OTH-B RADAR

Environmental Impact Analysis Process

Final Environmental Impact Statement
Proposed
Alaskan Radar System
Over-the-Horizon Backscatter Radar Program
January 1987

DEPARTMENT OF THE AIR FORCE
AIR FORCE SYSTEMS COMMAND
ELECTRONIC SYSTEMS DIVISION

Air Force
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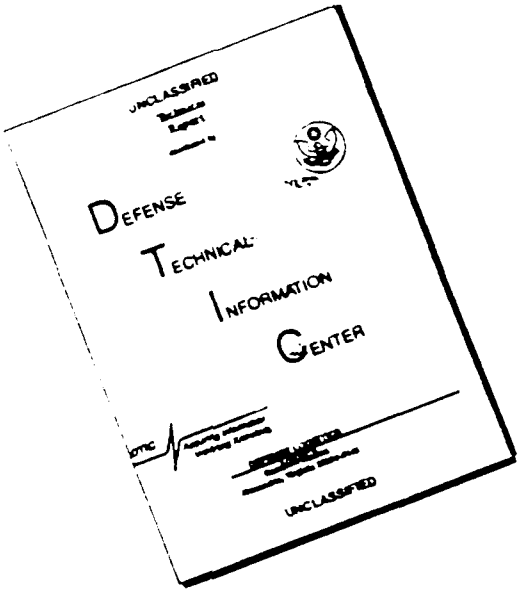

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COVER SHEET

(a) Responsible Agency: U.S. Air Force; cooperating agencies: U.S. Bureau of Land Management, U.S. Fish and Wildlife Service.

(b) Proposed Action: Construction and operation of the Alaskan Radar System, an Over-the-Horizon Backscatter (OTH-B) radar system that would be located in southcentral Alaska.

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(d) Designation: Final Environmental Impact Statement (FEIS)

(e) Abstract: This document describes the probable environmental impacts of constructing and operating a new surveillance and tracking radar that operates in the High-Frequency band of the electromagnetic spectrum. The radar system would consist of two very large transmit antenna arrays, two larger receive antenna arrays, and an operations center located in southcentral Alaska. Five areas were considered for either the transmit arrays or the receive arrays, and one for the operations center. The significance of possible physical and biological impacts would depend on the specific sites selected in these study areas. Grading and borrow requirements, damage to the permafrost and subsequent damage to the terrain, disruption of salmon spawning beds, disturbance of trumpeter swan nesting areas, the collision of birds with the antenna structure and backscreen, and land acquisition are key concerns. Significant economic stimulation of local rural economies would result from ARS construction and operation. Some impact on subsistence activities could occur from alteration of game migration patterns and from increased access to subsistence resources. Electromagnetic interference with telecommunication systems is unlikely. No reliable evidence exists that chronic exposure of humans to the radiofrequency radiation levels outside the exclusion fence surrounding the transmit arrays is likely to be harmful to even the most susceptible members of the population.

(f) Released to the public January 30, 1987.

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SUMMARY

FINAL ENVIRONMENTAL IMPACT STATEMENT
Construction and Operation of the Alaskan OTH-B Radar System

Description of the Action

The Over-the-Horizon Backscatter (OTH-B) radar is a surveillance and tracking radar system that the U.S. Air Force plans to construct and operate at four locations in the United States. The functions of these radar systems are to detect, track, and give early warning of aircraft and cruise missiles approaching North America. Early warning of hostile aircraft approaching North America is critical to the defense of the United States.

The four planned OTH-B systems would establish a surveillance zone around the east, west, and south perimeters of North America. The Alaskan Radar System (ARS) is needed to complete the perimeter coverage of the western and northwestern approaches to North America.

The functional components of the ARS would be geographically separated from one another: Different sites would be required for the transmit and receive antennas; the operations center, which would process radar data, would be separate from both of those sites. Five areas in southcentral Alaska were studied for the transmit and receive sites, and various feasible pairs of these areas as transmit-receive site combinations were considered. Elmendorf Air Force Base, Alaska, is the proposed location of the operations center.

The OTH-B transmitters and receivers use very large fixed antennas. The two antenna arrays and related structures at the transmit site would require a minimum of about 1,300 acres; the two at the receive site would require a minimum of about 1,200 acres. The operations center would be housed in a conventional building of about 33,000 ft^2. Approximately 70 maintenance and security personnel would be required at the transmit site and about 60 at the receive site; about 315 operating personnel would be located at the operations center.

The Air Force has identified the study area pair of Gulkana and Tok as the preferred areas for the transmit and receive sites, respectively, considering technical, operational, and environmental factors. The alternative study area pair is Paxson East (transmit site) and Tok (receive site). The expected environmental impacts of the operations center at Elmendorf Air Force Base are not significant.

Public Concerns

In conformance with the requirements of the Council on Environmental Quality, the Air Force convened a series of nine scoping meetings in communities near the areas studied and in Anchorage and Fairbanks. Attendees asked many questions about the characteristics and features of the radar system and its construction. At the request of citizens seeking more information, Air Force personnel subsequently conducted telephone conversations and held additional meetings. During these various exchanges, concerns were expressed about:

- Electromagnetic interference with various electronic systems, especially with communication and aviation systems
- Environmental impacts, including physical, biological, cultural, and scenic effects
- Impacts on surrounding lands and activities, such as prospecting, hunting, and recreation, especially those resulting from improved access
- Biological effects of radiofrequency radiation (RFR)
- Restrictions on aircraft operations
- Superior alternative surveillance systems
- The use of land already in federal control
- OTH-B as a military target
- Job opportunities for local residents
- Site selection and decision-making processes.

The Draft EIS was filed with the U.S. Environmental Protection Agency on August 22, 1986. Public hearings on the Draft EIS were held in Anchorage, Fairbanks, Tok, and Glennallen, Alaska, in September 1986. In addition to oral remarks, the public and agencies submitted written comments and questions both at the hearings and later by mail.

The comments and questions focused primarily on physical and biological impacts on natural resources and on potential electromagnetic interference with telecommunications systems. Concern was expressed, in particular, about disruption of recreation, subsistence activities, and aviation. Considerable interest was also evident in employment opportunities and economic effects. Overall, the public and agencies' positive interest in the ARS was tempered by a desire to minimize possible adverse consequences.

Environmental Effects

Biophysical Effects

The areas studied for the transmit and receive sites are largely spruce forests in discontinuous permafrost zones. Various rivers, lakes, and streams exist within or border the study areas. Three of the study areas (Glennallen, Gulkana, and Tok) are flat to gently sloping, with frequent boggy and wet areas; the other two study areas (Paxson East and Indian Creek) are located in more rugged, higher terrain. Because of the wetness as well as the likelihood of permafrost in all areas, significant amounts of borrow material might be required. Potential gravel sources exist near Tok, Gulkana, and Paxson East. Construction at Glennallen and Indian creek would require borrow from remote sources. The presence of permafrost would require Arctic construction practices, including site preparation work in the winter. Risk of permafrost damage is greatest at the Glennallen and Gulkana study areas.

Land ownership is complex, ranging from federal and state lands to those held by, allotted to, or selected by Native corporations or individuals. In addition to land for the antenna arrays and associated facilities, the project would need land for access roads, which could be as long as 15 miles; for construction staging areas; and for gravel sources. Land acquisition could be a significant and time-consuming process in certain cases and could alter existing land use patterns.

Wildlife, which is common in all of the study areas, is used for both subsistence and recreation. Large mammals such as moose, caribou, and bear are hunted, and smaller mammals are trapped.

Three of the study areas (Glennallen, Gulkana, and Tok) lie under major bird migratory flyways. A significant portion of the world's trumpeter swan population nests in or near the Glennallen study area, and swans are also observed in the Gulkana area. Raptors may breed in the Tok study area. Given the many large birds in these study areas, siting the antenna arrays in them may lead to bird collisions.

Fish are an important local resource for recreation, local subsistence, and commerce, and salmon (a fish protected by the Constitution of Alaska) inhabit the waterways of all five study areas. Possible access routes to sites in the Indian Creek and Paxson East study areas might follow creeks in which salmon are found. Construction in these areas would thus require special precautions to prevent siltation of sensitive salmon waters and disturbance of spawning beds.

Although no threatened or endangered species are thought to inhabit any of the study areas, field surveys may be required to ascertain the presence or absence of one bird species in that category, as well as certain plants that are regarded as sensitive.

Neither water quality nor air quality is expected to be significantly affected if proper measures are followed during construction and operation.

Socioeconomic Effects

The Copper River Valley area, centered on Glennallen, Gakona, and Copper Center, has about 2,000 inhabitants. The Glenn, Richardson, and Tok Cutoff Highways intersect in this area, and the Trans-Alaska Pipeline passes through it. About 1,000 people live in the area around Tok at the junction of the Alaska Highway and the Tok Cutoff. These towns are important centers of the local economies. In contrast, Paxson is a small recreation center located at the junction of the Richardson and Denali Highways. Indian Creek is sparsely inhabited, lying between and at some distance from two small villages, Chistochina and Slana. Employment in these rural areas is often sporadic and seasonal, and many inhabitants rely on subsistence hunting and fishing.

Jobs from ARS construction and operation and secondary benefits from expenditures could be important locally, but the magnitude of the benefit would depend on the amount of local hiring. The impacts could be particularly significant in the smaller villages, where any effect would constitute a large change in the current situation. Siting at Paxson East would double the local population if the entire workforce lived in that area. If the Air Force were to locate both the transmit and receive sites in the Copper River Valley, the combined impacts could be particularly significant for Glennallen.

The proposed project would cause the loss of several thousand acres of land sometimes used for subsistence. In addition, increased access to remote subsistence areas could have a negative impact on the people who rely on such areas.

The decision to encourage or discourage the ARS employees from bringing dependent families into the area could have an impact on the nearest communities. The significance of the impact would depend on a variety of particular circumstances. For example, in some instances, the local economy and supporting infrastructure could be strengthened by the nearby presence of the facility and employees. Under other scenarios, the Air Force could operate the facility autonomously in a remote site with little apparent local impact. On the more adverse side, the project could introduce social or economic imbalances into sensitive community environments.

Cultural resources exist in and around the study areas, and additional significant resources are likely to be found in all areas. Proper surveys, consultation with Native American groups, and mitigation measures would thus be required.

Radiofrequency Radiation

Detailed calculations were made to estimate the magnitude and distribution of radiofrequency radiation (RFR) from the ARS, and the resulting values were used to estimate the possible effects of RFR. The validity of the computational methods was confirmed by measurements made at the Experimental Radar System (ERS) in Maine and, more recently, at the East Coast Radar System. The exclusion fence around the transmit antenna arrays would be located so that the average power density at ground level outside the fence (0.02 mW/cm^2) would be well below the levels designated by the American National Standards Institute (ANSI) 1982 standard for both occupational and general public exposure (1 mW/cm^2). The potential for RFR effects exists only at the transmit site and is the same for each of the potential transmit sites; no RFR effects occur at the receive site.

Human Health

Because radiation safety is of paramount importance, an in-depth, critical review of the available literature on the biological effects of RFR was carried out. That review does not include any system-specific information; rather, it addresses the present state of scientific knowledge on the biological effects of RFR in the range from 0 to 300 GHz. The conclusions regarding possible RFR bioeffects of the OTH-B radar were derived from the most pertinent and scientifically significant results.

Epidemiologic studies performed in the United States and other countries have not provided adequate scientific evidence that environmental levels of RFR constitute a hazard to the general population.

Most U.S. experiments with animals that yielded recognizable and repeatable effects of exposure to RFR were performed at whole-body average specific-absorption-rates (SARs) of more than about 4 W/kg (the basis for the ANSI standard). Such effects are thermal, in the sense that the RFR energy is absorbed by the organism as widely distributed heat that increases the whole-body temperature, or as internally localized heat that is biologically significant even with functioning natural heat-exchange and thermoregulatory mechanisms operating.

The existence of threshold values of average power density has been experimentally demonstrated for some effects and postulated for others. Exposure to RFR at average power densities exceeding the threshold for a specific effect for durations of a few minutes to a few hours (depending on the value) may or may not cause irreversible tissue alterations. The heat produced by indefinitely long or chronic exposures at power densities well below the threshold is not accumulated because its rate of production is readily compensated for by heat-exchange processes or thermoregulation.

Most investigations involving chronic exposures of mammals indicated either that no effects occurred or that reversible, noncumulative behavioral or physiological effects took place for SARs exceeding 4 W/kg. In the few cases in which irreversible adverse effects of exposure were found, such effects were absent for SARs below 4 W/kg. In a relatively small number of investigations, biological effects of RFR were reported at SARs of less than about 4 W/kg.

In sum, the review of the relevant literature indicates that no reliable scientific evidence exists to suggest that chronic exposure to RFR from the OTH-B radar outside the exclusion fence would be deleterious to the health of even the most susceptible members of the population such as the unborn, infirm, or aged.

Electromagnetic Interference and Hazard Effects

The potential for electromagnetic interference and hazard effects exists only at the transmit site. The ARS transmitters would operate from 5 to 28 MHz, which is within what is commonly called the high-frequency (HF) band. Users of the HF band communicate between points as far away from each other as the opposite sides of the earth. The band as a whole is shared by other OTH-B radars, the Alaska Fixed Service, air-to-ground and ship-to-shore communications, standard time and frequency broadcasts, the Amateur Radio Service, Citizens' Band radio, and others. The specific portions of the HF band within which the ARS would transmit are also occupied by the Fixed Service (set aside for point-to-point communication between non-mobile stations) and the Broadcast Service (international radio broadcasting stations such as the Voice of America).

The radar can operate on a large number of channels. Its frequency use cannot be predicted exactly, however, because it will depend not only on changing ionospheric conditions, but on the frequencies independently used by other occupants of these bands--frequencies that the radar would attempt to avoid. If the radar were operated on a frequency already occupied, it could interfere with reception at distant receivers. Operation of the ERS for approximately 1 year, however, resulted in no valid reports of interference from either Fixed-Service stations or from listeners on the international broadcast bands.

The radar's modulation has been carefully designed so as not to interfere with reception in the adjacent bands. Occupants of these adjacent bands include the Amateur Radio Service, the Maritime Mobile and Aeronautical Mobile Services, standard time and frequency services, and, when the radar is in the Fixed-Service bands, the Broadcast Service. The radar would be operated sufficiently far from the band edges so as not to produce adjacent-channel interference.

The radar would also radiate low-power harmonics of its fundamental frequencies that could interfere with systems using those frequencies. The harmonics would typically not propagate by sky wave to distant regions; thus, any interference effects would be strictly local. Harmonic interference would result from transmission only on particular frequencies. Among the systems considered for potential interference from the radar's harmonics were television, land-mobile radio, air-to-ground radio, and very high frequency (VHF) omnirange (VOR) air navigation beacons.

All study areas are beyond the main service areas of any major television broadcast stations. Television service for all areas is provided by the Entertainment Television Project. If interference with television reception were to occur, the radar could avoid the offending frequencies. Measurements in Maine near the ERS showed that at distances of 6 miles or more from the radar, the radar's harmonics that could potentially interfere with television were generally so weak that they were not detectable above the background radio noise.

Measurements and experience at the ERS suggested that harmonic interference with low-band VHF land mobile radio was unlikely at distances greater than about 3 or 4 miles, and a similar prediction applies for the ARS.

Although the VHF air-mobile communication frequencies may be susceptible to harmonic interference, no complaints were voiced during the more than one year that the ERS was operated.

VORTAC and nondirectional beacon ground stations are within a very few miles of the Glennallen and Gulkana study areas; established air routes pass over or close to all of the study areas. Aircraft using VORTACs would sometimes be illuminated by the ARS, and their VOR receivers are potentially susceptible to harmonic interference. Measurements at the ERS indicate that the interference may become severe when the aircraft are within about 30 miles of the front of the transmit arrays. However, those harmonic interference problems result from operation of the radar only on certain frequencies, which can be determined. The Air Force would cooperate with the Federal Aviation Administration (FAA) to determine whether interference exists and to resolve any interference problems.

Aircraft use directional antennas to receive the signal from nondirectional radio beacons and to determine the direction to the beacon. No experimental information is available to judge whether the OTH-B signal would interfere with aircraft reception of a beacon signal.

Operation of the ARS radar is not expected to interfere with reception of broadcast radio beyond a few miles from the transmit site.

The Air Force has developed an "Operational Plan for RF Interference Avoidance" for the OTH-B radars. This plan contains detailed operational procedures to be followed when changing frequencies to avoid producing interference to other users of the radio spectrum. It also contains procedures for cooperative remedial action that the radar operators are to follow when receiving a complaint that the radar has produced interference or is currently doing so.

The ARS would not be a threat to fuel-handling operations, nor would it constitute a threat to cardiac pacemaker owners outside the exclusion fence.

Some electroexplosive devices (EEDs), such as electrical blasting caps, could be detonated by electromagnetic energy. Safe separation distances depend on the electrical conductivity of the ground. They cannot be determined with certainty until measurements of this parameter are made. Estimates indicate that the storage or transport of EEDs would be safe outside the exclusion fence if they were enclosed in metal containers. Otherwise, the safe distance would be about 3 miles in front of the transmit arrays and about 3,000 ft behind them. The use or handling of blasting caps in preparation for blasting operations would be safe if it were done at least 6 miles from the front of the transmit arrays, depending on ground conductivity.

Alternatives Considered

No Action or Postponement of Action

Under this alternative, the ARS would not be constructed and operated on any combination of the study areas, or it would be postponed to allow resolution of specific problems or issues related to these activities. Because the mission requirement would not be satisfied, the Air Force would continue to study the need for and methods to achieve the mission.

Other Surveillance Systems

Under this alternative, airborne or satellite surveillance systems would be used in place of the ARS. However, airborne systems are prohibitively expensive, and satellite systems require additional development.

Other Locations

No alternative locations to those identified as study areas have been considered. Operational requirements defined an optimal siting region. Additional operational criteria identified the EIS study areas and excluded the remaining portion of the siting region.

Conclusion

Significant long-term biological and physical impacts from the construction and operation of the ARS are possible, but their occurrence depends on the specific sites selected. Carefully planned and executed mitigation measures would reduce the likelihood and severity of potential problems. Selection of less favorable sites would result in significant impacts or require major mitigation measures. Because of the sparse population in the areas studied, significant socioeconomic impacts would occur. The magnitude of these impacts would depend on the study area and the manner in which the project was implemented.

After publication of the Final EIS, the Air Force will make its decision following the 30 days required by the Council on Environmental Quality regulations. At the end of that period, it will prepare a Record of Decision (ROD) to document its decision. The Air Force will continue to carry out site-specific environmental studies. These studies, developed in coordination and with the assistance of local, state, and federal agencies, will be used to help select the optimum location of the antenna sectors within the selected study areas and also to help determine the specific mitigation measures that will be implemented to minimize any resulting environmental impacts. The study results will be used to prepare an environmental assessment focused on specific potential transmit and receive sites.

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CONTENTS

Part I
(Bound Separately)

Draft Environmental Impact Statement

Part II

Public Comments and Air Force Responses

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LIST OF TABLES

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1 INTRODUCTION

1.1 Guide to the Final Environmental Impact Statement

The Final Environmental Impact Statement (EIS) has two parts: Part I is the Draft EIS that was filed with the U.S. Environmental Protection Agency (EPA) and made available to the public on August 22, 1986. Part II includes the transcripts of the public hearings, comments and questions submitted to the Air Force, and the Air Force's responses to those submittals. In addition, the Summary from the Draft EIS has been included in Part II; it incorporates the corrections and changes arising from the public review of the Draft EIS. Most importantly, the preferred study areas in Alaska for locating the transmit and receive sites are identified in Section 2.

In completing the Final EIS, the Air Force has addressed the public and agency comments. Each comment for which a response has been prepared, whether the comment is contained in a hearing transcript or in a separate submission, has been assigned a number in the margin. Comments or information that arrived after the closing date for public comment have been considered in preparing the Final EIS.

1.2 Near-Term Milestones

On publication of the Final EIS, the Air Force will make its decision after waiting the 30 days required by the Council on Environmental Quality regulations. At the end of that period, it will prepare a Record of Decision (ROD) to document its decisions about whether, where, and how it will proceed with the proposed action.

The ROD will describe the mitigation strategy the Air Force will employ. In general, the strategy will be to avoid or minimize potential impacts by careful design and placement of the Alaskan Radar System (ARS) facilities. When possible, specific measures will be identified as well. However, many of the mitigation measures will not emerge until coordination with state and federal agencies has taken place and additional environmental studies have been conducted. The mitigation measures selected for application will be compiled in a mitigation plan.

1.3 Future Environmental Activities

As noted in the Draft EIS, the Air Force is committed to carrying out additional environmental studies to complete the assessment of potential impacts and to suggest modifications to the project design or other mitigation measures to avoid or minimize those impacts. These studies will be the basis of a site-specific environmental assessment of potential locations for the transmit and receive sites. If potentially

significant impacts on the environment not previously identified are discovered and cannot be satisfactorily mitigated, the Air Force will prepare a site-specific EIS.

The specific studies, and their scope and methods, will be developed in cooperation with federal and state agencies with environmental responsibilities. The studies will be tailored to address issues related to the study areas recommended and to potential site locations within those areas. The Air Force tentatively plans to carry out additional studies on vegetation, including wildlife habitat; wildlife, including fish, raptors, waterfowl, and game; bird collisions; recreation; subsistence; and cultural resources.

2 PREFERRED STUDY AREAS

As a result of carrying out its Environmental Impact Analysis Process (EIAP), the Air Force has identified the Gulkana study area as the preferred location for the ARS transmit site and the Tok study area as the preferred location for the receive site. The conclusion is based on a combination of technical, operational, and environmental considerations. The Air Force has identified an alternative pair consisting of the Paxson East study area for the transmit site and the Tok study area for the receive site.

The Draft EIS described the process used to identify the five study areas which are known as Glennallen, Gulkana, Indian Creek, Paxson East, and Tok. The EIS also described the potential environmental impacts associated with constructing and operating the ARS transmit or receive site in each of the study areas.

Three study areas were designated as potential receive site locations: Glennallen, Gulkana, and Indian Creek. The Paxson East study area was determined to be too small for two receive antenna sectors. At the time the Draft EIS was prepared, the Tok study area also appeared to be unsuitable for the receive site; although the study area at Tok was much larger, no locations that allowed placing the two antenna sectors adjacent to one another existed.

The possibility of Tok as the receive site location was raised during the public hearings on the Draft EIS. Based on discussions during the hearings, the Air Force reevaluated the need for locating the two antenna sectors adjacent to one another in this study area. The primary motivation for adjacent siting was site security--the ability to monitor and, when necessary, to patrol the antenna sectors with a single security patrol. However, by locating the antenna sectors near the main highway, separation up to several miles would be acceptable. Therefore, Tok was redesignated as a possible receive site location. No additional or new environmental impacts are associated with using the Tok study area for the receive rather than the transmit site.

Three study areas were previously designated as potential transmit site locations: Glennallen, Paxson East, and Tok. With the addition of Tok as a possible receive site location, the Air Force reevaluated the Gulkana and Indian Creek study areas as possible transmit site locations that could be paired with Tok. The reevaluation indicated that either could be paired with Tok. The only change in environmental impacts in considering the two areas as transmit, rather than receive, site

locations is the introduction of radiofrequency radiation (RFR) and the attendant potential health effects and electromagnetic interference. The Draft EIS described those potential impacts, and they apply equally to each of the transmit study areas (Gulkana and Indian Creek).

The full set of possible pairings between transmit study areas and receive study areas is shown in Table 2-1. Additional considerations, including more specific application of operational, technical, and environmental factors, were used to determine the preferred study area pair.

Table 2-1

REVISED TRANSMIT-RECEIVE STUDY AREA PAIRINGS

	Transmit Areas				
Receive Areas	Glennallen	Gulkana	Indian Creek	Tok	Paxson East
Glennallen	--	No	Yes	Yes	Yes
Gulkana	No	--	No	Yes	Yes
Indian Creek	Yes	No	--	Yes	No
Tok	Yes	Yes	Yes	--	Yes

The five pairs for which a "No" entry is given in the matrix are too close together; the separation between the transmit and receive sites should be at least 50 nm. (In the Draft EIS, the Gulkana-Paxson East pair was marked "No;" however, that combination was subsequently determined to be acceptable because the terrain between the two locations compensates for a separation distance of slightly less than 50 nm.)

As described in the Draft EIS, the most severe environmental impacts are associated with the Glennallen study area, as either the transmit or receive site location. The environmental impacts associated with Indian Creek as the transmit or receive site location are less severe than for Glennallen. However, the combination of the impacts and the significantly greater amounts of fill material required for the antenna sites at the Indian Creek area makes this study area much less desirable than Gulkana or Tok.

Tok can be considered as either a transmit or a receive site location. The number and extent of mitigation measures that may be necessary, however, are significantly greater if Tok is selected as the

transmit site location. The proximity to the Tok airport and to the LORAN station increases the possibility of interference if Tok is the transmit site location. Although these effects can be minimized, and in most cases eliminated, the additional engineering work and test efforts required to implement specific corrections may be significant. Consideration of Tok for the receive site eliminates these potential interference effects. In addition, the potential for bird collisions should be lower at Tok if it is considered as a receive rather than a transmit study area. Although the receive antenna is longer, it is significantly shorter than the transmit antenna. Therefore, the Air Force prefers to consider the Tok study area as a potential receive site location rather than as a potential transmit site location.

These considerations result in the following new matrix of study area pairings (see Table 2-2).

Table 2-2

TRANSMIT-RECEIVE STUDY AREA PAIRINGS

	Transmit Areas	
Receive Areas	Gulkana	Paxson East
Gulkana	--	Yes
Tok	Yes	Yes

The Draft EIS notes that the Paxson East study area has fewer overall adverse environmental impacts associated with it. During the hearings conducted for the ARS, the public emphasized the potential adverse impact of selecting Paxson East for the transmit site on the high recreational use of the Paxson area. Two other factors, however, also make this area less desirable than Gulkana. Because the area is remote, the Air Force would need to construct a complete living facility to house and support the 70 personnel required at the transmit site. In addition to increasing the initial program costs, the living facility would also increase operating costs for the life of the system. Finally, the remoteness of the area and the more severe winter conditions associated with it would increase construction costs significantly compared with those for Gulkana.

In comparing Tok and Gulkana as receive site locations, the potential environmental effects at both are quite similar, although the concern over bird collisions is greater in the Tok area. However, in terms of total program costs--both initial acquisition as well as long-term operating costs--selection of Tok as a receive study area should result in considerable savings. Availability of the Tok Terminal

as a support facility, supplemented with housing in the Tok community, would eliminate the need for construction and support of a total composite living facility.

The preceding analysis leads to the selection of the Gulkana and Tok study areas as the preferred study area pair for the transmit and receive sites, respectively. If Gulkana should later be determined to be unacceptable, the alternative pair would be Paxson East for the transmit site and Tok for the receive site.

After it has made its decision in the Record of Decision, the Air Force will continue its environmental studies as it works to identify specific sites within these study areas. The environmental studies will also be used to assist in determining the mitigation measures that should be implemented for the selected antenna locations. Local, state, and federal agencies will have the opportunity to participate in these studies. Recognizing that the Draft and Final EISs evaluate only the study areas, the additional environmental studies will involve more complete and detailed analysis of potential impacts and the mitigation measures required for specific antenna sites. Studies are tentatively planned to address vegetation, wildlife, bird collisions, recreation, subsistence, and cultural resources. These studies will be used to prepare an environmental assessment of specific alternative transmit and receive sites within the selected study areas.

3 PUBLIC HEARINGS

In September 1986, public hearings were held in Anchorage, Fairbanks, Tok, and Glennallen, Alaska. The proceedings of those hearings were recorded and transcribed by a professional court reporter. Transcripts of the hearings follow.

The Air Force and its contractors responded to questions posed at the hearings. In a few cases when clarification or further information was judged necessary, additional responses were developed; they are included in Section 5. The comments for which responses have been prepared are numbered in the margin of the transcripts.

3.1 Transcript, Anchorage, Alaska

The hearing at Anchorage, Alaska commenced at 7 PM, September 23, 1986.

Lt. Col. Bristol: Good evening ladies and gentlemen. It is my pleasure to welcome you here tonight to this public hearing on the Draft Environmental Impact Statement recently filed and published by the United States Air Force and currently being evaluated on the proposed construction and operation of an Alaskan Over-the-Horizon Backscatter Radar System.

I am Lieutenant Colonel Matt Bristol, a full-time Air Force trial judge for the United States Air Force, currently based in Washington, D.C. I have been appointed by the Office of the Judge Advocate General in Washington to serve as the presiding officer at this and a series of three other public hearings being conducted in Alaska this week on the subject of the Draft Environmental Impact Statement. I am not here as an expert--far from it. I have read portions of the draft statement as perhaps have many of you, but I don't get a vote. I wear the same uniform as the gentleman to my immediate right, whom I'll introduce in a moment. But I am not a proponent of this proposal. I am here in a neutral capacity, just as I do when I am serving as a trial judge, and my objective is simply to ensure that this is an orderly and fair hearing, and that all of you as concerned citizens, representatives of various private associations or government agencies, have an opportunity to express yourself concerning this particular issue.

Tonight we're talking about a process that involves two-way communication. The first side of that is--involves your listening--as you'll be given a briefing concerning this particular proposal. The second part of it, which is perhaps the most important, is the presentation of your views, comments, for the consideration of Air Force officials in the decision-making process as the Air Force, in effect, converts this Draft Environmental Impact Statement into a Final

Environmental Impact Statement incident to the decision-making process on the proposal itself. So it's an important part of that decision-making process that you are directly and personally involved in, and I commend you for taking your time to come out this evening to take part in this hearing.

As I say, I wear the same blue suit as the gentleman to my right and as several of the other gentlemen here, but prior to yesterday morning, had never met or spoken with any of the individuals who wear the blue suits, so I guess it is a large Air Force after all.

Some of you may have gotten a copy, as you came in, of a single page form that I would urge you to take a look at as we proceed in the hearing--a multi-purpose form, regardless of whether you wish to make any comment, either oral comments or written comments. You can use this form just simply to manifest your desire for a copy of the Final Environmental Impact Statement or to convey any other comments, and all of your comments whether submitted tonight orally or submitted in writing, even submitted on this type of form, will be included in the analysis that the Air Force does and, in effect, incorporated into this decision-making process as we proceed toward a Final Environmental Impact Statement and as our government proceeds to a final decision on this particular proposal.

Now, the way we're going to proceed tonight is sort of in this order. First of all, we're going to have the briefing that I referenced earlier about the system. Following the briefing, we'll take a very short, perhaps just five minute break, and then we'll have about a fifteen minute period where you'll have an opportunity to ask questions of the briefer in an effort to clarify any of the points that he may have made, or to ask a question concerning some aspect of the Draft Environmental Impact Statement. Following those questions, and, in fact, during the recess that immediately preceeds these questions, I'm going to try to get all of these comment sheets and I'm going to try to order them. You'll note that in the middle of the comment sheet there's an area where you can check the particular environmental categories in which your interests may lie. I'm going to try to group those by category and then arrange an orderly sequence in which we can receive your comments, be they written comments or oral comments. And if there's time remaining after those comments, then we're going to have a general question and answer session and we expect to adjourn at or before 10 o'clock this evening. Now a few of the ground rules and--this is going to be very brief. There are time limits as to the making of statements. For those of you who are public officials or those of you who are representing a group, as the sole representative speaking tonight on behalf of that group, then you have a 5-minute time limit for the making of oral comments. And for those of you who are speaking in your individual capacities, there is a 3-minute time limit. There is no possibility of borrowing time or passing time to another individual, and what we'll do is, when we see you getting within about 30 seconds of the conclusion of your allotted time, I will raise my hand or do something to put you on notice, and then you'll be allowed to conclude.

Just like in the courtroom, this may--obviously I am in the courtroom most of the time--but the questions that we're involved in today following the briefing are not intended to be, is not intended to be a chance for argumentative or cross-examining type questions, but rather, just straight-forward questions as I'm sure you would ask anyway to try to clarify an issue. There's no tallying of votes--we're not going to have a show of hands on the proposal or to get into any kind of debate mode. We're simply in an information gathering mode, and we want to have this hearing serve its intended purpose, of this two-way channel of information.

I would like to introduce at this time Colonel Jim Lee, who is going to be doing our briefing. Colonel Lee is the Director of the Over-the-Horizon Backscatter Radar Project, and he is based with the Electronic Systems Division in Hanscom Air Force Base, Massachusetts. Colonel Lee, would you please stand. Thank you very much. You may be seated.

And with Colonel Lee is Dr. Sid Everett who just got in, like 20 minutes ago. I thought I had an adventurous flight out of Washington yesterday, but I think Sid takes the prize in that respect, that he just came in from down in California, I believe. Dr. Everett is with SRI International, a consultant to the United States Air Force who's had a very active role in the development and preparation of the Draft Environmental Impact Statement.

For those of you who may want to make comments but you don't necessarily want to make them tonight, or who may want to make them later, you can make them by mail to Lieutenant Gale Brown, who's with her back to the table over on the far left. And I might use this opportunity to also introduce Captain Bob Morris who is the Public Affairs Officer at the Alaskan Air Command. So even after we're gone, Captain Morris will still be here in the event that you have some questions about any of the procedures in this hearing or any substantive issues concerning the proposal itself. But if you'd give your comment cards--and I think the comment cards themselves have the address at the bottom to which any comments can be addressed--just to do so, so that they can be submitted by the deadline, the 13th of October.

I think that's all the preliminary remarks that I have this evening. I am going to try to take a very low-key approach and have only minimal involvement in the hearing and I'll only be involved if I see some need to be involved. Again, thank you very much for your attendance this evening, and without further ado, I'll give you Colonel Jim Lee. Thank you.

Colonel Lee: It's a pleasure for me to be here tonight representing the Air Force in this very important part of the environmental impact analysis process. In our presentation tonight, we'd like to first describe that environmental process. Then I would like to briefly review the system characteristics of the OTH-Backscatter Radar System. I'll show some actual slides of the East Coast system that is currently in test so you'll have a first-hand view of exactly

what kind of a system you might expect to be deployed here for the Alaskan Radar System--if this project is approved. I'll also describe the siting process, the selection of the individual study areas that we're carrying through this environmental impact analysis process. Dr. Sid Everett then will stand up and take over that part of the briefing summarizing environmental concerns and major impacts, and how we might mitigate against those to address those impacts. And then I'll make some final summary remarks on the overall schedule that would lead to the Air Force record of decision.

Before I begin, however, I would like to introduce some other people who are here as a part of the team tonight. They're here to address any specific, more detailed questions related to different parts of the process or the program.

First, Mr. Ernest Woods is Chief of the Real Estate Division, Army Corps of Engineers, here in Anchorage. The Army Corps of Engineers, would have the responsibility for the actual land acquisition process once the decision were made, so he's here to address any specific questions that you would have in that area.

On his right is Dr. Gordon Guttrich. Dr. Guttrich is an Associate Department Head at the Mitre Corporation outside of Hanscom Air Force Base. The Mitre Corporation provides the systems engineering for the Air Force OTH Program, and Dr. Guttrich himself has been with the program for about 10 years, very much involved in the early testing of the Experimental Radar System.

Next to Dr. Guttrich is Mr. Sal Cuccarese, Natural Resource Specialist from the University of Alaska. Sal has some first-hand experience actually walking around--a lot of the information on the specific study areas that we have identified and that I'll describe in just a minute.

And then finally, Mr. Hanson, who is with the Civil Engineering organization, Headquarters, Alaskan Air Command. He is also very familiar with the study areas and these gentlemen will assist me then in answering specific questions.

The proposed program is the Alaskan Over-the-Horizon Backscatter Radar. We're in this environmental impact analysis process that started out with the Air Force filing a Notice of Intent for the proposed construction and deployment of the Alaskan OTH System. We conducted a series of scoping meetings, including a meeting here in Anchorage as well as several other communities close to the potentially affected areas for the site selection.

We are now in the public hearing process, having filed the Draft Environmental Impact Statement. After we have received all of your comments, we will issue a Final EIS the latter part of November. After the minimum 30-day waiting period, the Air Force will then be able to file its Record of Decision, selecting a particular study area for location of the transmit antennas as well as the receive antennas and the Operations Center.

The Alaskan OTH system is a very important part of a complete network of 4 major radar systems. The East Coast system that you see on the right has been fully funded and approved by Congress. We are currently in testing on the northeastern sector of that system. The complete system will be finished within the next couple of years.

The West Coast system has similarily been approved by Congress. We are ready to award the contract for the construction of that system and we have already begun construction of the Operations Center for the West Coast system at Mountain Home Air Force Base.

We are currently in the environmental impact analysis process for the Central Radar System, with about the same milestone events as we're carrying for the proposed Alaskan Radar System. These four systems, linking with the existing Seek Igloo and North Warning Systems to the north, will provide for the first time a complete surveillance area that will give long-range early warning for potential strategic aircraft attacks against the North American continent.

This is part of the reason that this type of a system is so important--this is the Blackjack long-range strategic aircraft that is currently in flight test in the Soviet Union. If that schedule were continued, this system could be operational as early as the beginning of the next decade. In addition to this, however, we have Soviet Bear aircraft that have been around for many years. This particular version, the Soviet Bear H, is the newest one of the aircraft and can carry air-launched cruise missiles.

More important, and of great significance to this area of the country, Soviet aircraft like this Bear H regularly approach towards the continent. And F-15s from the Alaskan Air Command, as that F-15 is there, are scrambled, go out to the area, make visual identification, and will follow along the Soviet aircraft as they fly outside of the airspace. So the threat is there--it's growing. The Soviets are placing much more emphasis on increasing the number and quality of these long-range strategic aircraft.

We currently have no long-range detection capability against aircraft as this. We have a network of coastal radars around the continental United States. They're similar to the radars that are identified there as the Seek Igloo and North Warning System. These radars, however, are limited to about a 200 mile detection range. That really does not give much warning if that's the earliest you are able to detect the aircraft.

The OTH system, on the other hand, extends that surveillance barrier out to about 1,800 nautical miles. Even at high speed aircraft velocities today, that translates to several hours of additional warning time. And that warning time could be used by our national command authorities then as added time for negotiations, for alerting our civilian populations, for increasing the alert status of our own forces, and responding as necessary if that threat continues to come in and approach the North American continent.

This is an artist's conception of the East Coast Radar System and the surveillance coverage that it provides going out to some 1,800 nautical miles from its location in Maine.

This is the transmit antenna, one of three for the East Coast System. The antenna is approximately 4,000 feet long. The highest portion, to your upper left, is 135 feet tall.

This is another shot of that same transmit antenna. Here you see that after the area has been cleared, and the groundscreen laid directly in front of the antenna, natural vegetation is allowed to grow back in. In the case of the areas that we would identify and look at within Alaska, the only preparation work that we will need to do is that area directly in front of the antenna where we place the groundscreen. Natural vegetation can grow and, in fact, we seed, as we have in this case, to ensure that we do have that ground cover. You will also notice there is a fence that goes around the entire area. This exclusion fence is to ensure that we keep animals and people away--from both damaging the system and also to ensure that radiofrequency energy levels outside of that fence are well below the established standards. We'll talk more to that in Dr. Everett's portion of the presentation.

This is the receive antenna. It would be located at another site approximately 50-100 miles from the transmit antenna. The antenna itself is on the left, the antenna elements are about 19 feet tall. The back screen on the right is 65 feet tall. That entire array in the case of the East Coast system is about 5,000 feet long. To get better capability, however, against the cruise missile detection threat, the length of the antennas for the Central, West Coast, and the Alaskan System will be approximately 8,000 feet long.

The information from the receive antennas is sent then by those radio dishes, the white dishes that you see here, to the Operations Center. In the case of the East Coast system, that Operations Center is at Bangor Air National Guard Base, Bangor, Maine. For the proposed Alaskan Radar System, the Operations Center would be located here in Anchorage, at Elmendorf Air Force Base.

Inside the Center, the data is processed and displayed to the number of radar system operators that sit at these consoles. We end up with an actual geographic display of a surveillance area and the computer automatically provides detection and maintains the track of those aircraft. It further identifies them against established and known commercial aircraft or military aircraft from pilot position reports or from flight plans filed with the FAA or other international air traffic control centers.

With this East Coast system then--and as I said, we are currently in testing--we will have that coverage to the East. The West Coast will start construction very soon and we are going forward for the Central and Alaskan systems.

What I would like to do next is to focus on the proposed Alaskan Radar System and identify the specific study areas that we have been looking at.

This is that surveillance area, extending out from the transmit site, providing an area of coverage that extends from 500 to 1,800 nautical miles. To provide that kind of coverage, both linking along the North Slope, as well as picking up coverage to the Aleutians and extending on out, we end up with a fairly narrow, defined area in the Southeastern part of Alaska where we need to locate the transmit and receive sites. This area is identified in red. Within that area then, we would need or could locate both the transmit and receive sites.

There are a number of additional criteria, however, that are used to further narrow down the areas. Recognizing the kind of country and the problems in logistics and communications and power, we need to have those sites located within about 10 miles of the major highway structure. Further, as we look out towards the West, we have to ensure that we have clear access for the radar beam that extends up from 3 to 5 degrees on up to about 25 degrees.

If we look at that area then, and block out those portions that are off the main highways, and further cross-hatch those areas where we would not have a clear view out to the West, the clear portions that are shown are those potential locations where we could have a transmit site or a receive site. Within those areas then, we further looked at locations that could support the large amount of area that's required for the two transmit antennas and two receive antennas. The results of this process left us with these five study areas that have been identified and documented in the Draft Environmental Impact Statement: the Glennallen study area, Gulkana, Indian Creek, Tok, and Paxson East.

There are still some additional criteria that are used in trying to do the site pairings. We need to be approximately 50 nautical miles--no more than 150 miles--between the transmit and receive sites. And we also have to ensure that there is enough land available without obstructions, without significant potential environmental impacts, for location of the antennas. And so there are certain pairing combinations that are appropriate. There are other pairing combinations that we cannot use.

At the final selected study area for the transmit site, we will end up with two antennas, each of them on a sector of land approximately one mile by one mile, about 650 acres. In the black line, you see the antenna itself. The groundscreen is in front of that area. Beyond that, then as long as the land did not rise more than about 1 degree above the horizon, we would not need to do anything further to that portion of the land area.

In the case of the receive antenna, again, we're looking at approximately 600 acres, but in this case the length of the area is about 10,000 feet by a little over 2,600 feet in width.

During the completion of this process, as we go through and get your comments tonight and before the comment period closes, and then in preparation of the Final EIS and analysis of all those results, we will by the end of December select one of these study areas for the transmit site and one for the receive site.

At this point I would like to introduce Dr. Everett to describe the primary environmental concerns.

Dr. Everett: [Refer to briefing slides, Section 3.5, p. 3-133] Good evening. As you can see, the document is a substantial one. It contains sections covering all of these topics. I don't propose to walk through all of them, nor to talk about all aspects of any one of them, but I'll touch on a few of the subjects.

One of the issues has to do with the source of materials, gravel or other materials used to fill the cover. We concluded that there is the possibility of somewhat greater impacts at several of the sites and a lot fewer impacts at Tok, in particular. The difference, of course, depends on how much might be needed to construct a site in those areas, the amount of material that is likely to be available, the susceptibility of the soil to erosion, matters like that.

The Air Force would propose to examine the situation fairly carefully as it narrowed down its areas of interest and looked at specific sites, and would be surveying the resources that are available for this purpose and developing new ones, if necessary--following the applicable laws and regulations and reclaiming as necessary the various areas that have been disturbed.

Another issue in the lands topic has to do with permafrost. A distinctive feature about building the OTH--or I should say a distinctive feature of building the OTH-B in Alaska, compared to the other three sites in the Lower 48, is the presence of permafrost. All the areas that we've looked at have some permafrost to some degree, and the issue here is the possibility of altering the thermal regime such that the permafrost--fails, I guess perhaps would be the word--and had some effects on drainage or subsidence. And our estimates of the possibilities range as shown there.

Obviously, good construction practices call for determining what's out there before construction begins in earnest, and planning the methods of construction accordingly.

A total of about 3,000 acres may be involved, affected, in constructing the two sites, the transmit and receive sites. The effects can come in the form of direct loss of vegetation or some interference with their evolution and change. We are not aware of any unique plant species or communities in these areas at the moment.

In terms of total acreage, that is numerically speaking, the acreage, say 3,000 acres, is not large compared to the regional totals involved. However, obviously, going into specific locations could involve causing local problems such as getting into wetland or boggy areas that may have particular value. Still in all, generally, we are not expecting significant adverse effects.

The Air Force will approach this problem by conferring with not only with the Fish and Wildlife Service which is mentioned on the slide, but other agencies that are knowledgeable about the resources in the area.

