Environmental Office

Dear Colonel Gaylor:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency for the Strategic Target System (STARS) Program, Pacific Missile Range Facility, Kauai, Hawaii (FC/90-031)

We have reviewed your assessment of the subject activity's consistency with Hawaii's Federally approved CZM Program and concur with your finding that the activity is consistent to the maximum extent practicable, predicated on the following conditions.

1. It is a CZM Program mandate to provide coastal recreational opportunities accessible to the public. A supporting policy calls for managing public access to and along shorelines with recreational value. In this regard, we are concerned that public access to and along the State-owned shoreline areas and Polihale State Park will be closed periodically for brief, approximately 20-minute periods, up to four times per year for up to ten years beginning in 1991. Therefore, as a condition of this CZM consistency approval, we are requiring that appropriate government agencies, including but not limited to the County of Kauai Planning Department, the State of Hawaii Department of Land and Natural Resources, the State of Hawaii Department of Transportation, and the State of Hawaii Office of State Planning, be notified in writing in advance of launchings and that a public information telephone number be provided.

2. Another CZM mandate is to protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems. In this regard, we are concerned that a spill of hazardous material associated with the liquid propellant would adversely impact the coastal and ocean

environment if not properly contained. Therefore, we concur with the spill response procedures presented on page 17 of the STARS environmental assessment (EA). Furthermore, as a condition to CZM consistency approval, the intrusion of any hazardous material into the ocean by any means is prohibited.

3. When transporting the liquid propellants from Nawiliwili Harbor to the Pacific Missile Range Facility, an emergency response team must be on-hand and travel with the transport convoy, rather than on-call as presented on page 16 of the EA. Our concern is that an on-hand response team can act quicker to prevent adverse impacts upon the coastal and ocean environment.

4. A supporting coastal ecosystem policy is to preserve valuable coastal ecosystems of significant biological importance. In this regard, we are concerned that facility lighting can adversely affect the threatened Newell's Townsend's shearwater. Therefore, we concur with the mitigation measures proposed on page 61 of the EA to use a U.S. Fish and Wildlife Service approved lighting system to protect the shearwaters. In addition, as a condition to this CZM consistency approval, facility lighting must be implemented pursuant to the recommendations of July 20, 1990, of the U.S. Fish and Wildlife Service Pacific Islands Office, or as otherwise modified by the Service, that:

   a. Unless absolutely necessary, floodlights and other non-essential lights must be extinguished during the few weeks each year when fledgling shearwaters fly from the upper interior portions of Kauai to the sea. This period is usually in the early Fall (October). The State's District Wildlife Biologist should be consulted annually for more specific dates.

   b. Security guards and other appropriate staff must be instructed to inspect fence lines during the fledgling season and pick up any grounded shearwaters. Shearwaters are to be turned over to "aid stations" established around the island during those weeks to collect, treat, and release "fallout" fledglings. A record of any such birds collected must be provided to the State's District Biologist and to the U.S. Fish and Wildlife Service Pacific Islands Office.

On the basis of the four conditions prescribed above, Hawaii CZM consistency conditional approval is hereby granted.

This approval does not constitute approval with any other regulations administered by the Department of Land and Natural Resources, the Department of Transportation, or the County of Kauai. We note that the Department of Land and Natural Resources is requiring a Conservation District Use Application (CDUA) for the safety zones affecting State lands at Polihale State Park. We anticipate that the CDUA concerns and requirements will be satisfied.

Sincerely,

Harold S. Masumoto

Harold S. Masumoto
Director

cc: U.S. Fish and Wildlife Service,
Pacific Islands Office
Department of Transportation
Department of Land and Natural Resources
Department of Health
County of Kauai Planning Department

JDN/fn
Wang 3268P
System 3

JOHN WAIHEE
GOVERNOR OF HAWAII

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:

April 21, 1992 92-122/epo

Deputy Commander
U. S. Army Strategic Defense Command
CSSD-EN-V (D.R. Gallien)
P.O. Box 1500
Huntsville, AL 35807-3801

Dear Sir:

Subject: Draft Environmental Impact Statement (DEIS) for the Strategic Target System

Thank you for allowing us to review and comment on the subject document. We have the following comments to offer:

On September 26, 1990, in a letter addressed to Mr. Randy Gallien, we commented on the Revised Preliminary Final Environmental Assessment for the Strategic Target Systems in Kauai. These comments are still applicable, and a copy of that letter is enclosed. The only additional comments that we would make at this time are the following:

1. A serious concern exists as to the devastating impact an early termination of the booster, either on the launch pad or just above the launch pad, would have on the surrounding environment and human health. When the booster is terminated, both burning and unburned booster propellant, along with the hydrazine and nitrogen tetroxide liquid propellant in the rocket, will be dispersed over a wide area.

   The draft EIS does not address the effects these dispersed chemicals would have on the environment and the risks posed to human health. It also does not fully cover what actions will be taken to clean-up the chemical contamination and to handle the disposal of the contaminated hazardous waste. The final EIS should address these issues and include a contingency plan which would be used in a response to an accident of this type.

2. The EIS should disclose the extent of heavy metal and corrosive releases expected from normal atmospheric flight operations.

If you should have any questions, please contact Mr. Michael Miyasaka at 586-4226.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

Enc.

c: Solid and Hazardous Waste Branch

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

September 26, 1990

In reply, please refer to:
EPHSD
2-170

Mr. Randy Gallien, USASDC CSSD-EN
106 Wynn Drive
P.O. Box 1500
Huntsville, Alabama 35807-3801

Dear Mr. Gallien:

Subject: Comments on the Revised Preliminary Final Environmental Assessment for the Strategic Target Systems (STARS)

Thank you for allowing us to review and comment on the subject document. We provide the following comments:

Air Pollution

The Environmental Assessment should provide as an appendix a detailed discussion on the air quality impact analysis. As a minimum, the following areas should be addressed:

1. The air pollution dispersion models and the meteorological conditions used in determining the air quality impacts should be clearly described along with any deviations or assumptions.

2. Since each launching is a limited-term event, the impacts should be determined for a shorter averaging period. A 1-hour average concentration is preferable to the 8-hour average concentration as reported.

3. The impact is calculated for a distance of 3,000 meters from the launch pad. The impact should be calculated for maximum concentration at or beyond the property line and also at the nearest residence.

4. The assessment of the emissions and the air quality impacts resulting from a liquid fuel spill, a launch pad explosion, and an early launch termination should be conducted.

5. It is not clear whether only solid propellant boosters will be used or whether liquid propellant may be used as an alternative. The air quality assessment should consider the impacts resulting from all the various types of boosters that might be employed.

6. Health risks associated with air quality impacts should be discussed. At a minimum, the impact results with threshold limit values adjusted with an appropriate safety factor should be compared. It would also be important to discuss long-term effects associated with repeated exposures to potential air pollutants including carcinogenic effects. Worse case and most likely case scenarios should be considered.

Solid and Hazardous Waste

The report does address our concerns related to the generation and proper management of hazardous waste.

Hazard Evaluation and Emergency Response

1. The transportation safety plan for Hydrazine and Nitrogen tetroxide shipments should include the notification of both the State Civil Defense Agency and the Kauai County Civil Defense Agency.

2. For spills occurring during fueling/defueling of Hydrazine and Nitrogen tetroxide: "washing down to dilute concentrations" is not the best method for clean-up of these chemicals. Using sand or other absorbent material is the method of choice. Water spray should be used to control vapors (DOT 1990 Emergency Response Guidebook).

Otherwise, this report has adequately addressed the toxicological and health related aspects of the chemicals involved.

Noise

The Environmental Assessment contains no information on projected noise levels from STARS vehicles, therefore, the potential noise impacts on residential communities cannot be assessed.

The report indicates that noise impacts would not be significant since the noise is a one-time event, launches will not be simultaneous and the nearest noise sensitive area (residential), off base, is eight miles from the launch site. However, single events with noise levels significantly above the ambient levels will result in disturbances in terms of annoyances. This environmental assessment must include an analysis on the potential noise levels at the various communities that may be affected.