Possible effects on wildlife come from a variety of ways. The second bullet refers to the possibility of creating an erosion that would wind up in the streams, or perhaps directly impacting the streams during construction.

The next bullet refers to noise and the general commotion of activity which could disturb animals and drive them out of an area.

The next deals with the possibility of diverting migration paths because of the presence of a sizeable amount of land in the midst of migration.

The final bullet has to do with the possibility that greater traffic or greater hunting pressure may lead to more taking of wildlife, legal and illegal.

Generally speaking--well, not generally speaking, we have addressed each of these points in the document and I will quickly say that there are--there is an expectation of--minor, if any, effects on the last point--and also a feeling that the caribou which are the key species involved in possible migration effects would not be seriously affected by any alterations in their migration patterns. The other two matters that I have talked about so far in this slide, can be controlled by good construction practices and perhaps some techniques of identifying areas and setting them off from locations of possible impact.

The bullet that I skipped--on collisions--I treat further in this slide. This structure as you saw from the pictures, is substantial in the sense that it is quite long and of reasonable height ranging from 35 to as much as 135 feet tall. On the other hand it is very airy. It is not bulky. It will look, in some respects, like a conventional bridge structure with a large dimension wire mesh screen spanning the major structural elements. Nevertheless, there are a number of factors which can contribute to significant potential for birds colliding with the structure. They're listed there. There are certain species in the area that are susceptible, largely because they are large-bodied, have a high wing loading--if you're an aerodynamicist--and not particularly agile.

Prospects for poor weather are obviously good, and lighting can always be a problem in any species', including humans' ability to pick

something out. The small structural elements refer to the fact that although any species might see a tower, they may not be able to see a wire or wire mesh strung between them. The greatest potential as seen for collisions--seen as the three areas there--Glennallen, of course the home of a substantial--I should say, not necessarily the home, but the nesting areas for swans, trumpeter swans in particular--and Tok, well-known for its large numbers of migratory birds moving up and down the valley.

The way to handle this is, of course, first to avoid going into areas where there is a high density of birds. The second category is to increase the visibility of this structure which can be done by some lighting effects. And finally the prospects of altering the environment in some fashion, such as by planting trees which would create some additional visual structure that birds could see and be diverted by.

This, in some respects, is a lot more theoretical than practical, and this is an issue, in particular, that needs further attention by both the Air Force and some other resource agencies in the state.

Water resources, the prospects for impacts, first bullet--as we talked about briefly in the first one, drainage is a matter that is going to have to be dealt with on a site-by-site basis. I'd like to skip down to Water Supply and Wastewater Discharge by saying that the amount of water that's required for this system has to--only, almost only, with the personnel that would be there and that the water demand is not unusually high--will probably be drawn either by wells or from surface water. And what is done depends on a particular site and conditions at that site--likewise with the wastewater discharge. In both cases the Air Force will be seeking advice from, and direction and probably regulation, from the agencies that have an interest, if not a direct responsibility, in managing that resource.

Going on into the socioeconomic area, I've listed the employment and the number of jobs at the various sites. Those are, as I say, the jobs. Whether there will be dependents there depends on the outside hiring practices of the contractors who are doing this work and, of course, the household size of the people coming in. The Air Force will influence, by its policy on dependents, and exactly how they want to staff the transmit and receive site, and also any specification on work schedules and the transportation they're likely to provide, will affect the residential patterns. It's difficult to say, therefore, except within a broad range, what the overall population change might be. But based on a few reasonable assumptions, we see population changes in the ranges shown on the slide. Those are substantial--although, as you can see in Anchorage, Anchorage has sufficiently large population that even a 315-person increase in employment and dependents is a very small increase.

On this slide, I have gone on the first two bullets, into the construction employment--pointing out that there could be a substantial peak both in the rural sites and in Anchorage over the duration of the

construction. And there'll be quite substantial changes in the number of people employed in the various areas. Those are quite high percentages--once again Anchorage being low because of the large workforce already here. I haven't repeated the number of jobs in operations, but I've shown what the changes might be as a percentage when operation is under way.

The last bullet refers to the fact that--because there is a seasonal cycle in the rural areas and a limited variety of materials and services available to be purchased in these rural areas directly--that we're not expecting that there would be a large multiplier creating additional jobs in addition to, beyond the direct employment by the sites.

Subsistence could be affected, again, by loss of--direct loss of--use, by changes in access to areas of traditional use. Possibility of greater competition from the new--presumably new--employees coming in from outside, although that could be a mixed composition.

Finally, effects on wildlife and migration changes. The last matter I think I've mentioned already. Competition is probably controllable by the means that are currently used. I cannot speak to the success of that control, however--personally, at least. It's clear that some additional consideration has to be given to this point--this point on possible effects on subsistence as the process of selecting a site study area, then a site, continues and possibilities are narrowed down. Given its large structure in a fairly undeveloped part of the world, clearly then, there is a chance of being offended by its presence. The importance of this to anyone really depends on how distinctive the particular landscape is--how clearly one could see the structure from where you happen to be. I've mentioned roads here, and whether the view has already been altered, if not actually compromised, by other facilities or applications of some sort.

If the site is built at least a mile from the road, chances are it's not going to be seen either because it's simply invisible at that distance--it's not being particularly bulky, or it can be screened either at the site or off the road. On the other hand, its obviously going to be visible from the air if you happen to be flying nearby.

The first two dashes under Mitigations, I've touched on by saying how it may not be visible. If you're far enough away, you might be able to screen it. The last one has to do with some concepts that designers would get into, but you could think of it most simply when you think about rights-of-way which have been laid out with linear and angular elements that have, therefore, given you an obvious clue that it's a manmade change and modifications. It's possible to consider minimizing contrasts like that--by altering your technique or clearing or cutting a rights-of-way--possibly your selection of colors on your buildings.

In the area of cultural resources, we learned that very little was known about the areas we were particularly interested in. So we reached

the conclusion that, based on information provided to us and what was known about areas around the areas of interest to us, that there was a good chance of a prehistoric or historic nature would be found in these study areas when the earth was turned. There is no recourse for the Air Force but to follow the well-established rules of the game in this area. And in conjunction with the State Historic Preservation Office and the Advisory Council on Historic Preservation, which is a national organization, and talking also with local groups, to evaluate any resources that are turned up--actually before that I think, to involve them in planning, making a plan to respond to any discoveries, evaluating what is discovered and deciding what mitigation, if any procedure at that time.

The last point has to do with the perennial problem of telling your employees that things that they could find are valuable, and it's important not to disturb them, and there're penalties if they do disturb them.

Now I'd like to move into the more technical area of the possible effects of RF radiation, which is what is transmitted by only the transmitter. The receive station produces no emanations from the antenna.

This radar operates in the HF band. As I've written there, you can see some of the other types of radio services that also exist in that band. VOA is the Voice of America. Now, this device could in--could theoretically--interfere in three ways, at least as I've defined them here: within the band, namely the HF band that it will be operating in; frequencies immediately adjacent to the bands it will operate in; and finally, on frequencies that are multiples, or harmonic frequencies of other frequencies they would operate on. The last one is where possible interference with TV or certain kinds of mobile radio or aircraft VOR beacons comes into play.

It is important to know that the radar signal is one of considerable quality. The energy is highly concentrated in the main beam. There is not much energy in the sidelobes or backlobes, and its purity is quite high, so that you have most of your energy on the frequency you really want to be on--in a narrow band and around it.

The way to avoid interference is fourfold. First of all, there are allocations or assignments to other users in the HF band which the radar is going to honor. Some frequencies will simply be off limits, programmed due to the radar operation so that they will not be called up for use. It will stay off the edge of the bands it is authorized to work on, certain distance, to preclude interfering with immediately adjacent frequencies.

An important procedure that we'll follow is to listen on the bands that it is considering using before actually operating on them, to ensure that no one is already operating there. And if it's a clear channel, then it will come up on that. This is one of the rules of the

road in operating on these bands where there's no specific allocation. If someone attempts to come up after the radar is on, of course, there is an interference possibility.

Finally, for many of the pieces of equipment that are operating at much higher frequencies, the radar can remain off the subharmonic frequencies in order to avoid interference.

The final remark is that the predecessor version of the East Coast Radar System was operating, was called the Experimental Radar System, and it--no interference can be attributed to its operation.

A quick look at the possible hazards from this RF energy. None to cardiac pacemakers--this was an issue some years ago when OTH was beginning to emerge. None on fuel handling. Electroexplosive devices include electric blasting caps--if they're being carried in metal containers, they're safe at 1,300 feet or further, which is not to say they're unsafe at 1,299 feet--that is a continuous function. If they're nonmetal, about 2.3 miles, and if they're being handled for use, about 4 miles, which obviously implies that there has to be information disseminated to possible users in this area. This is commonly done in the East Coast and will be done in the West Coast System.

This slide is a summation of the findings in the area of possible effects on human health. Like a radio wave, the fence is going to be placed far enough from the transmitter that the exposure levels will below the standards that have been set. We have examined the literature quite extensively, and concluded that there's no evidence to indicate that these levels are going to be harmful.

To wrap it up, some significant biological effects are possible. As I've said a number of times, a lot depends on exactly where the radar is built. Yet there is a good chance that the likelihood and severity can be kept well controlled by mitigation measures, either by the selection of the site or the design of the system and the way it's constructed.

Significant socioeconomic impacts would occur--that's the employment and income effects in an area, again--largely because there are very small populations out there to begin with.

Final point is--in as much as the study areas are quite large, and the sites within them where the radar may be built are only now being identified for further study, the Air Force is committed to preparing followup documentation--a followup document reporting on the specifics of the sites and possible impacts at those sites.

Colonel Lee: Thank you Dr. Everett. This is the overall schedule as the Air Force will complete this environmental impact analysis process. We're currently in the midst of the public hearings. We will have a second hearing in Fairbanks tomorrow night. The next night we'll be going out to Tok, and, finally, on Friday night, in Glennallen for the fourth and final public hearing.

Taking all of the information that we receive as a part of these hearings, and more important, the written comments that are provided to us, then we will prepare the Final Environmental Impact Statement. That document will be published at the end of November. The final Record of Decision that we're looking for would be filed the last part of December, this calendar year.

The objective, of course, for the Air Force, is to complete the action--to select the sites for the proposed Alaskan Radar System. The Draft EIS describes the system characteristics--its operations, some of the technical parameters dealing with the OTH system--and also goes into a lot more detail on the specific environmental concerns, effects, and possible mitigations.

One of these study areas would be selected then as the transmit site, a second study area as the receive site, and then following that Record of Decision at the end of December, the Air Force would continue doing work looking at the specific, more detailed, location of the two antennas within each one of those areas. And as Dr. Everett emphasized, we will do a followup environmental assessment to report any additional information that we find as we look at more detail, at the siting of the specific antenna, and also to confirm that those effects that we do find are addressed or have been addressed within the environmental process as we're carried it out this year.

To conclude then, the Alaskan Radar System, the proposed plan to construct and deploy this system, is very important to the Air Force, the Department of Defense, and really to the nation. This complete network of surveillance systems provides a significant added capability that we do not have today, and will greatly benefit all of us. Thank you very much.

Lt. Col. Bristol: Thank you Colonel Lee. You may have noticed that this is being recorded this evening. Ms. Joan Stolle is a qualified court reporter who is taking this hearing down verbatim, that is, every word that is spoken by any of the participants. And that verbatim transcript will be prepared, that is, typed up and sent to me. I will authenticate it, that is, sign after reading it and assuring myself that is a true and correct record of the hearing. I will authenticate it and then pass it along to the Air Force decision-makers.

We're going to take a short recess and just before we do, remind those who may have arrived after my opening remarks, that we do have the comment sheets. And when we return from the recess, I'd like it if everyone that desires to do so, to go ahead and fill one of these out and give it to Lieutenant Gale Brown, who's there in the entryway, or to myself, or to any of the individuals on the panel. And then as I review these, not only can we sort of wrap them up in terms of the particular environmental concerns so that we can address them group by group, but also it would give me an idea of about how much time might be consumed in the making of the statements by you as members of the public. And we may, therefore, have additional time before getting to the statements, for you all to be able to ask questions of Colonel Lee or of any of the other members of the panel.

When we get to the questions--it will be immediately after we return from the recess--the procedure is going to go like this: If you wish to be recognized, raise your hand--I'll recognize you--proceed to this podium in the center, just so that we can make sure your remarks are recorded, and then, say your name. If it's a name that you don't think anyone will be able to understand for spelling purposes, spell it out--and indicate your affiliation, that is if you represent an organization, or your address, and then you may directly ask the question and direct it to Colonel Lee. Colonel Lee in turn can either answer it himself, or he may choose to refer it to one of the experts that are seated to his right.

So, again, if you wish to do so, fill out the comment sheet. When we return, we will collect them if you have not already provided them to us. We will proceed to the question period and immediately following the question period, we'll go with the oral or written comments.

Thank you very much. We're going to recess. The clock on the wall says its about seven minutes before the hour of 8 o'clock. Let's return--say in five minutes after eight--to give us time to stretch and take a break and whatever may be necessary. Thank you very much.

Lt. Col. Bristol: [After recess] I previously indicated that this is going to be an informal hearing, and it is--that there is no rigid--we are going to try to keep to a time schedule, but that's for your benefit, to make sure that as many people as possible who wish to be heard, have that opportunity. But some people asked if it was necessary that this document be submitted this evening. The answer, of course, is no. It can be submitted any time prior to the 13th of October. This can be submitted in addition to, or in lieu of, any comments or questions that you would like to raise this evening. So, without further explanation, we're going to proceed now to the question period.

If anybody has a statement that they want to make, sort of as a predicate to a question, it might be better to wait until we finish with just plain questions seeking clarification and get into the statements. And then you can make the statement and raise the question in the context of that statement rather than mixing the two up together. So we're going to take first the questions and then we'll proceed to take the statements.

Who would like to be first? This gentleman here, would you like to approach the podium sir and just tell us your name and your affiliation or address and then you may direct your question to Colonel Lee. Thank you.

Eric Haemer: Eric Haemer and I represent Consulting Engineers. We understand that each site--transmitter site--will require about 10 to 20 megawatts of electrical power consumption. Could you address where--what your plan is for that power supply, whether it will be an on-site power supply or supplied from the public sector or what thought process you've included to date on that?

Colonel Lee: Sure. The Air Force is taking a couple of different approaches in looking at the power requirements. And, yes, we do need about 10 megawatts to supply the power for the two individual transmit antennas.

1 The Air Force will first look at third-party financing--having the local private sector, if you will, supply power. In that case, the Air Force on a long term basis would buy power as a part of that arrangement, and then some local or state company would actually do the construction of the power system. If that does not turn out to be an attractive alternative, on a long-term cost basis, or there are companies that are not interested in doing that, then we are also identifying the alternative of building our own power system under a separate military construction program. So in the planning for the Air Force budget, we have included the potential funds that would be required to actually construct a power system.

In the EIS, we describe a little bit about some of the potential impacts of that system and the amount of power required--some of the environmental impacts of having a system that large.

As far as how it would actually be done, and the final decision, I really can't say at this point. But we will go through that third-party financing study, and then based on the results of that, would decide how best to proceed, either continuing that way or going forward with our own Air Force construction system.

While there are commercial power systems available, none of them are adequate to supply our needs for the transmit site. And even for the receive site, we may still need to do some backup, standby, power systems--of course, at a much lower power level. For the receive antenna we only need about 2 megawatts total power there.

The concern is to have the power and also to have it with a good reliability system. Does that answer--?

Mr. Haemer: Thank you.

Lt. Col. Bristol: Yes, sir.

Tim Pettis: My name is Tim Pettis and I am an amateur radio operator and I'm also employed by Alascom, the long lines carrier for the state of Alaska. I would like to inquire as to your plans for dealing with EMI in the area of the transmitter, and inquire as to the extent of the reponsibility that the Air Force will take in dealing with the elimination of RFI and EMI in that area.

Lt. Col. Bristol: Before you answer, Mr. Pettis, could you spell your name for the record?

Mr. Pettis: It's P as in Paul, E-T-T-I-S.

Lt. Col. Bristol: Thank you sir.

Colonel Lee: Thank you. Dr. Guttrich?

Dr. Guttrich: I believe most of the interference effects that we--thank you--know about are very local to the system, and are described in the Environmental Impact Statement. We would not expect any significant problems, except within a couple miles, and most of the sites that have been indicated, there should be little possibility for interference.

Our experience with the Experimental Radar System showed no adverse effects to any services. The only difficulty that was not extremely local, had to do with airborne radios. And that could be eliminated by avoiding subharmonics of the frequencies involved. So I don't know if I've answered your question.

Mr. Pettis: The part of it that was not dealt with is the area of responsibility of the government as far as dealing with the problems as they do occur.

Colonel Lee: Let me respond to that if I could. And this again is based on the approach that we took for the Experimental Radar System and the approach that we're taking for the East Coast and West Coast radar system.

As those interference effects are identified to us, we will try to ensure that we do not provide that, on anything other than an immediate temporary basis. So as those reports are brought in to us, we will then see how we can, by locking out the particular harmonic, ensure that we don't have that kind of an EMI effect.

In the case of TV or radio or any of the other effects that are addressed in the EIS--that's the approach that we would take. There really can't be any absolute guarantees that we will cause no interference at all. But to the extent that we can, we will be able to--and there are many techniques that we can use--ensure that we don't cause those effects except within that immediate mile or so of the antennas themselves.

Mr. Pettis: I don't mean to drag this out, and you can stop me if I go too far here--too far afield--but the frequencies of operation, are they public information? Are they a matter of public information? Will you be using spread spectrum or what technique will you be using to both assure yourself of anti-jamming, you know, because I'm sure that that's a considerable factor.

Colonel Lee: We do have a spectrum monitor that analyzes all those other users within that 5 to 28 megahertz frequency range that we have. We have a number of frequencies that are guarded--that are locked out from the computer system. And as we gain more experience with users within that local area and identify additional frequencies, or harmonics of

frequencies, we'll similarily lock those out of the computer system itself. We will do that in a very open way, and solicit comments and input.

Dr. Guttrich: I think I understand the question better now. It's an FM-CW wave form that we will utilize. So it's very well controlled within a particular area of the spectrum. We're not going to tell ahead of time where we are going to operate, because that obviously would cause us problems in carrying out the job. However, a log is kept--every frequency that's used as a function of time--so if complaints come in, that can be checked afterward for interference effects. So there will be a time history, you know, of the frequencies that are utilized.

Mr. Pettis: I see.

Dr. Guttrich: I don't think we're going to publish them.....

Colonel Lee: No, not in advance.

Dr. Guttrich: . . . . .in the newspaper, but I mean they'll be available for checking out. And the intent is to avoid interference, and if it's found, to find ways to mitigate it--delete that from your frequency spectrum. We will have a plan for the system that it instructs the operators how they address those in a normal operational way, to establish the frequencies to use and be able to keep that log and then go and take corrective action as required.

Mr. Pettis: I see. Thank you.

Lt. Col. Bristol: Next.

Mr. Slabonik: Hi. My name is Bill Slabonik. S-L-A-B-O-N-I-K. And I'm at Post Office Box 1235, Coast Guard Support Center, Kodiak, Alaska, and my concern is basically is the--or is the Air Force concerned with monopolizing a frequency or even shifting frequencies--that with the power levels they must be using to get this return, the peak of our sunspot cycle which is coming at the beginning of the next decade when you said you may be on-line--this frequency could, maybe, wipe out communications half-way around the world. So it's an international question.

Have we addressed the problem on an international level of world telecommunications, where I know our transmit capability with this system is going to be much greater than our listening capability for someone who's trying to communicate with 50 watts or even 15 kw half-way around the world. We may not hear them when we listen for a clear frequency, but does that mean we'll go ahead and transmit our 3-1/2 megawatts anyway? That's my concern.

Have we addressed it internationally, are we monitoring it in Europe for interference? It's not too bad right now, but you talk--3 or 5 to 23 degrees with a 350 kilometer, F2 layer--we're talking 2,300 miles on the first skip with good ionization of the F2. You've got subsequent skip that's power levels half-way around the world--no problem, and I'm concerned of international communications and broadcast interference. Maybe you could clarify some of that?

Colonel Lee: Let me make some summary comments and then, again, Dr. Guttrich may want to provide some--a more detailed answer.

That potential is recognized. We're at about 1 megawatt transmitted power for each of the antennas, and the maximum surveillance zone that we're looking at is about 1,800 miles for the kind of power levels and the frequencies that we're using. But yes, we realize that we wouldn't be able to hear somebody at a much weaker level, again, several thousand miles further than that. But on the second hop our signal could potentially interfere with him.

There's no way to predict that ahead of time. There's no way in the sort of sampling of the spectrum that we will do to be able to establish that. So again, on a as-reported basis of interference incidents as they do occur, then we should be able to establish and modify the frequencies that we transmit on. If it's just the occasional user that happens to be on that frequency over there, then there always is going to be that potential--that we're going to be interfering with him. However, I would hasten to add that we will not be, on a long-term basis, operating on any single, given frequency. There will be a fair amount of shifting around in frequencies as we shift the range of the detection barrier that we establish for the system.

Mr. Slabonik: Okay. To clarify my position, as I've experienced interference greatly on a basis from one of our neighbors who's experimenting in backscatter technique and, as a SAR pilot I fly the Bering and all over the Aleutians continually, and many times our HF communications are almost negated due to heavy interference, pulse-type interference, from someone using backscatter techniques, and those are partially my concerns. We operate 50 to 100 watts transmit power to try to maintain guard with our home base, but many times someone who could care less how loud or how effective we are can totally wipe us out and not even know we're there and cause many difficulties--much soul-searching at home wondering if we're around--and it's a real concern for low power HF users who have to use it everyday, day in and day out, to do their jobs.

Colonel Lee: I assume that one of those potential sources that you are talking about is the OTH system that the Soviet Union has. They've got two systems that are identified and they were documented in the Secretary of Defense report to Congress. It's affectionately called by the community the "Woodpecker". It's extremely noisy, a very broad spectrum, and not a lot of attention paid to potential interference effects. Our system, with its much cleaner signal, FM-CW continuous

wave--we should not have those kinds of effects on the community that would be several thousand miles away.

Mr. Slabonik: Thank you very much, Colonel.

Colonel Lee: Thank you.

Lt. Col. Bristol: Next. Yes sir.

Mr. Pappas: My name is George Pappas and I'm a local resident and private pilot. Recently LORAN C has come in as a very fundamental part of our navigation system here in light aircraft and my concern is along the same lines as this. I don't know what frequencies are. I'm not an electronics expert, but I just was curious if this was addressed. Are your frequencies anywhere close to LORAN's and is it going to interfere with them?

Colonel Lee: The frequencies that the LORAN uses are quite different from what we have in the HF spectrum, but again there is that possibility of harmonics. That's one of those cases where if we did discover that we were interfering because of some harmonic, we would be able to lock that out from our system.

Mr. Pappas: I noticed in your draft statement there you did address OMNI, the VOR signal, but nothing was mentioned about LORAN there, and I just wanted to call your attention that LORAN is a very significant means of navigation and getting more so all the time.

Colonel Lee: And, in fact, one of the site areas that we're looking at outside of Tok is very close to that LORAN installation. . . .

Mr. Pappas: Yea, it's right next door to the master.

Colonel Lee: . . . . . And so, we had looked in particular about the potential interference. It shouldn't interfere with us, or we with that system, except with that potential on some subharmonic. And that we would look for and correct as necessary.

Mr. Pappas: Thank you.

Lt. Col. Bristol: Anyone else care to pose a question? If not we'll proceed. Excuse me, there. . . . .

Mr. Chambers: My name is Jim Chambers. I'm also a local resident and local pilot. How much airspace is going to be taken out for this? How much available airspace is going to be removed from the public?

Colonel Lee: When we look at the receive site, there will be no restrictions at all other than the fact, as someone pointed out to me before, the fact that we've got a long area with a relatively flat groundscreen--we don't want someone trying to use it as a temporary landing field. But no effects on the aircraft navigation or instruments at the receive site at all.

In the case of the transmit site, what we did during the Experimental Radar System days, and what we are now also doing for the East Coast System, is establishing a five-mile temporary restricted area immediately around the transmit site, extending up to about 5,000-foot altitude above ground level. We, on a permanent basis, will bring that area in. Our estimates are that beyond about a mile in front of that antenna area, or half mile on either side, we should have no harmful effects on aircraft that would be flying through that area. There may be some impact on some of the navigation instruments if you were to fly directly in the beam itself, in the sense of causing needles to swing. But no effects, or long-term effects at all. If an airplane were to fly through the beam, the period that you would be in the beam and its energy level are such that still there would be no harmful effects to the crew, the pilot, or to the system.

Mr. Chambers: Okay. So you're saying initially maybe a five mile by five mile area of restricted airspace which may be shrunk at some later time.

Colonel Lee: That's correct.

Mr. Chambers: Okay. Thank you.

Lt. Col. Bristol: Yes sir.

Mr. Pettis: My name is Tim Pettis again. And I guess I'm looking at the long range of this. Is there a gap across the North Pole in your plan there? The DEW line does provide short-range radar coverage of the--that particular polar cap, but I'm curious if you're going farther with this or is this the extent of the radar network that you are building?

Colonel Lee: This will be the extent of the OTH systems that we're proposing to build. Mother Nature doesn't like OTH systems looking directly north. That's the main reason. Otherwise, it would be nice to have an OTH system that gives that same kind of long-range, wide-area surveillance coverage. But if you begin to look directly north, you have the effects of the ionosphere and the aurora disturbing that ionosphere, so it's much more difficult to get reliable, consistent signal returns as we send the signal bouncing or refracting through that disturbed part of the ionosphere. So, for that reason, we are not proposing to carry anything beyond the Alaskan System. We will continue to rely upon the Seek Igloo and the North Warning System, which is the upgrade of the DEW line, to provide that radar net across the direct northern approaches to the North American continent.

Lt. Col. Bristol: Does that answer your question sir? Thank you. Any other questions? All right. Now we're ready to proceed to the portion of tonight's program involving the making of statements. That is, a statement can be made orally from the podium, much the same way in which questions are posed, or the statement can be submitted in writing or both. As I mentioned before, the statements can be submitted

following the termination of the hearing by the 13th of October of this year. I didn't receive any comment forms that had that particular block checked, but I don't want to make the assumption that there isn't anyone who doesn't--who wants to make a statement. Colonel, did you receive any? Did any of the members of the panel receive any?

Colonel Lee: No. No. Just the two that I had on questions.

Lt. Col. Bristol: Is there anyone here who would like to make a statement? Okay, I have one hand in the very back. And ma'am, is that a second? As I indicated before, in the order of proceedings, if there are any public officials tonight then I'd give them sort of first go. I don't believe that there are. And, other than those that are in uniform, and perhaps a few others that are here in their private capacity who are also public officials, any that are representing groups would be in the next contingent--and then finally, those who are speaking on their own behalf. I gather that the two that we have are in the latter category. All right. Ladies first. Ma'am, why don't you take the podium and proceed with your statement. Identify yourself at the beginning and your address as well.

Ms. Stirling: My name is Marilyn Stirling and I own property in the Paxson area, and I'm definitely not an official. I definitely think we need this radar warning system, and I'm for it. I would like to make one comment though. I feel that the Paxson area is not the place for it. And the reason I say this is that it has no facilities for the large number of people it would take to build the facility and--or to maintain it. It does not have much in the way of school. It does not have housing. Nothing much for recreation as far as social activities. It would be, I think, a bad area to choose in this respect. I also feel that it has--one thing that was mentioned, was that the permafrost was not a bad thing there. It is. Permafrost is very bad where we have our cabin, and it could be--it's something that should be considered. We have a great number of waterfowl that come into the area and use the lakes there. We have many, many swans. We have eagles. We have many things that we would feel that might possibly be affected. And caribou, of course, do migrate through that area. And that might not be good. Now whether it would actually affect them or not I have no idea, but it should be said anyway. It is a beautiful area. To me, it should remain as untouched as possible--but that's a personal feeling. But I do definitely think that the radar warning system is necessary. And if it had to be in that area, yes. But if it could go to Glennallen where they have facilities and schools and social recreation, or Tok, where they--oh, and Glennallen they also have a hospital--I think it would be much better. Thank you.

Lt. Col. Bristol: Thank you. Gentleman in the back row.

Mr. Douthat: My name is Darryl Douthat, D-O-U-T-H-A-T. My address is Box 38, Chugiak, 99567. I'm in a recreational area of the vicinity near Lake Louise, off Lake Louise road in particular--property and a cabin in that area. And I share some of the sentiments, but I think

each of us whose familiar with a given area recognize more clearly some of the problems in each of those areas. I speak for myself, but my reaction is shared by other landowners and recreational users in the area with whom I've discussed this over the past couple of months.

Essentially, in reading the draft statement, I felt that the potential impact in recreational use has not been correctly assessed, especially with regard to that area designated Glennallen. It's not really Glennallen. The geographical center of it is essentially the same distance from Crosswind Lake, and that gives it an entirely different character. The recreational subsistence use of that area is already very heavy. Any further development in the area is certainly going to lead to conflict directly with hunting and trapping in the area, primarily as a consequence of just putting in a larger population. If it were in downtown Glennallen, it's less likely to have an impact. But it's not, as I understand the map. And so I feel that essentially putting a site there is almost certainly going to lead to much higher use. And the area is already, I believe, at carrying capacity in many ways. Thank you.

Lt. Col. Bristol: Anyone else care to make a statement? Are there any other questions? Have any of you thought of any other questions that you'd like to raise, perhaps some of the statements that have been made have raised a question in your mind. As I said, we're following an informal schedule, if you do. Sir? If you have a question would you like to, ah. . . . .

Unidentified voice: Yes, I do.

Lt. Col. Bristol: . . . . . approach the podium, please. Could you approach the podium please? Or. . . . .

Unidentified voice: You want me at the mike?

Lt. Col. Bristol: . . . . . Yes sir. Just so that it'll be recorded so that it can be part of the transcript.

Mr. Syren: I'm wondering--ah, well--my name is Alvin Syren. I've lived in Anchorage since I've came to Alaska 40 years ago. I don't really know anything about this system but I'm sure that as we are fed information, I'm wondering, will we have chance at another public hearing here in Anchorage over this thing. The first I've seen on it is this little picture brochure, and I'm not that much of an expert to really know what all is involved. However, if it is strictly for defense, I'm all for it if we can live with the system and if there's no ill effects from it. Because I certainly feel, very strongly, that it is time for America and to start defending against our enemies instead of all the time helping them.

Colonel Lee: There were a couple questions that you raised and let me take them then.

The first one is, yes, it is a defensive system. It does provide advance warning--time for our people to better prepare themselves to take defensive actions if indeed an attack is underway. So it is--strictly as its objective--defense.

The comments about, or the question really, about whether additional hearings would be held--we have established and provided formal announcement of just these four public hearings. But one of the main objectives of the hearings is doing exactly what is taking place--to make people aware of the project, some of the system characteristics, if they were not otherwise familiar with it. We would make sure that you had a copy of the Draft Environmental Impact Statement, if you haven't had access to it, and then stress the value of getting your written comments over the next several weeks, up until that 13th of October closeout period. That's the real value of having the public hearings--to ensure that we've made the comments available, the characteristics available, to the public--and giving them adequate time then to further consider, do additional reading, talking with their friends or neighbors, and then send us in writing your comments or reactions. That would be very useful to us if you can.

Mr. Syren: I think I've got one more question. . . . .

Colonel Lee: Please.

Mr. Syren: . . . . .Perhaps in connection with the carriers that's in our harbors as of right now, will this system enhance the whole military strategy and protection and equipment throughout our whole forces?

Colonel Lee: This system, the OTH system, is a complementary system. It makes other systems better. Our system, for example, together with the line-of-sight microwave radars, gives a much stronger defense capability. And being able to both acquire, detect, and track aircraft at long ranges, and still using the more precise line of sight capabilities of these other radars, provide the kind of airspace control directly adjacent to the coastline. So it's a complementary system to lots of others. There is no single solution that provides the answer to the defense needs that we have. But this certainly is a very important one, and for the dollars involved, gives a significant capability that really can't be matched by any other type of surveillance system.

Mr. Syren: I'm all for it.

Lt. Col. Bristol: Thank you sir. Has anyone else any questions? Yes ma'am.

Mrs. Brandt: My name is Carolyn Brandt. My husband and I own a cabin near the Paxson area and I had a question about the facilities there. Right now Paxson is a lodge that has a small grocery store and a bar and a service station. What facilities would be built for this many

people? There is a small elementary school there, but there is no high school. The students are shipped out somewhere else. There's no medical facility. There's no housing or there's no shopping center. It's a six to seven hour drive from Anchorage, which is where most people come to do their shopping. What kind of facilities would be built?

Colonel Lee: I mentioned--in the comments to the previous question--the DEW line or North Warning System of microwave radars. We have those scattered in very remote parts of Alaska and across Canada. And in those cases, what we have done is set up completely self-contained living facilities where the people remain in that area. There's adequate facilities for the entire complement of people that are required, and supplies are brought in as required. We're looking at a number of alternatives for the study areas for the proposed Alaskan system. Where we have established facilities, such as near Glennallen or Tok, there may not be the same kind of requirement as for Paxson. For planning purposes, however, we have defined the requirements for a single composite living facility that would be able to meet the total needs of that group of about 70 people for the transmit site and about 60 people for the receive site. If there were no other facilities available, then we would be able to house them and to provide them supplies in that one central location. If they wanted to bring family members along, or try to exist in the local community, or build some additional cabins, that choice would be up to the individuals. But we would, as a part of our planning in those kinds of cases, provide a total living facility for them.

Mrs. Brandt: Okay. But it would not include housing for families?

Colonel Lee: It would not. That's correct.

Lt. Col. Bristol: Sir.

Mr. Pettis: Is this system intended to be maintained and operated by a contractor, is that what I understood? And have contractors--is this out for bid or where does it stand in its conception to fruition phase? Thank you.

Lt. Col. Bristol: Let me just state for the record that the questioner is Mr. Pettis.

Colonel Lee: In the case of the East Coast System, which is now under test, the maintenance concept, long-term, is for contractor-supplied maintenance at the transmit and receive site as well as at the Operations Center. The only "blue suit" federal workers are directly at the Operations Center. The maintenance people are civilian contractor hired to provide the operation and maintenance at the remote transmit and receive site.

Again in the case of the East Coast System, we're using federal civil service workers to provide the site security. That same type of a parallel is being followed for the West Coast System, and that's what we would be proposing for the Alaskan System as well.

You asked about the sense of timing, though, and we're really quite a few years away from making definite commitments or from having to take the action to implement that.

Under present Air Force planning, we could start the preliminary construction, setting up some roads, access roads and base camp as early as the middle of 1988. The full construction activity would probably not begin, however, until the year after that, and then we would still have several years before the complete system were up and operating, and that full time force--the 70 people at the transmit, the 60 at the receive--were in place. But under the present plans, those would be civilian, approximately half of them, contractor-hired maintenance personnel--the other half site security personnel.

Lt. Col. Bristol: Would anyone else care to ask any questions? Any questions at all concerning any of the particular environmental impacts that Dr. Everett addressed in his remarks or anything concerning the environmental impacts as addressed in the draft statement?

O.K. Thank you very much. That pretty well concludes this evenings hearing. On behalf of the Department of the Air Force, I would like to thank each of you for participating and remind you again that this unique process in which your input, both presented this evening, and presented in the form of comments sheets submitted to the Electronics Systems Division by the 13th of October, ensures, in a meaningful way, that your input will be directly considered in the decision-making process as the Air Force evaluates its particular needs and takes these environmental concerns, just like it does the operational ones, and factor all of that together and makes recommendations to our government for a decision in our national interest. Again, your part is very, very important, and thank you again for your participation. Good evening.

3.2 Transcript, Fairbanks, Alaska

The hearing at Fairbanks, Alaska commenced at 6:03 PM, September 24, 1986.

Lt. Col. Bristol: Good evening. Ladies and gentlemen, last month the Air Force filed a Draft Environmental Impact Statement or EIS with the Environmental Protection Agency on the proposed construction and operation of an Alaskan Over-the-Horizon Backscatter, OTH-B Radar, System.

My name is Matt Bristol. I'm an Air Force Lieutenant Colonel, and I'm a trial judge who works for the Judge Advocate General of the Air Force in Washington, D.C. The reason I'm here is--I'm to act as presiding officer at this public hearing on the Draft Environmental Impact Statement, which I realize some of you have had an opportunity to read. And for those of you who haven't, we have some additional copies with us this evening, or we can, if we get your name and address, can arrange to have one mailed to you.

Under the environmental laws of the United States, when an agency of the government decides to propose a particular action that could have an impact upon the environment, there's a procedure that comes into being. And a part of that procedure is what we are doing tonight. And that is a two-way channel of communications between you, as members of the public--be you here in your individual capacity or as a representative of a public office, agency or private association--for you to hear about this proposal--to inform yourself about this proposal so that you can make up your own mind about it, and for you to provide the Air Force with your input and your comments about how this proposal might, in your view, impact upon the environment in any one of a number of ways. You are--and if those of you who haven't seen it--on the back table Lt. Gale Brown who's standing there just to the left of the doorway has some comment sheets. And this is sort of a multi-purpose document on which you can manifest whether you wish to ask a question at some point during the hearing, whether you wish to offer a verbal or oral statement, whether you'd like to submit a written statement for the record, whether you'd like to receive a copy of the Draft Environmental Impact Statement. And it has an area where you can check the particular area to which your comments or questions might pertain--for example, biological impacts or health hazards, air quality, water quality, that sort of thing. You're not limited to just making comments this evening. Whether you chose to make a comment or statement this evening, or whether you choose to ask questions when we reach that point in the program, you have basically until the 13th of October to submit final comments. You can use this particular form, and the address to which you send the comments is written right on the bottom of the form. And whether you provide comments tonight or whether you submit them in writing or both, your comments will be incorporated into the Air Force decision-making process. They'll be a part of the record of this hearing, and they will be on the table along with all the operational

information and all the other information that bears upon the decision when the Air Force sits down to make its decision as to how it wishes to proceed.

You'll notice that we have some recording equipment set up. A verbatim record, that is, a word for word record, is being prepared just as in the case when I sit as a court-martial judge. And when that record's prepared, it'll have everything. It'll have my remarks now, any questions that you might raise, any statements that you choose to make from the podium. And that record will be again, part of the--that'll be the transcript of this hearing--and that'll be part of the package that is reviewed by the Air Force in deciding how to proceed and what types of actions might be necessary to properly take into account the environmental impacts that we can anticipate.

The way we're going to proceed tonight is roughly as follows. I must emphasize that this is an informal hearing. I don't want anyone to be hesitant to ask a question or to make a statement. There aren't any special rules that apply. About the main rule that applies is that we just have a limited amount of time. We have basically this facility until 9 o'clock. The first part of the business is going to be a briefing by the Director of the OTH-B Radar System Program Office, Colonel Jim Lee, who's seated to my right. The second portion--that'll last about a little over half an hour and there may be some individuals who speak in conjunction with Colonel Lee as a part of that briefing. In fact, Dr. Sid Everett whose over--Sid, if you'd stand up or raise your hand there--he'll probably be addressing the environmental aspects as a part of Colonel Lee's basic presentation. After that, we're going to take about a five to ten minute short break just to stretch. And if you haven't had a chance to do so by then, you can fill out one of the comment cards if you'd like to do so. Then we'll collect those comment cards, and we'll sort of group them as to the environmental area, subject-wise, to which those comments or questions relate. We'll reconvene, go first with the questions, and then after all the questions are out and answered to your satisfaction or to the best that we can do it, then we'll go into the statements. We'll proceed in the order of public officials, if there are any officials of any government agencies which choose to make a statement. Second, the people who represent organizations. One such person per organization, and then, lastly, individuals in their private capacity. Just a clarification on the people that are representing organizations. As many people that wish to speak can, but the time limits that we're going to adopt, basically--5 minutes for people from the agencies, 5 minutes for the one main representative of any private association, and 3 minutes for any citizen or anyone else who's affiliated with an organization, for the purposes of making a statement from the podium. The only reason we have those time limits is so that I can ensure that, as the presiding officer, that to the maximum extent possible everyone has a chance to be heard. That's the purpose--to have a full opportunity for you to be heard and for the Air Force to explain its position.

Very briefly--I am not, even though I wear the same uniform, quite proudly, as Colonel Lee and some of the other people that are here this evening--I am not a part of this team. I am not a proponent per se of this program. I probably don't know much more about it than you do. I met these gentlemen yesterday. My purpose here is not to--I'm not an expert on this particular matter. I'm just here in much the same capacity as when I'm in court--just to make sure that everybody has a fair hearing.

The kinds of questions when we get to the questionning part--while we're informal--we're talking about questions that seek clarification, either as to matters that have been covered in the briefing or matters that are in the Draft Environmental Impact Statement. I'm not talking about the courtroom cross-examination or argumentative type questions. If you have something you want to say, then the proper time is when we line up everybody for the making of oral statements or written statements.

All right, without further ado, I'm going to introduce Colonel Jim Lee who's going to give the briefing on the Alaskan--the proposed Alaskan Radar System or the backscatter. Colonel Lee. . . . .

Colonel Lee: Good evening. I'm glad to be here tonight to be able to give you a summary of the process that we're now going through, a brief description of the proposed Over-the-Horizon radar program, some of the system characteristics--showing you some specific pictures from the East Coast system that is now currently in test. And then I'll introduce and we'll hear from Dr. Everett who'll summarize some of the major environmental factors and concerns that have been identified during the scoping process. I'll return then for some summary comments, and that will conclude our formal presentation. Then as our hearing officer identified, we'll go into the question and answer and comment period.

I've got some 35-millimeter slides. To ensure that you can see them clearly we're going to bring the lights down--it'll just be for this portion for the presentation. The action that we're dealing with tonight is the proposed construction and deployment of an Alaskan Over-the-Horizon Backscatter Radar. The process that we're going through is this environmental impact analysis process. It started with the Air Force filing a Notice of Intent to proceed with the development, construction, and deployment of this system. We were here in Fairbanks, as in a number of areas, to conduct scoping meetings shortly after the beginning of the year. The information and the comments that we received were used in preparing the Draft Environmental Impact Statement that was published and distributed last month. Following the public hearings, we will prepare the Final Environmental Impact Statement and distribute that document the end of November. That will allow us to have the Record of Decision after the mandatory minimum 30-day waiting period to announce then--our selection of the proposed location for the

transmit antennas, for the receive antennas, for the operations center. These three major elements comprise the Over-the-Horizon radar program.

The OTH Program, as we refer to it, really consists of four separate radar systems. The East Coast System, off to your right, has already been fully funded by Congress; it is an approved program. We are currently in testing on that upper northeast sector. The West Coast System has similarly been approved and funded by Congress. We received the funding for the first sector in the FY86 budget. Congress is currently debating the funding for sectors 5 and 6 that would complete the West Coast System. Both the Central Radar System and the Alaskan Radar System are proposed systems at this point in time, and we are going through this environmental impact process for both of these systems.

There is a very important reason why we are carrying out this program. As you can see, those fans extend out a great distance from the coastline of the United States. We currently have a network of coastal radars around the coastline of the United States. They're microwave radars with a range of about 200 miles. The Over-the-Horizon radar--because of its unique characteristic of being able to bounce our high frequency radio wave from the ionosphere, we can extend that detection and tracking range out to about 1,800 nautical miles. That translates into several hours of additional time--time for our decision-makers to enter into further negotiations, to warn our public, to increase as necessary the alert status of our forces, and, if that attack is indeed progressing, then to be in a position where we can best respond to protect the interests of the United States.

The reason that this is so important is because of a large increase in activity that we have seen in the Soviet Union. This is the Blackjack aircraft. It's an artists drawing, but this aircraft is currently in flight test in the Soviet Union. If they continue on their present schedule, this system could be operational by the start of the next decade.

The aircraft on the left is the Soviet Bear H aircraft, one of the newest series of Bear aircraft that the Soviet Union is still producing today. That aircraft can carry the cruise missiles, and, as seen in this picture here, regularly flies in towards the Alaskan coastline and is intercepted and escorted by F-15s, such as this one shown here, from the Alaskan Air Command. There are similar occurrences from the northeastern part of the United States with these Soviet aircraft on training missions coming in towards the United States, being intercepted and escorted around the outer areas. So the threat is real.

We currently don't have any kind of a system that can, over a wide area, detect these aircraft for more than a couple hundred miles from the coastline. This complete network of all systems then will give us complete coverage around the continental United States. The Over-the-Horizon radar, because it utilizes that ionosphere to refract

radio waves, presents some difficulties when we try to look directly north. We are unable to reliably use that type of radar system, and so we rely on the current Seek Igloo set of microwave radars within Alaska and also the upgrade of the DEW line, which is now ongoing, referred to as the North Warning System. So that--the complete OTH system plus the Seek Igloo and North Warning--will give us that complete coverage around the continental United States.