Sincerely,

Bruce S. Anderson

BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

cc: Office of State Planning, Attention: John Nakagawa

APPENDIX

APPENDIX
DRAFT ENVIRONMENTAL IMPACT STATEMENT
EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT STATEMENT EXECUTIVE SUMMARY[1]

This Draft Environmental Impact Statement (DEIS) has been prepared in accordance with Council on Environmental Quality and Department of Defense regulations that implement the National Environmental Policy Act (NEPA). The proposed action is to launch Strategic Target System vehicles with experimental payloads into near space to simulate the reentry of intercontinental ballistic missiles and to establish land use controls over certain lands and waters adjacent to the launch site. The purpose of these launches (up to four each year for 10 years) is to test nonnuclear elements of the Strategic Defense Initiative (SDI).

Vehicles would be launched from the Kauai Test Facility (KTF) at the U.S. Navy Pacific Missile Range Facility (PMRF) on the island of Kauai. The vehicles would be aimed toward points within range of the sensing and tracking stations at U.S. Army Kwajalein Atoll (USAKA). KTF has been the site of more than 300 rocket test launches since the facility was first established for that purpose in 1962. ***From January 1981 through September 1991, 499 sounding rockets, 574 drones, and 22 target missiles were launched from PMRF.***

In July 1990, the U.S. Army Strategic Defense Command issued an Environmental Assessment (EA) for the Strategic Target System program that covered all activity in the continental United States and Hawaii relating to the proposed action. In August 1990, the U.S. Army and U.S. Navy issued a Finding of No Significant Impact (FONSI), and a demonstration launch was scheduled for March 1991. In October 1990, the finding was challenged in Federal District Court on grounds that the EA was inadequate and that an Environmental Impact Statement (EIS) was required by NEPA. The District Court ruled that an EIS was not required, but directed the U.S. Army to prepare a supplemental EA for air quality. Following publication of the supplemental EA, the court ruled that the U.S. Army had fully complied with NEPA and allowed the program to proceed.

In September 1991, responding to local concerns, the Department of Defense initiated an EIS for Strategic Target System activities on the island of Kauai. Congress provided funding for the preparation of the EIS. Launch preparations are limited until the EIS process is completed. In November 1991, the U.S. Army filed a Notice of Intent and solicited comments on the scope of the EIS from the public and from local, state, and federal agencies. In scoping comments and at public meetings on Kauai in 1990 and 1991, concerns were expressed about adverse effects on the physical environment, on public health and safety, on cultural resources, and on socioeconomic conditions.

[1]The Executive Summary from the Draft Environmental Impact Statement (DEIS) is included here for readers who may not have convenient access to the complete DEIS.

Agencies and the interested public will have an opportunity to comment on this DEIS in writing and at a public hearing on Kauai as indicated at the front of this document. The Final EIS will address comments made in writing or at the public hearing.

ALTERNATIVES

NEPA requires the consideration of reasonable alternatives to a proposed action. This DEIS considered alternative launch sites and launch vehicles and a no action alternative. The alternative launch sites considered were U.S. Army Kwajalein Atoll, Republic of the Marshall Islands, Wake Island, Johnston Island, Midway Island, Guam, Poker Flat Research Range, AK, floating barges, fixed ocean platforms, Vandenberg Air Force Base, CA, and White Sands Missile Range, NM. None of these sites met both operational and safety criteria. Alternative launch vehicles considered were the Castor IV, Minuteman I and II, Minuteman III, Poseidon, Pegasus, Taurus, an augmented Strategic Target System vehicle, and several hybrid vehicle configurations. These vehicles did not meet operational and safety criteria or were eliminated by treaty limitations. Only the no action alternative was carried forward in the analysis. Under the no action alternative, PMRF and KTF would continue to perform its fleet training and other missile testing missions. Selection of the no action alternative would result in no significant impacts on Kauai.

AFFECTED ENVIRONMENT

PMRF occupies a long, narrow site extending 13 kilometers (km) (8 miles [mi]) along the western shore of the island of Kauai. The land area, 779 hectares (1,925 acres), is low and flat. Natural vegetation is mainly kiawe/koa haole scrub and grasses. The large open fields are regularly mowed.

The facility is bordered by Polihale State Park on the north, by sugar cane fields on the east, by the county landfill on the south, and by the ocean on the west. The Strategic Target System launch site is located on KTF at the northern end of PMRF, against the southern margin of the Nohili Dunes.

Geology and Soils

Subsurface conditions are stable and the sandy surface soils have been flattened and stabilized by ground cover. The soil is permeable and drains readily. Wind erosion can be severe when vegetation is removed.

Water Resources

The groundwater and surface waters within PMRF are significant mainly for support of native plants and animals. The aquifer is a lens of brackish groundwater floating on seawater and is recharged from rainfall and seepage from the underlying sediments. Marine water quality off PMRF is good.

Air Quality

Air quality in the vicinity of the Strategic Target System launch site is generally excellent. Air emissions of concern at PMRF are from diesel generators, aircraft, and periodic rocket launches. The practice of burning sugar cane fields causes periods of heavy smoke and ash.

Biological Resources

Portions of KTF and PMRF provide or could provide habitat for some of the 11 federally designated threatened or endangered, or candidate species found on the west side of the island or in the waters offshore.

Cultural Resources

The entire land area of KTF and PMRF could be considered archaeologically sensitive because of the cultural resources found within the installation.

Land Use

Most of the land around PMRF is planted in sugar cane. Polihale State Park on the north is a popular beach. The nearest community to PMRF is Kekaha, 13 km (8 mi) south. Commercial tourist facilities on Kauai are mostly concentrated on the eastern and southern shore. A danger zone has been established offshore to protect submerged cables for the underwater range and small craft from PMRF operations.

Visual Resources

The launch site is located adjacent to the Nohili Dunes, which are the highest natural feature on the base. In the area adjacent to the launch site, the Nohili Dunes are covered by thick vegetation. The view of the entire launch complex is effectively screened by vegetation except from the southwest.

Noise

Noise sources at PMRF and KTF are from aircraft operations and rocket launches and from daily base operations. Noise from rocket launches is infrequent and short term. The nearest off-base housing is 13 km (8 mi) away in the community of Kekaha.

Hazardous Materials and Waste

Hazardous wastes are disposed of through the Defense Reutilization and Marketing Office at Pearl Harbor. In 1990, PMRF accumulated and disposed of 44,710 kg (98,566 lb) of hazardous material/waste.

Public Health and Safety

Ground and range safety at PMRF and KTF is subject to a strict regulatory environment established by the Department of Defense, Department of Energy, Department of Transportation, and the Environmental Protection Agency. Regulations apply to the transport, use, and disposal of hazardous materials/waste and to launch preparation and launch operations. Specific safe operating procedures are established for all hazardous activities. All Strategic Target System launch vehicles (also referred to as "boosters") are certified to the original flight specifications. In the unlikely event of failure, the ground and range safety officers have established safety areas (from which the public will be excluded) to protect personnel, facilities, and the public.

Infrastructure

Electricity at PMRF is supplied by Kauai Electric Company supplemented by diesel generators on the site. Potable water is obtained from the Kekaha Sugar Company well, which is located high on Kamokala Ridge, and from the County of Kauai. Water pressure at the Strategic Target System launch facility is adequate for fire protection. A hydrant and fire suppression system are located inside the launch facility fence line. Existing septic tank and leach field systems have been sized to serve the launch facility.

Socioeconomics

Approximately 850 people are employed at PMRF. About 140 military personnel live on the installation. Most of the government civilian employees and contractor employees live in adjacent communities.

The economy of Kauai is dominated by tourism and agriculture. Employment at PMRF pays generally higher wages compared with other employment on Kauai. In 1991 PMRF had an operating budget of $50.1 million, including a payroll of $29.6 million. KTF has an annual operating budget of approximately $2.5 million.

ENVIRONMENTAL CONSEQUENCES AND MITIGATIONS

Geology and Soils

New construction will take place at previously disturbed sites where the ground has already been leveled and stabilized. Soil studies have found no evidence of contamination from the Strategic Target System type of solid-fuel components due to previous launches over many years.