This is a concept of the surveillance area provided by the East Coast Radar System. We have the transmit site located in Moscow, Maine, and the receive site at Columbia Falls, Maine. At each of those two sites there are three antennas bore-sighted to provide the particular area of coverage that is shown by those three fans that are illustrated in this artist's drawing.

This is the actual transmit site, one of three for the East Coast Radar System. The antenna--actually six antennas together in a line, each covering a different portion of the high frequency spectrum--is about 5,000 feet long. This is another picture of that same antenna. In the case of the West Coast, the proposed Central and Alaskan systems, we're looking at an area of approximately one mile square for each of these transmit antennas. And you can see, outlined around the area, there is an exclusion fence that ensures that animals and people then do not enter into the area where they can do damage to the antennas, or where they can be susceptible to radiofrequency energy levels above levels that have been determined to be potentially dangerous.

This is the receive antenna. The portion of the antenna on the left is only some 19 feet tall. The backscreen on the right is 65 feet tall. This is in contrast to the tallest portion of the transmit antenna which is 135 feet tall. This antenna, for the West Coast, Central and Alaskan systems, will be approximately 8,000 feet long. The antenna that you're seeing here is just 5,000 feet. The antenna is being increased to give us better signal sensitivity for good detection capability against the cruise missile threat.

The signal information from the receive antenna is sent by tropo links--and those are the white dishes that you see there--down to the operations center. This is the operations center located at Bangor Air National Guard Base, Bangor, Maine. Inside that center the information, after it has been processed by the computer system, is displayed in the format such as the geographic display that's shown there in the upper right. The system will automatically identify, track and maintain those tracks of aircraft that are flying within the area that has been illuminated. The system will further correlate those tracks with known pilot position reports or flight plans that have been filed so that we can automatically correlate known tracks with those that we are picking up.

That East Coast system will be finished with its complete testing within the next year and a half. We are currently under construction

for the West Coast system. We have started the construction of the operations center, and are currently in negotiations for the construction of the actual transmit and receive sites.

What I'd like to do in the next portion is to describe the specific areas that we have identified for consideration within Alaska for the required coverage that we need. You can see, from the sectors that are laid out there, the proposed deployment of the Alaskan System will allow us to have that surveillance coverage that meets up with the West Coast System and also, as shown more clearly here, will provide coverage from the coastline on out to that maximum 1,800 nautical mile detection capability.

The geometries associated with providing that overlapping with the West Coast System and covering that coastal area defines a rather small area within the southeastern part of Alaska for location of the transmit and receive sites. That's the area that's identified in red on this chart. Within that area then, we have applied a number of criteria to try to select alternative study areas that we would carry through this environmental impact analysis process. The first and most important, was to look at those areas that would be within 10 miles of the major highway system, because that would greatly reduce our construction costs as well as provide for communications and for power. Further, because the system using these radars is looking off to the west, we needed to ensure that we had a clear line-of-sight. So those areas that were excluded for those two reasons--the orange areas off the main highway structure, the cross-hatch areas where we would not have a clear looking shot out to the west--left us with the remaining clear portions where we could possibly locate the transmit and receive sites. We further considered those areas that were large enough to be able to have or contain the transmit or receive sites, as well as also ensuring that the areas were more than 10 miles from any established airways or any other potential large sources of interference.

The net result of that process was a narrowing down of alternative study areas that were first identified, to these five areas shown here. First, the Glennallen area, just to the west of Glennallen, and then continuing on the highway to the northeast, the Gulkana study area, Indian Creek, and further up to the northeast, Tok, and finally Paxson East.

At each one of those areas we looked then at being able to site the transmit or receive antennas. At the particular site location that would finally be selected, we would be constructing two transmit antennas, each one of those rectangular areas being approximately 650 acres. The black line, the heavy black line, is the antenna. The groundscreen which is the only portion where we need some very clear, level land is shown in front of the antennas.

In the case of the receive antennas, the length of that area is about 10,000 feet, about 2,600 feet in width, again for a total acreage of about 600 acres for each of the two receive antenna sectors.

When we go through this complete process, the Air Force would select one of the study areas as a transmit site--one of the receive, one of the other study areas as a receive site. However, these study areas right now are very large and are somewhat general. We have gone through the environmental analysis process looking at the potential environmental effects for each of them. But after the specific study areas have been selected, we will then look at how we would site the antennas within those areas and then would do some further environmental analysis, an environmental assessment as we refer to it, to ensure that the concerns that we had identified in this process were still appropriate and the mitigation measures that had identified were satisfactory then for the specific site selections.

At this time then I would like to turn this over to Dr. Everett to summarize the primary environmental concerns.

Dr. Everett: [Refer to briefing slides, Section 3.5, p. 3-133] In assessing the environmental impacts in constructing and operating this Alaskan radar system at any of these study areas, we considered these topics. They're all spoken of in the document. Tonight I'm going to touch on just a few subjects in the various areas.

One important consideration is fill material--fill and cover material, which could be gravel or other soil or earth. The requirements vary considerably from area to area, and as a result the impacts that are potential, that are possible, also vary. The impacts are, of course, dependent upon the availability of the borrowed material, the requirement for it in any of these areas, and the susceptibility of the soil for erosion or thermal degradation. In general, the Air Force intends to investigate the availability of the resources in the areas that are selected, develop new sources if that proves to be necessary, and, in general, comply with whatever regulations apply, reclaiming if that is necessary as well.

Another key issue is permafrost, which is a different challenge from what has faced the Air Force in the other locations in the United States at which they're building this type of radar. All of the areas that have been examined have at least some permafrost. We estimate that there is some variation in the possibility of degradation and the other consequences that come from affecting the permafrost during construction. So once again, the strategy is to examine the particular sites that are of interest within the various study areas, determining what is there, planning and designing the facilities accordingly, and following through with conventional and well-established construction practices.

A total of on the order of 3,000 acres may be required--both at the transmit--that is to say, a total counting both the transmit and receive sites. Vegetation could be affected either by direct loss, as in clearing to lay the groundscreen, or by interruption in the normal

evolution and change and growth of the vegetation. It appears that there are no special species of concern there. The amount of acreage is not large compared to the total amount of acreage in any of the regions we are looking at. Nevertheless, even though we feel that no significant adverse effects are likely, there could be local effects, that is, very site specific effects that may be significant. In general, once again the Air Force would be planning its work according to additional studies on the specific sites of interest, avoiding the more sensitive areas if at all possible and accomplishing this in conjunction with agencies, federal and state--in addition to the Fish and Wildlife Service which happens to be mentioned on this slide--in order to do the best job possible.

Wildlife can be affected in a number of ways. There are five mentioned here on this slide. I'm going to come back to the first item at the end of the slide. Speaking of aquatic habitat alteration, I'm referring to direct damage to streambeds, or causing erosion which would affect the streams directly and, therefore, the fisheries. Good practice in planning, designing and executing the construction of these sites should avoid any but the most minor of effects of that type.

Humans, whether creating noise or being generally active, can potentially disturb wildlife in an area, driving them off. We feel this will be a relatively small effect. There are a number of things that can be done to reduce it, including maintaining buffer zones or timing of construction activities. Because these units that are going to be required for each antenna array are on the order of 600 acres, quite sizeable in a local sense to you and I as we move about, there is a possibility that migration patterns of some large animals may be affected--caribou being the key species. Again, we don't feel that that is going to be a significant effect, because of their numbers or their ability to reproduce will not be affected by the placement of these antennas.

The last item is thought to be a minor impact, of minor potential, simply because the amount of additional hunting pressure does not seem to be very large--and controllable by--and it is controllable by the fashion in which it's now controlled. The amount of traffic that would be added by the operation or even the construction of these sites is not substantial.

Bird collisions is a special case that we're looking at. There is a significant potential. Some of the areas have particular species, large-bodied, not particularly agile birds. Of course, there's always the opportunity for poor weather and poor lighting that makes the structures themselves difficult to see. The structures, although they are large--looking in some respects like bridge girders--are also small in the sense that there are elements or components of these structures that are fine wires. The--as you can tell from the other pictures, this is, in some respects, a wide large-grid wire mesh screen fastened between the antenna towers or the support towers, and those are very

difficult to see. Because there are swan nesting areas in Glennallen, flyways in the Tok area, we feel there is a greater potential in those study areas for collisions than in the others. One way to minimize these effects is to avoid the areas of higher bird densities. Another is to increase the visibility of the structure itself. Ideas in that area include lighting or streamers of some sort, for example. And modification of the environment around the structure has also been suggested. This could include planting some vegetation that would reduce the net height of the structure, if you will, compared to the surrounding area.

The next few slides deal with social or economic considerations of building and operating these radar sites. The employment numbers are as you see. It is unclear what the dependent situation might be, because the presence depends quite a bit upon the fraction of people who are employed, who are coming from outside versus local, and on the household size involved. The Air Force will have a policy on families and whether they can be brought into an area, as will any contractor who is providing services to the Air Force in either building or operating the system. Work schedules and transportation will also influence the prospects of these families, or even single individuals, living out in the community if facilities are actually available. But on the basis of some reasonable assumptions about these various factors, we estimate that the total population change introduced, caused by the introduction of these radar sites, would be in the range shown on these charts, the percentages shown here. Clearly, even though 315 people will be employed in the Anchorage area, the population there is so large the change is very small. It's much more substantial in the bush.

Continuing on in the subject of employment, here we see the construction employment followed by the construction effects. It is a high peak compared to the average in construction at all the sites in question. And those--that peak of employment creates the prospect of changes in the ranges shown there. Again, significant changes in the bush--not so much so, in fact barely noticeable probably, in the Anchorage area. The operation employment would also create some changes. The changes are smaller, just in proportion to the number of people that would be employed. In the case of the rural or bush areas, there is a seasonal variation in employment, in the offering of services of various kinds. Therefore, the last point made there, is that we're not expecting that the local communities will capture a lot of secondary employment--that is, the creation of jobs to serve the people who are taking jobs at the sites.

We have a stuck machine. . . there we go.

Effects on subsistence are clearly possible. There could be some direct loss due to the enclosure of the sites behind this exclusion fence. Also a possibility of access changes, though there will be an attempt to minimize that effect. The introduction of additional people clearly has the potential for putting more pressure on the resources

used in subsistence. I mentioned wildlife migration changes there, although we feel in general there will be no significant net effect. It is possible, however, on a year to year basis, that there would be some variations introduced by the presence of these sites which could influence subsistence. In general, it's an area that requires some further study as the specific sites are narrowed down.

This is a large structure. The question arises to whether it would be--have an effect on the scenic quality of the area. What is the prospect there, depends on how distinctive the particular landscape is, whether there are already modifications in the form of buildings or other changes that have already been introduced, thereby, in some way, reducing the quality of that environment. And finally, how visible any changes that are introduced may be, whether its from the road, or from trails or from the air. Although some of these--all these areas are quite large--and although in general, they're near the roads from the point of view of construction and servicing, when in operation, in most cases we would expect the sites to be built more than one mile from the highways. We're not expecting that scenic effects or visual quality degradation would be significant except possibly in Indian Creek, depending again upon exactly where it might take place. Clearly, these changes would be visible from the air in the vicinity. But in the case of ground viewing there are a number of ways in which the possible effects could be mitigated or reduced. They include staying away from sites that would be quite visible from overlooks or viewpoints. It's possible to screen--to do certain things to screen at the site or from the vicinity of the viewpoint--and there are certain techniques of choice of colors, avoiding reflecting surfaces to minimize the contrast that is being introduced.

Just a reminder, again, this is a large structure, but it's a very open or airy one. You don't have to be very far away from it before it starts to disappear.

Most of the areas that we looked at are relatively unknown when it comes to cultural resources, but the consensus is that the Air Force is quite likely to find something when it begins its construction activities. There is very little to be done about that in advance, and the approach has to be one of planning for the possibility, complying with all the applicable laws and regulations, consulting with state and federal officials on the plan, the findings, and what's going to be done about resources that are found.

The next few slides deal with the subject of the radiation, the radiofrequency radiation, the nonionizing radiation emitted by the radar, and what it might do to electronic systems or to our health. This radar is currently set--operates in the high frequency band between 5 and 28 megahertz. Some of you, I'm sure, know its the same part of the spectrum occupied by groups such as the amateurs, the citizen band users and large broadcasting stations such as the Voice of America. This radar has the potential to interfere with other operators within

that same band of 5 to 28 megahertz, in adjacent frequencies just below or just above, and interference with frequencies that are multiples of the frequencies between 5 and 28. The last category includes things such as TV and aircraft navigation beacons.

The radar signal is quite a quality signal. It's very highly concentrated, the power is very highly concentrated in the main lobe, the direction in which the radar wants to operate. Relatively little energy is in the side-or backlobes--that is to say, surrounding where it wants to look. And in general, there are a number of steps that are going to be taken that are both protective of other users of the spectrum and also protective of the radar itself.

First of all, some frequencies within that 5 to 28 megahertz are set aside for other users, and those will be avoided by programming of the frequency selection for the computer. Edges of the bands that are allowable for the radar will be avoided to offer some additional buffer to users in the adjacent frequencies. One of the key techniques will be to listen first before operating on frequencies that are available to any users. Frequencies that are not specifically allocated to others in this band are available to all. Now the radar does not care to have interference reaching it, so it will actually listen first to see whether a frequency is available before it transmits. That automatically will prevent much interference, though it can't guarantee that the radar is not interfering with a user some distance away.

And finally, for some of those electronic systems that I identified that are at frequencies, harmonic frequencies--the radar can be programmed to avoid the subharmonic frequency and therefore avoid interfering with the devices.

The Experimental Radar System was a predecessor to the East Coast Radar System and it was operated in, for testing purposes, for an extensive period of time, and there were no complaints of interference that could be traced to the operation of the radar.

A short summary of the possible hazards created by the transmission of this RF energy. As you can see, the only kinds of devices, the only kind of hazard that may be presented is the use of EEDs, electroexplosive devices such as electric blasting caps. It's not a problem if they're simply being transported in metal containers. That distance is well within the distance incorporated within the exclusion fence. If they are in nonmetal containers, or if they're being handled as if in use, the distance is a bit more and reaches beyond the exclusion distance. This is a situation in the East Coast and West Coast and is being handled by posting and information dissemination to agencies and residents of the area.

Finally, on the matter of human health, this slide summarizes the fact that we're dealing with a radio wave that's nonionizing. The exclusion fence is going to be set at a distance such that the exposure

to levels--the strength of the signal outside the fence will be below the standards.

We have looked at the literature at the possible biological effects quite extensively, and critically, and found there is not scientific evidence to indicate that there is going to be a health problem from exposure to these powers.

In summarizing, significant biological impacts are possible. Whether they occur and how serious they may be depends on the specific sites. But we feel that with good forethought, planning and execution, that their severity or even their likelihood can be reduced considerably. The changes could--not could be, will be--significant because of the influx of people. And as Colonel Lee pointed out, the Air Force intends, after the sites are selected, to in effect, update what has been reported in this Draft EIS with more specific information on the environment and possible consequences.

Colonel Lee: Thank you Dr. Everett. At the beginning of the presentation, I outlined the key steps in that environmental impact analysis process. These are the milestones that we have followed--and those key milestones that will finish the process. About two months from now, the end of November, we will be publishing the Final Environmental Impact Statement. That document will include the complete transcript from the public hearings, the one that we held last night in Anchorage, the meeting here tonight in Fairbanks, tomorrow night we will have public hearing in Tok, and then on Friday night the final one in Glennallen.

In addition, that document will include our responses--either to questions that were raised during the hearings that we did not have the full information to answer, or where specific comments are made where you are asking for some further response, or some further analysis, or work by the Air Force. That information as well, will be then included in this Final Environmental Impact Statement.

Following the 30-day waiting period then, the Air Force will be able to file its Record of Decision on selecting one of these study areas for the transmit site, one of the study areas for the receive site, and then confirming the proposed location of Elmendorf Air Force Base for the Operations Center.

With that process then, we will be able to request funding--as early then--in the FY88 president's budget that would go over to Congress the first of this next year. That would allow us to begin the construction activities for the Alaskan Radar System.

And as I identified at the very beginning of the presentation, the system provides a significant capability, a capability that we do not have today, one--because of the threat--that we feel is very important. It's an important system, a high priority system to the Air Force, to

the Department of Defense, and we feel a very significant contribution to the entire nation.

This completes our presentation. If we could have the lights then, please.

Lt. Col. Bristol: Just a few words before we recess. The procedure when we return from the recess. For those that would like to ask questions, I'll have this podium moved over either along this aisle or where the slide projector is now. And if you'd like to ask a question, it'll just be a matter of raising your hand--I'll recognize you. You can go to the podium, state your name for the record. If it's a name other than Smith, Jones or one that you think everyone here will know how to spell, just spell it so that we'll have it accurately reflected in the transcript--and then direct your question. Also when we come back for the question--Colonel Lee will introduce the members of his team, the various experts that will be in a position to attempt to answer your questions to your satisfaction.

As Colonel Lee mentioned, there may be some questions that we can't answer tonight, but those you can be assured will be answered, and that those responses will be incorporated in the Final Environmental Impact Statement.

After questions we'll go into the statements. Again, during this short recess, if you haven't already had a chance to get that comment sheet, I urge you to take one and fill it out--and they're on the table in the back of the room. So it's now ten minutes almost to 7 o'clock. Let's just take say--about seven minutes, and try to come back at two minutes prior to 7 o'clock. Then we can get started and include the questions right about on 7. Thank you.

Lt. Col. Bristol: [After recess] Before we proceed with the questions, I'm going to ask Colonel Lee to introduce the members of his team of experts and people from whom you will undoubtedly be hearing at some point during the evening. Colonel Lee.

Colonel Lee: Thank you. I want to introduce the members of the Air Force team that are here to assist me--really to assist us. They've all had a part, either as a part of the basic program, or part of the work done preparing this Draft Environmental Impact analysis--EIS document.

Dr. Everett--you've already heard from. He's from SRI International. They're the organization that has been working with the Air Force and doing most of the--a lot of the work in actually preparing the document itself.

To his right is Dr. Gordon Guttrich. Dr. Guttrich is an Associate Department Head from the Mitre Corporation. The Mitre Corporation provides systems engineering support to the Air Force at Hanscom Air

Force Base where I have my program office. Dr. Guttrich has been associated with the OTH program for over 10 years and was involved with the Experimental Radar System, the actual test and development of the work for the site in the '80-81 period when it was actually tested.

On Dr. Guttrich's right is Mr. Ernest Woods, Chief of the Real Estate Division, Army Corps of Engineers, from Anchorage. When we actually get to the process of looking at a study area, and beginning that--excuse me--that land acquisition activity, then Mr. Wood's office would be involved in that process.

Next to him is Mr. Sal Cuccarese from the University of Alaska branch at Anchorage. He is an environmental planner, a consultant to the Air Force in this process of preparing the document.

Next to him is Dr. Jamie Maughan who is an environmental scientist with the firm Metcalf and Eddy. They also provide contracting support in this environmental area to the Air Force.

And then finally, Mr. Bill Hanson, who is a civil engineer in the Civil Engineering organization at Headquarters, Alaskan Air Command at Anchorage. He is most familiar with some of the construction techniques and the location and the siting that we would be doing, not only for the antennas, but for the support facilities that would go along with the system.

So while you can direct your questions to me, then I will--kind of designate the key persons that would be able to provide answers in more depth. Thank you.

Lt. Col. Bristol: Thank you Colonel Lee. Just to emphasize two points about this comment sheet--number one, it's not necessary to fill one out in order to either ask a question or make a comment today. And number two, it's not necessary, if you do wish to fill one out, to submit it today. You may do so, but you may also submit it by mail by the 13th of October, 1986.

The question period which we're going to start right now--once you're recognized, just proceed to the podium, state your name for the record as I indicated before. Indicate your address or if you're representing an organization, either a public agency or a private association, state the identification of that organization or association--and then you may proceed with your question.

If you have a statement to make, hold off on that until--even though it may involve a question, if it seems more like a statement than question in your mind--hold off on that until after we've gotten through with the questions.

We're going to be informal again, so if you think of a question based on someone else's question or during one of the statements, we can

come back and we'll try to conclude with a general question and answer session to the extent that we have time. Who'd like to be the first questioner for this evening? Sir.

Mr. Gillette: My name is Ralph Gillette. You want my address?

Lt. Col. Bristol: Address or organization sir. Yes.

Mr. Gillette: I'm in Fairbanks, Alaska. 1718 Jack Street is my mailing address. I'm representing an individual, and my question--I want to know if the--in selecting the sites has the money to develop the sites--is that part of the consideration? For instance, some of these sites seem to be--like Tok is located on a roadway next to a power plant, and Paxson East is in the middle of nowhere with 5 miles of road and no water and no electricity and they're going to have to build a 10 megawatt power plant. Are these things considered in the site selection or does that enter into the picture--the cost of developing these resources there. I don't know who to direct that to sir?

Lt. Col. Bristol: All right sir.

Colonel Lee: Yes. If you can--for the others as well--you can direct the questions to me and I'll take a first stab at it and may call on some of the other experts as well.

The process that we have described in the Draft Environmental Impact Statement really summarizes--after the system description--the primary environmental impacts. That's key to documenting the effects that would be most significant to the system. When we make the final decision, however, there are many other factors that will be included in that process--and those things that you've already identified, involving finally the total cost, the availability of land, the cost of that land, whether or not you would need a power plant. We certainly will need some type of a power plant for the transmit antenna. We require about 10 megawatts total power. So in any of the locations that we're looking at, we don't have sufficient power capacity to provide that. So we're looking, in that sense, either at third-party financing or at the Air Force building their own power plant.

At the receive site, however, it may be possible in certain locations to use that existing power system, perhaps with some upgrade. So, yes, all those key factors that you identified will be included then in that final decision process. And that decision, coming the end of December, will be made in the Office of the Secretary of the Air Force. He'll have the full record of this environmental process and he'll have this additional information as well.

Mr. Gillette: I have one other question. Could I ask it?

Lt. Col. Bristol: Please.

Mr. Gillette: And now too with the Paxson East site, I understand from the literature that the transmit--that'll be a transmit site--the antenna will be pointed to the northeast. And I have holdings at Summit Lake, my recreation cabin and I think I'm bore-sighted right directly into that line of that antenna. We're 4 miles away. There's a whole community there which I noticed was not considered or mentioned in the statement. I'm a ham radio operator, hold an extra-class license. I operate from that position. I'm an avid short-wave listener also. I wonder what type of interference that I can expect at that short distance and in the direct line of that antenna?

Colonel Lee: You should have no interference, but the reasons why and how we work--I'm going to let Dr. Guttrich answer.

Dr. Guttrich: Okay. The wave form is FM-CW, which is very well controlled within the nominal band width of the radar signal. Outside of that band width, it rapidly drops down about 50 dB, and quite rapidly beyond that. There would definitely be interference in the frequency that we--on which we would operate. But that would normally be the extent of it. I would expect little interference outside the band that we occupy. And we do not operate on the short-wave frequencies at all. We avoid the short-wave ham bands in our operation and there's a guard band around the frequencies. I don't know that we ever had hams within 4 miles--I can't give you an iron-clad guarantee--but we had no interference at all with the Experimental Radar System in--which has very similar characteristics. It operated for approximately a year, eight hours a day on a rotating time basis and there were no interference reports.

Mr. Gillette: Wasn't that at a lower power though and. . . . .

Dr. Guttrich: . . . . .very similar. It's--in some cases it was operated at essentially the full power. It was normally operated slightly below the current plan because there was difficulty with those transmitters in reaching the design power. But it's like a factor, I think, 25% more power. There's a slightly greater frequency range. . .

Mr. Gillette: . . . . .and there's guard frequencies around those bands even though they're not listed in the table under guard frequency?

Dr. Guttrich: That's correct. The ones that are listed there are complete lockouts. But, we as a matter of policy don't operate in the ham band.

Mr. Gillette: Thank you.

Colonel Lee: One other key part is that we have a continually operating spectrum monitor as well. And so we actively track anyone who may be operating within those frequencies.

Mr. Gillette: Yes, but that's only transmitting. That can't tell what frequency I'm listening to.

Colonel Lee: But if you're able to pick up. . . . .

Mr. Gillette: It won't detect that.

Colonel Lee: . . . . . the signal with your equipment, then I assure you that with our 8,000-foot long antenna, we can pick up that same signal. And we don't want to transmit on that either, because then that very faint signal coming back is mixed with your signal--that you're listening to--and will make it more difficult for us to extract out that energy representing a target out there. So for that reason, we really look for established clear channels before we do any transmitting.

Mr. Gillette: Thank you sir.

Lt. Col. Bristol: Who'd like to be next? Please don't hesitate. If you have any questions at all at any point of--that's been raised, that you'd like to have clarified, or if you've had a chance to read--yes, sir--if you've had a chance to read any portions of the Draft Environmental Impact Statement. Anything regarding that is also fair subject for questionning.

Mr. Anderson: I'm Nick Anderson out in District 18, North Pole area. Sorry I wasn't able to get more information in the local media about the Backscatter system. I was able--I see you guys have been travelling. I was able to get some information out of the Grand Forks, North Dakota, newspaper about it, and I do have some questions that reflects that system--in this system. If I may?

First question I have is on the power requirements. I don't know if you're familiar with the structure of the commercial power system here in Alaska, but I'd like to have some information on exactly how do you plan to power this thing? Are you going to utilize local rural electric co-ops, and also with the Alaska--are you requiring a subsidy from the Alaska Power Authority, which we do in Alaska, subsidize rural power users?

The other question--number of questions I have. . . . .

Lt. Col. Bristol: Why don't we just take one at a time and let them address that and then. . . . .

Mr. Anderson: . . . . .has any--any consideration been given to this point?

Lt. Col Bristol: . . . . .when they're finished, you can proceed to the next.

Mr. Hanson: Well, I can explain to you exactly what we intend to do, at least at this juncture.

The first thing we're going to do is put out a Request for Proposals to the public. There's already been a Commerce Business Daily notification that this Request for Proposals is coming out. Our intent right now is to submit this Request for Proposals to the industry for comment. I would expect that that document would be available middle of next month.

What this document's going to say is--anybody in the industry wants to supply power to the Air Force--here's the conditions that we need. Here's the type of power. Here's the parameters that we require. How'd you like to do that, and how much will you charge us for a 20 year contract?

We are not going to be terribly concerned about the service area of the local utility or--they'll be able to participate. Whether or not there'd be state money or other money involved in any effort to build the power plant or make a regional power source, all those things are possible. But the Request for Proposals will not restrict the source of power to any particular service area, to any agency, or whatever. In other words, Joe Blow off the street that can get the financial capability and whatever, and put together a proposal that says here's how I'm going to supply the Air Force power, he can certainly do that. It'll be totally competitive. And the analysis of how we would make the decision to pursue that third-party, or this contract, would be based on life-cycle costs compared to what it'll cost the government to build the power plant and operate it over the same period of time.

Mr. Anderson: In other words, this would be in accordance with existing military commercial power agreements, such as at King Salmon, Eielson, Ft. Wainwright, Kotzebue, and other. . . . .

Mr. Hanson: No, sir. Not quite the same.

Mr. Anderson: . . . . . Not quite the same? What exactly is your structure then?

Mr. Hanson: Well, the difference is, is that, under normal circumstances, when we enter into a agreement with a commercial utility, we agree to buy the commercial power at some--usually the APUC--rate or some modification thereof. In this case, it'll be a separate contract and it will have a lot of provisions in it that a normal utility service contract does not have in it. It'll have liquidated damages for failure to deliver the power on time, and in the quality and whatever. It'll be--it's a little bit of a new concept for the Defense Department to enter into, but I believe the 1982 Congress gave us the authority to do that sort of thing and there has been two or three different efforts to pursue that new authority.

This will be something new for the state of Alaska. And if you're in the power business, the trick here is to get ahold of that Request for Proposals, analyze it, send us your comments, and then later on in the year, we intend to put out a--this first iteration would be for just industry comment to tell us what's wrong or right or what's confusing or what would be unacceptable or good or better to change in this Request for Proposals. And then later on in this year, after we've decided where these facilities are going to be built, then we'll be able to put out to the public a formal request--that at the end of the analysis, we'll either enter into a contract with that proposer, or build the government power plant and reject all proposals.

Mr. Anderson: Well, in Alaska that's not been the history of the co-generation and co-op use between military and commercial power sources. So I see you are making exceptions to existing policy.

Mr. Hanson: Yes sir.

Mr. Anderson: Okay. I haven't really seen any of your information. You said there's not a significant amount of information on electromagnetic interference and health hazards. I feel that there is a world body of information that hasn't been utilized. I think that the international standard is 0.01 microwatts per square meter. Is that the standard you're using here? 3

Dr. Everett: What body identifies this as a world standard?

Mr. Anderson: I believe the International Telecommunications Union.

Dr. Everett: And you're speaking of health effects or interference?

Mr. Anderson: Health hazards.

Dr. Everett: The specific standard that we generally refer to is the ANSI one, the American National Standards Institute, which is described in the document as well as some others. I believe there is also a short discussion of other standards from other countries mentioned, but we're specifically talking about ANSI, which is one milliwatt per square centimeter power density.

Mr. Anderson: Which is significantly different than the world standard.

Dr. Everett: If that's the world standard, yes it is.

Mr. Anderson: Yeah. Okay. As far as electromagnetic interference, as a private airplane pilot I know that there--at Clear Air Force Station they have a 20-mile warning zone for electromagnetic interference instruments. Is that your anticipation here?

Colonel Lee: Let me direct. . . . .

Dr. Everett: You want to go ahead. . . . .

Dr. Guttrich: Go ahead.

Colonel Lee: Let me give you the example of what we did in the Experimental Radar System, and we're also following through right now on the East Coast System. And that's--on a temporary basis--to establish a restricted area 5 miles around the transmit antenna up to a height of 5,000 feet above the ground. On a permanent basis, we will be reducing, or will probably be reducing that. Our calculations, in terms of the radiofrequency radiation effects, suggest that an aircraft can fly within about one mile of the site in front of the antenna, and about half a mile on either side and be outside of the area where he would experience any RFR levels above those that could be considered to cause any kind of a problem. For the time being, on a temporary basis, we're filing with FAA for a request for a restricted area that's five miles around the transmit antenna. No restrictions at all, of course, around the receive antenna.

Mr. Anderson: There would be no restrictions in the receive area?

Colonel Lee: That is correct.

Dr. Guttrich: We don't like people to land on the groundscreen. That's. . . . .

Mr. Anderson: Okay. That's another--brings me to another point. You're anticipating--is it two 8,000-foot screens for the receiver?

Colonel Lee: There are two separate receive antennas. Each one is 8,000 feet long and will have a groundscreen that extends approximately 750 feet in front of the antenna, running the entire length of the antenna. That groundscreen is just laid on top of the pad or surface of the level land that has been established for it. Natural vegetation is allowed throughout the transmit or receive antenna areas.

Mr. Anderson: What type of fill--I mean--what anticipated permafrost barrier do you plan on having?

Mr. Hanson: Well, there's several--I can tell you some of the things we've been thinking about. First off, of course, just a nice clean gravel fill with appropriate thickness would effectively insulate permafrost. There's no structural load involved except under the antenna supports themselves. And those antennas would probably end up, in a permafrost area, would probably end up on a thermal-pile or a driven-pile type of foundation.

Mr. Anderson: And. . . . .

Mr. Hanson: We've even considered mounting the groundscreen on some sort of pile-supported structure.

Colonel Lee: The specific techniques that we would use would depend on the site area and the specific siting of the antennas within that area.

Mr. Anderson: It seems to me that it's pretty--do you have it--technology current of this type of installation in permafrost conditions? Is there a working. . . . .

Mr. Hanson: As far as the structure, yes. No question about that. We've put communications antennas all over the state of Alaska in just about every kind of foundation condition you can imagine, and I can show you a lot of them that are many years old that function perfectly well.

The idea of how to handle the groundscreen is something a little bit new. But I really believe that the structural loading is so low, and the construction techniques that are well proven will prove to be satisfactory to support that groundscreen.

Mr. Anderson: Okay. On the land acquisition methods. You say all this is now unselected federal lands? All these various areas? Unappropriated--undesignated federal areas?

Mr. Woods: The land ownership under consideration varies. Some of it is Native Corporation owned, some of it is individual Native allotments. There may be one or two private owners involved, and I don't think there's very much federal land involved. It's all been conveyed to people.

Mr. Anderson: When the North Dakota articles--the farmers weren't real too happy with the land acquisition methods. How do you anticipate solving the local problems here?

Mr. Woods: Land acquisition by the Federal government is governed by Public Law 91646. It requires an appraisal--real estate appraisal. And we here in Alaska have a policy of hiring contract appraisers, Alaskan residents, who are best qualified for that particular type of property. In other words, if it's a farm, we hire a farm appraiser--better qualified, the best qualified. Then when we come out to talk to the landowner, by law, we must offer him the price that's indicated in that appraisal. We can't undercut the appraisal. We have to offer that price.

Colonel Lee: The other comment that I'd make--I see you're referring to the Grand Forks newspaper that came out when we were there for the public hearings on the Central Radar System. In contrast to part of what was reported there, there are many landowners that are interested in negotiating with the government in some of the study areas

that we had identified there. And in that Central Radar System, we're considering both direct acquisition as well as leasing. So that, depending on the particular location that you're talking about, the acceptance in the Central Radar System ranged from quite general enthusiasm and willingness to negotiate for sale or lease, to some areas that, yes, were strongly opposed to it.

Mr. Anderson: Sir, it depends if you're going broke or not, I would think. I'm a farmer from back there. So if you move it over 30 miles I might be in a position to talk to you. But, the last item I have would be on something that's, of course, always a proverbial Alaskan issue--is training and employment programs.

You're talking about having a 20-year program. What do you anticipate being the training and employment policy? Are you going to follow through with Civil Service contract or military?

Colonel Lee: The numbers that were given in the presentation portion that Dr. Everett had, identified approximately 70 people on a permanent basis for the transmit site, about 60 people on the receive site. About half of those would be the security personnel. The present plans, following through the example that we have for the East Coast Radar System, would be to use federal Civil Service people for those security positions.

That area, because Alaska is a little bit different than some of the locations in the southern United States, is still being reviewed. But based on the parallel that's been established for the East and West Coast, then, those would be people that could be hired from the local area--brought in as federal wage grade civil servants.

The other half, and there are slightly more at the transmit site than the receive site, would be contractor-hired workers that would provide the maintenance support for the equipment, both at the transmit site and receive site. There are more at the transmit site because, if we do require a power plant that the Air Force would build, operate, and maintain, then we need those additional workers there.

That decision on the hiring would be then handled through that prime contractor. We're talking about something that would be well into the early '90s before any firm decisions on the selection--by the contractor--and the timing of when those people would be required.

If there are particular requirements that are in effect, by law, at that time--of course, the contractor would be required to comply with those.

Mr. Anderson: Okay. My only closing comments would be that I would urge you to work with the Alaska Power Authority and the rural electric co-ops in designing your power plant system so it would work, as in other places in Alaska do. You do have a co-generation based

power plant system. There is--the difference in Alaska is that our power generation infrastructure is not at all similar to what you refer to in the Lower 48 or in other industrialized areas. It is, and it needs, the base of cooperation rather than isolation which you seem to be encouraging.

Lt. Col. Bristol: Excuse me. Why don't we reserve that for the statement portion and perhaps there are some other individuals. . . . .

Mr. Anderson: Okay, well I just wanted to make a few comments and then I'll be gone.

Lt. Col. Bristol: . . . . .Okay, you can conclude then.

Mr. Anderson: All right. The other issue I'd like to bring up is on the training and employment. This is a perennial Alaskan issue. I think that this should be considered--instead of the short-term 3 or 4 year contract with the contractor--but it should be looked at from a long-term basis. And my last comment is I believe a land acquisition methods, that a special commission should be set up as we have in the past on other government and major issues such as the Alaskan Pipeline to deal with land acquisition problems. Thank you.

Lt. Col. Bristol: Who else would like to ask a question? Yes ma'am.

Ms. Jaeger: My name is Lisa Jaeger and I work for Tanana Chiefs Corporation and I'd just have a quick question still about employment--and that would be about the construction aspect. If there would be local hire opportunities for the construction?

Colonel Lee: The actual construction at the transmit and receive sites--for the clearing, the laying of those borrow areas where the groundscreen would be put on, the thermal piles, the erection of the antennas--all that would be handled by the prime contractor that would be selected for the construction of the Alaskan Radar System. There is additional construction work that would be handled by contracts established through the Corps of Engineers here in Alaska. Those projects would be funded under the military construction program. Depending on when the program starts and the requirements that were in effect at that time, it's difficult right now to say exactly what procedures would be followed. But to the extent that local people were available and had the necessary qualifications for that type of work and the equipment, it's certainly more advantageous to a company such as General Electric or Raytheon in Massachusetts or New York to deal with some company here in Alaska to handle the actual construction effort. And then the practices--hiring practices--would be as established with those companies. This is an area that's still under review and, of course, will be reassessed when we actually start the construction effort.

Ms. Jaeger: I guess the type of prime contractor would be like General Electric or Raytheon or that type of firm?

Colonel Lee: That's correct.

Ms. Jaeger: Okay, thank you.

Lt. Col. Bristol: Anyone else care to ask any questions? Sir?

Mr. Carroll: My name is Art Carroll. I live at 999 Coppet here in Fairbanks. I'm interested in the Paxson East area. Mainly along with Ralph, live--have a cabin in the Summit Lake area which is 4 miles away and was wondering if any studies had been done regarding the salmon streams which would border this Paxson East area?

Dr. Everett: What do you say--would you like to. . . . .

Mr. Cuccarese: Yes, certainly. Yes, we have documented the presence of salmon with the appropriate Fish and Game personnel. The facility itself should not have any effect whatever on Fish Creek, which is the main stream of interest, or on the runs using the Gulkana River. Present plans are to route the access road away from the streambed itself. And the radar, where they would be constructed in the Paxson East facility, would be located in back of the edge of the hill a sufficient distance. Little chance exists of the products of erosion entering the stream even in the worst case situation, but the application of best management practices for erosion in this kind of environment, we just don't. And I may add that ADF&G biologists generally concur--with reservations, of course, not knowing the exact plans--that there is little likelihood of any effect on the salmon resource or any other fishery source also.

Mr. Carroll: The construction thing would probably be the only risk there. I mean. . . . .

Mr. Cuccarese: Yes, and. . . . .

Mr. Carroll: . . . . .they'd have to be extremely careful during the construction and the access road would apparently be up Fish Creek Canyon?

Mr. Cuccarese: No.

Mr. Carroll: No? You have any idea where it would be? Or do they have a guesstimate on it?

Mr. Cuccarese: Bill?

Mr. Hanson: Well, there's been several alternative routes looked at. And, of course, the level of study that we've been limited to so far is using aerial photography. And, the actual routes have not been

laid out on the ground, and it's hard to describe to you. I guess, maybe if you'd like, we'll sit down and I can make you a piece of the map and I can send it to you or something like that.

Mr. Carroll: Okay.

Mr. Hanson: The--up Fish Creek Canyon was the first alternative because that's the simplest. But there are alternative routes into the site which stay pretty much away from Fish Creek.

Mr. Carroll: Has there been--I just read briefly in this book, I didn't get a chance to look at it really good, that first impact statement that you have there--been much consideration given to the fact that it's probably the prime snowmobile recreational area for the Fairbanks area? That exact spot is a very, very hot recreational area for the Summit Lake area, which is growing dramatically. They just let 40 some lots go down there within the last couple of years, and there's been a lot of growth. The lodge is building condominiums. It's become a very, very hot recreational area for the Fairbanks area, as well as some from Anchorage and, of course, the Paxson/Gulkana area. Has been much consideration given for that fact there? 4

Mr. Hanson: I don't know. . . . .

Colonel Lee: In general, recreational use has been an area that we have looked at, not in a great amount of detail yet. We'll provide more information on that in the Final Environmental Impact Statement. But, those recreational uses, as well as the other environmental concerns are all being addressed at each one of the areas and will be factored into that final decision.

Mr. Hanson: We really haven't received any evidence that the actual sites themselves, that area that we're talking about for actual construction, would be of real high value for that activity.

Mr. Carroll: It appears that way, and we'd like to point that out.

Unidentified Voice (female): It's misleading.

Mr. Carroll: Yea.

Mr. Hanson: What--I guess. . . . .One of the. . . . .

Unidentified Voice (male): Photograph it in winter and look at all the snowmachine tracks all over.

Mr. Carroll: That's what we'd like to point out. We'd like to really bring it up. . . . .

Lt. Col. Bristol: Excuse me.

Mr. Hanson: Obviously that's one of the reasons we're here.

Lt. Col. Bristol: Excuse me. We've got to have the identification of the speakers on the record. So when we get to the comments portion then you can make your statements. Are there any other questions? If not we can go right into the comments. Yes sir?

Mr. Willey: My name is Dain Willey. I live at 452 Dros Road, Fairbanks. I have a question concerning the target area of the sensing. There's a lot of ships out there and I'm wondering if they will interfere with any ship-to-shore or any other frequencies they may use for their own radar or etcetera? And I'm wondering if that's a concern.

Dr. Guttrich: We avoid search and rescue and we've done--we've had interaction with the Coast Guard. Certainly on the East Coast, and there was no evidence, as I say, again on the Experimental System--no evidence of interference with those kinds of communications.

Colonel Lee: Related to that, however, we will be collecting information as we begin to do the testing and go operational. And to the extent that there is specific examples of interference that are identified we can again, if necessary, identify those subharmonics and similarly be able to, through the computer system, lockout those particular harmonics. So again, eliminating that possibility of interference.

Mr. Willey: So your system is able to switch off of any other frequency that might be used or interfered with. . . . .

Colonel Lee: That's correct.

Mr. Willey: . . . . .and find its own.

Colonel Lee: We do have the ability to switch frequencies as well as to switch and move the range that we're illuminating as we scan across that sector. And it can be done rapidly. And it's done also on the basis of continually listening across the entire spectrum to ensure that we can always have clear channels available.

Mr. Willey: And also, in the target areas, the intensity of the radiation is not harmful to humans?

Colonel Lee: That's correct. It is not.

Mr. Willey: Or biological?

Colonel Lee: That's correct.

Mr. Willey: Thank you.

Lt. Col. Bristol: Any other questions? Okay. Why don't we proceed right into the statements. Anyone that would like to make a statement--I have received three or four of these comments sheets. But again, it's not necessary that a comment sheet be prepared. There was one gentleman, Scott Dennis, whose address is Post Office Box 82514, Fairbanks, Alaska. A landowner, businessman, who asked that I read a statement into the record. So I'll just go ahead and do that and we'll proceed with the remainder of the statements.

Mr. Dennis says as follows: "As an amateur radio operator I have, on many occasions, had to communicate in spite of severe interference I'm told originate in the Soviet Union. Our government doesn't offer an explanation of this interference but OTH-B radar seems a good guess. I would urge that our system use such techniques as listen first and spread spectrum which could potentially render the system undetectable. I know that we are conducting such research and have full confidence that such a system could be deployed in the time-frame specified. I don't think that anyone wants another 'Woodpecker' without regard to other HF operations. Thank you."

Would anyone else care to make a statement? If so, just raise your hand, I'll recognize you and you can proceed to the podium. In contrast with the situation on the questions, the statements won't be addressed by members of the panel unless they feel that, absent some type of comment, that it might be a misleading impression being given. Yes sir. Sir? That's alright.

Mr. Gillette: Once again my name is Ralph Gillette. 1718 Jack Street in Fairbanks, Alaska. I'm a 30-year resident of Alaska. I'm a landowner. I'm a snowmachine dealer in the Summit Lake area. I'm a extra class amateur license holder. I'm a broadcast engineer. I have a first class radio/telephone license with the FCC. And I'm the Director of Engineering for Fairbanks Television.

I want to speak against the selection of the Paxson East site for many, many reasons. A lot of them were brought out already. It's quite obvious that none of the recreational studies have been done at all. Nobody is aware of the prime potential snowmachining in that area which has been that way. We've been a snowmachine dealer since 1970 and are very familiar with the impact that it'll have on the Fairbanks and Anchorage snowmachiners. It was pointed out the State has just released 42 lots in the Summit area. Sold them at $30,000 apiece for remote recreational cabins. I don't think a city built in their backyard is what these people are expecting.

Summit has not been considered in the proposal for Paxson East. I read the Environmental Impact Statement. It seems to be very erroneous about all of the tables from Paxson--the closest place from Summit. Paxson is 2,000 feet lower in elevation. The snow tables for Paxson do not correspond with this elevation at all. The water tables that are for Fish Creek do not correspond with 1,345 feet up the hill where the

site is. There seems to be a lot of things that haven't been considered. The access road that has been talked about. Nobody has explained how they're going to go from 3,000 feet to 4,000 to 4,500 feet in that short distance and not go up the creek. I think that there's a lot to be learned there.

The road commission at Paxson has road closures constantly on the corner where Fish Creek is every year. They have had for the past 30 years. I don't think the snow loads have been considered. I don't think the runoff has been considered there, although the chart shows 27 inches. I don't know where they got that figure from. There isn't a weather station anywhere's up around there. I object to the open access that will probably be made by this access road. It will open the whole upper Gakona River to the rape of the animals, which already has a problem with the Fish Creek trail that has been open quite a bit. I object to the closure of the Fish Creek trail, probably because then we won't even be able to get in the area maybe. Nobody seems to know just exactly which way it's going to go.

The Environmental Impact Statement calls--says that there is important caribou habitats there. There's a big bear population but nothing has been said about--addressed about, what they're going to do about that. The impact of people, 70 people in that immediate area--there's only 10 lots in Summit to start with. Now they went to 42 with the State. We've been impacted four times over. Now they're going to double that with this. I don't know what the community can stand. If we'd done that with Fairbanks or Anchorage you know the results. It seems to me quite a bit of overkill. The amount of money it would take to put in roads, to build a city in the top of nowhere. To build a power plant--there's absolutely nothing there--I think would make it cost prohibitive in a lot of ways.

The interference problem I'm very much concerned about. The electromagnetic environment up there is very quiet. That's what makes it an ideal sort of way listening place. You can't generate 10 megawatts of power and have it quiet. I can hearing the brushes in the local lodge when they get out of their generator. I don't think any studies have been done on a power plant--the noise that it would do to the animals. It creates a lot of noise and noise pollution. I don't think that there has been any studies of people, land. And Gunn Lake and Swampy Lakes that are within two miles of this site--aircraft landing in and out of there all the time. The television possibilities of interference down there are severe. The people down there are very much dependent on television in the winter. They are in a remote area. Definitely they need good signals. The statement says that they don't know where they're coming from or where the translators are. They've been licensed by myself for about 25 years. They haven't changed any bit. They're still there.

The salmon in the creek. There's quite a bit of concern about that all the way up, through, to upper Fish Creek. Quite a few of us who

have run that creek have talked to the Fish and Game in years past. They're very concerned about that point, too--of any damage in any way, shape. And this is going to be right up on the hill from there, with a tremendous amount of slopes. I think everybody is concerned about what would happen to sewage. What would happen to the 10,000 gallons of water that's required there a day to run the camp? What would happen with any type of contamination to the soil, oil spills? Anything would definitely run straight down. I see nothing mentioned about the trumpeter swans that we've seen there at Fish Lakes for the past 15 years. Nothing has been mentioned of that. That's right down from the site. And my other comments, I think I'll put in writing.

Lt. Col. Bristol: Thank you sir.

Mr. Gillette: Thank you.

Lt. Col. Bristol: Okay, before we have the next. . . . . Could I just see a show of hands as to the number of people who at this point in time would like to speak. Just for my planning purposes. One, two, three, alright, thank you. Sir?

Mr. Anderson: Nick Anderson again out at District 18. From the information I've heard and been made available to local community, it seems that this Environmental Impact Statement so far has been a wash. And when I say that, I think that you gentlemen should be embarrassed to come before us with this kind of Environmental Impact Statement. It seems to me that there's been--(a) no advance publicity information submitted to the community to base their decision on whether to support or not support this project. And I think that you should go back and come back with a good environmental impact statement and a good information campaign to the public with both sides represented so we can make an intelligent decision. It seems to me from the responses that I had earlier that this project has been predestined to be built without--with little or no regard to the local populace. And I think that we should put this matter to referendum for the state of Alaska. Also I'd like to see you come back with a lot better impact statement including wildlife impact, electromagnetic impact, rural development, and cultural programs, and a cost figure of what we're really getting for our money. Because to date I haven't seen a figure of what it's going to cost or how you're going to pay for it. Thank you. 5

Lt. Col. Bristol: Ma'am. Yea, would you like. . .

Ms. Lorkowski: My name is Terry Lorkowski. I live at 249 Bentley here in Fairbanks and my main concern is that Paxson East was chosen as a name because there's a post office there, but it's real misleading for the site. Summit Lake is a lot closer, and there is quite a weekend population down there. And during the spring months, it will range up to 200 plus, and probably 95 percent of those people are snowmachiners who are not intimidated by any of the geographical features down there--whether it be a crevice or a glacier or a manmade site. And it is quite a popular recreational area, which has been stated before.

The other thing that I wanted to mention is that it might be easier to build there because it's above treeline. But it's also a lot more fragile, and that's also been mentioned as far as the habitat and the animals. But also the construction will be quite an impact on the land.

And the other thing that I wanted to say is just--I'm wondering about housing. And I suppose that maybe the contractor would consider that, if he were going to build the site. But you know, where would the workers live? Summit Lodge is booked a year in advance for the months of March, April and May. It just is going to have a much bigger impact than I think is represented in the EIS, and I think the area needs to be looked at specifically. Fish Creek is mentioned, and Gun Creek is mentioned, and right in between there you have the point where Summit Lodge is and quite a few of the recreational cabins down there. So, you know, I think it needs to be researched more, and that's my comment.

Lt. Col. Bristol: Thank you.

Ms. Lorkowski: Thank you.

Lt. Col. Bristol: Sir?

Mr. Carroll: My name is Art Carroll. I live at 999 Coppet in Fairbanks. I just wanted to reiterate the recreational aspects and hope that you would go back and research this part of it, much more than you have in the past, possibly. And, I know you've looked at the environmental--the salmon, the caribou--and I'm sure that you're always looking at that very strongly. But look at the recreational part of it very strongly. I'd also like to go on record as opposing, obviously, the Paxson East area and hope that we could keep this, probably a necessary project, maybe in areas near where there are towns where the 70 people wouldn't impact the area like it would in an area like Summit and Paxson. If you could keep it near Tok or Glennallen or Gulkana, there's already a lot of people there, and 70 people might even be just a plus for them to help their economic base. And if they could keep it out of the areas where we only have 70 people living there year round, it would be very helpful. I'd also like to know how to, maybe, get more of these--we'd like to get more input from the people in the area. A lot of the people didn't realize that we were having this meeting and I'd like to know how to, maybe, make sure that a lot of our recreational fans can get information to you so you'll know how many people feel this way.

Colonel Lee: May I respond to that?

Lt. Col. Bristol: Yes, sir.

Colonel Lee: If you'll ensure that Lt. Brown has specific addresses, if there are names of people, or if there's a central place where we can send some additional copies of this Draft EIS, we'll do

that immediately. And then, please, for all of you, spread the word. We've got 'til the 13th of October to have the written comments back in, and we openly ask for--solicit--comments based on that information that's there. So we'll get you additional copies of the Draft EIS and please, have them write back to us.

Mr. Carroll: Fine, thank you.

Colonel Lee: Thank you.

Lt. Col. Bristol: Anyone else who's not already done so would like to make a statement? Yes ma'am.

Ms. Colonell: My name is Vayla Colonell. That's V-A-Y-L-A, C-O-L-O-N-E-L-L. I'm here tonight representing Golden Valley Electric Association, representing the manager, Mike Kelly and the Board of Directors. I just wanted to state that Golden Valley is looking forward to an opportunity to comment on the Request for Proposal and we will be requesting one of those. And I'd just like to state that we hope some weight will be given to the fact that an operating electric utility that has a proven record of reliability and good service and backup capacity has some value in the consideration in the system like this. Damages for failure to perform are not going to be satisfactory when your system is not operational, because your contracted utility is not coming through for you. I hope some weight will be given to the environmental constraints that surround generating electricity. It can't be done without making noise; without making some emissions. And, of course, those are some things that are already taken care of for an existing power utility. So, we will be making comments on that and looking forward to working with the Air Force should that site be selected that is within reach of our service area. Thank you.

Lt. Col. Bristol: Thank you. Anyone else who hasn't made one that would like to make a statement for the record? All right, we can go now into a general question and answer. Are there any questions that perhaps some of the statements may have raised to--that any of you might have that you'd like to direct to Colonel Lee at this time. Sort of a last chance there. Are you raising your hand sir? No? Okay. Ma'am?

Ms. Valley: Yes. I'd like to know at what point you'll be deciding on the site? In the Final EIS?

Colonel Lee: The Final Environmental Impact Statement will not have a selection. It will provide the additional information and responses to a lot of the questions and suggestions for additional information that have been identified here tonight. The actual decision then would not be made for about 30 days after that document has been sent out. And then it will include these additional factors as well. But I emphasize that even then, what we're selecting is a general study area. And we recognize that there's further details, more detailed environmental assessment work that needs to be done before, within an

area of many, many square miles, exactly where you're going to the put the individual antennas.

Lt. Col. Bristol: Ma'am, could you state your name again for the record just so the court reporter will have it.

Ms. Valley: Yes, I'm Nancy Valley and I'm representing the Division of Lands, Department of Natural Resources.

Lt. Col. Bristol: Thank you. Any other questions? Okay. I think we have some extra copies of the comment sheets. So for any of you who'd like to take some of those for your friends or neighbors, or you can reproduce them from the copies that we have, you're welcome to those. Thank you very much for joining us. This script will be prepared--it will be verbatim. I will review it and assure it accurately reflects all of the proceedings. Your input provided both tonight and through comment sheets that are received by the 13th of October will combined with that and will be factored into the officials who prepare the Final Environmental Impact Statement. Your input is just critical. And you're right, there are things, obviously, that you who've lived here for many years appreciate and know to an extent that people that are just coming from without and looking at it perhaps can't approach. That's the reason for this two way communication, dialog. It is a critical and important part of the decision-making process and that's what the public law is--wisely provides for. So, again, thank you very much. I really appreciate your participation and your coming. Good evening.

3.3 Transcript, Tok, Alaska

The hearing at Tok, Alaska commenced at 7 PM, September, 25, 1986.

Lt. Col. Bristol: Good evening ladies and gentlemen. My name is Matt Bristol. I'm an Air Force trial judge, and the Judge Advocate General of the Air Force in Washington has asked me to preside over this and three other hearings. This is actually the third of four hearings that we've been holding, as I'm sure many of you have heard, in Alaska on the Air Force's proposed construction and operation of an Over-the-Horizon Backscatter Radar System for Alaska.

Colonel Jim Lee, who's standing over to my right, is the Program Director of the Air Force's OTH-B, Over-the-Horizon Radar System at Hanscom Air Force Base, Massachusetts. I don't really know any more--other just from having participated in these briefings and having read the summary of the first part of this Draft Environmental Impact Statement, I don't know much more about this than you do. That is, I'm not from the program office--I'm not an expert on it. I haven't had any input to it--haven't rendered any legal advice upon it. And so, my function here is a simple one, and that is to preside over the hearing and to make sure that each of you who desire to be heard can not only get as complete a picture of the system and its operational and its environmental aspects, but also have a chance to voice your concerns, your thoughts, your views concerning how this project, in your view, might impact upon the area that you know best--that is, the area where you live.

The way we're going to proceed tonight is basically as follows. We're going to have a briefing--slide type briefing, that Colonel Lee, and also Dr. Sid Everett, who's standing right behind Colonel Lee, who's had a substantial role in the preparation of the Draft Environmental Impact Statement. They're going to explain the system to you. After that briefing we're going to have a short recess, probably something on the order of a 5-minute stretch-type recess. And then we'll have questions in an effort to try to clarify some of the points either about the briefing or about the Draft Environmental Impact Statement.

As Colonel Lee will explain, the process, and this is a uniquely American process. At least to my knowledge, from a legal standpoint, it doesn't exist anywhere else, and that is that your government is explaining an action that it would like to take--that it proposes to take, that it isn't going to take, it isn't even going to make a final set of recommendations or decisions--until it has this dialog and it has this opportunity to receive your input, so that your input can be factored into the final decision-making process. And Colonel Lee will address that further.

This isn't a debate. It isn't necessarily going to answer all of your questions. But it will put you in a position--there may be some questions tonight that Colonel Lee's people haven't anticipated and

can't answer just because of limited research materials available here. But they will answer them, and the answers will be reflected in the Final Environmental Impact Statement and you, moreover, have until the 13th of October. I'd encourage you to fill out tonight and give to Lt. Gale Brown who's back at the door--you passed her when you came in tonight--one of these comment sheets. And you'll see that it's sort of a multi-purpose form. Most important, it tells us who you are and your address, whether you'd like a copy of the Draft Environmental Impact Statement or the final one, if you'd like to ask a question or make an oral statement or a written statement, the particular areas in which you have your primary interest, that is, concerning the environmental impacts of the proposal. And, in fact, this on the bottom has the address, by the 13th of October, that you can submit comments. We have lots of these and, in fact, you can make an oral statement tonight--let us have this sheet with your name and information on it, and then you can submit another one if you wish to elaborate further, or if you wish to think about it a little bit more before submitting additional comments.

We have a court reporter with us tonight, and Laurie Eller is taking down every word that we say. So it's important when we get to the questionning part and to the statements--what we'll do is just have you stand up in your place rather than try to come to the front or anything, and be relaxed. It is an informal hearing--I don't want anyone to be hesitant to speak up. If anyone has a question as we're proceeding, raise your hand--I'll recognize you, and we'll get the question answered. But, most of all, take part and participate to the full extent that you choose, because that's exactly why we're here. So when you do stand up, however, tell us who you are, your name and address, even though you may have written it down on this sheet, so that Ms. Eller can get it for the record. If it's a name that I'm not likely to know how to spell, and be liberal in that respect--that I'm not a very good speller, spell it out for us for the record. And the same thing goes for, like street names that may not be that common, so that we can get those correctly for the record as well.

So first of all the briefing--then questions, then after the questions we'll go right into statements. And at the recess I'll collect these forms if you haven't already given them to Lt. Brown or someone else, and we'll take a look at them and sort of put them in the category--air quality, water quality, the particular environmental qual--category to which they relate, and then we'll recognize individuals by category to make statements.

We have a limited amount of time. So the way the time is going to work, and I'll try to be--we'll just see how many people wish to make statements and we can be flexible. But, basically, its--for public officials or people who are representing organizations as the sole representative who's speaking of that organization--it's a 5-minute limit on a statement. And for individuals who are just speaking on their own behalf, it's a 3 minute limit. And, as I say, depending on how many

people wish to make statements, we can go beyond that. The main thing is that we have between now and 10 o'clock, so I'm going to cease my babbling and let this hearing proceed so that as many people that wish to ask questions and make statements can do so. So, without further ado, it's my pleasure and privilege to introduce Colonel Jim Lee.

Colonel Lee: Thank you very much. I'm pleased to be back here in the community of Tok tonight as part of another major step in this environmental impact analysis process. The proposed action that we're dealing with tonight is the development, construction and operation of the Alaskan Over-the-Horizon Backscatter Radar.

In the presentation tonight I'd like to first describe the process that we're going through, and then give you a description of the system as it would be constructed and deployed in the state of Alaska. Dr. Everett will then summarize the major environmental concerns as we have identified them and documented them in the Draft Environmental Impact Statement, and then I'll return for some closing comments to conclude the presentation.

The environmental impact analysis process is a process that's established by public law to ensure that you, the public, who might be most affected by a proposed action, can participate in that decision process. Starting off with an announcement, a Notice of Intent to proceed with the construction and deployment of the Alaskan OTH System, we had a series of scoping meetings, including one here in the community of Tok, beginning of this year. Just last month we filed the summary of our findings as a result of the scoping meetings and the other process we went through--that Draft Environmental Impact Statement was distributed out to the different communities, agencies and individuals And we have some additional copies that we can still send to you if there are those of you here tonight that would like to have your copy for further, more detailed, review.

Public law then requires that we conduct a series of public hearings to formally give you an opportunity to respond to the Draft EIS and to ask any further questions that you might have about the project. The transcript of the public hearings, as well as answers to questions that you've raised that we cannot provide specific material for tonight, will all be included in the Final Environmental Impact Statement that will be published the end of November. The actual Record of Decision--the decision would be made by the Office of the Secretary of the Air Force--would not take place then until the end of the year--the last part of December.

As I mentioned in the beginning, the proposed action is the construction and deployment of an Alaskan Over-the-Horizon Radar System--a system that will allow us, from the transmit and receive sites, to see approximately 1,800 nautical miles away and being able to detect, track and identify any aircraft or aircraft launching cruise

missile that might be within that surveillance area. The Alaska OTH System is one of four systems that will, when they're finally constructed, provide a complete surveillance system around the eastern, southern, western and northern approaches to the continent.

The kind of OTH system that we have does not work very well looking directly north because of the effects of the aurora. For that reason, we continue to rely on, and they're really complimentary systems, the Seek Igloo series of microwave short-wave, line-of-sight systems within the state of Alaska, and the upgrade of the old DEW line system across northern Canada.

The East Coast System has been fully funded and approved. We are currently in testing on the first sector of that East Coast System. This is the same location where we operated the Experimental Radar System from 1980 to 1981, verifying that we could achieve this kind of performance, and also allowing us an opportunity then to gather data on some of the effects. A lot of the information describing effects that are in the Draft EIS are as a result of our experience with this Experimental Radar System.

The West Coast System has also been approved and is now under construction. The Central Radar System and the Alaskan are both proposed at this time, and we are going through the environmental impact analysis process for both of these systems.

As I mentioned, this type of OTH system will allow us to detect and track aircraft as far as 1,800 nautical miles. That's in contrast to our current set of line-of-sight radars, such as these, and such as the radars that are all around the coast of the United States. Those radars are limited to a detection range of only a few hundred miles. We're able to provide several hours of warning time, in contrast to the much less than an hour warning time that we have with these limited line-of-sight type radar systems. That's extremely important--for the very basic reason that the Soviets are continuing a large upgrade program in their long-range strategic aircraft. This is an artist's concept of the Soviet "Blackjack" aircraft. But more than just a concept, this aircraft is in flight test now in the Soviet Union. If they continued on the present schedule, it could be operational by the start of the next decade.

This is a photograph--perhaps you've seen ones like it in your newspapers here in the state of Alaska. This is an Alaskan Air Command F-15 which was launched against, followed and tracked along a Soviet Bear H aircraft as it flew along the coastline of Alaska. On a regular basis the Soviets are sending these Bear aircraft on training missions towards the United States and, as we're able to detect them then a couple hundred miles away from the coastline, we send up aircraft to intercept, if you will, and follow them along as they fly along the outer parts of the continent. This aircraft is the newest version of the Soviet Bear aircraft. It can also carry the air-launched cruise

missile. The Soviets have a large number of these and the older versions of the Bear aircraft, and they are continuing to upgrade them and improve them. So the threat is real. Those of you up here in Alaska are probably a lot more aware of it than some of the folks down in the southern United States. It's for this kind of a threat that we need the several hours of additional warning that an OTH system will provide.

I mentioned that the East Coast System is now currently in testing. And in the next set of slides, I'd like to show you some photographs of the transmit and receive sites--the actual antennas. And if this particular site were selected as a transmit site, then you might expect a similar kind of installation here.

This is the concept of how that system is deployed and provides surveillance at the East Coast area. We have three transmit antennas at Moscow, Maine, that are linked with three receive antennas at Columbia Falls, Maine. This is a picture of one of those three transmit antennas. The entire antenna is approximately 4,000 feet long. The highest portion of the antenna is 135 feet tall down to 35 feet tall at the shortest portion. In front of the antenna there is a groundscreen that extends out about 750 feet and runs that entire length of the antenna. Here you see the support building that houses the transmitter equipment and also the personnel then that provide for the operation and maintenance of that antenna system and also for site security.

This is another picture of that same antenna. Again, you see the length of that 4,000 foot antenna. This area in front was cleared to lay the groundscreen which is a steel, coated with protective coatings, mesh that helps better reflect the energy to provide better performance for the system. The area in front of the antenna screen can be allowed to remain in its natural form here, in some of the site areas that we have seen. Our only requirement is that we have no obstructions more than about 1 degree above the horizon. That is, no more than about 100 feet when you're about a mile out in front.

The other thing I call your attention to is that the entire area is fenced off. That's to ensure that animals do not wander into the area and potentially do damage to the antennas. The second reason that the fence is there is to provide an exclusion zone so that we can be assured that there will be no potentially harmful effects of this radio energy to anyone then who would be outside that fenced area. Dr. Everett will talk more to that particular environmental concern during his comments.

This is the receive antenna. The receive site needs to be between 50 and 150 miles away from the transmit site. The antenna itself runs the length of about 5,000 feet long in the case of the East Coast System--and for the West Coast, Central and Alaskan Systems, the length of that receive antenna will be about 8,000 feet long. That's to give us improved sensitivity, a better detection capability, against the cruise missiles.

The backscreen, which has this mesh again to provide a better reflection of the radio energy, is 65 feet tall and runs that entire length of the antenna.

The information from the receive antenna is sent back to the operations center. Information is sent back using tropo radio links, these white dishes that are shown here. Inside the operations center, that data is analyzed by the computer system and displayed to the operators using displays such as the one shown here. This is a depiction of that northeastern section of the East Coast Radar System. The computer system takes the data, is able to establish a track, to continue that track, identify its direction, its speed--and it's also able to compare that information with information from pilot position reports or flight plans that have been filed. And we can correlate--or, that is, identify, those tracks that we are picking up with known tracks and therefore, declare that that is an established commercial airliner or some other military aircraft that we have identified.

The entire system then will be operational for the East Coast within the next year and a half or two years. We have now started construction on the West Coast.

What I'd like to do here, now, is describe why it is we're looking at this particular section in the southeast part of Alaska to provide the necessary coverage. The first thing that we want to do is be able to have that coverage linked up with the West Coast System. We also want to ensure that we have the maximum distance out to cover beyond the Aleutian Chain. But we also want that coverage to pick up as close as we can to the coastal area. By having that coverage within the coastal area, and recognizing that the distance before we can begin to start that surveillance area is about 500 miles, we're left with this area in the southeastern part of the state of Alaska. This is the area within which we would have both the transmit site and the receive site.

Within that area then, we've established several additional criteria to help us locate possible study areas. Looking at the major highway system to ensure that with reasonable cost we will be able to do the construction, provide for communications and for power, we have excluded all of those areas that are more than about 10 miles either side of the major highway system.

In addition, for a location to be useable, we need for those antennas as they scan out to the west, not to have any disturbances or any large mountainous areas within that line-of-sight. So if there are any line-of-sight obstacles more than about 1 degree for the first 10 miles or 3 degrees beyond that, they're not suitable for a location. That crosses out all those areas as identified--leaving this clear area, as shown here--around the Tok area--and over in this portion.

The additional criteria then are the ability to site and locate the large antennas that I showed you in the previous pictures. We also have additional criteria to ensure that there will be minimum interference to our system and also to ensure that we do not interfere with others, either communities or radio communications systems.

The five areas that are the result of this analysis are identified here. The Glennallen study area, Gulkana study area, Indian Creek, Tok, and Paxson East. Because of the geometries or locations or size of the areas involved, not each of these sites can support the longer receive antenna. For example, Tok would have to be a transmit site rather than a receive site. Also, we have some minimum separation criteria between the transmit and receive sites. So Paxson East would not be matched up with an Indian Creek. However, a Paxson/Gulkana combination would work, and a Tok combination as a transmit site would work--would be within the acceptable distances from the other sites. 6

In the next portion now, I'd like to introduce Dr. Sid Everett from SRI International, who assisted us in preparing this work. He will then describe some of the environmental impacts. But let me first give you more of a picture of what the antennas areas look like.

If Tok were selected as a transmit site, there would be two areas about 650 acres each that would be required for the antenna. The receive antenna would require about 600 acres, a much longer antenna but much narrower. During this process, over the remaining part of the calendar year then, we will be getting the information that you present to us here tonight and before the 13th of October, prepare the Final EIS and prepare our decision-makers then to make their final decision on one of these study areas.

Dr. Everett. . . . .

Lt. Col. Bristol: Sir, before Dr. Everett starts, I have about 10 seats down here in the front area for those of you who arrived later. If you'd like you can come on down this left side and just walk across and you're welcome to have some of the front row seats. On the other hand, if you prefer to stay where you are--the best seats--except--your choice. If anyone else would like to come down? Watch the wires and things on the floor. We've got this place wired. All right, thank you very much. Dr. Everett.

Dr. Everett: [Refer to briefing slides, Section 3.5, p. 3-133] Good evening. I'm going to say a few words about the Environmental Impact Statement itself. Those of you who have looked at it, even at the summary, are probably well aware of the fact that the document speaks or addresses each of these subjects. My intention tonight is to talk about just a few of them and a few parts of each of those subjects.

First--one of the issues is the availability of cover and fill material. The material requirements are estimated to vary considerable

from area to area--that is, study area to study area. The quantities that are required, the availability of the area, the susceptibility of the soils to erosion, are all factors which affect what the impacts may be in acquiring this material and then applying it in areas.

The Air Force intends to use what's available, if it's truly available without considerable hardship to the area or costliness. It will develop new sources if necessary, and in general comply with the applicable regulations in developing these materials--the sources of these materials, reclaiming the land and so forth.

Permafrost is a unique feature for the Air Force in the construction of this particular OTH system. It doesn't exist at any of the other locations. All the areas we've examined have some amount of permafrost. Since the sites have yet to have been surveyed in detail, we're not positive about the extent. There is always the possibility of degradation of the permafrost because of the thermal relationships have been altered. And you can see, for the moment, our estimates of the significance of the various effects. Once again, the sites are going to be surveyed with some care. And before any construction begins, a plan and design and specification of techniques in order to minimize the effects will be used.

Considering both sites, perhaps 3,000 acres may be involved. At each site, this site in particular in the Tok area, if it were installed here as a transmit site, on the order of 12 or 13 hundred acres could be affected--either by direct loss, that is to say inclusion within the exclusion fence, or in the vicinity of the buildings that go with the entire installation, or some alteration of the evolution of the vegetation.

We found no unique species or communities of vegetation in any of the areas. And the quantity--that is to say the amount of vegetation involved--is not so large as to be considered significant, if you look at the total amount of that particular kind of vegetation in the area. So we're not expecting there'd be significant negative effects. However, we recognize that when specific sites are located--identified within a given study area, that there could be some local effects to be aware of. Therefore, in examining the areas and selecting the sites, there will be an attempt to avoid sensitive lands. Agencies such as the Fish and Wildlife Service and other state, local, federal agencies will be consulted in this selection process.

We saw that wildlife could be affected in a number of ways. I'll come back to bird collisions on the next slide. The next item refers to possibility of affecting streams either by directly encroaching on them or by erosion from the construction site into them. It would appear that sound practices in laying out a site and executing the construction could prevent that from being a significant effect.

Humans, by the noise they create and the activity they generate, obviously can also disturb wildlife. This can be a problem in some areas, and there are some techniques to reduce that such as maintaining buffer zones, timing construction according to the seasons of use by the wildlife. A 4 or 5 thousand foot plot of land, obviously, potentially, can affect migration patterns. The major animal of concern here is the caribou and the--their behavior as far as migration is such that it's not expected that the impact on them would be significant. From year to year there could be some variation, but we don't expect their numbers would be altered in any fashion because of this installation.

The final item has to do with what we feel is a minor prospect, in as much as not much additional traffic is going to be generated by this installation, nor uncontrolled hunting. We feel that the effects of this installation are minor in that area.

Now the structure--the one at Tok perhaps being 4 to 5 thousand feet long, as much as 135 feet tall presents the potential for birds colliding with it. In this particular area, you have a large number of migrating waterfowl. There is always the prospect of poor weather, or at least poor lighting conditions. And this structure, although it's large as you could tell from the pictures, is not bulky or generally opaque. It's more nearly invisible--once you're several miles away from it--with the human eye. It's not at all clear that it's less visible to the bird even as it approaches. One way to minimize this effect is of course to avoid the high bird use areas if at all possible. Failing that, or taking the best advantage one can of that, the next steps are to attempt to increase the visibility of the structure to birds, such as using lighting or, if necessary, or as an alternative or as a supplement--planting of trees along the backside of this back stream could make the entire installation more visible, generally deflect the path of the birds. This is an area that will require some attention to do the best job possible, minimizing those impacts. The potential does exist for a significant number of collisions.

Turning to the social and economic aspects of this installation--transmit site would employ 70 on-site. It's not clear--well, I shouldn't say it that way--but I will say is that there is no specified policy on outside hiring. We don't know exactly the size of the households of people--if they come with family units. We're not sure what the work schedules are going to be or how the transportation would be arranged. So it's difficult to say what number of dependants might accompany that number of 70 people employed on the site. However, taking some reasonable guesses about what the composition of the new population would be, we're estimating the population changes are shown there, as a percentage of the population in recent years. Tanana Valley area, you would see, might gain 10% in population size due to the employment during the operations phase.

Going further into the employment, I've got some numbers up there on the construction. The construction at a transmit site might average

a hundred employees, perhaps two hundred at peak during summers over perhaps four years of construction activity. That represents a rather substantial increase in the number of employed in this area, as you can see by the chart. In all cases, changes in the Anchorage area are minor compared to the numbers of people and the number of jobs there. In fact they've insignificant.

The last point on the slide is simply that, generally speaking, in the more rural areas of the bush, the opportunity to capture jobs as a fall-out of the direct employment at the site is less than it is in perhaps suburban or less rural, somewhat more populated areas. There are fewer opportunities to simply capture this--expenditures of the employees. Therefore, we feel that the multiplier effect in secondary employment is going to be minimal.

Subsistence could be affected, again by direct loss of the habitat for animals, by changes in the access to areas of traditional subsistence use, the possibility of greater competition by the introduction of additional people, and the possibility that there'd be some change in the migration paths. In most of these cases--the migration changes, the prospect of greater competition, even access changes--we're not expecting significant change.

In any case, this is going to require some additional care, consideration, as time goes on. For the study is required by least one law, and we will no doubt be conferring with the officials who are concerned with this sort of thing, as well as probably the local population as well.

A structure this size, of course, can alter your outlook on the landscape. Now, how important this is to you depends on your values of course, but also on such things as how distinctive the landscape--the immediate landscape--is compared to the general area, how visible the structure might be from the roads or from the air, whether they're already modifications in the form of buildings or other changes that humans have put in there.

Generally speaking, these sites will probably be some distance off the highway, not very likely to be observable. On the other hand, of course, flying anywhere near them, they would be highly observable. The way in which this can be dealt with is, as implied by my remark about staying away from the highway, is to put them in areas where they're not so visible. It's possible to screen from the highway. It may be possible to screen at the site itself to reduce their intrusiveness, if they are intrusive. And also techniques to minimize or contrast such as by choice of paint, and modification of the way in which the clearing is done, so it looks more natural and less artificial.

In the areas we've studied, there is relatively little--little information about cultural resources. But there is a consensus among the people we talked to that we're likely to encounter resources of some

sort, prehistoric or historic artifacts. The Air Force will be complying with all the applicable laws and regulations, consulting with the Federal and State officials, and local groups including Native groups, in order to develop a plan for dealing with the prospect of finding cultural resources and then acting to extract the information or preserve them or undertake some other steps.

The next few slides talk about the possible effects of the transmission of this radio energy on devices and people. This radar operates in the high frequency band between frequencies at 5 to 28 megahertz. Also within the high frequency band are the other activities shown there--amateur radio, citizens' band, and large international broadcasting stations such as the Voice of America.

In principle--in theory this system can interfere with other users of the spectrum that are within that same band of frequencies, 5 to 28 megahertz, or in frequencies immediately adjacent to them, or with users at frequencies that are multiples of the frequency numbers between 5 and 28. It's the last category that includes things such as TV and navigation beacons as well as mobile radio.

The signal from the OTH radar is quite a good one. It's very concentrated in the main beam, going out in the direction in which the energy is desired to be. It is also very highly concentrated at the frequencies at which it chooses to operate, as opposed to putting very much energy in adjacent frequencies or in the harmonics.

The way in which interference is going to be avoided or greatly minimized is by the steps that are enumerated there. First, there are frequencies within the band of 5 to 28 megahertz which have been allocated or assigned to other users. Quite specifically, the radar will not operate on those. The controlling computer programs and the operators will be directed to avoid those frequencies. The operators will also stay away from the edges of the bands in which the radar is authorized to operate and away from those bands in the middle of other users in order to avoid the possibility of energy--undesirable energy getting into the other user's frequencies.

In the remaining span of the 5 to 28 megahertz band, there are rules of the road for operation. And one of them is if you can listen and hear no one operating, then you're permitted to transmit. The radar will operate in that mode. It will be listening to determine frequencies which it can use without interfering with someone else.

And finally, for devices such as navigation beacons and other devices which--with specific frequencies that are multiples of the frequencies that the radar would operate on, if interference is a possibility or even is demonstrated, the radar can then be programmed to avoid those frequencies and eliminate--or well, in that case, eliminate the frequency--the interference.

The final point is that on the East Coast, prior to getting the construction of the East Coast Radar System, there was an experimental installation called the Experimental Radar System. And during it's period of testing, there were no reports of interference that could be attributed to the operation of the radar.

Radiofrequency energy, in principle, can affect other devices never intended to capture energy transmissions. But in the case of cardiac pacemakers, in field handling there is simply no hazard. In the case of devices, called electroexplosive devices, one type of which is an electric blasting cap, there are safe separation distances to be determined based on the ground's conductivity. You can see that, if these devices are carried in metal containers, that about 1,300 feet is the safe separation distance. That is well within the exclusion fence that will be constructed. The--an EED carried in a non-metal container or if it's actually being handled for use, is safe with some conservatism, only at a much greater distance. That's a situation that's similar on the East Coast and the West Coast--will be similar also in the Central System. And it calls for the Air Force to post, in the zone around and outside the exclusion fence, in front of the radar, and to notify local residents and organizations of the possibility of a hazard.

Questions over the years have arisen about the possible human health effects of being exposed to this radiation. One point to be made is that this just like radio wave, but it's radio energy. The exclusion fence is going to be placed a sufficient distance from the antennas to ensure that the exposure levels outside the fence are below the standards accepted for protecting against possible health effects.

Our firm has spent quite a few years critically reviewing reports in the literature--scientific literature--for their validity and what they tell us about the prospect of human health effects. And what we've discovered is that, in the energy levels from this radar, outside the fence, there appears to be no evidence that there will be adverse threats.

To summarize, some significant biological impacts are possible, such as bird collisions. But whether they do, and how severe they are, depends on the specific sites that would be selected in the study areas, and in just about every case there is good opportunity to reduce these effects.

Because the rural areas--the bush--have relatively low population density, the economic effects are likely to be significant in the short term, certainly during construction--a little less so during the operations phase.

And finally, because the Air Force has yet to select specific sites within the study areas to locate the transmit antennas and the receive antennas, it will conduct an environmental assessment. It will--subsequent to this EIS, after the sites are selected--it will do

additional studies and make an additional report, if you will, describing specifics of the site and whether there are any other impacts to be--of--impacts of concern to be dealt with.

And now I will turn this back to Colonel Lee to conclude.

Colonel Lee: Thank you. I mentioned the major milestone events in this environmental impact analysis process in my introductory remarks. This is a summary again of those key events that have taken place, and have yet to take place. We started out this round of public hearings with a hearing in Anchorage, Alaska. We followed that with one last night in Fairbanks. We're here tonight in Tok. We'll conclude the fourth and last of the public hearings in Glennallen tomorrow night. The Final Environmental Impact Statement will be issued the end of November. We then will have a minimum thirty day waiting period before we are able then to file our Record of Decision. And to emphasize again, that decision will be to select one of these five study areas as the proposed location for the transmit site, and one of the study areas for the receive site. From that point, we will continue with much more detailed work that wi'l look exactly where, within those areas, we would site those antennas. And as Dr. Everett mentioned, would do more detailed work in an environmental assessment--to ensure that the general factors and concerns that we've identified in the Draft EIS and will be summarized again in the Final EIS, still apply; that there are no additional concerns that have been identified; and that all the proper mitigation measures--those measures to ensure that there are no harmful effects--have been taken into account.

With that process then complete with the decision to select a study area at the end of the year, we would be able to request funding from Congress in the President's budget that would go over to Congress the first part of the year.

The earliest that any type of construction activity would take place would be the middle of 1988. And depending on the funding level that Congress provides for the program yet this year, it could be that that activity would not start until 1989, with the major construction effort then not until about the beginning of 1990. We would then have that construction activity for a 2- to a 3-year, possibly 4-year time period--depending again upon the level of funding that Congress provides for the program.

The Over-the-Horizon Backscatter radar program is an extremely important one to the Air Force, and to the Department of Defense. It gives us a capability that we do not have now, today--a capability which, because of the threat as identified to you tonight, is very important for us to have. The added warning time that this type of a system provides, really improves the stability. It is strictly a defensive type of system. It means that we have additional warning if an attack is launched against the United States--time to start to try to do additional negotiations, to ensure that our local populations are

warned of an impending attack, added time to increase the alert status of our forces--and if an attack really is continuing to proceed toward the North American continent, then we have time to properly respond.

As I mentioned, Congress has already approved and has funded the West--the East Coast, and is into that process for the West Coast System. We are committed to the program. The question, however, on if and when we proceed with the Alaskan system, rests with you as well as with our Congress in the completion of this environmental impact analysis process, and then in the funding actions that Congress would subsequently take.

This completes the presentation tonight. If we could have the lights then? I thank you very much for your attention.

Lt. Col. Bristol: Thank you, Colonel Lee. Before we take a short recess and, as you can see, we have some coffee here that you might want to get--just like to mention again, especially for the benefit for those of you who arrived a little late, get one of the comment sheets and fill it out, especially if you think you'd like to ask a question or make a statement. You don't have to write the question or the statement on the form. All you need to do is put your name and address and check the appropriate blocks and then hand that in to Lieutenant Brown who's back there at the door, or to me or to Colonel Lee or anyone you see here that appears to be part of the team. And we'll take those up and review them during the recess and we'll start right away with the questions.

I mentioned earlier that we're going to just have people ask the questions from where they're positioned. We do have some microphones here, and depending upon how well the voices are picked up by the court reporter's sound equipment, I might start being a portable microphone, and carrying these microphones around to assist so that all of the information that you provide is recorded so it can be part of the verbatim record. Thank you very much. It's now, by the clock on the wall, it's coming up on ten to eight. Why don't we recess until 8 o'clock and then we'll resume. Thank you.

Lt. Col. Bristol: [After recess] Quiet. We're going to start up again in just a second now. One final count--I'll say we have one, two, three, four, five, six, seven, eight, nine, ten seats down here toward the front if anybody'd like to come down before we get going. You're more than welcome to. . . . And before we get into the question period, I'd like to say two things: we brought a microphone down here on the front, and if it's not inconvenient, just so we're sure everybody gets picked up--and I'll leave this to your option--but I would encourage you to come down and get somewhere near that microphone. It's more likely that you'll be picked up by our recording equipment. Also, I'm going to ask Colonel Lee at this time to introduce the members of his panel that are going to be prepared to assist Colonel Lee in addressing your questions. Colonel Lee?

Colonel Lee: Thank you. You've already met Dr. Everett. SRI has been under contract to the Air Force to help prepare the Environmental Impact Statement documents. SRI has also been a supporting contractor to the Air Force for many, many years in doing work in the Over-the-Horizon radar technology.

On my immediate left is Dr. Gordon Guttrich. He's the Associate Department Head of the Mitre Corporation. They provide the systems engineering support to my program office at Hanscom Air Force Base Dr. Guttrich, himself, has been associated with this OTH Program, including the Experimental Radar System, for about the last ten years and spent some time up on the site during the actual testing phase as well.

Continuing on to the left, Dr. Jamie Maughan is an environmental scientist with the firm Metcalf and Eddy. They are also a consulting, supporting contractor to the Air Force on this program.

On the other side next to Dr. Everett, is Mr. Ernest Woods. Mr. Woods is Chief of the Real Estate Division of the Corps of Engineers at Anchorage. The actual land acquisition process is handled by the Corps of Engineers, as the executive agency for the Department of Defense.

And then finally, over on the right, is Mr. Bill Hanson, who's from the Civil Engineering Organization. He's the Director of Engineering Programs at the Alaskan Air Command Headquarters, at Anchorage. So these people are here to help me and to help you in making sure that we get as complete information to you tonight as we can. You can feel free to direct your questions to me, and then I will either provide the preliminary information or may turn the question directly over to one of these experts here tonight.

Lt. Col. Bristol: Thank you Colonel Lee. Who'd like to get us started? Yes, sir.

Mr. Frede Glidden: Yes, sir. Yes. My name is Frede Glidden. I'm president of the Chamber of Commerce and I'd like to read a letter from the Chamber of Commerce to you people and it says: "Dear Sirs. To follow-up on our letter of February 3, 1986, the Chamber of Commerce would like to again emphasize our support for the construction of the Backscatter system in Tok. We realize that there are some environmental concerns. Our membership is some 70 strong and we believe any perceived environmental problems are more than off-set by both the national and local advantages created by the Backscatter system. Tok would be very positively impacted by the economic good created by both the construction and operation phase of the system. Tok has a lot to offer, and the members of the Tok Chamber of Commerce hope Tok will be chosen as one of your sites. Thank you for your time in this matter and please feel free to contact us."

Lt. Col. Bristol: Thank you Mr. Glidden.

Mr. Glidden: I'd like to give this to you.

Lt. Col. Bristol: Thank you very much. I know there's some who have some questions because I've seen your names on the sheets and the blocks checked. Again, we're going to be very informal. Yes, sir. We're going to be very informal, just come up and pose the question and then if you like you can return to your seat or you might have a follow on question you can just stay right up here with us. Yes, sir.

Mr. Bill Simmons: Yeah. I'll help start it out. My name is Bill Simmons. I would like to know how much air space the air traffic people are going to lose on account of this transmitter or receiver station and the distances that we will lose in flying over it and the area around it.

Lt. Col. Bristol: Yes sir.

Mr. Simmons: That's one of the questions I'd like to have answered.

Colonel Lee: You mentioned both the transmit and the receive site. In the case of the receive site, there would not be any restrictions at all in air space around the antenna system. I guess our major concern there is that it is not looked at--the groundscreen area--and attempt to use it as a landing field. But there will be no other restrictions really around the receive site.

In the case of the transmit site, beyond about a mile in front of the antenna, or a half mile on either side, there should be no harmful effects in flying through the beam area itself. What we would do is establish a restricted area that would be approximately that size, extending up about 5,000 feet above the ground level. That should provide adequate protection for airplanes flying through that. And then, similarly, you should not be causing interference to our system by having energy bouncing from the plane and possibly then being picked up or received by the receive antennas.

In the case of the Experimental Radar System, during the actual testing, we established a temporary restricted area with the FAA of just a five-mile radius around the antenna itself. And during our testing of the East Coast Radar System, again on this temporary basis, we've just established a five-mile radius around the antenna extending up to 5,000 feet. But we intend to shrink that down, more to the distances that I've identified. Because that, from our calculations, really would be the concerned area.

Mr. Simmons: Okay. I have one more question that's not quite in that line that I'd like to ask while I'm here.

Lt. Col. Bristol: Yes sir.

Mr. Simmons: When this is built or if it's built, whichever one, it will be run by military personnel, it will be run by Civil Service

personnel, it will be contracted out to civilian agencies, who's going to run this operation?

Colonel Lee: The 70 people that were identified when Dr. Everett was talking about the economic impact, would be almost totally civilian personnel. Over half of them would be contractor hired maintenance and operation people. The prime contractor for the East Coast and West Coast Systems is General Electric Company out of Syracuse, New York. We would expect a prime for an Alaskan or Central system to be a company like that, G.E. or Raytheon. They would have the responsibility for providing the long-term contractor maintenance and support for the site. So that's a little over half of those people.

The remaining portion of them would be those people required for site security. Our plan right now is to carry through with the same example as we're using on the East Coast System, and that's to establish those as civilian federal wage-grade positions. So to the extent that people were able to, they could be hired then from the area and brought on the rolls as civil servants. And they would provide, then, the long-term security. There would only be a couple of military people involved with the site as supervisors of the entire operations.

Mr. Simmons: Okay. Then we could expect a little less than half the personnel would be Civil Service employees?

Colonel Lee: That's correct.

Mr. Simmons: And this station would be opened up--we'll say nationwide for all Civil Service employees to bid on the jobs?

Colonel Lee: I'm not sure exactly how that process would work. The positions have to be established and announced in that manner, but the practicality of people from the other areas coming on in here for those type positions is something we couldn't estimate. Mr. Hanson, you've had more experience working with some of these radar sites--could you add some added material?