Water Resources

Water sampling indicated no evidence that surface water or groundwater has been affected by past launches. Booster motor emission and dispersion rates and expected wind velocities are such that no measurable change is expected to occur in the quality of surface water. No emission byproducts are predicted to reach island drinking supplies.

Air Quality

The air quality impacts of Strategic Target System launches have been studied extensively using two dispersion models. These studies indicate that airborne pollutants from either a normal or a terminated launch would not endanger public health or cause significant environmental impacts. Nor would the amount of contaminants from the Strategic Target System program contribute in any measurable way to the depletion of stratospheric ozone.

Air samples will be collected during the first demonstration launch to validate the accuracy of the models and to evaluate compliance with federal and state standards.

Biological Resources

Construction will remove only 0.2 hectares (0.4 acres) of weedy ground cover from an area that is regularly mowed. The continuing presence of sensitive plant species after many years of launch activity suggests that emissions from Strategic Target System launches will not have any significant impact on adder's tongue (*Ophioglossum concinnum*) and other rare species. Impacts from construction can be mitigated by relocating plants to protected locations.

The Newell's shearwater (*Puffinus newelli*) is a federally listed threatened species that may fly over PMRF at night, mainly between April and November. Reflection from outdoor lighting could disorient the birds. Lighting will be designed to minimize reflection.

The likelihood that debris from a spent booster or terminated launch would strike a humpback whale (*Megaptera novaeangliae*) is remote. If humpback whales or monk seals (*Monachus schauinslandi*) are sighted in the safety zone or launch hazard area, the launch will be delayed until they are clear. Liquid propellant transport activities will avoid any interference with green sea turtle (*Chelonia mydus*) nests that may be located on the beach.

Cultural Resources

New construction will not affect the Nohili Dunes. Where construction is planned south of the dunes, ground-penetrating radar will be used to scan the subsurface. An archaeologist will be on-site during ground-disturbing activities. Ignition of the trees and other vegetation on the dune could occur during an on-pad mishap or early flight termination. If extensive burning of the dune should occur, a postburn archaeological survey would be conducted.

Land Use

Public access to a small portion of the beaches fronting PMRF will be restricted for about 56 days a year. Because recreation use there is low and many other beaches are accessible, closure is not considered significant. For safety, 20 minutes before each scheduled launch, portions of sugar cane fields and Polihale State Park would be verified clear of people. Up to three hours before a scheduled launch, PMRF personnel may advise people within these areas of their need to leave to allow the area to be verified clear 20 minutes prior to launch. Portions of the waters offshore would be closed by the U.S. Coast Guard prior to each scheduled launch.

Visual Resources

The new structures for Strategic Target System launches would be largely shielded from public view by the height of the vegetation and the dunes. The appearance of the new structures is not significant in the context of the many larger structures already existing at KTF and PMRF.

Noise

Noise levels from the Strategic Target System booster will be substantially less than from, for example, the Strypi booster that has been launched more than 20 times from PMRF and KTF without known public concern. The noise level will be high during liftoff but will last only a few seconds. The peak noise level at liftoff reaching the nearest off-base housing is estimated to be well within standard acceptable limits.

Hazardous Materials and Waste

Hazardous materials and wastes generated by Strategic Target System activities will not exceed existing capabilities for handling and disposal in accordance with the strict federal regulations currently in force. Hazardous materials will be transported by the safest available routes in containers approved by the U.S. Department of Transportation. Fueling operations will be conducted in accordance with the strict procedures in place at KTF.

Public Health and Safety

The refurbished launch vehicles will be carefully examined and certified to their original flight specifications. A safety zone and a safety easement have been established to protect workers and the public.

Infrastructure

Expected demand is within the capacity of the existing infrastructure.

Socioeconomics

Additional personnel traveling to PMRF for launch activities would benefit local hotels, restaurants, and other service establishments.

ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Adverse impacts from the proposed action would be mitigated to no significance by measures prescribed in this DEIS. No significant unavoidable impacts would result from the proposed action.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Use of refurbished launch vehicles avoids or reduces the commitment of new raw materials. The Strategic Target System program would not commit natural resources in significant quantities.