Mr. Hanson: Well, I'm sure that all Civil Service positions would be handled out of the Elmendorf Civilian Personnel Office and it--of course, the first attempt is always--we normally don't go outside the state for wage-grade positions. It's a very rare occurrence.

Mr. Simmons: Local--by local you mean Alaskan?

Mr. Hanson: Sure.

Mr. Simmons: What I'm trying--the point I'm trying to get across to these people, is that a little less than half of these jobs are not guaranteed to be hired in Tok. They're going to be competing on the Civil Service level throughout Alaska, at least.

Mr. Hanson: Well, ...

Mr. Simmons: I'm familiar with the Civil Service because I'm a retired Civil Service employee. And I worked with this pipeline out here for many years and I watched the hiring process there. And very, very little of it was done locally, so I didn't want these people to have high expectations in having 30 jobs through the Civil Service come right out of the city of Tok.

Mr. Hanson: Well, I will say one thing--that we're cheap. And we would like to hire people we don't have to pay to move somewhere. Now how exact the regulations would be--based on past experience, I'd say we'd try to recruit in the local area for those jobs which we could find people to respond to.

Mr. Simmons: Thank you. I'm sure there's a lot of other questions--giving the rest . . . . .

Mr. Hanson: Thank you.

Lt. Col. Bristol: Thank you sir. Ma'am.

Ms. Sandy Ahlstrom: All right. My name is Sandy Ahlstrom. Is this--since this is an early warning system, I don't know it's the earliest, would that make it a more likely primary target or first strike target for incoming missiles?

Colonel Lee: It is an early warning system--an early warning system for aircraft that would be launched against the North American continent. We believe it would not make this a military target for a first strike, because in doing that, that would in itself establish the warning that would cause our--us to start those responsive actions. So in that sense, it's very much a defensive system that is to provide that additional time for our decision-makers to consider what kinds of alternatives that we could take.

We have had this question asked of us in every hearing literally, here in Alaska and also down in the Central Radar System. We just finished the public hearings there two weeks ago. And it's difficult to imagine any scenario where it would be to the advantage of the Soviet Union to provide warning by trying to destroy this particular system. So we do not believe it would be that type of a military target.

Lt. Col. Bristol: Yes sir.

Mr. John Bower (ph): My name is John Bower and I have several questions. What--along the construction phase of it you had between 100 and 200 people for the rural area. Is that for both the transmit and the receive site, or is that for just one--or at each site?

Colonel Lee: Yes, that was for each site. . . . .

Mr. Bower: Okay.

Colonel Lee: . . . . .and that was based on our experience with the East Coast Radar System.

Mr. Bower: Okay. You had noted that the multiplier effect of one person with the other jobs that are also created was probably going to be low for the rural areas. That may not be true because people are always developing some sort of businesses, so you may get a higher multiplier effect than you will in the city.

The next question is--I guess on the security of the system you mention there is just going to be the fence around the installation here. What security do you have from something coming from the sky trying to blow this thing up?

Colonel Lee: We have no security system there at all. Again, that really is not consistent with a warning system, to have that kind of security system. It's also difficult to imagine what kind of a system you might have--to provide that kind of warning for the warning system. So our objective really is to ensure that the integrity of the site itself is maintained--that either animals or people do not get inside the area where they can do damage or potentially destroy the capability of the system.

Mr. Bower: But what would--just to, you know, play the Devil's Advocate, what would say prevent someone from getting a small aircraft and dumping something on top of this--on the radar system there to short it out or whatever else and, you know, if we're using that to monitor the Soviet Union from coming over, then if these installations are down, does that mean that they're coming over? To me it would--I guess I sympathize with the lady's comments that it means they would look at knocking these systems out before they would send the planes over obviously.

Colonel Lee: There are many different kinds of scenarios that we can develop and try to guess at what each side might do. There really isn't any way that we can prevent direct sabotage of that kind from damaging the system and destroying its effectiveness. But it's one of a network of warning systems, and we would expect that if this system went down for some unexplained reason, then we would, kind of, increase our awareness. We would be looking more closely at other kinds of sensor systems that we have to try to establish if this were some direct precursor event, or if it was just some other random occurrence.

Mr. Bower: Okay. Thank you.

Lt. Col. Bristol: In the back, sir.

Mr. Bill Arpino: My name is Bill Arpino and I've got two questions. In the presentation you mentioned that Tok would require a 3,000 acre site. In this 3,000 acre site, how much of that is cleared? And the other question is, of the permanent staff that is going to be operating this site, do you intend to house them on-site or would they be housed in the community?

Colonel Lee: To the first question, the 3,000 acres was meant to be an estimate for the entire system, both transmit and receive sites. If Tok were selected for the transmit site there would be two 650 acre sections for the antennas itself, and then whatever additional acreage were required for the access road or the road between the two sector areas. So, approximately 1,300 acres total would be required for the transmit site.

On the permanent staff, there are several alternatives that are being considered. We've got those study areas--as I showed on the chart--ranging--from Paxson where there is very little support structure--infrastructure--available--to Tok where there is considerably more--to Glennallen which is still a larger community. In an area such as Paxson, we would probably go ahead and construct a complete composite living facility to provide a capability for that entire staff to permanently spend their time and be supported there. In the case of Glennallen or Tok, that may not be necessary. You all recognize that we've got the Tok terminal station outside the area--that may provide an opportunity to house some of those people. What we need to do is ensure that there is both available within the community or, if not in the community, through some separate effort, enough housing to support that crew of some 70 people. We wouldn't require that they come as bachelors or single individuals. Nor would we require that they come with their families. Those decisions would be left up to the individuals. But certainly to the extent that a community was immediately in that area, we would expect that those individuals that are married would bring their families up, and we would not restrict them from living in the local community.

Lt. Col. Bristol: Yes sir in about the fifth row.

Mr. Freddie Pride: I have--Freddie Pride of Tok. I have one question that the Air Force, the Army and everyone else should be looking at here in Alaska along with the civilian population. We have two major metropolitan areas, and frankly all medical facilities are in those areas, both military and civilian. There is no, literally no backup within many thousands of miles. And I think that Tok, if it's selected, should be looked at very extensively to put in a major medical facility here for the benefit of everyone. I think it's well worth looking at. Thank you.

Lt. Col. Bristol: Just as a reminder, although it's--we're informal and we can deviate from the agenda, we're trying to get the

questions out now and as soon as we have questions completed then we'll go into the statements themselves. Yes sir.

Mr. Tony Jordan: Okay, I have a question that sort of relates to that.

Lt. Col. Bristol: Yes sir.

Mr. Jordan: My name is Tony Jordan. You talked--the Colonel talked about Tok as a support--he used the words support services. Our social services, as they are, are already overworked, and most of the organizations here are understaffed and underbudgeted. We're having a hard time coping with what problems we have now, and surely the addition of this many more people, both during the construction and long-term, is going to create additional problems. And I've noticed in the blue book there, that there is no provision provided for that. We have no monies expected--increased monies from the State. In fact, most of our organizations are looking at cutbacks. How do you expect us to cope with that many more problems?

Colonel Lee: That's an area of input that we welcome from the community. If there are those kinds of concerns we'd like to have them identified to us. When I made the statement, I was trying to contrast between a situation like Paxson where we would probably have to have a complete composite living facility to support all of the people. We don't think that type of a total requirement would be necessary here in Tok. There certainly is some housing that is available here. I understand, in the communications that we've had and discussions with some of the people here, that you could be able to handle a few additional students within the school system. There are certainly some businesses that are here. From that standpoint, there is some support structure available here that would not necessarily be available in some of the other areas. I didn't mean to try to make any more conclusive statement than that. So again, we welcome more input from the area if there are concerns there.

Mr. Jordan: Well, I was talking more about our emergency services, our mental health services, things like that. I still don't see any provisions in your program or proposal that would help us deal with those problems at all. All's I see is that we're getting more of a load without input of monies or personnel from the Air Force.

Colonel Lee: Mr. Hanson would you comment please?

Mr. Hanson: Yes. Typically what we do at our remote locations is--there, there is a kind of two-fold method of handling things like medical problems. The first is--generally with the population size we're talking about, we would have a physician's extender type person as part of the staff. Okay. And he would have a capability to do first aid and whatever. Beyond that, generally we would have a structured plan, either a chartered aircraft on retainer along with provisions for

military evacuation in serious medical cases. So the site itself, I don't really believe, would have a negative impact--at least in that area. As far as other social impacts, of course, there may be some. I'm really not sure how that would be handled. But as far as the medical area, because we're--the government is an employer and responsible for on-the-job injuries and things like that, I'm positive that if the local community is not available to help, then we would generate our own as far as the staff at the site.

Colonel Lee: In that line also, to the extent that we can, as Mr. Hanson earlier remarked, we would try to do that local hire of those security people so they really would be people within the area. To the extent there may be some trained electronic technicians that might be available to do some of that operation and support work, that could be hired by the prime contractor, then those people similarly could come from the area. So in that case the total number would be far less than the 70--as outside people bringing added pressure onto the system. But again, I stress--if there are other folks that have had those same concerns and want to identify specifics, please provide them as written comments then so they can be included and considered in that decision process.

Lt. Col. Bristol: Any other questions? Yes sir.

Mr. Jim Cliver: My name is Jim Cliver and I was just wondering what is the OTH-B radar going to provide for us that Cobra Dane radar on Shemya isn't?

Lt. Col. Bristol: All right, thank you.

Colonel Lee: The Cobra Dane system is one that I don't have any personal knowledge of myself. The OTH system I can speak to is a unique
7 system. It can provide that well over a million and a half square miles of surveillance area from a single location. And it can do it at those areas of interest--starting with the coastline of Alaska out, extending well beyond the Aleutian Chain. So there is no system that has any kind of capability such as that--for aircraft that can be flying all the way down to the surface up to the height of the ionosphere.

Once this barrier is established--this tracking barrier--as we scan across these two 60-degree sectors, there is no way that an aircraft could pass through that area without it being detected by this OTH system. There isn't any other system that has that kind of capability that we now have.

Lt. Col. Bristol: Yes sir, on the aisle.

Mr. David Parker: My name is David Parker and I have two questions. One is more of a clarification. Initially you indicated that perhaps up to 35 people--resident people would be employed during the operational phase, yet one of the pages in the book, 4-23, seems to

be indicating that during operation, a secondary employment due to one site is expected to be between 10 and 15 people. The numbers don't jive, or maybe I don't know what secondary operation refers to.

Dr. Everett: The 35, which is rough guess of the number that would be directly employed refers to simply those employed on the site. The secondary employment refers to jobs created by the presence of those new employees at the site. So, a good example might--well maybe it's not a good example, but to explain it, it's the difference between a person who's employed as a radar technician at the site, and a person who opens up a service station in the community to serve the person who is employed at the site.

Mr. Parker: So there's an outside chance that as many as 35 people from Tok could be employed at the site itself during operations?

Colonel Lee: If you were to look at the total security force and perhaps a few additional folks hired in the operation and maintenance, yes, that would be a good estimate.

Mr. Parker: All right, thank you sir. That clarifies that point. The next question I had was towards the end of the booklet here. It seems to me that small aircraft navigation will be impacted--small aircraft communications will be impacted. The ADS systems hasn't even been studied yet. And there's a high probability of impacting the local TV transmit site up on the mountain here. And the questions I would have is--to what extent would the Air Force be prepared to do something, and of course, how quickly? You know, if the systems are going to be out for six months while you figure out what to do--what do we do in the meantime? And given the Tok transportation and location we're basically at here, you don't run across the street to buy the part you need. I mean you could be looking at months to get whatever you think you need to correct it. Thank you.

Dr. Everett: Do you want to. . . . .

Colonel Lee: Dr. Guttrich?

Dr. Guttrich: All I can say is the--we have experience with the Experimental Radar System in Maine. Except for very local effects there were no impacts. We--the most significant one having to do--did have to do with aircraft, the VOR. There were tests done with the FAA, you know, looking for impacts. The effect was one that, when we were operating on subharmonics of some of the lower frequencies, you get deviations in the equipment, and that went out to as much as 30 miles. That was corrected by locking out the subharmonics. So we anticipate that as a part of the--if this were chosen as a location there would be a period of time where you would look for such effects and what stations are involved and work out ways to mitigate the situation.

Colonel Lee: The document itself does not go into a great amount of detail in any level on potential effects, but the main mitigation measure that we are using is to gather the information as we start that operation. And the easiest and simplest thing is literally to program the computer not to operate on those subharmonics. So in that sense, we can eliminate that source of interference almost instantly. If there are additional things, such as filtering, that are required--yes, that may take some additional time. But based on the experience that we have had, as Dr. Guttrich said on the ERS--and certainly by the time that we start construction of the Alaskan System, we will be operational on the East Coast and we will be into testing on the West Coast system. The same kind of a system, the same kinds of potential interference sources, should make us pretty experienced at how to deal and mitigate and eliminate those interference effects.

Mr. Parker: One follow-up question there--maybe it'll help, at least to me--is you list the frequencies that you'll be running between 5 megahertz, I guess and 28. Well, is this like 23 frequencies? Is this 200 frequencies? Is this several thousand? You list like 20.0029, like a 4-digit place after the decimal point. What separates a frequency?

Dr. Guttrich: We have various modes of operation. Normally it's a 10 kilohertz chunk of spectrum that we utilize. We keep logs, and the frequencies that are utilized are in the fixed band, and international broadcast, which is used almost not at all, because there aren't any frequencies there. So it's basically the fixed band that is utilized. We keep out of the amateur band. There are a bunch of search and rescue bands that are automatically locked out--Coast Guard frequencies that are used for other services--that where we could cause interference, are locked out of the operation altogether.

Lt. Col. Bristol: If I understood the question correctly, it was that area between the two extremes of the frequencies on which we'd be operating, how is that divided up? Is that a matter of just subtracting the lower number from the higher number and therefore arriving at the result as to the number of intermediate frequencies or is that a greater number of frequencies along that?

Dr. Guttrich: The center frequency of operation is steppable in 1 hertz steps so there's a large number. But we hunt for holes in the spectrum that are not utilized by other users. I should say, by the way, that's not just because we're good guys, but interference if other people are operating on a frequency--that prevents our being able to do the detection job. So we have to have a clear channel search to look for clear frequencies before we come up on a frequency for transmission.

Colonel Lee: We operate a spectrum monitor, continuously scanning over those frequencies to ensure that anytime before we transmit, that we do have a clear channel. The actual frequency that we're operating on at any given moment depends on many things, including how far out in

range do we want that barrier to be, and also what is the height or condition of the ionosphere at that time. So, it's a very dynamic system with frequent changes in the operating frequency. But they're all done on the basis of listening first and establishing that they are clear channels.

Lt. Col. Bristol: There was another question over here. Yes sir.

Mr. Glen Marunde: Glen Marunde, Tok. Two-part question. How long would it be before this system might be obsolete and abandoned, and the second part is--are there any commercial applications in the future such as space travel or research or some commercial application.

Lt. Col. Bristol: Thank you sir. Could you spell your last name for me sir?

Mr. Marunde: M-A-R-U-N-D-E.

Lt. Col. Bristol: Thank you sir.

Colonel Lee: The system is intended to operate for a minimum of 20 years. We talk about a 20-year lifecycle, but that's more for the purposes of planning the total support that's required--the numbers of military personnel and how long they'll need to continue funding for that. The basic technology that we're using might change over the years. I suspect that there may be opportunities to do--make some upgrades to the transmitters, or to some of the receive hardware. But the basic physics of using HF energy--refracting it from the ionosphere to be able to detect things 1,800 miles away--will not become obsolete. And it's difficult to imagine any kind of system for the next 20 years, maybe 40 years or more, that with this single kind of a system, can cover that widespread an area. So we don't expect that the system is going to become obsolete at all. The only thing--if we end up in a situation where we had no more requirement for surveillance of an area, that would be the only condition where you'd think that this type would become obsolete. But certainly not in terms of its capability to detect and track aircraft approaching the continent.

Lt. Col. Bristol: Yes sir.

Mr. Marunde: Also, will you have your own power company? Your own power or will you, like the Coast Guard does now, they get power locally and then they have their own for standby?

Colonel Lee: I'm going to let Mr. Hanson answer that, but first I didn't finish answering your second question though on the commercial application. What we're doing is a military application of what the ham radio operators have been doing for the last 40 years or more--using HF to communicate halfway across the world. I don't know of any other kind of commercial application to this type of system--none that we're aware of. Mr. Hanson would you answer his following question?

Mr. Hanson: Okay. As far as power, our current plan is to pursue a commercial contract, if you will--and as a parallel track to that, to pursue a government built and operated plant. And then, when we get the numbers, the cost and the--both operational and first cost for construction for the government plant--when we get all that sorted out, and those two come together, then we'll make a decision based on economics as to which was is of most benefit to the government. As far as the commercial--the third party potential for supplying this power, there's been a Commerce Business Daily advertisement that's on the street now. And sometime in the next month, we're going to put out a Request for Proposals in a draft form for everyone that's interested to comment on. This is--we're kind of plowing new ground here. What we're going to do is try to work with the industry if you will, or anybody that's interested in investing in that sort of activity. And the first phase, again, will be a comment, and then we'll revise our documents and then put them back out as a formal Request for Proposals. And the time we do that is when we open the bids and do the comparison with the government costs. We'll make a decision and either award the contract or decide to build the government plant.

Mr. Marunde: About what are the power requirements in terms of megawatts for the transmitter site?

Mr. Hanson: Ten megawatts.

Colonel Lee: To ensure that there's no confusion there, however, the 10 megawatts is a total power requirement--including power for heat--for living facilities. In terms of the power that the antenna puts out, it's about 1 megawatt for each of the antennas.

Lt. Col. Bristol: Next.

Colonel Lee: There was a question over. . . . .

Lt. Col. Bristol: Yes sir.

Mr. Ed Gatzke: My name is Ed Gatzke, Tok, and I have some question about communication interference. Between 5 and 20 megacycles, European stations like Radio Moscow and so on, they broadcast on several frequencies simultaneously. Is that your format also, or do you just move around in that cycle?

Dr. Guttrich: We have various modes. Typically, we try to utilize one frequency to scan the sector. However, as conditions may--the ionospheric condition changes the function and direction--we may utilize more than one frequency. Each of the two radar sectors scans in eight positions across--to cover its 60-degree coverage, so there would be a total of 16 positions. There could be as many as 16 frequencies, but in general, we would expect to operate--2 or 3 would be typical.

Mr. Gatzke: Okay, and each antenna puts out a megawatt. What's your proximity to populated areas? How far away will you be?

Colonel Lee: The exculsion fence that we talked about in the presentation encloses that area which is about one mile by one mile. Outside of that fence there should be no problems or concerns at all. So it's more a matter of siting the place. We try to stay away from any extremely large population centers, more for potential interference that they might cause to our system. This is particularly in the case of the receive antennas. But in looking at the Tok location, for example, there are areas that we could consider a couple miles outside of town that would provide adequate location of the antennas for our purposes, and certainly would cause no interference or harmful effects on any of the local population.

Mr. Gatzke: There's a proposed commercial station being installed here. We had to worry about the LORAN site because they have harmonics on the 100 KC all the way up to 1 meg, so we had to stay away from them. On the low end receive band, how much interference would we cause you or you can cause us?

Colonel Lee: Dr. Guttrich?

Dr. Guttrich: We don't expect any interference between the two systems, but this is the first time that we've had the potential of LORAN and the OTH being very close together. So we will--but we'll be looking at this as we go along. I think it was--we estimated 2 miles separation was surely adequate to avoid mutual interference, one to the other, under any circumstances. I think less than that probably would be okay as well, at least if our antennas are in front of the LORAN. We would--we want to be forward of your antennas, of the LORAN antennas.

Mr. Gatzke: So you'll be between town and the LORAN site for this site.

Colonel Lee: Yes. That's one potential area that we're looking at. That study area was fairly large and we're looking at potential sitings at several locations within that area.

Mr. Gatzke: Okay, thank you.

Colonel Lee: Thank you.

Lt. Col. Bristol: Yes sir.

Mr. Pride: I myself have about a $20 clock radio at home on my table, and I got a little antenna booster that I bought for $15 and can pick up KFAR in Fairbanks and KNIK. KFAR--I get a beep, beep, beep coming through the radio around the Coast Guard Station down here. I'm just letting you know what's--I don't know what can be done about--I'm like to know how things pick up. . . . .

Lt. Col. Bristol: Sir, in the back, you have a question?

Mr. K. C. Jones: On the--on your transmit signal, are you going to be vertically polarized, or is it horizontally polarized, or both?

Lt. Col. Bristol: Sir, could you state your name please for the record?

Mr. Jones: My name is K. C. Jones.

Dr. Guttrich: The lower frequency, well it may depend. The East Coast System utilizes both a combination of horizontal and vertical at the lower frequencies, and vertical at the higher frequencies. It may be that we go vertical all the way on the Alaskan.

Mr. Jones: Then it hasn't been determined for this system yet what type polarization you're going to be using.

Colonel Lee: That's correct. Similarly, for the Central Radar System, that is open. For both the East and West Coast, the radar systems antennas are, for all purposes, identical. But we're looking to see whether we may have improved effectiveness to go more towards vertical polarization for all six bands.

Lt. Col. Bristol: In the back in the blue shirt sir, and I'll get to you next sir.

Mr. Jerry Burnett (ph): My name is Jerry Burnett (ph) and I was--I noticed that in your presentation you indicated that there had to be a pretty clear, yea, 1 degree angle that you could accept up to 10 miles, and then 3 degrees beyond that, so it would seem as though the Tanana Valley area, in the Tok general area that really limits you to the north side of the Tanana Valley pretty near to the--I mean doesn't it narrow it down so that you've got a pretty narrow area that you can even accept as your site for the transmitter to get the 120-degree angle that you indicated you need for the proper coverage.

Mr. Hanson: Well, there's really not a lot of area when you consider the whole valley, but there are about 6 or 8 specific locations that are--that meet the criteria--a couple of which would result in a split site. In other words, we're building two separate antennas for this transmit site. A couple of these areas result, would result, in an antenna being several miles from the other antenna. Now we don't like that but there are, I think, 3 locations that I recall, where the antennas can actually be put together. And, of course, the proximity of the LORAN and all the other electronic facilities in the area complicate things. But, yes, we just can't put it anywhere. And yes, there are some very specific locations that we're limited to because of all the terrain features and the other installations that are here.

Mr. Burnett: That's what I've wondered--if a split site is acceptable at all like ten miles apart or whatever.

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Mr. Hanson: Well, I think so, but I'm not sure everybody else does.

Colonel Lee: There are a number of tradeoffs in the final decision-making process. Ideally, you'd like total level ground with no obstruction, where you can put two antennas right next to each other. That may not be the case in this area. It might not be the case in any of the areas, so when you finally finish the process, and we had the comments and the input from all of the people, then we will be able to combine all those factors together, including some additional factors such as the availability of land, cost of land, the total cost of construction. All of those factors then would go into that final decision that would be made the end of December.

Lt. Col. Bristol: Yes sir, in the back row.

Mr. Arpino: Yea, my name is Bill Arpino. I have--you've been talking about the five sites. How contingent is the selection of one site--how does it affect the other one. In other words, for instance, if Paxson was--and Gulkana was thrown out, does that make Tok out of the picture. Or if Tok is not chosen, are one or two of the other sites out of the running? In other words, how do they relate to each other?

Colonel Lee: There is a certain matrix, if you will, a combination of sites that can work. There are some combinations that cannot work. The Paxson with Gulkana, excuse me, with Indian Creek--the distance there is too close. So we can't consider those together. If Paxson were selected as a transmit site, then Tok would be out of the question because Tok is being looked at as a transmit site only. We can't find enough area with those terrain features to support the much larger receive antenna. If Tok were selected as a transmit site, however, those other areas except for Paxson could all be matched up as a receive site, so there's still a fair amount of possible choices there.

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Lt. Col. Bristol: I think there was a question--yes sir.

Mr. Jordan: My name is Tony Jordan again. If you got 7 or 8 sites selected, or possible sites, in Tok, by looking at a BLM map isn't not hard to see that a lot of that land in this valley is native controlled. So it's sort of a two-part question. First, do you intend to attempt appropriating that land and, if so, how?

Colonel Lee: I'm going to ask Mr. Woods to answer that question, but before he does let me clarify one point. When Mr. Hanson was talking about different locations where you could site the antenna, that was really to ensure that these large study areas we had selected could support the antenna. Those are just several possible of many possible locations. The exact siting would not take place then until after that Record of Decision was made. So right now we're looking at those on the

basis of assuring ourselves that there were more than a single possible location. Or if there were just a single possible location, we wanted to ensure that we were aware of those different factors that would say--this was acceptable or was not acceptable. The actual process for the land, then, would be handled by the Corps of Engineers. Mr. Woods would you answer that.

Mr. Woods: Native-controlled land is treated the same way as individually owned land. That is, we have it appraised and offer to buy it at the appraised value. We will make no attempt to have their selections voided in order to preclude us from paying. We will go through the process of buying it just like anybody else would have to.

Mr. Jordan: In other words, you--but you would use eminent domain if you had to?

Mr. Woods: Well, with the project authorization and the authority to acquire land then--that's when the project is approved and the siting is finalized and--in all likelihood, to avoid cancelling the project, we would institute eminent domain proceedings.

Mr. Jordan: Thank you.

Colonel Lee: If I can comment a little bit further on that--that option is always provided. It's established by Congress so that important high priority projects can continue. But one of the reasons that we identify several study areas is to try to avoid getting into that kind of situation. Our first preference is always to try to identify land that we can acquire through the normal negotiations--acquisition, purchase, or leasing. In the case of the Central Radar System for example, we're looking at both direct purchase as well as leasing. So the priority is to try to find willing landowners, native corporations, that would be willing to negotiate with the government. And that availability of land will also be factored into the final decision process.

Mr. Jordan: So, in other words, you will approach the native corporations that own the land around here before making your final draft to see if they are willing to go along with this?

Colonel Lee: The final draft itself will not address the availability of land other than the information that we already have. We've identified tentative landowners; we've had discussions with some of the native corporations. Those discussions would continue. But in that final decision process, from the filing of the Final Environmental Impact Statement, we would want to ensure that we had as much information available on the land, the ownership, and willingness of parties to deal with the government because, again, as Mr. Woods said, that process is there--but we really would like to avoid that eminent domain.

Lt. Col. Bristol: Yes sir.

Mr. Glidden: I have a couple questions. You referred to a couple times on security and on-site security. What would be the job of security personnel and at any time would they be armed personnel?

Colonel Lee: The primary purpose of the security personnel is just to maintain the integrity of the site. They would be housed or stay within the one single building for one of the antennas. In addition to the fencing, we would have sensor devices that would allow us to identify if the fenceline had been broken or if people had intruded into the area. And then their task would be to go out and if it was repair work that was required, go ahead and file a report and start that action.

The question on whether or not they would be armed personnel, in the majority of cases there would not be any requirement for that. It's mainly to ensure that the system can continue to operate so that we don't have destruction of the fence and the potential destruction of the system itself. The final decisions on how that would be handled would be a part of the Alaskan Air Command then, when we actually started approaching the operational periods.

Mr. Glidden: And also in your discussion of restricted air space, you did not refer to the restriction due to interference with the signal--rather to health hazard. What would be the worst possible health hazard?

Colonel Lee: Dr. Everett. . . . .

Dr. Everett: Well, it's difficult to say, because the worst case is essentially no case. You can fly down the beam if you will and it's unlikely that you'd be in the beam long enough to be affected by this, especially if you were in a metal aircraft which provides additional shielding. So there's no bad, worst case effect here to be concerned about. That possibility is even further removed by an expected requirement to stay out of a restricted area.

Mr. Glidden: Well let's say that I am a Sunday joyrider and I'm out in an ultralight buzzing your site and I spend half an hour flying around the middle of your beam. What is the worst possible case?

(Indiscernible - laughter)

Mr. Glidden: This is a real possibility.

Dr. Everett: At high power densities the worst thing that's likely to happen to you with an exposure like that is that you may get warm. There are thermal effects and anything that would be done physiologically to you is reversible, unless you found a way to float right there for an extended period of time without drawing attention to yourself.

(Indiscernible - laughter)

Mr. Glidden: I believe in your book under this particular subject, that you referred to birds and something about. . . . .

Dr. Everett: Small mammals.

Mr. Glidden: . . . . .effects on birds' brains or mammals, I--if they flew through it it might do something to them.

Dr. Everett: I don't think we wrote that. We spoke about the possibility of rodents or small mammals getting inside the enclosure and showed that there'd be no effect on them due to their size and the nature of the electromagnetic field there. There is--there are reports of various kinds of effects at the cellular level and so forth, but none of these have been shown to be occurring at the kinds of power densities that are associated with this radar. They're different, generally higher levels, pulse rather than continuous wave, and because they're higher levels they're the thermal type. You'd have to get a pretty good jolt of radar energy to have a serious effect.

Mr. Glidden: Well, locally here, since the LORAN Station was put in, migrating birds have had a tendency to swarm in that area and circle for perhaps a short period of time and continue on. Is there any possible effect like this, or do you have any idea what it would do to migrating birds?

Dr. Everett: That's probably an effect due to the lighting.

Mr. Glidden: Perhaps, I don't know. It's just something that. . . . .

Dr. Everett: Yea, right.

Mr. Glidden: . . . . .has occurred.

Lt. Col. Bristol: Could I ask for a show of hands. . . . .

Dr. Everett: It almost certainly is not RF energy.

Colonel Lee: I want to clarify a point on that too. If I can before we leave--that make one other comment for better understanding again of how the system works. From one of those bands within that radar transmitter, we're scanning across a 60-degree area on the order of every 10 to 20 seconds. So you and your ultralight would have to move continually across and into the main. . . . .

(Indiscernible - laughter)

Colonel Lee: . . . . .at most you're going to be in the area for a few seconds and even then there is absolutely no way that there would be any kind of a harmful effect.

Mr. Glidden: It's not being pointed in one direction constant all the time.

Colonel Lee: That's correct. It is scanning.

Mr. Glidden: It's back and forth in the power band.

Colonel Lee: That's correct. It's electronically scanning.

Mr. Glidden: All right.

Lt. Col. Bristol: Just one second sir. Could I ask for a show of hands on those individuals who'd like to make an oral statement for the record during the coming statement portion. I want to make sure we have enough time prior to having to conclude at 10 o'clock so that everyone who wishes to make a statement can do so. If we have enough time then we can continue now with the question and answer, but I don't want to have anyone prevented from making a statement just because of the elapsed time. How many of you, either by filling out this form or otherwise, would like to make a statement here for the record this evening? Show by raising--there's one. Okay. Then let's press on with some more questions and we'll get to the statements. Yes sir.

Mr. Dick Schultz: My name is Dick Schultz and I have a question on--you mentioned that Tok was only considered as a transmit site but I didn't catch why.

Colonel Lee: The reason was--the much longer antenna array for a receive antenna. While we're still talking about 600 acres, we need about 10,000 feet long by about 2,600 feet, and again, those same requirements--extremely level with a clear siting angle without any terrain obstacles. We were unable to find potential areas within this study area where we would be able to site two antennas of that length. 9

Mr. Schultz: Did that include native lands also?

Mr. Hanson: Yes.

Mr. Schultz: It just seems ironic to me that Tok is impacted more per capita by land disposals than any area in the state of Alaska when they dispose of land here. And I'm just wondering if, because of the land mass that we do have available here, because of attractiveness of it, I just find it hard to believe that you can't find 10,000 feet or whatever of land.

Mr. Hanson: We've had a lot of, hopefully, smart people trying and when you sit down with all the electronic installations and all the

restrictions we have on the siting of the system, it just rules all these out.

Colonel Lee: For example, that 10 miles either side of the highway was one of the requirements that we had, and that was to ensure that for the construction and operations cost that we would be able to have a cost-effective system.

Mr. Schultz: That was the other point that I wanted to bring up. It looks to me like that if you're looking at a cost, you're looking at the government spending money. And the way to cut and do the right thing, you'd reduce it down to three sites. You would have the Gulkana, Glennallen and Tok areas. Because the cost of building or creating a community at Indian River or Paxson is going to be--escalate your costs tremendously higher. So cost-effectiveness, you would have to have narrowed that decision down to at least three areas I would think.

Colonel Lee: The one comment that I would make is that in this environmental analysis process, the key thing that we wanted to identify is environmental concerns, and to ensure that the different study areas had been properly categorized. If, as a result of cost-effectiveness or some other factor, we end up selecting a site that environmentally is not as preferred as another site, then we have complied with the required process. We have gone through this analysis process, have identified and documented all those environmental concerns, but then we can apply some of these additional factors such as the cost-effectiveness. It is a total integrated decision process when we finally make that at the end of December.

Mr. Schultz: End of December? I thought you said the end of November that this report was going to be done?

Colonel Lee: The Final Environmental Statement will be filed the end of November. To the extent we can, we will list in it the environmentally preferred solution, or a ranking of study areas, but the actual decision on which study area were made will not take place until the end of December.

Mr. Schultz: Okay. You made some comments earlier about some negative attributes that some of the various sites had. And one of them was permafrost and one of them was migratory birds. Now how--who are you going to talk to to make a determination about this particular area with its lack of permafrost or in areas where you think that there may be permafrost as opposed to another community that probably has permafrost, etcetera, and also, how are you going to and who are you going to talk to to make a determination about the migratory birds? I mean is it already done and just has to be typed, up or are you really going to talk to somebody.

Lt. Col. Bristol: That's what we're doing I think.

Colonel Lee: Dr. Everett would you. . . . .

Dr. Everett: We are going to talk--we have talked with and will be also talking again with refuge managers, state and local officials or biologists shall we say, and federal I left out in that list. Particularly because of the collision potential those discussions are important, so that there is initially a consensus about the possibilities or at least a consensus about how to approach a potential problem--what to do about it if it occurs, and how to stay on top of it. Would you care to handle the permafrost question?

Colonel Lee: Before we do that let me ask Dr. Maughan to explain a little bit more some of the agencies and people that we have been in contact with.

Mr. Schultz: If I may follow-up on that. So if you do talk to agencies, people that are working in the area, etcetera, locals, if those impacts they claim are going to be adverse, are you going to go farther than that to go into other records that are available in the state for the people to look at, and maybe go back a longer period of time than what a person has been in a local community? Some people may have been in a local area for 4, 5, or 6 years and they have documentation for that length of time. But over a period of 20, 30, 40 years, there may be information available. Are you going to try to seek that information or are you just going to take their statements and record them.

Dr. Everett: One of the questions about getting more information is--what is the value of getting additional information? If it turns out that the consequences of being wrong about the information in hand is not significant, than it's possible to make a decision to proceed while taking measures to protect against the worst case. If it turns out that not having that longer time series of information, the example you gave--if we knew more about the longer history, then we could make a better decision, possibly save money, possibly avoid a worst case that we can't handle. Then, obviously, that information has a good deal more value--and proceed with it, to search it out.

Mr. Schultz: (Indiscernible) . . . . .that you've outlined here for the end of November, doesn't appear to me that you're going to be able to get a tremendous amount more information than you already have. You're going to have to digest and regurgitate what you have.

Colonel Lee: Well, that's correct. There has been a lot of study already done, a lot of contact. And Dr. Maughan, would you comment a little on some of that work that we have done.

Dr. Maughan: We have searched the available literature in preparing this draft document, so there's a wealth of published--and also conversations with officials--represented in this document. So we feel we have a general feel for what the patterns are. We have also

made and will be making some site visits to look not only at whether or not the birds are there but whether or not there's appropriate habitat in the area which would attract them. So we will accomplish that, and we have, and are working with the U.S. Fish and Wildlife Service as well as the state agencies to identify those areas. And I think that we probably rely much more heavily on the historic record, the record you refer to, that might be for 20 years than what might be in the memory of somebody who's been here locally for 3 or 4 years, and we look at that in context. We look at a number of aspects. Not only whether or not the birds are there, but also what could be done to mitigate any impacts on any birds that might be in the valley. And what mitigation is possible is also considered in whether to site the facility at a particular location. In other words, even if you identify an impact, if you identify a mitigation measure that would be appropriate, that also would be considered in the decision-making process.

Lt. Col. Bristol: Yes sir. Right in the very back.

Dr. Everett: I'd like to follow-up. Not all of what Dr. Maughan said necessarily has to be done between now and the completion of the Final EIS. Some of those pieces of additional information, the consultations and decisions about what to do can come later. And as I indicated in my closing chart or slide, there is going to be additional work done in the field and in offices and as we get into more and more detail, we get beyond the time in which the EIS is going to be completed.

Colonel Lee: If there are additional facts that you feel that we should have, if there are additional references or material that upon your review of the Draft EIS you feel is missing, then please, we would ask you to include that in the comments you will send back to us by the 13th of October. Because yes, as you recognized, there isn't a lot of time between now and the end of November. The real purpose of the Final EIS is to ensure that the proceedings of the public hearings, additional questions, additional information that we can gather, are all documented in that Final EIS. It really doesn't provide an opportunity to do a lot of additional new research or documentation for the final document.

Lt. Col. Bristol: Thank you Colonel Lee. The gentlemen in the very back in the brown coat.

Mr. Doug Euers: My name is Doug Euers. I'm a 38-year resident of Tok. In the past I've seen a lot of cooperation between federal and state agencies. I've seen a lot of cooperation between private enterprise and a lot of people locally that have cooperated. I don't have any questions or comments.

Lt. Col. Bristol: Thank you sir. Okay. We're going to get right to the statements momentarily. Are there any questions now to try to clarify anything that's been pointed out either in the briefings or perhaps in other questions. But statements, I'm going to get to as soon

as we finish with the questions and we're getting into our last hour. Any other questions? Yes sir. Please . . . . .

Mr. Pride: I have . . . . .

Lt. Col. Bristol: . . . . .identify yourself for the record, please.

Mr. Pride: . . . . .a question from the conversations talks about the surface areas and the lands for these sites. And I just wonder is there's any investigations going on for the subsurface for building these antennas and that--for to keep them upright.

Lt. Col. Bristol: Yes sir.

Mr. Hanson: Up to this point there's been really no subsurface investigation, other than a general analysis of the geology and an analysis of what we know about the area. We've taken existing soil borings and geotechnical reports in the area. We've in some cases, been able to very accurately extrapolate those to predict what sort of materials we're going to encounter. We've worked closely with the state highway department, virtually everybody, that has any construction in the area. I've got as-built drawings on the LORAN. I've got state highway drawings all over my office. So we have research plus available information to determine, in a general sense, what sort of soil condition we've going to have. And right now, having had 20 years experience designing structures in Alaska, I really don't think there's any insurmountable problem.

Mr. Pride: The reason I ask the question sir was that I, in the past, personally, myself have worked on dragline in the Fairbanks area and the thing about it, when we were stringing up trees at 30 (indiscernible). That's in the Fairbanks area, so it don't sound to me like it's very stable up there. I think it's more of a (indiscernible - cough) for such a (indiscernible) antenna.

Mr. Hanson: This antenna is really not that big a structure. Your LORAN structure is what--7-800 feet and we're talking about 135. So the structure itself, is not that significant. Each one of the structural elements of the antenna will have a foundation and that foundation is not something terribly unusual or complicated.

Mr. Pride: Okay.

Lt. Col. Bristol: Yes sir. Question?

Mr. Ed Gatzke: Yeah. Ed Gatzke again. I have a question on the transmitter and tower system. If it's scanning then the whole tower has to be at one height.

Colonel Lee: That's correct. We've got six individual bands. Twelve elements per band and so each one of those different segments is used when we're transmitting on a portion of that band.

Mr. Gatzke: All right.

Colonel Lee: So we're scanning from the effective center of one of those six sub-arrays.

Mr. Gatzke: Do you have a number or an estimate of maximum power output on each one of those towers per square centimeter? You know--the maximum output, with the wattages?

Dr. Guttrich: There's approximately one megawatt that goes out and so the--at the higher frequencies the density is higher.

Mr. Gatzke: Right.

Dr. Guttrich: And--but in all cases--at the exclusion fence it would be below the one milliwatt per square centimeter.

Mr. Gatzke: Okay, for all the power itself you don't have a figure. I'm just curious what the power radiation was on the power.

Dr. Guttrich: I think you had some estimates in the EIS.

Dr. Everett: I'm not sure. Close in, because the field does funny things, it's a very approximate estimate. But it's possible--what I can suggest if you're interested in estimating a number, in one of the appendices, either A or B, the dimensions--the physical dimensions of the various bands--band positions on each array are given. Given heights and the linear dimension and the approximate one megawatt output you can get a fair guess of the average.

Mr. Gatzke: I see. Thank you.

Lt. Col. Bristol: Any other questions to clarify any points that have been made, either about the briefing or about the Draft Environmental Impact Statement. If not, then, are there any people here who'd like to make a statement. Again, just stand up at your place as long as we can hear you or you can come up to the microphone. Anything you'd like to say about this subject, anything you'd like to pass along to the Air Force. Again, the quality of the decision is directly related to the quality of your input and that's--obviously the participation here, in terms of the percentage of the residents, is just the most significant participation that we've seen so far in this trip and the quality of your input, not just in asking and getting information from the Air Force, but your telling us about what you perceive to be the anticipated impact on this environment. That's something that we very, very desperately need to be a part of this process. So if in doubt, let us hear what you have to say.

Anyone like to make a statement now? Anything at all that you'd like to convey to us? Yes sir.

Mr. David Parker: I'm David Parker and the statement I would like to make was--earlier a gentleman up here addressed the social impacts that the additional families would bring to the community. Another area of concern that I would have would be the impact on the available resources, specifically like fish, game, trapping, outdoor recreational opportunities, just (indiscernible) recreation. What are these people going to do when they come into the area other than their jobs? And that particular impact on the particular area with our dwindling resources, meaning like the birds, the migratory birds, the trapline experiences and things of this nature. I presume the people that come up here are going to be interested in these things. It's kind of normal. Let's go to Alaska, let's do these things. And I would like to see something like this taken into consideration. How, I don't know. But this should be considered.

Lt. Col. Bristol: Thank you sir. Sir?

Mr. Schultz: My name is Dick Schultz. About the social impacts on any community that's going to receive it--one of these sites. It's going to become a state problem but there's also--but the state will handle that. And there's also usually monies available from the Federal government to impact funds if a community is impacted and they can prove that the impact is having some kind of detrimental force on that community, whatever. So there is federal monies available also. I'll let it go right there.

Lt. Col. Bristol: The one in the very back, sir. You wish to make a comment?

Mr. Eagle: Yes. My name is Wayne Eagle and I'd like to make a statement that I support the construction of this facility here in Tok. And I also believe that the benefits to this community far outweigh any negative aspects that I'm aware of at this time.

Lt. Col. Bristol: Thank you sir.

Unidentified male: Here, Here.

(Loud clapping)

Lt. Col. Bristol: Any other comments? Yes, sir?

Mr. George Hunt: I'm George Hunt and I'm the power company here. And I speak on behalf of my company president that I talked to today. And we're able and prepared to supply whatever telephone and power facilities it takes to get this operational.

Lt. Col. Bristol: Thank you sir. Any other statements? Any other questions? Yes sir.

Mr. Paul Smith: My name is Paul Smith and I'm speaking of the impact on communities. And this community at one time was more or less not run by the military, but pipeline out here I'm sure you're aware of that, and I have the good fortune to work out there for a good number of years. And we had, at one time, the peak of employment, there was 57 men. There was also a large Air Force contingent in the area as well as a large road commission at that time. And there were a lot more people in Tok then they are now. And I, for one, would like to welcome this project.

Lt. Col. Bristol: Thank you sir. Is there any particular area that we haven't talked about, environmentally, that hasn't been mentioned, that you didn't see mentioned in the Draft Environmental Impact Statement, that you'd like to make sure is considered? Any aspect of it? In the very back, sir.

Mr. Mel Pulsifer: Yes, Chief Warrant Officer, Officer Pulsifer over at the Coast Guard LORAN Station. One of the areas that has not been addressed is the impact on the personnel, particularily Air Force personnel, that would be stationed here. And having been stationed in several different places around the globe, I think it would be fair to say that this is one of the nicer communities that a military person could be stationed at. Obviously, it's somewhat remote. But, in terms of the welcome you receive and the cooperation from the people living here, it's among the finest.

Lt. Col. Bristol: Thank you sir.

(Loud clapping)

Lt. Col. Bristol: Sir.

Mr. Clem Rundy (ph): I'd like to make sure that the Chamber's letter gets inserted into this part because it was actually presented during the questions.

Lt. Col. Bristol: Yes sir.

Mr. Rundy (ph): So I hope that's covered.

Lt. Col. Bristol: That will be, thank you. Any other statements that anyone would care to make. Or if there are no statements, if you've thought of another question, we can close and use any of the remaining time, if you have any questions you need answered. If they're none--then thank you again very much for your participation. Your input, as I indicated before, will be reflected in that Final EIS and will be factored into the Air Force decision-making process. Good evening, and thank you again.

3.4 Transcript, Glennallen, Alaska

The hearing at Glennallen, Alaska commenced at 7 pm, September 26, 1986.

Lt. Col. Bristol: Good evening. I'm Lieutenant Colonel Matt Bristol. I've been designated by the Air Force Judge Advocate General to be the presiding officer this evening, at what is the fourth and final of public hearings conducted here in Alaska this week on the Air Force's proposed construction and operation of the Over-the-Horizon Backscatter Radar System.

Our agenda tonight is going to be as follows. Initially, we're going to receive a briefing from Colonel Jim Lee, who's seated to my immediate left, who is the Chief of the Program Office of the Backscatter Radar System at Hanscom Air Force Base, Massachusetts. At a later point in the evening, he would be introducing a group of the members of his team who have the expertise in the various aspects of this proposal.

The proposal, itself, in terms of its environmental aspects, is described in the Draft Environmental Impact Statement which many of you perhaps have had a chance to see. Those of you who haven't--it's not too late to get a copy. In fact, as you enter, I hope this evening that you got a comment sheet from Lieutenant Gale Brown. If you didn't, we're going to have a short recess immediately following the briefing that Colonel Lee and Dr. Sid Everett, who's to Colonel Lee's immediate left, are going to jointly give. And on that comment sheet you can, in addition to giving us your name and address, you can tell us whether you want a copy of the Draft Environmental Impact Statement, whether you'd like a copy of the Final Impact Statement--to be prepared after we've had the benefit of your input and after this hearing and its transcript are reviewed--and also if you'd like to make a statement tonight, or if you'd like ask a question. So after the briefing we'll have a short recess--we'll collect the comment sheets, then we'll go into questions--that is, questions you want to ask to clarify something that the briefers may have said or not said, and or any question you might have about the Draft Environmental Impact Statement.

After the questions are over, we're going to statements. A statement can be submitted in writing via the comment sheet. It can be submitted orally, here in this public hearing, or it can be done both ways. And as you can see by the comment sheets, you don't have to submit any statement tonight in order to have your views considered in the decision-making process. Because until the 13th of October, statements are still receiveable at the office address listed on the comment sheet at Hanscom Air Force Base, Massachusetts.

Now, my function ordinarily, is as a trial judge for the Air Force. That's what I do full-time, so I'm not an expert on this proposal. I really don't know much more about it than you do. My function is to see that we have a fair hearing, that all of you who wish to speak are heard, and that you have your questions answered. So I haven't had any legal input into this. I'm not technically part of the team. I just came in on a different flight from these gentlemen and have been traveling with them this week--again, just serving as a presiding officer for the hearings.

As you can see we have recording equipment here. Laurie Eller from near Anchorage is our court reporter. Everything we say is going to be taken down verbatim. It'll be made into a transcript, just like sort of a trial transcript. I'll review the transcript. The transcript will be incorporated into the final decision-making process.

Now this is an informal hearing. So, anyone that wants to speak, when we get to the timeframe that -- during which you have -- come on in, sir -- questions or statements, I don't want anyone to hesitate to speak for fear that they might be asking a stupid question or whatever. There are no stupid questions. All questions are fair and the main thing is to get this clarified in your mind.

It's a two-way communication. The first side of it is Colonel Lee and Dr. Everett presenting the information to you. The second part of it is you--who know more than anyone else about your own local area and the various environmental aspects of it that could be impacted by this proposal--for you to convey information to this team. Again, so it can be made a matter of record, so that these matters can be taken into appropriate account in the Air Force decision-making process which Colonel Lee will touch on a little bit more in more detail in a moment.

We basically have until 10 o'clock. I will let the questions go, depending on how many people indicate they want to make a statement. I'll let the questions go for as long as we can ensure that everyone who wishes to make a statement has the time to do so. But, again, the main thing is to give everybody an equal opportunity to be heard during the course of this hearing.

With respect to the statements, the normal time limits that we follow--if someone is a public official, the statement is 5 minutes of maximum duration. If someone is a official representing a private association and they are the spokesperson, more or less, for that association, they also have a 5-minute time limit. If someone is speaking just in their individual capacity, they have a 3-minute time limit. Again, depending on how many people indicate that they wish to ask questions, we'll divide up the time that we have. But the main thing is to try to manage that time so that everyone who cares to can be heard.

Without further delays or lawyer explanations, I'm going to introduce the chief of the team, Colonel Jim Lee.

Colonel Lee: I'm pleased to be back in Glennallen for a very key milestone in this process involved with the proposed Alaskan Over-the-Horizon, or OTH, as I'll refer to it during the rest of the briefing.

This is a major program for the Department of Defense and for the Air Force. We are conducting these public hearings in the state of Alaska, as Colonel Bristol mentioned, to ensure that we have gotten the information over to you, and that you've had a chance to respond back to us.

The process that we're going through consists of these steps. Following the publication of our Air Force Notice of Intent to proceed with the proposed construction and deployment of the Alaskan Radar System, we were out in the area to conduct a series of scoping meetings. The input that we received from you as a result of those meetings--and follow-up discussions, some phone calls, visits to the area--were all used in preparing the Draft Environmental Impact Statement that was sent out last month. Of course, we're here tonight in the last of the four public hearings. The information that you have given us, some follow-up answers that we may have to provide in the document, as well as responding to some of your comments, will all be used then in preparing that Final Environmental Impact Statement. That document will be issued by the Department of the Air Force the end of November. Following a minimum 30-day waiting period, the Air Force will then be able to make it's Record of Decision--the selection of a study area for the transmit site and the receive site for the Alaskan Radar System.

The Alaskan System is one of four OTH systems that provide a complete surveillance area around the continental United States. The only place where the OTH type of system does not work is looking directly north into the aurora, and for that reason we've continued to rely upon the Seek Igloo radar system and the upgrade of the Distant Early Warning -- the DEW line, which is now called North Warning System.

The OTH system allows us, from a single site, to detect and track aircraft as far as 1,800 nautical miles away from the coast. So for this location--if Glennallen is selected as a receive site--some 1,800 nautical miles away we will be able to begin our tracking surveillance, and be able to detect any aircraft that would be flying towards the continent of the United States.

We don't have that type of capability now. There is a series of coastal radars. They're very similar to the line-of-sight radars across the northern part of the continent. They're limited in range to a few hundred miles. If you translate that into warning time for an aircraft flying towards the continent, you can see that much above about a half

and hour you really don't have warning. The OTH system, on the other hand, with its 1,800 nautical miles, will translate that into about 3 hours of warning time for an aircraft to be approaching the Alaskan coastline.

This is significant for this kind of reason--this is an artist's concept of the Soviet's newest aircraft, the Blackjack. But more than an artist's concept, this aircraft is in flight test now in the Soviet Union. And if they continue on their current schedule, this aircraft will be operational by the beginning of the next decade.

In addition to that new aircraft, of course, the Soviets are continuing with their older model Bear aircraft and with some really improved, modified Bear aircraft similar to this Bear H which is shown in the photograph. You may recognize from the AK on the tail of that F-15 that--this is one of Alaskan Air Command's F-15s that on a regular basis is sent up to intercept and to follow these Soviet aircraft as they pass along the coastline. With the OTH system we will be able to detect this kind of movement, literally hours ahead of when we now can. So the Alaskan system is extremely important in providing this entire coastal network.

The East Coast System is already completely funded, authorized by Congress, and we're currently testing in the first sector of that East Coast System. That's the same location where we operated an Experimental Radar System from 1980-81. We verified that this kind of a system could indeed detect and track aircraft up to this maximum range.

The West Coast System has also been approved and Congress has already provided the funds for the first sector. And the funds for the remaining two sectors are currently in the '87 President's budget that Congress is now debating.

Construction at the Operations Center has already started, and we should be awarding the contract for the main construction activity in this first sector in the next few weeks. The remaining two systems are the proposed systems that we are carrying through this environmental impact analysis process.

But I'd like now to move you to some actual pictures of the hardware that you might expect to see if Glennallen were selected as either a transmit or a receive site.

We end up with two separate locations, anywhere from 50 to 150 miles apart. The transmit antenna sends that energy out--the return energy is picked up at the receive site. In the case of the Alaskan system, you would need two antennas at the transmit site--two antennas at the receive site.

This is a picture of the antenna--one of the sectors for the East Coast radar system. This location is just outside of Moscow, Maine. The antenna is approximately 4,000 feet long. At it's tallest point it's 135 feet tall--at the lowest, 35 feet. This antenna--depending on the selected beam that we transmit on, the selected sub-array of this entire antenna--operates in the 5 to 28 megahertz frequency range.

This is another shot of that same antenna after the vegetation had grown back in. In front of the antenna itself, there is a groundscreen that extends out about 750 feet in front of the antenna and runs the entire length. That groundscreen is just laid out as a mesh on top of the level ground. In the case of the Alaskan areas that we're looking at, there would be no need--other than perhaps cutting down some of, or taking down some of the trees, to ensure we had clear visibility out in front of the antenna--that there would be no need to do anything else to the area.

I also call your attention to this fence that will surround the entire transmit site. This is both to keep animals from getting in and doing damage to the antennas, and it's also to ensure that no one could get inside this area where they might be likely to receive a higher level of radiofrequency energy, or RFR, that we have determined to be harmful on a very long-term basis. So outside of this fenced area there should be no harmful effects at all. Dr. Everett will address this particular impact more in his presentation.

At the receive site we have a different kind of antenna. The antenna elements that are shown here--they're about 19 feet tall. The backscreen runs 65 feet tall and has, supporting it, a mesh. This mesh acts as a backscreen, similar to, again, the groundscreen that's in front of that. The purpose there is to focus and concentrate that radio energy.

The length of the receive antenna for the East Coast System is about 5,000 feet long. To get better detection capability, better system sensitivity, the antenna length has been increased to 8,000 feet for the West Coast, Central, and proposed Alaskan Radar System.

The signal information from the receive antennas is sent to the operations center by way of these radio links. Inside the operations center, that signal information is processed by computers. It shows up on displays such as this. Against the geographic plot of the particular area being scanned, the computer system will automatically place a mark and continue that track as an aircraft is identified and tracked. It'll further compare that information to known flight plan information or pilot position reports, and be able to identify and change color code to note that that's a known, established aircraft, whether commercial aircraft or some other aircraft that we know of. The other information or tracks that we cannot identify can then be provided to the Region Operations Control Center at Elmendorf--and then for tasking of our Alaskan's Air Command's F-15s--at a much greater time beyond what we currently have.

For this entire system to provide the needed coverage, we need to locate the transmit and receive antenna at a particular place. We need it, in the case of the Alaskan System, to ensure that the coverage would extend down to where the West Coast coverage was overlaid. Further, we wanted to make sure that our maximum range covered well beyond the Aleutian chain and that we also had coverage toward the North.

Looking in more detail at that coverage then--if we want to provide the coverage over the coastline, we need to concentrate on an area in the southeast part of Alaska for locating the transmit and receive antennas. That area is highlighted here and was the beginning of our study for alternative candidate site areas.

There were a number of criteria that we used to narrow in on specific locations. First of all, to ensure that we would be able to--at a reasonable cost, construct the antenna systems--to be able to provide the communications and the access to the areas, we excluded all those areas that were more than about 10 miles either side of the main highway structure. Beyond that, the next criterion was to look towards the west in that area that we would scan. And we needed to ensure that there were no terrain obstacles more than 3 degrees all the way out as far as the system would be able to look, down to about 1 degree in closer distance from the antenna. As a result, all of these cross-hatch areas are not acceptable then for possible locations.

Within the rest of the territory then, we looked at additional factors, such as the availability of land that could support and locate these large antennas, given the particular terrain features that we have--streams, rivers, and such things as that. The net result--were five study areas as shown here: Glennallen, Gulkana, Indian Creek, Tok, and Paxson. Recalling that earlier I said that the transmit and receive sites need to be between 50 and 150 miles apart, the combination between Paxson and Indian Creek is too close--so that particular pairing would not work. But Tok could be paired with Indian Creek, Gulkana, or Glennallen. Glennallen could be paired with any of these sites except for Gulkana. So these particular combinations were identified in the Draft Environmental Impact Statement. And as a final result of this process, one of the study areas will be selected for the transmit antenna and one for the receive antenna. . . Please just come across. . .

For a site to be selected as a transmit site then, two antenna sectors such as illustrated here would be constructed. We see the 5,000 feet area for the antenna and the sounder at the end of it. This transmit antenna itself is about 4,000 feet long. The entire area for the antenna, its ground screen and the exclusion fence is about one mile square, about 650 acres. So a total requirement of about 1,300 acres for the antenna sectors themselves, and then whatever additional land would be required for access roads and--if it's required at some sites, a living facility were built--then we need some additional acreage for that.

In looking at the receive antenna, the land requirements here are a sector about 10,000 feet long by about 2,600 feet deep, a total of about 600 acres. So again, if Glennallen were selected as the receive site we would be looking at a total requirement of about 1,200 acres.

As I mentioned, the process that we have been carrying through is intended to pick two of these study areas then--one for the transmit, one for the receive site. When that selection is made at the end of December, we would then do further environmental work to determine exactly where within the study area we should best locate the individual antennas. And we will do a more detailed environmental assessment to ensure that the concerns and the mitigations that we have identified in our Environmental Impact Statement are consistent. If there's new information that's found, we need to make sure that's properly handled. And most important, where there are environmental impacts, to ensure that we have done the most we can to mitigate against those impacts.

I'd now like to introduce Dr. Everett to brief you on the major environmental concerns.

Dr. Everett: [Refer to briefing slides, Section 3.5, p. 3-133] Good evening. I supervised the preparation of that Draft EIS which I know some of you have seen. It's sizeable. Tonight I'm going to touch on just a few parts of it, a few subjects. These were all the topics that were covered in the document. As I say, I'll touch on a few.

One of the issues is the source of fill and cover material for the site when it is constructed. The requirements for a site in each of the study areas vary, depending on the nature of the soil itself, its susceptibility to erosion, the availability in the immediate area. So the impacts are seen as varying from study area to study area as well.

The Air Force intends to examine the material sources in the area at the time the sites are being selected--develop new sources if necessary, and in the course of using existing or developing new sources, comply with the regulations and do appropriate reclamation after the source is tapped.

Another important issue is permafrost, of course. It's the new -- a new feature in terms of construction of OTH. Permafrost doesn't exist in the Lower 48. We know that all the areas have some permafrost, and of course it's possible that there would be some changes due to alterations in the thermal regime. So the Air Force's intention is, in the course of selecting sites, to determine the extent and nature of the permafrost and design its construction accordingly--its buildings, the manner in which it does the construction.

Vegetation can be lost either by directly clearing it or by interrupting its normal growth and evolution. About 1,300 acres would be required for a transmit site--about 1,200 for the receive site, speaking only of the areas that would be enclosed. The 3,000 acres, then, is the sum of those two figures plus more miscellaneous acreage

accounted for by buildings and roads. We're not aware of any special species or communities of species in the areas. Some local effects we feel are possible, depending on the specific sites. But in general, the amount of land that's involved is not large compared to the total acreage of the same type of vegetation in any of the regions. As much as possible, the Air Force is intending to avoid sensitive lands. And in the process of selecting sites and developing them, we'll confer with agencies such as the Fish and Wildlife Service and other knowledgeable state and federal agencies that can contribute to this selection process.

Wildlife can be affected in a number of ways. I'm going to return to the first item, bird collision. Aquatic habitat alteration refers to the possibility of directly disturbing a stream by crossing it or building in it, or by allowing materials to run off in the course of erosion into the stream and damaging a fishery in that fashion. We feel that with good planning and design and good construction practices--housekeeping if you will--that that will be a minor problem. Humans when they're doing just about anything can disturb wildlife due to noise in general, activity and commotion. Some measures can be taken there such as maintaining a buffer zone around known sensitive habitats for species.

Having a structure that's 4 or 8,000 feet long, enclosed -- enclosing perhaps 600-650 acres can clearly alter migration patterns, if there should be large mammals moving through the area. We feel that on a year to year basis there could be some variations--difficult to trace exactly to the presence of this fence, if you will, this installation. We're not expecting there would be any effects on the animals' numbers or their ability to reproduce. So, overall, in the long run, we see--we don't see significant effects.

The final item refers to additional hunting pressure or perhaps the possibility of additional collisions on highways due to additional traffic. However, there is not much in the way of additional traffic associated with the construction and operation of this system. And we see, therefore, little or no effect there. And we expect that the hunting pressure would be controlled in the same fashion as it is now for the existing population.

This structure is sizeable. It's long--between 35 and 135 feet tall when we're considering the transmit site. It is--though big--not particularly bulky. In fact, very airy one might say, and therefore not as easy to see as if you were looking at the side of a large building of the same dimensions. That makes it difficult, not only for the human eye, but we presume for birds to see. That, plus the possibilities of poor lighting or poor weather--the fact that there're some birds in the area that are large, not very agile fliers, especially during take-offs and landings--leads to the possibility of significant potential for bird collisions with this structure. There's a very high potential at Glennallen, as I'm sure most of you are aware, because of the swans in the area and other birds. The Air Force will be avoiding the high bird use areas if at all possible, and will investigate the manners -- the

various techniques for increasing the visibility of the structure to the birds and also the possibility of creating diversions for bird flight using natural materials -- well exactly trees I guess, trying to reduce the less visible portions of the structure.

The next few slides talk about population and economic changes that might be expected. At a transmit site, approximately 70 people would be employed. The number of dependants that might be associated with this 70, this number of 70--is difficult to predict. It's going to depend on the hiring practices of the contractors working on the job. It's going to depend on work schedules, transportations -- transportation plans, and of course, whether the Air Force encourages or discourages families coming into the area. Nevertheless, we made some reasonable assumptions about dependents, and when doing that we determined that the population changes would be in the percentage ranges shown on this slide--say 3 to 12% in this area.

Something to point out about the areas that were shown on the map earlier is that if one site, say transmit site, is at Tok, the other one will be in the Copper River Basin. But it's also possible for both the transmit site and the receive site to be in the Copper River Basin if you include the Paxson East site in that definition. Under those circumstances the effect, although, would be in the higher range--the high part of the range of 3 to 12%--and when they're in different valleys, of course, the lower.

Construction employment over the period of time that will be required to build either the transmit or the receive site, say 4 years, would probably average about 100 people--perhaps peaking at 200 during the summers. This would imply a change of say 7 to 15% in this area in employment--in jobs. The operational employment number I mentioned before, 70, represents about 5% in this valley. The difference, of course, being directly related to the number of people employed.

The last item--the last point there refers to the prospect of a community capturing jobs as a result of the jobs created by direct employment. If there were 70 people employed at a transmit site, there is a chance that a surrounding community would find that some additional jobs are created in the community to serve the 70 employed directly at the site. In this case, the communities in the areas in which the transmit and receive sites may be built are rather small and limited in their ability to serve these people directly employed. We're not expecting, therefore, a large multiplier -- that is to say we're not expecting a lot of secondary jobs to be created. That will vary from place to place within the Copper River valley, as I'm sure you can guess. Glennallen would probably be able to capture more than the Gulkana area or the Paxson East area, and Tok would have a little different prospect as well.

We feel that subsistence would possibly be affected in the ways shown there--direct loss of the habitat favored by animals that are used by, used for subsistence purposes or perhaps changes in the ability to get to the areas of use--with more people in the area the prospect of greater competition is there--and finally the wildlife migration pattern changes, as I mentioned. But--as with wildlife migration--thought to be rather small. Additional competition, we think, is controllable, and access changes will be prevented if at all possible. In any case, a little more study is going to be required as the specific sites are narrowed down.

The structure is large, as I said, in connection with bird collisions. So the prospect of it being highly visible to the human eye is important. Whether the effect on your landscape is significant or not depends, of course, on how you think of your landscape--but also on how distinctive that particular part of it is--how visible the structure might be from a road or a viewpoint, and whether there are buildings or other structures or modifications that humans have already introduced.

Generally speaking, we're expecting that the transmit or receive site would be built some distance off the highway and unlikely to be seen from a highway except at a point that is elevated with respect to the site. Clearly, anyone that is flying in the area would be able to pick out a clearing of 600 acres.

To minimize the effects, the Air Force will be trying to select sites distant from the highway, will consider screening at the site to reduce it's visibility, perhaps screening on a highway if that is a problem from the point of view of aesthetics. Finally, there are several techniques to use to minimize the contrast of the site with its surroundings even if it is visible. And they range, of course, from choice of paints to a little cleverness in making the clearing so that it is not a clean, crisp line of clearing.

In all the areas that we examined, relatively little was known about what may exist in the way of prehistoric or historic relics. Therefore, it was the opinion of some, including ourselves, that there is a pretty good chance of encountering such cultural resources. There's little to be done in advance of that because of the absence of information. So the strategy that the Air Force must adopt is to develop a plan beforehand in conjunction with state and federal officials, have that instruction given to its construction crews, and then follow through with the discovery of any, evaluate them with the help of the federal and state authorities--and agree on plans to recover them, or extract the data, or determine that they are not significant in terms of the local history.

The next slides deal with the possibility that the radio energy emitted by this device may affect electronic systems or human health or present hazards of some other type. This radar, as Colonel Lee mentioned, operates in the high frequency band between 5 and 28 megahertz. Amaeteur radio and citizen's band radio and large international broadcasting stations such as the Voice of America also operate in the high frequency band.

The radar, in theory, could interfere with devices--other users--within that band of 5 to 28 megahertz, or perhaps in immediately adjacent bands, and finally with frequencies that are multiples of the range of 5 to 28--harmonic frequencies. The last category includes things such as TV and certain mobile radios and navigation beacons.

The fact is that the signal from the radar is a rather high quality one. Most of the energy is concentrated in the beam that points in the direction that the radar is trying to look in. Very little is passing into the atmosphere around it, or behind it. It is also highly concentrated in the frequency or the narrow band of frequencies that it wants to be operating on and not very much energy at all appears in frequencies above or below it. That goes a long way right there towards minimizing the possibilities of interference.

In that high frequency band, 5 to 28 megahertz, there are a number of--there are a number of frequencies allocated or assigned to other users. They can be search and rescue frequency users--and allocations such as that will be automatically avoided by the radar during its operation. There is an operating plan--and the computer will be programmed--and the operators will be instructed to avoid those frequencies. It will also stand back some frequency distance from frequencies used by other users in order to minimize the possibility of interfering with the immediately adjacent users.

Perhaps the most important feature of the plan, however, is that, since this radar doesn't care to have interference from other users of the spectrum, it will be listening across the bands on which it could operate and determining which frequencies are not being used before it starts operating on those frequencies. And that should greatly reduce the prospect of interference with other people using these bands.

And finally, for devices such as the navigation beacons, the relationship to the radar is one of--the multiples of the frequency. If it's determined that there might be, or is demonstrated that there is, an interference problem with a device such as a navigation beacon operating in a specific frequency, then the radar can be programmed to avoid operating at the so-called subharmonic frequency.

The final point about interference possibilities is that the Experimental Radar System--operated in Maine during its testing--did not have any instances of interference attributed to its operation during that period.

A radar, in principle, can present hazards to users of cardiac pacemakers or people that were handling fuel--and there'd be no hazard presented by this radar to either of that--either of those classes of people.

It's a little different story with electroexplosive devices, which include electric blasting caps. For these, the safe separation distance is 1,300 feet if they're being simply transported in metal containers. The 1,300 feet is well within the exclusion fence distance of the transmit site. And, of course, in the case of a receive site, no energy is being transmitted, so there is no issue whatsoever about either interference or hazards. If the EEDs are being carried in non-metal containers, or they're being handled in anticipation of use, then you can see that a few more miles are required to guarantee a safe distance -- safe use. That situation has to be handled by posting in the immediate area and notifying residents and authorities of the area.

The last key issue is human health. Now the radar, as I say, is very similar to a large radio station. The exclusion fence is going to be placed so that the exposure--the amount of energy in the air outside the exclusion fence--is below, which is to say, meets the applicable standards, the ANSI or the American National Standards Institute guidelines on exposure to this kind of nonionizing radiation. Further, we have independently looked at the literature on biological effects on animals and humans in a critical fashion. I must say, and it indicates --the literature indicates that there is no evidence to indicate that there would be a harm--harm to anyone who is exposed to the kind of radio energy that would exist outside the exclusion fence.

To summarize, some significant biological impacts are possible such as bird collisions. But whether they occur and how severe they are depends a lot on the specific sites. And of course there is a good prospect for minimizing these effects with a variety of measures. Because of the relatively small populations in the areas where the transmit and receive sites would be built, there will be significant, largely positive, effects on the economy of the area. And finally, as Colonel Lee said earlier, in the process of narrowing down to specifc study areas and then later specific sites for construction of the transmit and receive antennas, some additional work is going to be done researching environmental and other issues that relate to construction and operation, and to document--reporting this additional information--and any additional findings will also be prepared.

Colonel Lee: To summarize, these again are the same key milestones that I identified in the beginning of the session. As we conclude this evening we'll be finished with about two-thirds of that process--with the final events being publishing the Environmental Impact Statement the end of November and then establishing the Record of Decision. The decision will be made by the Office of the Secretary of the Air Force, having gone through and had all the requirements of this environmental impact analysis process. And again, the result of that will be to

select one of these areas. We had our first formal hearing in Anchorage. We then went to Fairbanks--and this was to ensure that all of the appropriate federal and state agencies as well as interested community members from those areas had a chance to participate in the hearings. We then went to Tok where we had our public hearing last night--concluding here in Glennallen to ensure that within this area we can again have the opinions expressed from those people that would be potentially most affected by a decision to select Indian Creek, Gulkana, or Glennallen as a study area for either the transmit or receive antenna.

When that process is complete, the Department of Defense will be able to request funding beginning for 1988. That budget request will go over to Congress the first part of the year. So under that timetable the earliest any activity would begin would be sometime about the middle of 1988 with establishing some access roads, sort of a base camp--to start the major construction a year later. So that activity would begin 1989 and would carry 3 or 4 years, depending on how Congress authorized and appropriated the funds.

As I mentioned, the Alaskan OTH system is a very high priority program. It's the necessary final link in establishing this complete surveillance system. The objective of the surveillance system is increased warning time--early detection and tracking. That additional time is intended to give our decision-makers, our national command authority, additional time to consider the alternatives available to them. It's also additional time to provide warning--alerting the civilian populations and also to increase the alert status of our forces--so that if an attack is indeed progressing against the United States, we have adequate time to respond.

Thank you very much. This concludes our presentation.

Lt. Col. Bristol: Ladies and gentlemen--some of you arrived after the preliminary remarks, but just for the benefit of everyone--we're going to take a recess now for about seven minutes. And after that we're going to have a question period designed for each and all of you--if you'd like to ask questions of Colonel Lee, perhaps to clarify any points that he might have made in the briefing, to clarify a matter that you might have noted when you read the Draft Environmental Impact Statement. If you wish to make comments--you wish to make a statement--hold that off until after the questions so that we'll get all the points clarified, and then you can take those into consideration as well in making any comments.

As I indicated before, we have the comment sheets. Fill these out now if you haven't done so. You don't need to write your question down or write your comment down. Just check the block here if you want to ask a question, here if you wish to make oral comments, if you wish to make a written statement--the particular area, air quality, biological

impacts, public services and facilities to which your concern, question, or comment might relate--and hand those in to Lieutenant Brown at the door or to myself during the recess. We'll review those and start out with the questions.

Now, so that everyone's identification will be a matter of record--what I'm going to do is move this podium sort of down this way, with the microphone. The microphone of course is linked to our court reporter's system. We don't have any other type of PA that's working tonight. When you want to ask a question, raise your hand. I'll identify you and then, it may be a little inconvenient depending on where you're located, but work your way down here to the front--ask the question using this microphone system. First of all, tell us your name. If it's something that you don't think I can spell--I'm not a very good speller--spell it for us so that we'll have it correctly reflected in the record. Also your address or, if you're representing an organization, the organization you're representing--and then ask the question. Colonel Lee will either answer it or--and he'll be introducing right after the recess the other members of his team--he might refer it to one of them.

We might not be able to answer all of your questions. Hopefully we can, but it's not the end of the process tonight--as previously mentioned. Every question that's asked will be answered in full, and that will be part of the transcript of this hearing. And that in turn will be part of the Air Force decision-making process on the schedule that Colonel Lee described.

So, I have about 7:48. It's possible someone else has better time, but when my watch says--let's see, 7:48--let's come back at about 5 minutes 'til 8 o'clock, and we'll resume with the questions. Thank you very much.

Lt. Col Bristol: [After recess] Before we start with the questions, I'm going to ask Colonel Lee to introduce the members of his panel. You cannot hear me? Okay, well this obviously isn't a microphone, but it's getting into the court reporter's system so I'll try to project a little bit louder. Before we start with the questions, I'm going to ask Colonel Lee to introduce the members of his panel, that is, the people that have come from various places in the United States and who are prepared to speak to the merits--the facts about this proposal. Colonel Lee.

Colonel Lee: Thank you. You've already had Dr. Everett introduced to you. Dr. Everett is from SRI International. They have been under contract to the Air Force to assist us in the actual work and preparation of the Environmental Impact Statement documents. The firm, SRI, has also been involved in working with the Air Force for the last 10 or more years in this Over-the-Horizon radar technology, so they've got a lot of experience in the system and the kind of effects that result from it.

To my left is Dr. Gordon Guttrich. Dr. Guttrich is an Associate Department Head from the Mitre Corporation. They are our system engineers for the Air Force on the OTH program. Dr. Guttrich and his people are located in the same building as I have my program office and provide the day-to-day engineering support. Dr. Guttrich has been working with the OTH program himself for over 10 years, and was associated with the Experimental Radar System, and actually spent time up on the site during the testing activity.

Continuing on to the left, Dr. Jamie Maughan is an environmental scientist from the firm Metcalf and Eddy. They are under contract to the Air Force to assist us in this process, and also to provide subcontractor facilities support as we go through the construction phase of the program.

Going back over to my right, I'd like to introduce Mr. Ernie Woods. Mr. Woods is Chief of the Real Estate Division, the Corps of Engineers, at Anchorage. When we get into the actual land acquisition process, the responsibility for that is given to the Corps of Engineers--so Mr. Woods' people would be the ones that would be responsible and would be carrying out that activity.

And then finally, on the end, is Mr. Bill Hanson, civil engineer. He is the Director of Engineering at the Alaskan Air Command in Anchorage.

Lt. Col. Bristol: Thank you Colonel Lee. Instead of having everyone come down to the podium as I previously mentioned, as you can see we have the podium on this side so the people to my left, to your right. And then we have Captain Morris, who is the Public Affairs Officer at the 21st Air Force [correction: Captain Morris is with Headquarters, Alaskan Air Command] who has another microphone, and he'll be in a position to pass that to individuals who are on this particular side of the group. And so that everyone can hear your question as well as to get it on the record, speak up as clearly and loudly as you can--beginning with your name and address or the organization which you represent--and then pose the question. Can everyone hear me over there now? Okay. Who'd like to ask the first question? Yes sir.

Mr. Bob Niebrugge: I noticed that the transmit site has significant electrical power, and I'd wonder what your plan is for acquiring the electrical power and how locally it might be -- might be helpful to get it locally and how significant that'll be in your final site selection?

Lt. Col. Bristol: Could you state your name and address sir, for the record?

Mr. Niebrugge: Bob Niebrugge. Post Office Box 365, Glennallen.

Unidentified voice (male): Speak up!

Unidentified voice (male): It's not coming over the PA.

Unidentified voice (male): Would you repeat the question?

Lt. Col. Bristol: We don't have a PA as far as I can tell, or do we? I think that we just -- Okay, the question -- Colonel Lee could you just repeat the question. . . . .

Colonel Lee: Yes.

Lt. Col. Bristol: . . . . .I think we heard -- we have the name and address already for the record and that's. . . . .

Colonel Lee: The question really asks about the amount of power, recognizing that the transmit site would require a large amount of power. And would that be provided locally--or what would be the plans for that? The total power requirement for the transmit site would be about 10 megawatts. For a receive site that power requirement would be about 2 megawatts. I'm going to have Mr. Hanson explain a little bit of the process that we're going through and how that would be handled. But just let me clarify--when I say 10 megawatts for the transmit site, that's the total electrical power required, including the heat, the actual operation of the system. But the radio power, the power that's sent out from the antennas, is only about 1 megawatt for each of the two antennas. Mr. Hanson?

Mr. Hanson: We're going to follow two parallel tracks on that position of power. The first half will be to develop a Request for Proposals which will be put out to the industries. And it'll be a competitive process in which the most competitive person that responds to that Request for Proposals will then be compared to the other parallel track--which is the construction and operation of a government power plant. And the decision as to whether to proceed with a commercial contract or with government power plant will be based upon the economics of the situation. For your information, the public notice that the potential exists, or a Request for Proposals is forthcoming is already out in the construction media. And what we're going to do on the commercial activity is solicit comments from the industry for a period of a month or two, and we're going to put out a draft Request for Proposals to do that. So sometime, I expect the middle of October, the draft Request for Proposals will be available. We expect people that are interested in supplying this power to get ahold of that document, and review it--comment upon it. Then we'll take it, tailor it, revise it, change it as necessary, and then formally put it out as a Request for Proposals.

Lt. Col. Bristol: We're going to see if we can get a PA system here going in a second. I think it'll be a lot easier, so bear with me for just one second and we'll see if we can get this set up. This is either going to blow up or it's going to work.

(Laughter)

Lt. Col. Bristol: This might get music which you like or don't like.

Unidentified voice (male): How are we going to make the Backscatter to work if we can't get the PA system to work?

(Laughter)

Colonel Lee: One of the things is that--you don't have the judges work the PA system.

(Laughter)

Capt. Carol Randall: Test, 1, 2.

Unidentified voices: There we go. How 'bout that. All right.

Colonel Lee: I take back what I said.

(Laughter)

Lt. Col. Bristol: Okay, turn it on then. All right--what we're going to do is pass this around. And who'd like to ask the second question? Those whom I recognize -- yes sir in the back -- come on down. I feel like Monty Hall. . . . .

(Laughter)

Mr. Sheldon Sprecker: As one judge to another, that's all right. I'm Sheldon Sprecker. I'm the local judge here and I have three questions that I'd like to raise from each different organization I represent--if that's time-wise permitted. Number one, as a landowner and resident here, I have a biological question. Dr. Everett, what is the -- who has provided you the information for the swans, fish study, and things that are currently in the EIS? Where did that information come from? Some of that information is not really accurate. And if it's not based on some of our local biologists, you have perhaps a better hand or better handle on it. I'm wondering if you might have some erroneous information in some of things. There are fish listed in there that don't exist in the Copper Basin and there are swan habitat in the Glennallen area that--it's really farther away than what is shown on your map. So I just was wondering where you got that information.

Dr. Everett: You going to help me with that? You want it -- you want to take that Jim? I'll take 'er.

Dr. Maughan: I'll take it.

Dr. Everett: Do you want to start?

Dr. Maughan: The information sources are listed there for the various tables. And you're right--they, for the most part, cover a broader area than the specific study area that we're talking about. We wanted to have an inclusive list rather than narrow it down. After specific study areas are selected and we do more environmental work, then we will narrow down those lists to those found exactly within the sites of concern.

Colonel Lee: If I may add to that though--in that regard, if there is specific information that's available right here within the local area, sources that you'd recommend that we have not identified there, we'd appreciate your putting them down on a comment sheet so we have that information available, too.

Mr. Sprecker: The other question, in reference to services or public facilities--I'm also the fire chief here in Glennallen. What would be the needs of the sites in particular for public safety, as far as fire protection, and then also in the line of the court system, impact upon, during construction and that type thing. I went through the pipeline. I don't anticipate this project quite that size, but I'm sure they'll be some impact as far as needs in that area. Could you address that subject?

Colonel Lee: Bill, could you. . . . .

Mr. Hanson: As far as fire protection, it would be our intent to completely sprinkler all the buildings, so no structural fire protection would be required. Now, as far as site specific requirements, there may be some sites in which a forest fire or wildfire potential exists. And actually we haven't got to the details of determining that that would be required. I can imagine some sites where we'd want to put some sort of a structural fire or a capability to respond to a brush fire or whatever. What was the other part again?

Mr. Sprecker: As far as the court system is concerned, impact as far as work crews and that type thing coming in. The court system is usually about 3 years behind everybody else in preparing for extra duties.

Mr. Hanson: Well, I really can't respond to that. I have not a clue on how we would or could respond to something like that other than by keeping the people in the state informed of what's going on. Any better than that. . . . .

Colonel Lee: During the construction activity, of course, it would be a contractor. The main construction for the transmit or receive antennas would be handled by a company--either such as General Electric, who has had the contract for the East Coast and will have for the West Coast System, or Raytheon--someone like that. But coming into the area,

we would expect that they would, as much as possible, use local companies. So we would have, in that sense, a civilian workforce. To the extent they broke laws here locally, then they would be subject to your jurisdiction. Once the system was operational, the personnel at the sites would be--approximately half for contractor-hired maintenance people. So again, they would come under whatever established jurisdiction that you had. The other half, little bit less than a half, would be site security personnel. And following the example that we have used on the East Coast and plan to for the West Coast System, those would be federal wage-grade civil servants. So those people would be government workers, so there may be some difference in how that's handled. But again, that period of operation would not be for quite a few years. There's a lot of time for us to work out the procedures and agreements between the different jurisdictions and responsibilities.

Was there a third question?

Mr. Sprecker: Those two were. . . . .

Colonel Lee: Okay, thank you.

Lt. Col. Bristol: Who'd like to be next? Sir?

Mr. Roy Ewan: Good to see you again Colonel Lee and the rest of you. I'm Roy Ewan, President of Ahtna, Inc. I'm more interested in long-term positive impact, because of this possibility of having either the receiver or the transmit sites located in Glennallen or Gulkana or the other Copper River Basin area. My question is--is there any possibility of any training that could be begun now to qualify for some of the technical jobs that will be available because of this system? 11

Colonel Lee: That's a question that we've had raised several times, primarily up here in the Alaskan Radar System, more so than we've had for the Central Radar System--I just completed the public hearings for that system a couple of weeks ago.

The first key point is that we have several years to consider, and see, if there is a workable solution to provide that kind of training. In the case of the maintenance personnel, you would like to have people with some technical background--but the kind that perhaps could be provided either by trade school, by a special training program, or by some time spent in the military service in the maintenance work. Given that the main construction activity on the sites would not begin until about '89 and the system would not be finished and have personnel required until '91 or '92, we have time to see whether we can establish a process for the prime contractor to set up such a program. We can envision situations where it would be to his advantage, and cheaper, to be able to use some of those people rather than paying dislocation or moving costs to take some of these trained people down in New York or in Massachusetts where those two companies are located. So we will take

11 that as a point of interest and examine it further, and discuss with the prime contractor what arrangements we could make to see if this would be possible.

Lt. Col. Bristol: I think I saw a hand down this side on the left up toward the back. Is there somewhere there that had a question? There we go -- this gentlemen here.

Mr. Stan Brown: Stan Brown, Box 42, Glennallen, Alaska. Colonel Lee, I had a question on the radiation of the systems. You mentioned or somebody mentioned a little bit about radiation--if you were too close or riding by. Could you accent on that?

Colonel Lee: Certainly. I'm going to ask Dr. Everett to comment on that further.

Dr. Everett: First, the hazard exists only for the transmit system, not the receiver. Because only the transmitter is releasing radio energy. Second, the area of hazard is within the exclusion fence that would be constructed around the transmitter. The fields close in --the energy, the amount of energy in the air close in to the antennas--would be hazardous to a human if they spent any length of time in there. But as you move away from the antennas out towards the exclusion fence, the amount of energy that you would be absorbing falls. It's a function of the distance. So, by the time you got to the exclusion fence, in fact, before you got to the exclusion fence, you undoubtedly would pass through the level at which the standard has been set to protect humans from the absorption of this energy. So finally when you're outside the antenna--outside the exclusion fence--you would be definitely safe from even long-term chronic types of effects.

Mr. Brown: So there is no buffer zone there. In other words. . . . .

Dr. Everett: Beyond the exclusion fence.

Mr. Brown: . . . . .we can hunt up to the fence?

Dr. Everett: Sure, unless there's any other reason. . . . .

Colonel Lee: No. That's correct.

Dr. Everett: No, there's no risk there. Don't hunt with electric blasting caps though.

(Laughter)

Mr. Brown: I have one more question. You mentioned that if--the radar system tracks airplanes. What about missiles?

Colonel Lee: It is strictly an aircraft tracking system. It tracks missiles, but it's the air-launched cruise missile kind of missiles. It's not a system that can detect and track intercontinental ballistic missiles. We have those systems already in effect, such as the one at Clear, Alaska. So this is strictly for that aircraft surveillance and detection capability.

There was a question over here.

Lt. Col. Bristol: Next question. Green shirt over here.

Mr. Dan LeBlanc: I'm curious, since the contractor was G.E., did they give priority to the local sub-contractors in the area?

Lt. Col. Bristol: If you'd state your name please for the record.

Mr. LeBlanc: My name's Dan LeBlanc, P. O. Box 637, Glennallen.

Colonel Lee: General Electric has had the contract for the East Coast System working out of the sites in Moscow, Maine, and Columbia Falls, Maine, since June of 1982. Almost exclusively, for any kind of work that could be done at either of those areas, they went within the area and hired the local contractors--everything from the clearing and grading, to setting up the fences, to pouring concrete foundations for the antennas, to erecting the antennas. They had a list, literally, of several dozen local companies that were supporting the actual construction activity. We're currently negotiating the West Coast System with General Electric--and in similar fashion they have gone out to the areas where the sites are located and have a large number of subcontractors. So that's the practice that's been followed. It's the easiest and really, lowest cost one, and we would expect, to the maximum extent possible, the contractor would want to do that approaching a site here in Alaska as well. If the construction services, if the facilities and people are available in the area, that can certainly be the most cost-effective way.

There's also--and let me ask Bob [correction: Mr. Hanson's first name is Bill] Hanson to comment on that--there's a lot of interest in the local hire requirements. And Mr. Hanson is from the Alaskan Air Command and can probably comment more to that.

Mr. Hanson: Every year we have a military construction appropriation for construction of military facilities all over the world. And in the 1986 military construction bill contains specific local hire provisions for Alaska. Now I can't guarantee--I have not a clue whether--when this project is undertaken--that those provisions will be a matter of law or not. But, if it was today, any construction effort involved with military construction funds would require local hire in Alaska.

Lt. Col. Bristol: Anyone else have any questions? On the far end down here.

Mr. Lee Adler: My name is Lee Adler and I'm a 17-year resident of the area. I have two questions. One, what air space restrictions would be around the transmitting and receiving sites? And, let us say, that eventually I think, according to Murphy's Law, some light aircraft is going to stray very close to the transmitting site at the time of transmitting--what if he's 500 feet from the transmitter in a Super Cub and what would happen to him?

(Laughter)

Colonel Lee: If we're talking about the receive site, there are no restrictions or problems at all. Our greatest concern there might be someone trying to use the flat area, the groundscreen, as a landing field. We're hoping that that wouldn't be the case. But there would be no restrictions around the receive site.

In the case of the transmit site, we would establish an area of restriction. On a temporary basis, we did this with the Experimental Radar System, and during our check-out of the East Coast Radar we have a temporary area established. When we look at our calculations of this radiofrequency energy--if we are above about 5,000 feet above the land, more than about a mile in front or a half mile on either side, there should be no problem in flying around the transmit site as well. As I say, we will establish a permanent restricted area--so that would be identified. We recognize, however, that there still may be some people who would choose to fly through that. Given that we've got a beam that's scanning across--about 8, 10 to 20 seconds--the period of time that a light aircraft would be within that beam would probably be no more than a few seconds. Even at the much higher energy levels as he would come in directly inside the exclusion fence, the very short time that he would be there should cause no permanent, no harmful effects at all. If he's got certain aircraft navigation instruments, he may see some marked movements in instrument dial indicators. But no other effects should be there.

Lt. Col. Bristol: I think there was another question over on the same side here.

Ms. Marcy White: Thank you. My name is Marcy White and I'm a 40-year resident of the area. My address is Box 108, Glennallen. My question is--would you have uniformed personnel associated with the systems stationed in the area?

Colonel Lee: Okay. The only requirements we see for uniformed personnel would be one or two, three at most, maintenance personnel, supervisors if you will--senior enlisted, Senior Master Sargeant--that would be responsible for overseeing the work of all the people at the site. The rest of them would either be the security personnel--which I suggested would be contractor,--excuse me, federal wage-grade civil servants. And the others would be the contractor-hired maintenance personnel--so very few direct military people.

Lt. Col. Bristol: Gentlemen in the back.

Mr. Dean Moore: My name is Dean Moore, Copper Valley Telephone Cooperative. I'm the General Manager. Address is P. O. Box 337, Valdez, Alaska. The Copper Valley Telephone Cooperative is a locally owned and operated telephone cooperative in the Glennallen and Copper Basin also. For the record, we'd like to state the Cooperative is both financial and technically able to provide the telecommunications necessary for these sites. Now, is a RFP similar to that for power going to be put out for the telecommunication requirements?

Colonel Lee: Bill, could you answer that? You don't believe you can answer. . . . .

Mr. Hanson: Well, I guess I should have talked with our communicators a little more. But -- and probably what we need to do is -- need to do a little homework and check that out. My understanding is that, no, that will not be the case. That some direct form of communications such as a direct microwave link, hardwire, or tropo type system will be installed as part of the site. Comm studies are still in embryonic stages. Obviously we haven't chosen the sites, so there may be site specific alterations to that. That's about the best I can do. But we'll make note and if there is something forthcoming we certainly can send you the information and make sure you're on the list.

Mr. Moore: We'd like to be a part of that consideration.

Lt. Col. Bristol: Who else would like to ask a question? All right, if that for the moment -- all right, the gentlemen on the far left. My far left.

Mr. Al Sanders: My name's Al Sanders, Box 79, Copper Center. In your study I was reading on part of it and it said that on your tests conducted in Maine that most of your testing was done at 750 and 800 kW. And I was wondering--why, on the testing, that it wasn't tested at full power, and why is it that it wasn't run continually on a test basis in Maine, rather than morning and evening?

Colonel Lee: You want to answer--the first question on the amount of power? We do have a higher powered system, more reliable power on the East Coast production system than we had on the Experimental Radar System. But further, although we had a capability to transmit at about 1 megawatt from each of the antennas, that is really the maximum, and you would be expecting, under most conditions, to be operating at a lower power level. So, on that basis, the information and the calculation from the Experimental Radar System really would match up with what we would expect under most circumstances for the production, the full-time operating system.

The reason the system was not run continually was that it was an experimental radar system. We were not able with the equipment that we had at that time to operate on a continuous basis. The most significant times for us to operate--to ensure that the system was performing as it was intended--was during the night-day transitions periods. So we wanted to ensure that the equipment was up and operating, and all of the calibrations--all of the special test instrumentation was available, and operating during that time. But to go a little bit more specific, let me ask Dr. Guttrich who was a part of that process to explain a little bit more about that testing activity.

Dr. Guttrich: Yes. The design level is the same as what we have now. In doing the switching and so forth, there was some technical difficulties that made it preferable to operate slightly lower than the full available power. The -- so that answers your question about why we did less.

The experimental system was a technology demonstrated which operated from 1980 to 81. And the same site that was used for that operation, was also then used as the first sector of the operational system. So we have had no--that system was taken apart and some of the pieces were used in the operational system--but we had no operation in that intervening time. Does that cover your question, sir?

Mr. Sanders: Well, partially. I. . . . .

Dr. Guttrich: Okay.

Mr. Sanders: At approximately 800 you're looking at max power about 50% more than what you tested the system at. And you're going to have two antenna arrays, I assume now that each would putting out a max, like 1.2 megs, according to this.

Dr. Guttrich: Right.

Mr. Sanders: You tested at 820 on one array, it's what you tested at, right?

Dr. Guttrich: There were. . . . .

Colonel Lee: No, there were four arrays.

Mr. Sanders: What I'm saying though is--what is a 30-degree sector or a 60-degree sector?

Dr. Guttrich: It was a 60-degree sector.

Mr. Sanders: Okay.

Dr. Guttrich: It was only able to operate 30 degrees at a time.

Mr. Sanders: Okay. On that, you didn't do any testing during the day or ran--run it during the day in that area at all. Is that correct?

Dr. Guttrich: No. We--in addition to--there was an 8 hour--approximately an 8 hour a day, per day, schedule--but it was operated on a rotating basis.

Mr. Sanders: Four in the evening and four in the afternoon--in the morning maybe?

Dr. Guttrich: [illegible] went around in what--around I don't know what you call that--but where you split the shift to go. So we had operations at all times of the day and over three seasons.

Mr. Sanders: My questions that at a higher level of power--and I have a hard time comprehending if it's capability of a megawatt or 1.2 megs. I know that the Air Force, and if I was running anything, I would want to see as far as I could. I have a hard time believing that we're going to be running at reduced power all the time. But the interference that can be generated on all aspects of communications from our--everybody's got a long wire antenna strung out here to try to pick up Anchorage, to our translator system for FM and TV that we're looking at. We're also off the satellite and all this--the two-way communications and everything else that's in the valley--so what my questions were--your calculations in there said that according to the mathematical part of it that you've come up with a solution that's only going to affect certain areas. But if there hasn't been any physical tests made at the higher power settings and not in a--as a whole operations during the day, for instance in Maine, I can't see how you can safely say that there was no interference. There was something like--that you had one complaint over a year and it was resolved. But how can you assume that during the day, when there wasn't anything being done, that it was not going to interfere with some types of communications or reception of some sort? I know here, if you get out here a ways and turn on a radio at one of these places where we listen to some--get some decent reception where you don't have a bunch of electrical interference--we got what we call a "Russian Woodpecker" that they turn on over there and it's the Russians doing the same thing that you're trying to do to them and it just sounds like somebody tapping their fingers and really you can't hear nothing. And that's what my concerns are. Is--what's this going to do to us on this end?

Colonel Lee: First of all I'm glad you brought up the matter of the "Russian Woodpecker" because a lot of people, whether they state it or not, are certainly aware of the effects of that. That is an Over-the-Horizon radar system. It's one of two of them. One on either side of the Russian land area that overlook the central part of the United States. And if some of you afterward want to see a picture of that in this document that's put out by the Government Printing Office, Soviet Military Power, there is a diagram that actually shows that coverage area.

It's not a system like ours. Really not for the same purposes either--as we best can understand. But their's is a very noisy, pulse-type system--versus a continuous wave system that we have with extreme spectral purity with, outside of the band that we're using, a significant fall-off in the energy. We use the best engineering capability, solid state design, to be able to very cleanly shape that signal. Further, we listen for clear channels using the receive antenna--a continual spectrum monitor operates looking at those channels to ensure that, before we transmit within that HF area, we have a clear channel. That's both so that we won't interfere with someone but also so that we're not, with this very sensitive receive antenna, picking up somebody else's HF at the same time that we're trying to listen to this noise signal.

To clarify a little bit further--during that period of testing, we tested during every part of the day, night, throughout the full year season. It's just that we didn't operate every day for 8 hours during the daytime. It was a continual cycle that covered all of it. We did make a lot of measurements during that time, not just calculations. And also on the first sector of the East Coast Radar System, we have been transmitting, and often at full power levels, since November of this last year. Since about the middle of January, we've been operating between 2 and 4 hours a day during that test period. [See Response No. 81 for a correction.] We have been trying to gather information. If there has been interference, we have had none reported to us. We're continuing to look for that and will throughout the test program. But the thing to emphasize--using the same kind of computer capability that can do all these massive calculations--those same computers can lock out particular channels and harmonics that might be involved and that could cause interference. So, if as we start operation or testing we find examples of interference, we can establish those frequencies or harmonics and can lock the system out from them. So we should be able to continue to be a good neighbor in all of the frequency communication kinds of systems.

Lt. Col. Bristol: Just a moment.

Mr. Sanders: What's your document say (indiscernible - extraneous noises). . . . .on your filtering on this system on your harmonics and all that--is that standard 80 dB down or from carrier or what?

Dr. Guttrich: Harmonics out of the amplifier are at least 70 dB down. And in addition, the antennas are not very efficient at higher harmonics. So the output is typically 80 to 90 dB below the carrier.

Mr. Sanders: What I'm getting at is like--I've got a lot of radios out here. It's a 100-watt radio. We all run 80 dB down suppression, and the thing is, with a 100-watt radio, I can--got about 8 or 10 transmitters in one building up here that are supposed to be really great and all this and we don't have the FCC specs--but I still get intermod from many thousands of cycles or megacycles away, or whatever you want to go for. This is what I was wondering. What I'm asking about is, in the book here I've been assured that I'm not going

to have any problems with this. But I cannot in my own mind understand how this is going to do something. Transmit-wise, Tok with the LORAN system--I had an area up there to take care of and we fought that all the time--ever since it's been there. I mean it radiates into the ground. And I mean you pick up the telephone, and you've got the "Woodpecker" in that. And it's in all the communications and everything else. Is this going to create a similar problem to what we see from that? Along with the possibility of intermod, with everything else I've got.

Colonel Lee: Is there anything else you can add briefly?

Dr. Guttrich: We think not. The only significant difficulty that we had with our earlier operation, had to do with airborne aids to navigation, VOR, and that was looked at very carefully with the FAA.

On subharmonics, we could cause trouble out to about to 25-30 miles. That was avoided by blocking out subharmonics of the VOR frequency, and I think a couple might be involved here as well.

Everything else on the ground, because of falloff of the ground waves--most other effects are much more localized and you can't hear it on your car radio more than a couple miles away. We've had no difficulty in general.

I think we mentioned that the spectrum, within the HF band, is very well-contained--compared to the "Woodpecker"--suppressed much farther. We don't operate on the citizen's band. The Russian operations seem to operate anywhere. We lock out all emergency frequencies. Normally, we operate only on Fixed--on the services that are open to Fixed. As we indicated, we listen before we transmit and again, that's not just because we don't want to interfere with other people. But if we have other people on the channels, they interfere with us. So it's to our advantage to minimize interference as much as possible.

Lt. Col. Bristol: Who else would like to ask a question? Sir.

Mr. Brown: Yes, I'd like to . . . . .Stan Brown again, Box 42, Glennallen. I'd like to know how much is each project going to cost to build, and how much do you foresee contracted out to civilian construction?

Colonel Lee: In terms of the estimates of the total cost to construct the system, our estimate--as we have identified it and will be submitting those requests to Congress--it's about $450 million dollars. That includes all the construction costs, the equipment that's brought in, the personnel during that period. The majority of that will be tied in with the actual equipment itself. We do have, in the Draft Environmental Impact Statement, an estimate of the approximate amount of money that will be coming in the area during that period of construction. Because other than bringing in the antennas and the other electronics, the kind of equipment required for--that clearing of that

initial area for the groundscreen, pouring of foundations, concrete, setting up of the antennas and support buildings, that sort we can estimate--and could come from the area.

Dr. Everett: Yeah. This is the construction -- the transmit construction and receive . . . . .

Colonel Lee: Okay. Why don't you just . . . . .

Dr. Everett: Yeah.

Colonel Lee: Rather than me, I'll just let Dr. Sid Everett reference the specific sections.

Dr. Everett: I'm going to have to read this. Since I didn't make up a slide, I don't have this at my fingertips. But the construction costs have been estimated at $150 million dollars for the transmit site, which would include the power plant, and $45 million dollars for the receive site. Now, only a portion of that--or let me say it this way -- part of that goes into the cost of some of the equipment that's coming from out of the area. Some of that is going to wages and to materials and other services purchased from the local area. And what might be captured locally in the Copper River area for a transmit site costing approximately $150 million dollars is perhaps $10 to $12 million dollars annually. What might be captured for a receive site costing perhaps $45 million dollars, is on the order of $4 to $5 million dollars a year. There are then, of course, payrolls off the base which add to this. Those payrolls are about $2 million dollars a year as a rough estimate.

Lt. Col. Bristol: Yes sir. Another question over here?

Mr. Roy Ewan: I have a simple question. The question is--would you require any additional land to protect against shooting--people shooting the power--the installation or something similar to that?

Colonel Lee: Our plan is just to acquire that amount of land that we had identified for either the transmit or the receive site. And we would fence that entire area off. There really isn't any way--if we were to establish a larger area and you might say--perhaps you could fence that additional area off as well. So by having the single exclusion fence around the transmit site and a similar fence around the receive site--and we will also have monitors, sensors, that will be able to detect for us when anyone or animals have broken through that area--we feel that we can provide adequate security for the sites. So in our view, there wouldn't be any need for additional land beyond that. The only requirement, and that's what brought the estimate up to a maximum of about 3,000 acres, is that we may need additional land if we have to build some supporting facilities--or at some locations, even to the extent of building a complete, composite living facility that would house a total of 70 people at the transmit site or 60 people at a receive site.

Lt. Col. Bristol: I think there was another question over on this side.

Mr. Jim Lieb: Jim Lieb of the Alaska Department of Fish and Game in Glennallen. Dr. Everett indicated that there's been an extensive literature review on the biological effects of the radiofrequency effects.

Dr. Everett: Right.

Mr. Lieb: Is there any complete list of that literature in the EIS and if not can it be obtained?

Dr. Everett: There has been an extensive following and critiquing of the literature for--on the order of 5 or 6 years within SRI--under contract to another part of the Air Force, the Brooks School of Aerospace Medicine. There is, in fact, a kind of companion document to what is written here. This is more in the form of a summary of a document published by the School of Aerospace Medicine which is very elaborately--which very elaborately extends the information in here and completely cites the sources of the literature. That is called out in the early part of the section here. And the--in fact, the document that is cited here is just--is in the finishing stages of being updated. It's become a much larger document, a more complete review. If you're interested in getting ahold of the citations or seeing a list of the citations, you could turn to the section here dealing with the biological effects and see the citation. We could talk about this afterwards and arrange to get a copy of the report from which this summary is based--put you in touch with the proper person, even down at Brooks.

Lt. Col. Bristol: Okay. If there are no other. . . . .

Mr. Sanders: I want to talk to . . . . .

Lt. Col. Bristol: We're getting to the point of the program to make statements, so if it's a comment that you wish to make rather than a question to ask. . . . . Okay.

Mr. Sanders: On the radar system itself, what type of effect will like the northern lights and the other problems that we encounter up here, more so than than what you do down below, what percentage of useable time and effectiveness do you feel this will run? I know that you feel--that you'll end up with some problems. But I would assume that--some of your atmosphere, atmospherics and some of the strange things that happen--can cause problems.

Colonel Lee: As I identified when I showed you the picture of all of the four OTH sectors and the Seek Igloo and North Warning System, we cannot operate looking directly north. And to the extent that we begin

to approach that in the upper portions of that northwest sector--yes, during certain portions we will have difficulty in acquiring and tracking. That's the same kind of a situation though, we had looking at the very northeastern portion on the East Coast Radar System. It's just a matter of the physics. As you look directly north you experience some effects of that ionospheric disturbances. But no, we aren't prepared to discuss or provide answers on what percent of time. It depends on many different circumstances. We feel confident that the system gives us the capability that we need and is a very effective system.

Lt. Col. Bristol: In the front row.

Mr. Bob Gallatin: This is Bob Gallatin, Copper Valley Views. One question I have, and I believe you touched on this the last time you were here, how much of a target does it make--how much of a target is the site?

Colonel Lee: Thank you. We don't believe that the OTH system is any kind of a military target. First of all, it's a system strictly to provide advanced warning. And in the ultimate purpose, it would notify decision-makers that a potential attack was coming towards the North American continent. If someone were to target and destroy the OTH system--if it were here in Glennallen--that in itself would be the warning--the kind of warning that they had hoped to avoid. So in that case, we can't imagine any kind of a scenario where it would be to the Soviet's advantage to try to strike against the warning system itself. It really is to give us those several additional hours.

Lt. Col. Bristol: The gentleman. . . . . second row.

Mr. James Pinneo: James Pinneo, Faith Hospital, Glennallen. What weight is given to public opinion locally as you decide the Glennallen site or the Gulkana site or the Tok site? Is it 10%, 20%, and is geo--are the geographical considerations even greater impact. And lastly of course, the technical aspects of it? So what impact are we making tonight?

Colonel Lee: Let me assure you that you making an impact, and it's a very major impact on the process. First of all, in ensuring that we have provided the proper information and documented the environmental concerns--to the extent that we've learned new information in the public hearings, you've helped us better provide that Final Environmental Impact Statement.

The primary purpose of this EIS process is to consider those environmental concerns. But there are many other factors that go into that final decision as well, and they include the cost of construction, they include the availablity of land, and the cost of that land. And finally, the weight of public opinion enters into it because clearly the Air Force in setting up this type of system, wants to be a good neighbor--and all things being equal, would clearly like to move into a community that wants us, as well.

The extent that your statements of support or statements of criticism are provided, and are documented in the final transcript which will be a part of the document--that information then is available and is used by the Office of the Secretary of the Air Force in making that decision. So it's a total collection of all of these inputs. Beginning with these documents--with the additional information you're providing us--and most certainly your statements pro and con are also considered in that decision process.

I can't give you a weighting, an absolute one or even a relative one. Because I'm not sure how that decision is really made when it finally comes down to it. Our requirement is to ensure that all the information is available for the Office of the Secretary and that all the alternatives are there, and the decision will be made at that time.

Lt. Col. Bristol: I don't want to miss anyone. What we're going to do is go to statements now if there are no other questions at this point. I'll recognize people who'd like to make statements to be a part of the record. Any matter of information that any of you would like to convey to the team concerning what you perceive to be the environmental impacts of the proposal, something that perhaps hasn't been mentioned, something that you may have noted when you read the Draft Environmental Impact Statement that may not have been completely correct as you know the local area. Any statement at all that you would like to make--and after we finish the statements, if we have any time remaining, we'll go into a question and answer session because frequently the statements themselves suggest a particular question that you might not have entertained before. Again, we have the facility--and it's now about 8:50--and we have the facility until 10 o'clock. So who would like to be the first for a statement. Again we'll use this microphone and Captain Morris will try to get the microphone as close as possible to the individuals who care to speak. Don't be shy. Yes sir.

Mr. Frank Bettine: I'm Frank Bettine, manager of engineering at Copper Valley Electric. Our address is P.O. Box 45 here in Glennallen. I received your Draft Environmental Impact Statement and I've had conversations with various folks at Elmendorf concerning supplying power for either the transmit or the receiver site. I guess one of my major concerns is that the Draft Environmental Impact Statement doesn't really address supplying power to the site, either transmit or receiver site. It in effect treats supplying power as a separate entity or a separate item which will be--or come up for contract or Request for Proposal at a later date. And because of the remoteness here in Alaska, we don't have the opportunity or the availablity or the time to make a good system. And I believe that the availablity of power and the ability to supply power should be treated as an integral part of the EIS. To me that would seem--you would need to determine--as one of the criteria where you select the site, is the availability of power and the ability of the power company to supply that power. 12

We have reviewed numerous scenarios in supplying power to the radar site, both the transmit and receive site. And yet we have not been given the ability to input that information to effectively make your selection in the EIS document here. I believe that we, or whoever in the community or in the various communities you have gone to, should have that ability--and not treat the power plant as a separate item. Because it would affect us significantly here in the Basin as far as rates go to our consumers. And obviously we'd love to have the transmit site here. We could slash our rates by a significant factor. But I don't think you've given us the opportunity to make our presentation as to how we would provide the power.

Lt. Col. Bristol: If I as the presiding officer could just make a point in clarification, this is in--right now is an opportunity if there's anyone during the course of the hearing that's devoted to statements, has anything that they would like to say affirmatively as to the provision of power facilities and what have you, then that can be included within the making of the statements. Who would like to be next?

Mr. Dan LeBlanc: My name is Dan LeBlanc and I'm involved in one of the service industries. I manage a hotel. This is a positive statement to you now--be real positive--to Glennallen area. So I'm real supportive of it, in managing a lodge.

Lt. Col. Bristol: You want to say something?

Mr. Roy Ewan: Thank you. As the president of a Native Corporation that covers geographically the whole Copper River Basin, with the exception of Paxson, I want to make a positive statement also. We have studied the document only two days, but we've talked about this whole system at board meetings, at committee meetings, and at shareholder levels. And we are all in favor in seeing either the receive or the transmitter site in Glennallen or Gulkana or in any of the other areas. We see that--as being partners in the national defense aspect of it. And also the positive side we see--long term employment as a very positive impact in the Copper River Basin.

As landowners here in the valley, one of the largest private landowners in the valley, we feel that we could cooperate with the Air Force in mitigating all the negatives that may come up--maybe, if there are any--I don't know. I haven't heard anything negative here yet, but I think that we can cooperate with the Air Force in mitigating those negative aspects of the construction of these sites. I know that the people here in the valley have lived here a long time and know the country, especially the Ahtna people, the native people that lived here a long time. I have a gentleman here that's resided here about 70 years. I've been in the valley close to 50 years and I know there's impact--I think environmentally, fish and game--and I just wanted to let you know that we'll cooperate any way we can.

And I think I'd also like to make a statement saying that the impact statement is a little bit outdated in some of that data that's in there. I think that your housing statistics in there, I think we gathered way back in 1982. Since then I think we've had some new housing developments in the valley and several other things. Thank you very much.

Lt. Col. Bristol: Who else would like to make a statement? As I said before this is informal so please don't hesitate if there's something on your mind. Yes sir.

Mr. Goddard: My name is Jack Goddard. I'm retired and in business and I live here. I would like to say that I'd like to ask you folks to consider very strongly the Copper Valley Basin for the location of your radar site. I think that we in this area will benefit from it, and I think your Army or Air Force will also benefit from it. The people in this valley are good people and they'll treat you people right. We have a saying out here--and I'd like to get that off the books, because it's not very nice. They say that the Copper Valley Basin--measuring its growth is like watching wet paint dry at 50 below. I think that by getting our radar site here, we'll have some permanent growth instead of temporary. Thanks very much.

Lt. Col. Bristol: Anyone else care to make a statement? To my far right.

Mr. Niebrugge: Bob Niebrugge, Glennallen. I'm a businessman in the community and want to make it as a matter of record--that I hope you notice that all the message signs about town, nearly a dozen of them, all carry a message of support. And I think that's indicative of the general business community and the climate of the valley. We certainly encourage your selection of our valley for your site.

Lt. Col. Bristol: I know some of us noticed it coming in, because I saw Colonel Lee and members of his team photographing these signs. I think some of the local people were driving along and seeing these people photographing signs, and perhaps shaking their heads a little bit. (Laughter) Any other statements that anyone would care to make? Yes sir.

Mr. Sy Neeley: Sy Neeley, Copper Valley Construction, the local general contractor. I'd like to make a positive statement to you folks, too--if at all possible, if it's feasible in your design to utilize the area of the Copper River Basin. Like Jack, I think a lot of good people live here, and it's a good place to live. I've lived here all my life and I haven't got Ben beat--he's got me by about 20 years--but I'm going to catch you Ben. Thank you.

Lt. Col. Bristol: Thank you, sir. Are there any other statements? I want to thank you all very much for coming out tonight. Clearly, the process that the government -- that your government is making in coming to a decision -- clearly the process that we're going through is directly related to the quality of the input and to the proportion of the local community that are participating actively in the making of that input. And on both counts, you all have just done great. We appreciate your support. Were--did anyone else think of any questions that they wanted to ask that either were raised by one of the statements or that weren't raised before?

Unidentified female: What is the expected life of this project?

Lt. Col. Bristol: The question is "what is the expected life of this project"? Ma'am could you state your name for the record?

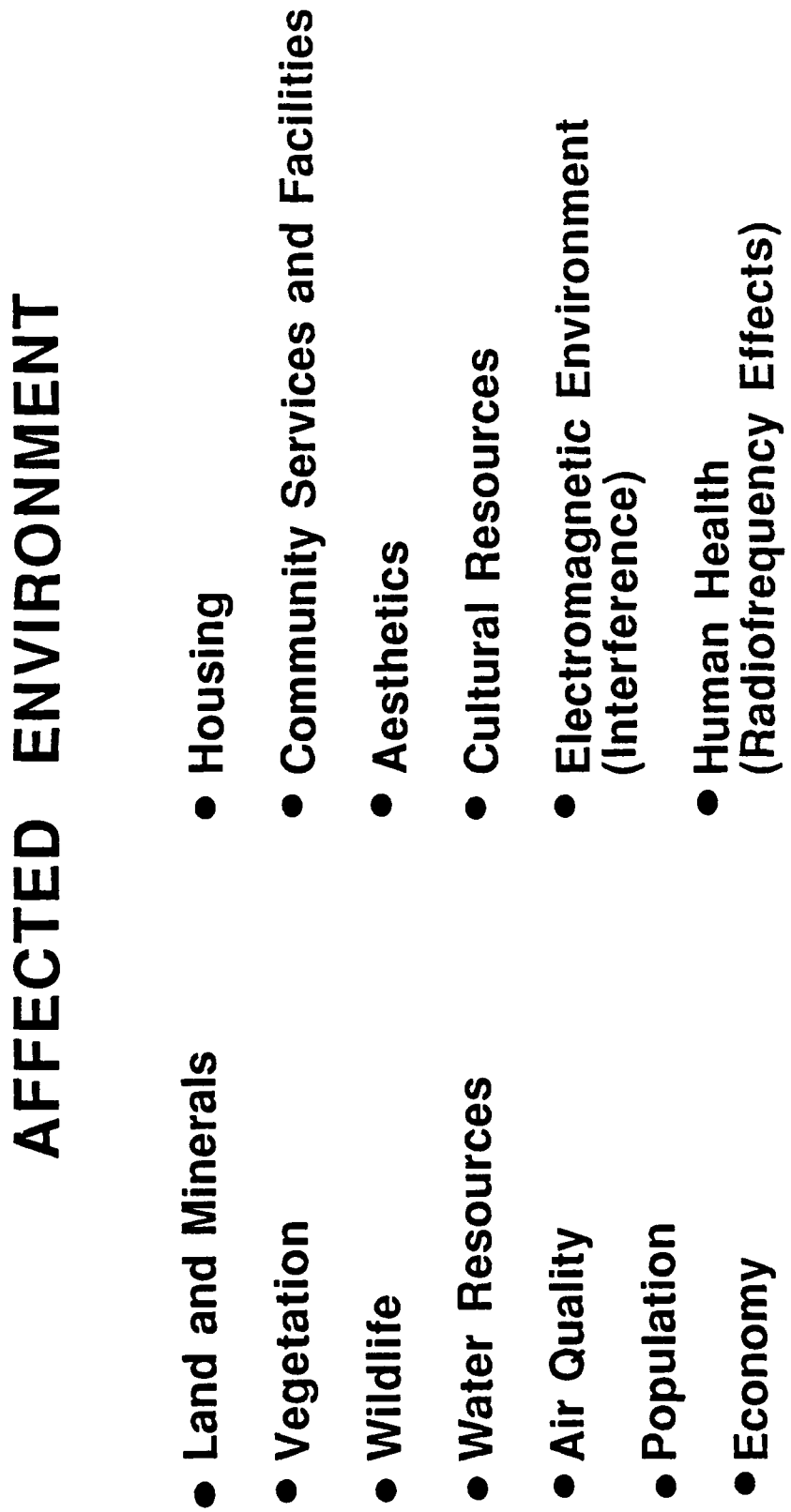
Ms. Elise Gaines (ph): Elise Gaines (ph), Mile 74 on the Rich.

Colonel Lee: In the Draft Environmental Impact Statement we talked to a 20-year operation time. But that's really a minimum period of time. That 20 years--we talked to it as a life cycle because it's to ensure that the people that would be providing personnel will start doing the planning now to ensure that we've got that support structure for a minimum of 20 years. Because we're using a technology that really has been around for a much longer period of time than that--the ability to use the ionosphere to refract radio waves--this type of system will not become obsolete. We may, at some later time, provide perhaps even cheaper, more cost-effective hardware within the transmit site--new solid state devices within the receive site--the way the beam is formed. But the basic system, the antenna structure, should remain viable well into the next century. The capability will always be there. And as long as we need to, or have an interest in that kind of a surveillance capability, this type of system will provide it--as I say--well into the next century.

Lt. Col. Bristol: Are there any other questions? If not, let me just state one more final time that you have until the 13th of October if you'd like to submit -- and I encourage you to do that. Think about what's been said here tonight. If you have a copy of the Draft Environmental Impact Statement, take a look at it. If you have anything by way of supplementation of what's in the Draft statement, any thoughts that you have after this evening, resolve the doubt in favor of submitting something so that those who are putting the final package together will have the benefit of your input and your thoughts. Again, thank you very much for your participation and for coming out tonight. It's been our pleasure to be here tonight.

3.5 Briefing Slides

The slides used by Dr. Everett during his presentations at the public hearings are reproduced on the following pages.



BORROW

- Material requirements vary
- Impacts
  - Greater at Glennallen and Gulkana
  - Lesser at Indian Creek and Paxson East
  - Few at Tok
- Approach
  - Survey resources
  - Develop new sources, if necessary
  - Comply with regulations
  - Reclaim disturbed areas

PERMAFROST DEGRADATION

- All areas have discontinuous permafrost
  - Variable amounts
  - Variable distribution
- Degradation and effects
  - least likely at Indian Creek and Paxson East
  - Moderate likelihood at Tok
  - Most likely at Glennallen and Gulkana
- Approach
  - Survey to map and characterize soils
  - Use arctic design and construction practices

VEGETATION

- Maximum affected area expected to be about 3,000 acres

  - Retardation of succession
  - Loss

- Impacts

  - No unique species or communities known
  - Acreage not significant regionally
  - Local effects possible
  - No significant adverse effects expected

- Approach

  - Avoid wetlands and other more sensitive vegetation, when possible
  - Confer with USFWS

WILDLIFE

- Bird collisions
- Aquatic habitat alteration
- Human disturbance
- Migration pattern alteration
- Hunting and vehicle collisions

BIRD COLLISIONS

- Significant potential exists
  - Susceptible species
  - Poor lighting and weather
  - Some small structural elements
  - Greatest potential at Glennallen, Gulkana, and Tok
- Approach
  - Avoid high bird use areas
  - Increase structure visibility
  - Create diversions

WATER RESOURCES

- Surface drainage
- Stream siltation
- Water supply
- Wastewater discharge

POPULATION

- Employment: 70 at transmit site, 60 at receive site, 315 at operations center
- Presence of families depends on: outside hiring, Air Force policy, household size
- Residential patterns on: work schedules, transportation
- Population change
  - 3% to 12% in the Copper River valley
  - 8% to 14% in the Tanana valley
  - < 0.2 % in Anchorage

EMPLOYMENT

- Construction
  - 100 average, 200 peak at rural sites over 4 years
  - 75 average, 200 peak in Anchorage over 2 years
- Construction effects
  - 7% to 15% in the Copper River valley
  - 20 % to 30% in the Tanana valley
  - < 0.2% in Anchorage
- Operation effects
  - 5% in the Copper River valley
  - 12% in the Tanana valley
  - < 0.5% in Anchorage
- Secondary employment effects minimal in rural areas

SUBSISTENCE

- Possible effects include
  - Loss of use
  - Access changes
  - Greater competition
  - Wildlife migration changes
- On federal lands, further study required by ANILCA

VISUAL EFFECTS

- Significance depends on
  - Distinctiveness of landscape
  - Visibility from roads
  - Existence of other human modifications
- Impacts possibly significant at Indian Creek because of contrasts and visibility
- Earthwork visible from the air
- Mitigations include
  - Siting away from viewpoints
  - Screening
  - Minimizing contrasts

CULTURAL RESOURCES

- Most study areas not surveyed
- Unidentified or unevaluated resources likely to be encountered
- Approach
  - Comply with applicable laws and regulations
  - Identify and evaluate discoveries and possible impacts
  - Develop and execute plans to avoid or mitigate impacts
  - Consult with the SHPO and the ACHP
  - Consult with local Alaska Native groups and elders
  - Orient employees

ELECTROMAGNETIC INTERFERENCE-1

- OTH-B operates in the HF band, which includes
  - Amateur radio
  - Citizens' Band radio
  - International radio stations (e.g. VOA)
- Interference possibilities include
  - In-band frequencies (Fixed, Broadcast)
  - Adjacent frequencies (Amateur, Broadcast, Mobile, standard services)
  - Harmonic frequencies (TV, land mobile, air-to-ground, VOR beacons)

ELECTROMAGNETIC INTERFERENCE-2

- OTH-B signal
  - Highly concentrated in main beam
  - Good spectral purity
- Mitigation measures
  - Respect frequency allocations to other users
  - Avoid band edges
  - Seek clear channels
  - Avoid subharmonic frequencies
- Operation of the Experimental Radar System caused no interference

ELECTROMAGNETIC HAZARDS

- Cardiac pacemakers
  - No hazard beyond exclusion fence
- Fuel handling
  - No hazard
- Electroexplosive device--safe separation distances
  - 1,300 feet in metal containers
  - 2.3 miles in nonmetal containers
  - 4 miles if being handled

RADIOFREQUENCY RADIATION - HUMAN HEALTH

- RFR from the OTH-B system is similar to radio waves
- The exclusion fence would be placed so that exposure levels would be below the applicable standards
- The biological effects literature has been extensively surveyed
- No reliable scientific evidence exists to indicate that exposure to OTH-B RFR levels outside the exclusion fence is harmful

SUMMARY

- Significant biological impacts are possible
  - Occurrence depends on specific sites
  - Likelihood and severity would be reduced by mitigation measures
- Significant socioeconomic impacts would occur
- Environmental assessment will be prepared after sites are selected

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4 COMMENTS

This section contains written comments that were submitted at the public hearings or subsequently by mail. At the public hearings, comment sheets were distributed to all attendees to determine whether they wished to ask a question, offer oral comments, submit a written statement, or receive a copy of the EIS. The form provided space in which to write comments for inclusion in the Final EIS. Most comment sheets received were submitted at the hearings; some were sent later by mail. Other correspondence with comments or questions or offering information was also received.

The written comments and letters are reprinted here in two subsections. In the first, in place of reproducing the entire form, remarks submitted on the comment sheets have been extracted, along with their author's identity. These comments are grouped according to the hearing at which they were submitted. Forms that were submitted without comments were made a part of the Environmental Impact Analysis Process (EIAP) file, but no information (e.g., the name of the individual) was extracted for inclusion in the Final EIS.

Letters received are reprinted in their entirety in the second part of this section, in approximate order of receipt.

Responses to questions or issues raised in the public comments, whatever their source, appear in Section 5. The comments for which responses have been prepared are numbered in the right hand margin of this section.

4.1 Comment Sheets

4.1.1 Anchorage

Carole Vining

13328 Diggins Drive, Anchorage, AK 99515

Are there any plans for cooperation or communication in aircraft search and rescue activity? 13

In particular, will this system play an active role in preventing incidents as the Korean flight 007?

John Morrone, Deputy Director, State of Alaska Division of Telecommunications Operations

5900 E. Tudor Road, Anchorage, AK 99502

The EIS (Draft) does not appear to sufficiently address the potential EMI generated by this system:

14

1. The extensive telecommunications systems operated by the State of Alaska in all study areas is omitted from mention in the EIS (Draft).

2. Engineering assumptions used to predict flux densities in the far field do not take into account work done at the University of Alaska as regards frozen ground nor do they seem to be born out by standard texts on the subject.

3. The graphs as to the out-of-band products as well as the narrative fails to adequately quantify expected RF levels.

15

In the past the state has been involved in the solution of EMI generated by the LORAN facility at Tok. These efforts were not without cost. It is our feeling that prior to final siting, those existing telecommunications facilities in the study areas be considered.

Marilyn Stirling

4400 Shoshoni, Anchorage, AK 99516

I recommend the choice of either the Glennallen or Tok sites rather than the Paxson area. Paxson has almost no facilities to accommodate the number of people needed to build and maintain the Paxson site (i.e., schools). Permafrost is a very bad problem in the Paxson area. The number of waterfowl which might be hurt by the large antenna is large. The visual effect on this untouched area would be considerable.

Glennallen and Tok already have schools, Glennallen a hospital and better housing, shopping and social facilities. I am definitely for the radar system.

Alexander James Stirling

4400 Shoshoni, Anchorage, AK 99516

I feel that Paxson, Gulkana, and Indian Creek cannot support the added population expansion. I also feel that the Paxson area will be adversely affected by destroying historical archeological sites.

I feel that the Tok and Glennallen sites are most able to absorb the social and environmental impacts.

Ed Granger

1011 Oceanview Drive, Anchorage, AK 99515

In 1971± the State was forced to build a "moose-proof" fence around the Cordova Airport. This fence was (is) 10 ft high, heavy WWF used, with 8" x 8" posts 16' O.C. The moose cross this fence at will. 16

Suggest the problem of fencing this proposed OTH-B site(s) be carefully studied to ensure it will do the job.

Tom Hopper

SR 9297 Hiland Road, Eagle River, AK 99577

Alaska has lots of pilots who might crash into tall things that are hard to see. 17

James M. Posey

2311 Canary Court, Anchorage, AK 99515

It appears that the system has been well planned, and the concerns for human environment have been provided for. As an Alaskan and concerned U.S. citizen, I feel that the OTH-B installation should proceed as soon as possible at the best technical site.

Most of the Alaskans will support the National Defense objectives of this system. The deminis impacts is an affordable price to pay.

The question is not if, but when and how!

Carolyn Brandt

4300 Manytell Avenue, Anchorage, AK 99516

I would suggest Glennallen and Tok as sites because they have more service facilities for those employed in constructing and maintaining the facility. They contain better medical services, schools, shopping facilities, and housing facilities. Glennallen is closer to Anchorage and therefore more accessible to those at the site. Paxson would be a poor choice because it is in an unspoiled natural state. It is a center for recreation, including fantastic hunting and fishing. There are no facilities for a project this size in Paxson and it would have a negative effect on the environment.

Eric J. Haemer, P.E.

12800 Huffman Circle, Anchorage, AK 99516

We believe that privatization of the power supply would be a benefit to both Alaska and the project. Proper design and equipment selection will produce a reliable and economic power source. Most of the sites have either a very limited or no available power. Placing the power source in the private sector will allow a positive participation by the local economy and offset some of the negative sociological impacts.

William Fixel

4020 E. 64th, Anchorage, AK 99507

I am commenting on the Glennallen area:

This area has been a source of prime hunting and fishing to me for the last 20 years. I feel that either transmitter or receiver in the area will hinder the game, plus the influx of new hunters on a road into this area will render it almost useless to me. I have property both on Tolsona Lake and Crosswind Lake and travel this by sno-machine in winter and by plane in summer. I have a feeling that I will be completely restricted to these modes of transportation, thus rendering these properties useless and invaluable to me.

18 Also I question whether it is of necessity to have the backscatter at all since its effectiveness in bad weather is questionable. It would appear to me that satellite snoopervision is much better.

19

Mel and Claudia Hoversten

5310 Arctic Blvd., Anchorage, AK 99518

We are very concerned about the possible selection of the Glennallen site for the OTH-B radar. We have owned and used property on Crosswinds Lake since 1963, and have invested a great deal of money in building a retirement home there. This was no easy task, as all materials had to be either flown in or transported by track vehicle and snow machine in the winter. We currently use this two-story house plus garage regularly for recreation hunting and fishing year around. As you know, the lake has no road access. However, there is an existing trail from the Glenn Highway near Tolsona Lake which originally was a dogsled trail as far back as the 1930s. This trail is the only winter access to our property, aside from ski-equipped small aircraft when weather and snow conditions permit. Not only is this trail essential for access, snow machine recreation is a popular activity in this area. In the summer, our access is by float plane from Tolsona Lake. Both winter and summer accesses are directly included in the Glennallen proposed radar location.

It is difficult to find such an ideal setting for hunting and fishing as Crosswinds Lake. It is remote, yet accessible; close enough to Anchorage to make it available, yet difficult enough to reach to keep it somewhat exclusive. It would be very hard to replace what we have invested in time and money at any place comparable, as spots such as this on lake-front property just do not exist now as they did when we first went to Crosswinds in the 1960s.

4.1.2 Fairbanks

Roy E. Marburger

P.O. Box 2498, Fairbanks, AK 99707

I am against the radar site being located in the Summit Lake area. The area is used for recreational purposes and any building of radar facilities should not be allowed. Many, many snowmobiles use the area, and the radar site would prohibit this kind of use. It would also cause a definite impact of the wildlife, birds, and the rural atmosphere of the Summit Lake area. Again, let me say I'm against having the radar site in the Summit Lake area, and thank you for letting me express my opinion.

W. Ronald Keyes

P.O. Box 80342, Fairbanks, AK 99708

Please note enclosed letter [see Section 4.2, p. 4-138].

My family and I have strong concern that this wilderness area be left alone.

Bill Lorkowski

249 Bentley Drive, Fairbanks, AK 99701

The area designated as Paxson East is used extensively for recreational purposes for hunting, fishing, snowmobiling, and skiing. This is a year-round recreational resource. I would like to see an extensive evaluation of the impact on the recreational uses of this land. Also address effects on aviation in terms of float plane operations from Summit Lake and other recreational lakes in the area (Caribou Lake, Gunn Lake, etc.). 20

I hunt in the Paxson East area and disagree with your statement about minimal impact on wildlife. The entire area is used by caribou, moose, and grizzly bear. Open access to the area by vehicles would have a severe detrimental effect on wildlife.

What are air and water quality effects of generating the power? This issue is not addressed. Also noise effects of generating power. 21

Scott D. Dennis

P.O. Box 82514, Fairbanks, AK 99708

22 As an amateur radio operator, I have on many occasions had to communicate in spite of severe interference I am told originate in the Soviet Union. Our government doesn't offer an explanation of this interference, but OTH-B radar seems a good guess.

I would urge that our system use such techniques as listen-first and spread-spectrum which could potentially render the system undetectable. I know that we are conducting such research and have full confidence that such a system could be deployed in the timeframe specified.

I don't think anyone wants another "woodpecker" operating without regard to other HF operations. Thank you.

Richard E. OBeid, Jr.

P.O. Box 61190, Fairbanks, AK 99706

I feel that a site of this nature would ruin the area known as Paxson East. Myself and many other people use this area for recreation quite extensively. I also am a landowner in this area and use it to get away from such things as you propose to build at the Paxson East Site. The other four sites under consideration have the facilities and would benefit from a site of this nature by adding jobs and revenue to those communities. Please do not use the Paxson East Site in your consideration for locating the OTH-B Radar System.

Vayla M. Colonell, Manager of Member Services

Golden Valley Electric Association
P.O. Box 1249, Fairbanks, AK 99707

GVEA is a rural electric cooperative serving interior Alaska. We understand that your office will be issuing a draft request-for-proposal for electric service to your transmitter and receiver sites and that you will be accepting industry comment on the draft RFP.

GVEA may be interested in submitting a proposal to supply electric service. Would you please send us a copy of the draft RFP for comment as soon as it is available. Thank you for your help.

Henry & Frances Zawacki

1038 Pedro Street, Fairbanks, AK; and Mile 200, Richardson Hwy

Re: Paxson Lake Area site, we request:

1. Studying other available locations further from cabins, recreational use areas, and prime caribou hunting areas. It will destroy this area for hunting, fishing, and winter recreational use.
2. Locating it near more readily available electricity supply--Tok, Glennallen, or Delta.
3. Alternative sites chosen and studied.
4. Greater studies on effects on game having to circumvent the fences.
5. Selection of virgin federal lands as not to disturb existing communities or recreational use areas. A saving of millions of dollars not having to buy land from Natives or the State.

23

We use this area extensively summer, fall, winter, and spring. We own Fielding Lake Lodge and Cabins about 3 miles from proposed site.

Randy R. Rogers, Northern Alaska Environmental Center

218 Driveway, Fairbanks, AK 99701

We would like to be included on the mailing list for the Final EIS and all environmental assessments on specific sites. We will submit written comments by mail. Thank you.

Mark B. Ringstad

502 Monroe Street, Fairbanks, AK 99701

Good luck!

Delores Linzner

1235 Noble Street, Apt. 6, Fairbanks, AK 99701

I am a former owner of property in this area, now owned by my son. This is a favorite recreational area for all my family. I'm sure you can find land in our big state away from a place that is already occupied like it is here.

23

Cathy J. Hodges

2608 Kuskokwim, Fairbanks, AK 99709

Regarding your consideration of the Paxson East site; as a landowner in the Fielding Lake area, which is approximately 5 miles from the proposed site, I would request that an alternate site be chosen, as the Paxson East area is used extensively for recreation and hunting purposes. Also, in view of the extremely high winds which are common in the area, it would seem that both construction and maintenance costs would be extremely high. While acknowledging that this radar system is needed in the interest of National Security, I feel that locating the site in the vicinity of Tok or Glennallen could be a positive boost to their economies.

Loa D. Carroll

2142 Airport, Fairbanks, AK 99701

Since 1940, a 1 1/3-acre lot located on lake-front property at Summit Lake, Alaska, has been in the Carroll family. I was born in 1966 and have spent virtually every weekend at Summit Lake enjoying the scenery and escaping city congestion. At present I am purchasing a 1 1/2-acre lot on the lake front. I feel that the location of this OTH-B Radar site is much too close to the residential area and will be an enormous hazard to the users of the land. The increase of residents in this area has grown consistently over the past 10 years. Another 70 permanent residents would completely take away from the intentions the landowners and recreational users have for this land. The area proposed to be used is directly affecting, or would directly affect the wildlife of the area. 600 acres of fenced-in land can be spared in other areas without as many hazards to be considered. Large animals could be kept from going near the site, but smaller animals and birds can easily avoid the fence and be faced with further problems. Because no one can ever know the eventual long-term effects of this type of site, I would like to again say that I am against the proposed Summit Lake site for the OTH-B Radar System.

James W. Linzner

1013 5th Avenue, Fairbanks, AK 99701

I hope you do not put a radar system in the Paxson East area.

I'm a landowner at Summit Lake. I plan to retire there because it is a nice recreational area. We also have a lot of small plane traffic. Please let me know the outcome.

Richard Hodges

2608 Kuskokwim, Fairbanks, AK 99709

Regarding your choice of the Paxson East site; as a landowner in the Fielding Lake area, which is about 5 miles away from the proposed site, I would request that an alternate site be chosen as the Paxson East area is used extensively for recreation and hunting purposes.

In view of the high winds which are common in the area, it would seem that the construction costs and maintenance cost would be high.

A Tok or Glennallen location would be a positive boost to their economies.

Henry W. & Wyan L. Grant

604 Cambridge Drive, Fairbanks, AK 99709-6758

See enclosed letter [see Section 4.2, p. 4-138].

Consider electrical power utilities in the area. Commercial power is unavailable in a 70-mile radius from Paxson East. 24

Garry Wayne Mitchell

1419 3rd Avenue, Fairbanks, AK 99701

I own property at Fielding Lake. My family and I have used this area for 20 years, both winter and summer. I do not think I need the OTH-B radar system in my backyard, of all the land in Alaska, why put your site near people that don't want it--the pipeline done enough. Please put your site somewhere else. 25

4.1.3 Tok

David Parker

Box 382, Tok, AK 99780 26

Recreational opportunities are not discussed in current EIS.

I don't recall seeing ice fog and safety discussed in current EIS.

I vote for no OTH-B construction in Tok. The fish-game-trapping, etc., lost will not be offset by the economic gain by the average Tok resident--only local business will gain in the long run, but all hunters, trappers, fishermen will lose. 27

LTJG Gregory A. Taylor, USCG

Commander (eee), U.S. Coast Guard
P.O. Box 3-5000, Juneau, AK 99801

USCG LORAN C Transmitting Station Tok is the master station for the Gulf of Alaska LORAN Chain and will soon be expanded to provide coverage over central Alaska.

28 I have several concerns regarding the effects this OTH-B System will have on the radio spectrum, specifically our existing LORAN-C operations and our HF communications.

Please contact our office officially. (907) 586-7327 (Juneau Federal Building). U.S. Coast Guard; Electronic Engineering Branch, Navigation Systems Section.

George Beaver

P.O. Box 483, Tok, AK 99780

29 I believe your intentions are good, but I feel your statement saying 60 to 70 people will be employed is deceiving to the public.

Your 60 to 70 people from your presentation will be contract personnel. To let people believe you will hire 60 to 70 people is fake.

James R. Cliver, Jr.

P.O. Box 528, Tok, AK 99780

30 The description that was given me of the Cobra Dane Radar located at Shemya, AK, is very similar to the OTH-B radar, i.e., miles of coverage, computer-controlled, etc. In light of this description paralleling the OTH-B, what benefit is the OTH-B over and above the radar on Shemya and if there is little to none, why build it? The OTH-B. I asked a version of this question at the meeting (public hearing). The colonel opened his answer to me by stating that he knew nothing about the Cobra Dane Radar but was able to assure me that no other radar was its (OTH-B) equal. There is an apparent contradiction.

Rex D. Jarrett

P.O. Box 30, Tok, AK 99780

100% in favor of construction in Tok. Favorable impacts on economy and general growth factors far outweigh any minimal environmental impacts. Build it in Tok and soon!

Roy Johnson

Box 135, Tok, AK 99780

I would like to voice my support for this project in Tok.

Larry Weisz

P.O. Box 185, Tok, AK 99780

I think our country needs this system, and it would work well in Tok.

Charolette C. Troupe

P.O. Box 559, Tok, AK

Request transmit subsystem in Tok.

Paul & LuV. Smith

P.O. Box 559, Tok, AK 99780

Request transmit subsystem in Tok.

George Pine

P.O. Box 4, Tok, AK 99780

I see no problems with the OTH-B system being constructed in Tok.

George H. Hunt

Box 683, Tok, AK 99780

The Tok area has the greatest area of gravel base soil of any. I plant power poles daily, and I know where the permafrost is located.

Carol Donnelly

P.O. Box 27, Tok, AK 99780

Go ahead! Build it here.

T. J. Donnelly

Box 27, Tok, AK 99780

Build it in Tok!

Wayne Eagle

P.O. Box 452, Tok, AK 99780

I support the construction of this facility in Tok.

Wally Wallis

Box 439, Tok, AK 99780

Build it here!

Sally Young

P.O. Box 231, Tok, AK 99780

31 More specifics as to the areas in this location under consideration.

Bob Folz

P.O. Box 231, Tok, AK

I am in favor of having this in Tok.

4.1.4 Glennallen

J. L. Loffredo, Engineer

Copper Valley Telephone Cooperative, Box 337, Valdez, AK 99686

Copper Valley Telephone Cooperative is a public-owned telecommunications company. We stand ready to provide whatever communication services that may be required for the backscatter facility. The Glennallen area is in Copper Valley Tel. Coop.'s certificated service area. Copper Valley Tel. Coop. has the technical and financial ability to provide the latest state-of-the-art communications equipment and services. C.V.T.C. also has the equipment and construction knowledge to install, operate, and maintain underground communication cables and facilities. We look forward to serving you.

Dan LeBlanc

P.O. Box 637, Glennallen, AK 99588

If the backscatter system goes into the Glennallen area, my concern is that the Federal Government support local businessmen and the private landowners.

Bob Gallatin (Copper Valley Views)

S.R. Box 147-6, Copper Center, AK 99573

This area needs backscatter!

Alan LeMaster

Gakona Junction Village, P.O. Box 222, Gakona, AK 99586

We were privileged to have your crew as our guests during their studies in August.

I sincerely extend an invitation to all your personnel to be our guests at the lodge during your future work in our area. We will be available for services year-round (with possibly some periods of January or February).

If you have a demand for term housing and/or meals, we are interested in consideration.

Vera Roberson

Box 375 (Mile 182.3 Glenn Hwy), Glennallen, AK 99588

Thank you for coming to Glennallen. I see the backscatter system as a plus for this area. Please consider the Copper Basin and hopefully the Glennallen area as one or both of the sites.

Marcy White

SRC 8886, Palmer, AK 99645

I fully support the OTH-B for installation in the Copper River Basin. This area is in need of building an economic base to develop the area. Our young people leave this area seeking jobs and professional placement because the area has experienced little or no growth in recent years. I have lived here forty years, raised four children, and all but one have found it necessary to domicile outside the CRB in order to earn a living, although they would greatly prefer to live here. In addition, it is my strong feeling that I wish to support our national effort to protect and defend our country.

Loren St. Amand

Drawer A, Copper Center, AK 99573

All for it.

Douglas W. (Sy) Neeley

Box 165, Glennallen, AK 99588

As chairman of the Glennallen Improvement Corp. (responsible for sewage disposal), my board will be submitting a written statement to your committee.

Dean A. Sawyer

Box 255, Glennallen, AK 99588

Welcome to Glennallen!! Like to see you in this area!

Paul V. Lewis

P.O. Box 272, Glennallen, AK 99588

As the local manager of a chain of lumber and hardware stores and a member of the District Board of Education, I can assure you that my employer wants your proposed OTH-B radar system located in the Glennallen area. Additionally, the school district wants your children to become a part of our education system. I believe our area would be good for the Air Force and the Air Force good for our area. We have a lot to offer one another! Welcome...

Sam L. Bishop Sr. & Joan D. Bishop

P.O. Box 367, Glennallen, AK 99588

We feel the Glennallen area would be a good place to locate either or both your OTH sites. We heartily support this as both a landowner and business person.

Lerica Jo Childs

P.O. Box 163, Glennallen, AK 99588

Though our community is small and spread out along the highway, there is a cohesiveness among the people that lends to a strong community spirit. As business people here for the past 15 years, we look to find ways to balance our economy year round. I feel having this OTH-B System in our Copper Basin will help us achieve that goal. Also, we have much to offer in the way of needed facilities--hospital, good schools, state trooper, power and telephone communication facilities. Plus, we want it for our area--both sites, if at all possible.

Jim Hannah

P.O. Box 695, Glennallen, AK 99588

I enjoyed the second presentation. Like several other people at the meeting, I support Backscatter Radar facility in the Glennallen...Copper River basin area. There appears to be enough BLM public lands to cut down on land acquisition...saving taxpayers' dollars. Local hire should be a high priority by contractors, but not at the risk of losing quality workmanship. A concern is greater competition for natural resources but this is more of a concern/problem with the local Federal/State/Subsistence Commission. 32 33

Marceline C. White

SRC 8886, Palmer, AK 99645

The State of Alaska is developing the Copper River Basin Plan, and I have been attending meetings for the public to have input on the draft before it is approved by the Commissioner of Natural Resources. The plan is addressed to the multiple use planning for approximately 3.3 million acres in our valley. I feel that the Air Force should be able to agree with the State on a parcel(s) adequate for the installation of the OTH-B without jeopardizing any of the other planned uses for this substantial portion of land. With modern technology what it is, surely habitat can be protected, life styles can be preserved, communications systems can be honored, and we can anticipate enjoying some economic benefits from the selection of the Glennallen/Copper Basin area for the backscatter.

I have lived in the basin for 40 years...homesteaded, established a business, raised four children, and buried one child and a husband all within the confines of the basin. I have had the privilege of working with the Air Force as a ground corps observer and with the Corps of Engineers when the White Alice projects were being built in this area. At all times (even prior to the era of EIS) these agencies were considerate of the local environment and population. I wholly support

At all times (even prior to the era of EIS) these agencies were considerate of the local environment and population. I wholly support and encourage the establishment of the OTH-B in our area. It will be an opportunity for young people who are born and raised in this valley to have employment in both construction and technical industries. Currently, most young people have to leave the area to find work when they would prefer to be able to work here.

The Air Force can become a partner in the development of the Copper Basin and enjoy many of the great advantages we consider to be outstanding in the Great Land.

4.2 Letters

The following individuals and organizations submitted comment letters:

Neil C. Johannsen, Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation

John C. Mitchell, Chief, Radiation Sciences Division, Air Force School of Aerospace Medicine

Lisa Jaeger, Village Government Specialist - Lands, Tanana Chiefs Conference, Inc.

State Senator Jay Kerttula, Wasilla

Frede Glidden, President, Tok Chamber of Commerce

Patty Bielawski, Project Coordinator, Alaska Office of Management and Budget, Division of Governmental Coordination

Glenn R. Johnson, Anchorage

Dean A. Moore, General Manager, Copper Valley Telephone Cooperative, Inc.

John P. Brandt, Anchorage

Tom Hawkins, Director, Alaska Department of Natural Resources, Division of Land and Water Management

David L. Highers, General Manager, Copper Valley Electric Association, Inc.

Daryl A. Douthat, Chugiak

Mike Tinker, Tangle Lakes Outfitters, Ester

L. Alan LeMaster, Gakona Junction Village, Gakona

David Ahn, Paxson Lake

Sarah Weston, Chistochina Trading Post, Gakona

Joyce Beelman, Environmental Field Officer, Alaska Department of Environmental Conservation, Northern Regional Office

State Representative Mike Davis, Fairbanks

Dennis D. Kelso, Deputy Commissioner, Alaska Department of Fish and Game

John Morrone, Deputy Director, Alaska Department of Administration, Division of Telecommunications Operations

Larry S. Lau, Resource Manager, Ahtna, Inc.

Larry M. Huff, Eagle River

Noel Newberg, Eagle River

Robert Niebrugge, Glennallen

Bruce Blanchard, Director, Environmental Project Review, U.S. Department of Interior, Washington, D.C.

Paul Gates, Regional Environmental Officer, U.S. Department of the Interior, Anchorage

Daniel I. Steinborn, Chief, EIS and Energy Review Section, U.S. Environmental Protection Agency, Region 10, Seattle, WA

Robert S. Burd, Director, Water Division, U.S. Environmental Protection Agency, Seattle, WA

David Cottingham, Ecology and Conservation Division, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Washington, D.C.

Robert W. McVey, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Juneau

Donald R. Etheredge, General Manager, Communications Supply, Fairbanks

The letters are reproduced in the following pages, as is one copy of the numerous form letters also submitted.

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STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION

BILL SHEFFIELD, GOVERNOR

3601 C STREET
ANCHORAGE, ALASKA 99503
PHONE: (907) 561-2020

MAILING ADDRESS
PO. BOX 7001
ANCHORAGE, ALASKA 99510

August 28, 1986

Re: 1130-4 Air Force

Subject: DEIS Alaskan Radar System OTH-B Radar Program August 1986

Lt. V. G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Dear Lt. Brown:

We have reviewed the subject document and have no substantial comment to make at this time. The sections concerning cultural resources are well written and appear to cover all concerns. We look forward to reviewing results of the appropriate survey and subsequent Section 106 consultations.

Sincerely,

Neil C. Johannsen
Director

Tom Smith, Deputy
By: Judith E. Bittner
for State Historic Preservation Officer

DR:tls

DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235-5000

8 SEP 1986

REPLY TO
ATTN OF: RZ

SUBJECT: Alaskan and Central OTH-B Draft Environmental Impact Statements

TO: HQ ESD/SCO (Lt. V.G. Brown)
Hanscom AFB, MA 01731

1. Comments by the personnel of the Radiation Sciences Division, USAF School of Aerospace Medicine, Brooks AFB, Texas on the draft environmental impact statements for the Alaskan and Central OTH-B radar systems are provided per your request. Both environmental impact documents are excellent and very credible. Their high quality indicates the expertise of the preparers and are what we have come to expect from the SRI International team. Specifically, the human health effects sections (Section 4.14) have been well prepared. The discussions therein are cogent and relevant. However, consideration should be given to using the report USAFSAM-TR-83-1 entitled "Bioeffects of Radiofrequency Radiation: A Review Pertinent to Air Force Operations" as an attachment to the EIS. This report was prepared during the environmental impact analysis process for the Southeast and Southwest PAVE PAWS radar systems, and has proven to be a very credible document, and represents a consistent Air Force position. 34

2. There are some additional items we would like to see addressed in the final versions however. On 30 July 1986, the Environmental Protection Agency published a notice of proposed recommendations entitled "Federal Radiation Protection Guidance; Proposed Alternatives for Controlling Public Exposure to Radiofrequency Radiation: Notice of Proposed Recommendations" (Federal Register, Vol. 52, No. 146). This notice offers four guidance options for consideration. The most stringent option limits environmental exposure to 0.04 W/kg; at 5 MHz this equates to a power density of 3.6 mW/cm^2 and about .11 mW/cm^2 at 28 MHz. If the highest power density at the exclusion fence is really 0.02 mW/cm^2, then exposures to the public would indeed be a factor of 5 below the strictest proposed option. A thorough discussion of this EPA proposal and its implications for the OTH-B should be developed for the final EIS. 35

3. A significant omission from the EIS is a discussion of the problem of perception, shock, and burn from the electric fields associated with the emissions at OTH-B frequencies. For instance at about 3 MHz the current flow for perception when in contact with a large ungrounded conductive object is associated with an electric field of around 50 V/m, while the let-go threshold at this frequency is about 100 V/m. A section on shock and burns hazards should definitely be added to the EIS. Some relevant references are: Gandhi and Chatterjee, Proceedings of the IEEE, Vol. 70, No. 12, 1982 and Chatterjee, et al., IEEE Transactions on Biomedical Engineering, Vol. BME-33, No. 5, 1986. 36

4. The following other specific comments are offered for clarification or revision.

a. Since the EPA has now issued their proposed Guidance, the 9th paragraph of 4.14.1.3 needs revision (Pg. 4-61 in the CRS EIS and pg. 4-60 in the ARS EIS). 37

b. In the Summary, the paragraph on Human Health (Pg. S-5 in the CRS, pg. S-4 in the ARS), in the fifth sentence, effects are said to occur at 1 mW/cm^2. This should be stated in terms of SAR. In fact, the ANSI rationale is that consistent effects are reported at SARs of 4 W/kg or higher. Also the next to last paragraph in this section (Pg. S-6 in CRS, pg. S-5 in ARS) needs to be rewritten in terms of SAR rather than mW/cm^2. 38

c. In 4.13.1.3, the power density at the exclusion fence is stated to be 0.02 mW/cm^2. The electric field associated with this power density is about 9 V/m, well below the perception threshold. This should be stated. 39

d. 9th paragraph of 4.14.2.1 (Pg. 4-71 in CRS, pg. 4-68 in ARS). The average power density is stated to be less than 0.1 mW/cm^2. This should read 0.02 mW/cm^2 to be in consonance with 4.13.1.3. 40

5. I'm sorry that I was unable to join your team in the recent public hearings in the Midwest. I was previously committed to GWEN scoping activities in Washington, DC. Please let us know if any specific questions were raised regarding RFR bioeffects. We would be pleased to respond as appropriate.

6. Let us know if we can help in any other way to complete the EIS process for the OTH-B systems.

John C Mitchell

JOHN C. MITCHELL
Chief, Radiation Sciences Division

cc: ESD/DE
(Col. Kishiyama)

Tanana Chiefs Conference, Inc.

201 First Ave.
Fairbanks, Alaska 99701
(907) 452-8251

September 8, 1986

HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
ATTN: Lieutenant V.G. Brown
Hanscom AFB, MA 01731-5000

Dear Lieutenant Brown:

The Tanana Chiefs Conference appreciates the opportunity to review and comment on the Environmental Impact Analysis of the proposed Alaskan Backscatter Radar System. The only proposed site in our region is the Tok site. If this site is chosen we
41 have two major concerns. The site must be positioned and developed to cause the least possible damage to the natural resources in the area - it must not damage the subsistence economy in the area. Secondly, if the Tok site is chosen, we insist that labor
42 be locally hired.

We appreciate being informed of developments on this matter.

Sincerely,

TANANA CHIEFS CONFERENCE, INC.

Lisa Jaeger

Lisa Jaeger
Village Government Specialist - Lands

State of Alaska

The Committee on Budget and Audit

SEN. JAY KERTTULA, CHAIRMAN
SEN. JOHN SACKETT
SEN. JOE JOSEPHSON
SEN. PAUL FISCHER
SEN. MITCH ABOOD
SEN. RICK HALFORD

REP. SAM COTTEN, V. CHAIRMAN
REP. AL ADAMS
REP. JIM DUNCAN
REP. RON LARSON
REP. TERRY MARTIN
REP. KAY WALLIS

POUCH V
STATE CAPITOL
JUNEAU, ALASKA 99811
(907) 465-4967

WASILLA, ALASKA
(907) 376-2675

September 10, 1986

Colonel Barry L. Thompson, USAF
Deputy Chief of Staff/Plans
Elmendorf Air Force Base
Alaska, AK 99506-5001

Dear Colonel Thompson:

I received your letter of August 26, 1986, concerning the proposed construction and operation of an Alaskan Over-the-Horizon Backscatter (OTH-B) Radar System.

I need information regarding the location and operation of the radar system sites for the Talkeetna Mtns. This proposed radar system will be partially located in the Nelchina Public Use Area (2.3 million acres). The Nelchina Public use area[2] was established for the preservation of wildlife habitat and the protection of the Nelchina Caribou herd and the central calving area. 43

I look forward to your response to my request.

Sincerely,

Senator Jay Kerttula

JK:mf

cc: Lt. General David L. Nichols, USAF
Elmendorf Air Force Base

[2] I wrote the law.

TOK CHAMBER OF COMMERCE

P.O. BOX 389 • TOK, ALASKA 99780

September 22, 1986

Colonel Robert Lee
Public Affairs Office (ESD/PAM)
HANSCOM AIR FORCE BASE
Massachusetts 01731-5000

Dear Sir:

To follow up on our letter of February 3, 1986, the Tok Chamber of Commerce would like to again emphasize our support for the construction of the Back Scatter Radar system in Tok.

We realize that there are some environmental concerns. Our membership is some seventy strong and we believe any perceived environmental problems are more than offset by both the national and local advantages created by the Back Scatter system.

Tok would be very positively impacted by the economic good created by both the construction and operational phase of the system. Tok has a lot to offer and the members of the Tok Chamber of Commerce hope Tok will be chosen as one of your sites.

Thank you for your time in this matter and please feel free to contact us if you have any questions on Tok.

Sincerely,

Mr Frede Glidden

Mr. Frede Glidden
President
Tok Chamber of Commerce

cc: file

FG/gb

STATE OF ALASKA

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

BILL SHEFFIELD, GOVERNOR

CENTRAL OFFICE
P.O. BOX AW
JUNEAU, ALASKA 99811-0165
PHONE: (907) 465-3562

SOUTHEAST REGIONAL OFFICE
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SOUTHCENTRAL REGIONAL OFFICE
2600 DENALI STREET
SUITE 700
ANCHORAGE, ALASKA 99503-2798
PHONE: (907) 274-1581

NORTHERN REGIONAL OFFICE
675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 456-3084

September 23, 1986

HQ Electronic Systems Division/SCO
Attn: Lt. V. G. Brown
Hanscom AFB, MA 01731

Dear Lt. Brown:

The Division of Governmental Coordination (DGC) has received and reviewed the Draft Environmental Impact Statement (DEIS) for the proposed construction and operation of the Alaska Over the Horizon Backscatter (OTH-B) Radar System. The DGC implements the Alaska Coastal Management Program (ACMP). Pursuant to the Federal Coastal Zone Management Act, federal activities which may impact Alaska's coastal zone must be conducted in a manner consistent to the maximum extent practicable with the state's ACMP.

DGC's primary interest in the DEIS was to review the proposed study areas and determine if these areas are within the state's coastal zone boundary. DGC has reviewed the study areas presented in Section 2.1.2.2 of the DEIS. Each of these areas is well outside the ACMP coastal zone boundary. Activities within these study areas are not likely to generate spillover impacts which would reach the coastal zone.

Should the selected project facility location be within the study areas presented in the DEIS, no further review of the OTH-B Radar Program by DGC is required and we request removal from your mailing list. However, if new study areas are identified as the Final EIS is prepared, please contact DGC for a determination on whether or not these new areas are within the state's coastal zone and, if so, the procedures for preparing a federal consistency determination.

Thank you for your cooperation with the ACMP.

Sincerely,

Patty Bielawski
Project Coordinator

cc: Meg Hayes
Department of Natural Resources

Bill Lamoreaux
Department of Environmental Conservation

Carl Yanagawa
Department of Fish and Game

John Tolley
Department of Transportation & Public Facilities

Robert L. Grogan
Division of Governmental Coordination

Patti Wightman
Division of Governmental Coordination

GLENN R. JOHNSON, M.D.
ORTHOPEDIC SURGEON
2851 PELICAN DR.
ANCHORAGE, ALASKA 99515
(907) 243-5205

September 30, 1986

Lt. V. G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Re: Alaska Radar System (OTH-B) & August 1986 Environmental Impact Analysis Statement

I recently read the above document, particularly sections 3.13 and 4.14. As an orthopedist I noticed no reference to possible hazard to electronic bone growth stimulators and orthopedic implants.

Appropriately mentioned were cardiac pacemaker studies, but no mention was documented studies of various bone growth stimulators which are very critically sensitive. Basically they create a weak RF field about healing bone to reproduce the weak piezoelectric signals in long bones. The energy delivered to the bone is very critical and falls within a very narrow therapeutic range. Too much field readily cause bone necrosis. Your report mentions time-averaged values of RFR, but in this case maximum values of power and voltage are critical! 44

It is a well known fact that people living near high power HF transmitters who have certain dental fillings and orthopedic hardware are often able to act as a "detector" and actually receive the transmitted signals. The metallic orthopedic implants are coupled to bone and bathed in the body's electrolyte solution, and I have not seen any study in your report on the effects of high power HF RFR on such implants and bone physiology. Again, if bone, particularly with a metallic implant, is exposed to enough induced voltage (and the amount is small!), necrosis results. 45

Also not mentioned, is a theory about migratory animals (e.g. caribou, birds, and fish) using a weak magnetic field as a basis for their migratory patterns. I do not know even if this is fact, but it should be addressed. How would large RF fields affect migratory patterns? 46

I also wonder if any thermal effect from the RFR would occur on the permafrost at various locations, depending upon the "impurities" in the permafrost layer. 47

The orthopedic literature has been flooded over the past decade with articles about the electrobiology of bone. I feel I have raised very important and critical issues that demand an answer before proceeding with construction of any high powered high frequency RF transmitter.

48 I would like to know how the "Russian Woodpecker" (which causes so much interference in the HF bands) is different from the USAF OTH-B radar and I would like some assurance such interference would not be caused by the U.S.

The August 1986 Environmental Impact Analysis Statement I read belonged to a radio station and I would like to have a copy for my personal use, if you would be so kind to send me a copy.

Thank you very much. Your response would be appreciated.

Sincerely,

Glenn R. Johnson, M.D.

COPPER VALLEY TELEPHONE
COOPERATIVE INCORPORATED

BOX 337, VALDEZ, ALASKA 99686 907-835-2231

October 1, 1986

Lt. V. G. Brown
HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
Hanscom AFB, MA 01731-5000

Dear Lt. Brown:

This letter is to further confirm my testimony provided at your public meeting held in Glennallen, Alaska on Friday, September 26, 1986, relative to the proposed locations of the transmitter and receiver for the OTH system.

As I stated in my testimony, Copper Valley Telephone Cooperative, Inc. (CVTC) is a member owned telecommunications company. We are financed by the Rural Electrification Administration (REA) for the purpose of planned capital additions to the system. CVTC is presently financially and technically able to provide whatever communications facilities you might request. The areas of proposed site locations, except for the Tok area, are located within the certified service area of CVTC.

CVTC is presently able to provide adequate engineering and technical assistance where needed, along with the latest state-of-the-art telecommunications equipment. Along with this CVTC has the necessary equipment and personnel available for the purpose of construction and maintenance of buried cable facilities.

49

I am enclosing a copy of a letter written in March, 1986, to which we have not received an answer, along with a copy of the form given us at the meeting in Glennallen. We are requesting a copy of the EIS upon its completion.

As I stated in Glennallen, CVTC is ready, willing and able to serve your needs and will appreciate your consideration and response.

Very Sincerely Yours,

Dean A. Moore, General Manager
COPPER VALLEY TELEPHONE COOPERATIVE, INC.

DM:jt
cc-file

COMMENT SHEET
ALASKAN OTH-B RADAR SYSTEM
PUBLIC HEARING
GLENNALLEN, AK
(26 Sep 86)

[Enclosure]

Name: Copper Valley Telephone Cooperative, Inc., Dean A. Moore, Gen. Mgr.

Mailing Address: PO Box 337, Valdez, AK. 99686

Please check one of the following:

Landowner _____ Business person XX Other _____

Check here if you wish to ask a question. _____

Check here if you wish to offer oral comments. x

Check here if you wish to submit a written statement. x

Check here if you wish to receive an EIS. xx draft xx final

Area of question or comment (check all that apply):

Air Quality	_____	Public Services and Facilities	x
Water Quality	_____	Health Hazards	_____
Biological Impacts	_____	Visual Impacts	_____
Geology/Soils	_____	Cultural Resources	_____
Land Use	_____	Other (specify)	_____

Please turn in this sheet as requested by the hearing officer.

Written comments to be included in preparation of the final EIS. You may use this sheet to submit a written comment in the space provided below. Please turn in your comments either at the break, at the close of the meeting, or mail to the address at the bottom of this sheet. Written comments may also be submitted in a letter or other format no later than October 13, 1986.

Please see transcription of comments made at September 26, 1986 meeting.

Mail to:
HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
Attn: Lt V. G. Brown
Hanscom AFB, MA 01731-5000

COPPER VALLEY TELEPHONE
COOPERATIVE INCORPORATED

[Enclosure]

March 3, 1986

Alaskan Air Command
Director Public Affairs
Elmendorf AFB, Alaska 99560

Dear Sir:

This letter is to provide information to your Communications Planning group regarding future telecommunication needs to the proposed "Backscatter Radar Sites" in the Glennallen area.

Copper Valley Telephone Cooperative, Inc., a U.S. Government Rural Electrification Administration financed company provides telephone service to the Glennallen area. We at Copper Valley Telephone Cooperative are willing and eager to provide the Air Force with whatever telecommunications services that may be requested from us.

Contact or correspondence may be directed to Copper Valley Telephone's main office in Valdez at 835-2231 to Mr. Dean Moore, General Manager or Mr. Joe Loffredo, Systems Engineer.

We look forward to hearing from you in the near future.

Cordially,

COPPER VALLEY TELEPHONE COOP., INC.

Dean A. Moore
General Manager

DAM:jt

COPPER VALLEY TELEPHONE COOPERATIVE, INC. BOX 337, VALDEZ, ALASKA 99686 907-835-2231

John P. Brandt
4300 Manytell Ave.
Anchorage, Alaska 99516

10-2-86

Lt. V. G. Brown (backscatter radar)

Many factors indicate that the Paxson east site is a poor selection for radar Below are twelve comments on the proposed site.

Please keep me informed. If I can be of any assistance, please ask.

John P. Brandt

50 1. Few facilities are available at Paxson ; no hospital, schools, troopers, shopp etc.

51 2. The local hire issue doesn't make good logic; only about 40 people live in the

50 3. Very little private land is available for employee residences

52 4. The Alaska Dept. of Fish & game has proposed that Paxson east not be a site

53 5. On page 2-3 EIS, a state highway system is needed for the site. The Richardso Highway is in very poor condition and many have rated the highway- unsafe.

54 6. With increased highway use, excessive highway animal kills would result in thi rich game area.

55 7. The Paxson east site has a marginal level grade for site construction - almos unsuitable.

56 8. EIS page 3-86, indicates drinking water below human standards.

57 9. Permafrost in the area is likely to increase construction costs.

58 10. EIS page 3-110 indicates local subsistence use. With a huge influx of empl ee severe over use would result.

59 11. Power plant emissions from diesel generators (NO_x) may have a severe impact on wildlife. EIS 4-16

58 12. EIS 4-27, suggests that impact of employees on recreational resources would be small. This is misleading. The BLM claims that many resources are saturat i the Paxson area: Delta River, Gulkana River

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF LAND AND WATER MANAGEMENT

BILL SHEFFIELD, GOVERNOR

3601 C STREET
PO. BOX 7-005
ANCHORAGE, ALASKA 99510-7005
PHONE: (907) 561-2020

October 7, 1986

RECEI

Lt. V.G. Brown
HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
Hanscom AFB, Massachusetts 01731

Dear Lt. Brown:

Thank you for the opportunity to review the Draft Environmental Impact Statement for the proposed Alaskan system of the Over-the-Horizon Backscatter Radar Program. Due to the way the transmit and receive sites need to be paired, it appears that part or all of at least one site is likely to be located on state-owned land. The Department of Natural Resources (DNR) manages these state-owned lands and if the final area selected by the USAF includes state land, will attempt to accommodate the USAF's needs.

Our comments focus on the use of state lands and how the USAF could acquire state land. We also have comments about specific study areas. Page specific comments on the Draft Evironmental Impact Statement (DEIS) are in the attachment.

Use of State Lands for the Facility

Any sale or lease of state lands must be in accordance with Title 38 of the Alaska Statutes, regulations contained in 11 AAC and any land use plans prepared by the department. The key portions of AS 38 relevant to land leases, land sales and land exchanges are briefly described below. 60

The four Copper River Basin sites (Glennallen, Gulkana, Paxson East and Indian Creek) fall within the Copper River Basin Area Plan (CRBAP). A draft of this area plan is currently out for public review with comments due to DNR by November 10. A copy of the draft plan is enclosed and we encourage comments from the USAF. As the USAF did not identify specific areas in time for us to address them in the draft plan, the draft plan does not provide specific guidance on the use of state land for such a facility. DNR will solicit additional comments regarding the use of state land for the radar facility at public meetings on the draft plan. The final area plan will provide direction to DNR on management of state land in these areas.

The Tok site includes state-owned and selected land subject to the Tanana Basin Area Plan or within the legislatively designated Tanana Valley Forest. The Tanana Basin Area Plan identifies state land in this area as having

potential for agricultural use or timber sales. It requires that these lands be kept in state ownership. The plan would need to be amended to allow for a land sale. Land north of the Tanana River in T. 19 N., R. 13 E., Copper River
60 Meridian, is within the Tanana Valley State Forest. These state lands were set aside by the legislature to be retained in state ownership for multiple use. Land within the state forest cannot be sold without the approval of the Alaska Legislature.

Acquisition of State Land

For a project of this magnitude, three possible options for use of state land would be:

1) long term (up to 55 years) lease of state land;
2) negotiated sale of state land; or
3) acquisition of state land by the USAF through a land exchange.

A brief summary of each of these methods and a few comments on each follows.

1. Land leases. DNR can issue a lease for the use of state land for up to 55 years. A lease could be issued under AS 38.05.810(a) without requiring the normal competitive bidding process usually required for leases. A lease would require interagency review and would need to be consistent with any approved land use plan and classifications.

2. Negotiated land sale. The USAF could apply for a negotiated land sale also under AS 38.05.810(a) and AS 38.05.045. A negotiated land sale would require interagency review, public review and would need to be consistent with any approved land use plan and classifications.

3. Land exchange. Under state law (AS 38.50), DNR can trade state land for other land of equal appraised value when it is in the state's best interest to do so. Any unequal value exchange requries legislative approval. The state would be interested in acquisition of certain lands owned by the USAF or other Department of Defense properties. Our recent experience with land exchanges has shown, however, that they can be a time consuming effort.

Comments Regarding Specific Areas

The five study areas should be more narrowly defined in the final Environmental Impact Statement. Four of the five sites include areas with homes and lodges or contain small areas on the edges of the study areas with severe environmental or size constraints. Our comments try to identify these areas.

Paxson East Area. This entire site is either state owned or state selected. The area has high public recreation and wildlife habitat values. The CRBAP
61 recognizes that Fish Creek is especially important for sockeye salmon, and any development of this site should protect this resource.

Indian Creek Area. Most of this area is owned by Ahtna, Inc. The CRBAP identifies fish and wildlife habitat and harvest as the primary surface values on state land in the northern and western parts of this area. 62

Gulkana. Most of this area is owned by Ahtna, Inc. The Final EIS should delete areas between the Richardson Highway and the Gulkana River due to high fish and recreation values of the river and the lack of sufficient land for the facility between the road and the river. Areas near Gakona village and Gakona Lodge should also be excluded from this area. 63

Tok. As previously noted, part of this area includes land within the Tanana Valley State Forest. 62

Glennallen/Crosswind Lake: Northern Two-thirds (T. 5 N., R. 3 W.; T. 5 N., R. 4 W.; T. 6 N., R. 3 W.; T. 6 N., R 4 W; and parts of T. 7 N., R. 3 W. and T. 7 N., R. 4 W). The draft CRBAP identifies the northern two-thirds of this area as important trumpeter swan nesting habitat. The protection of this trumpeter swan habitat has been one of the highest priorities expressed by the public at over 25 public meetings and through a public attitude survey conducted for the area plan. Crosswind Lake, at the north end of this area, is a very popular recreation area and has numerous private cabins. The state offered land for private ownership west of the lake in 1985 and the draft plan identifies the south and east shorelines as suitable for additional state land offerings. Much of the study area is very swampy and underlain by permafrost and would require extensive gravel for roads, buildings, and the groundscreen. The area is a considerable distance from roads, thereby increasing the need for gravel. Gravel resources in the area are very limited. The eastern half of this area is also selected by both the state and Ahtna, Inc., and settlement of conflicting land claims could take many years. Overall, the northern two-thirds of the Glennallen site seems to be poorly suited for either the transmit or receive site. 63

Glennallen/Crosswind Lake: Southern Third (T. 4 N., R. 3 W. (part) and T. 4 N., R. 4 W.). This area has much lower swan population density, is generally drier ground and much closer to the Glenn Highway. While most of this area seems more suitable for the facility, the following specific areas should be deleted. The area between Mud Lake-Tolsona Lake and Tolsona Creek is adjacent to existing settlement at these two lakes. Tolsona Creek is an important salmon stream. Areas south of the Glenn Highway and north of the Tazlina River are probably too small for the facility and if so, should be deleted. The Tolsona Mineral Springs north of Plumb Bob Lake have been identified in the CRBAP as a unique geologic resource which also should be excluded (the springs would likely be an unsuitable place for the facility).

One final comment is that we encourage the USAF to actively seek public involvement in its Environmental Assessment for site planning and design. Such public involvement will be required if the final proposal includes the use of state-owned lands.

The department will also be involved in permitting the use of gravel from state land and providing water appropriations for the facilities. In summary, I would like to reiterate that DNR is anxious to work with the USAF to provide

land for this facility if the final sites include state-owned land. We recognize that the facility will have positive economic benefits for local comunities. As the state's land manager, we must balance these benefits against the need to manage state land and water so that it best serves the interests of all Alaskans.

Sincerely,

Tom Hawkins
Director

cc: George Hollett, Acting Director, Division of Forestry
Margaret J. Hayes, DLWM, Southcentral Regional Manager
Jerry Brossia, DLWM, Northern Regional Manager
Veronica Clark, DLWM, Chief, Resource Allocation Section
Dick Myllus, DLWM, Project Manager, Copper River Basin Area Plan
Sid Everett, SRI International

Enclosure

ATTACHMENT: SPECIFIC COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

Page G-1 (Glossary), ADL. The abbreviation "ADL" is used by the Department of Natural Resources only to reference land records and with regard to certain statutory authority specifically granted to the Director of the Division of Lands in AS 38.05.035. The division within DNR responsible for managing state lands, other than those withdrawn by the legislature (such as state parks), is the Division of Land and Water Management (DLWM). This distinction needs to be made throughout the document, including pages 3-8, 3-27. 62

Page 2-20, Section 2.1.2.2.1., 3rd paragraph. The geography describing the Gakona area is incorrect. The area shown in Figure 3-3 starts within a mile of the junction of the Glenn and Richardson Highways not "beginning about 3 miles" from the junction. Tulsona Creek forms the eastern boundary (approximately), Copper River the southeastern boundary and the Gulkana River the western boundary of this area.

Page 3-1, Section 3.2.1.1., Third sentence. The Copper River Basin is composed primarily of glacial lacustrine sediments, it is not a flat outwash surface. Also, only parts of the basin are dominated by glacial moraines.

Page 3-3, Sections 3.2.1.1.1. and 3.2.1.1.2., First sentence of both paragraphs should indicate that this is a glaciolacustrine plain.

Page 3-10, Sections 3.2.2.1., 3.2.2.2., 3.2.2.3., 3.2.2.4. The narrative incorrectly implies that land patented or tentatively approved for patent to the state and land conveyed to Native corporations is federal land. Land patented to either the state or Native corporations is owned fee simple. Land tentatively approved to the state or interim conveyed to Native corporations is recognized by the state and federal government as having been transferred out of federal ownership subject only to survey of exterior boundaries. (See Alaska National Interest Lands Conservation Act, section 906(c).) Land with state or Native selections is federal land, but will likely be transferred to either the Native corporation or the state. In the Gakona area, the "university selected" land is "university owned."

Land status work conducted for the Copper River Basin Area Plan indicates that all oil and gas leases issued by the state or federal governments in the Glennallen and Gakona study area have expired.

Page 3-10, Section 3.2.2.1., Glennallen Study Area. Nearly the entire eastern half of this area is selected by both the state and Ahtna, Inc. Final resolution of the status of these selections could take many years making acquisition of a site in this area a very time consuming effort.

Page 3-16, Section 3.2.2.5., Tok Area. Land within the boundaries of the former Tetlin Indian Reservation is owned, not selected, by the Tetlin Native Corporation. Land referred to as "state approved" should be referred to as "state owned."

Page 3-28, Section 3.2.5.1.1., Last paragraph. Oil and gas exploration in the Glennallen area has included numerous geophysical exploration activities in the 1960's and 1970's. According to records of the Alaska Oil and Gas Conservation Commission exploratory wells were drilled in T. 4 N., R. 4 W., south of Tolsona Lake (by Copper Valley Machine Works, 1983) and in T. 4 N., R. 3 W., (by Pan America, 1963). Both were plugged and abandoned. 62

Page 3-34, Section 3.3.1., Habitat, Second paragraph. This paragraph implies that the entire Tok area, except south facing slopes, is underlain by permafrost. Tok is located on a course textured relic pleistocene alluvial fan which still has enough subsurface water flow to preclude permafrost. Its outer and lower edges, if swampy, are most likely frozen near the surface.

Page 3-41, Section 3.3.5. and 3.3.6. The DNR, Division of Geological and Geophysical Surveys data collected for the Copper River Basin Area Plan includes 1 inch to 1 mile (1:63,360) vegetative information for the Glennallen and Gulkana sites. This data is more accurate than data used in the DEIS and is available from DGGS. 64

Page 3-42, Section 3.3.9. The U.S. Department of Agriculture has mapped vegetation in the Tok area at a scale of two inches to the mile as part of its Tanana River Basin Study. This data is more accurate than the information used in the DEIS.

Page 3-125. Section 3.10.2.2. Transportation. Paxson and Chistochina also have airports. 62

Page 3-139, Section 3.12.2. Prehistoric Resources. A 1985 report by the DGGS entitled Cultural Resources Report: Copper River Resources Management Mapping Project (PDF Number 85-11) summarizes cultural resource information for the Copper River Basin. This report would provide additional information for this section of the DEIS. 65

Page 4-3, Section 4.2.2. Third paragraph, fourth sentence. ANGTS is the Alaska Natural (not National) Gas Transportation System. 62

Page 6-1, reference to Alaska Dept. of Natural Resources. It appears that numerous DNR reports prepared for the Copper River Basin Area Plan were used in this DEIS. A more thorough listing should be included in the references. See Appendix C of the enclosed Draft Area Plan which lists various reports used in preparing the DNR's area plan.

Page D-7 (Appendix D). First listing under Alaska Department of Natural Resources. Under AS 38.04 and AS 38.05, DNR has numerous authorities not mentioned here for the use and disposal of state lands. Some of the most pertinent authorities are described in DNR's general comments. This section should be expanded to note that DNR has authority to sell, exchange and lease state land and has authority to develop and implement land use plans for state land. 66

COPPER VALLEY ELECTRIC ASSOCIATION, INC.
SERVING VALDEZ AND THE COPPER RIVER BASIN

HEADQUARTERS:
P.O. BOX 45
GLENNALLEN, AK 99588
(907) 822-3211

DISTRICT OFFICE:
P.O. BOX 927
VALDEZ, AK 99686
(907) 835-4301

October 6, 1986

HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
Attn: Lt. V.G. Brown
Hanscom AFB, MA 01731-5000

The management staff of Copper Valley Electric Association, Inc. (CVEA), have completed their review of the Draft Environmental Impact Statement (EIS) for the Backscatter Radar System.

The review by CVEA's staff indicates the Draft EIS fails to adequately address the capabilities of CVEA to supply electrical energy and power for the OTH-B System. Further, the Draft EIS does not consider the availability of utility power as an influencing factor in selection of the OTH-B site. The Draft EIS also overlooks the positive effect on electric rates such a large load increase would have for approximately 2200 CVEA consumers. These consumers now pay some of the highest electrical rates in Alaska. 67 68

CVEA's Engineering Department is aware that a Request for Proposal will be forthcoming from the USAF which will solicit proposals from parties interested in providing electrical power to the OTH-B. It is apparent however, from reviewing the Draft EIS, that the USAF is treating the procurement of electrical power as a separate issue rather than an integrated issue related to the OTH-B site selection. 67

CVEA's staff disagrees with this approach and submits that the ability of CVEA to supply reliable and economic electrical power should be a major factor in determining site location for the OTH-B. This is especially true for the transmitter site which will require approximately 10 megawatts of electrical power.

CVEA is willing to work with the USAF to provide reliable, cost-effective electrical energy for the OTH-B radar sites. However, CVEA has had limited opportunity to provide input into the EIS process and the information CVEA did provide has seemingly been disregarded. CVEA previously supplied Mr. William R. Hanson, Director of Engineering and Environmental Planning, Elmendorf AFB and Mr. Edward Drinkard of SRI International with a system map depicting CVEA's generation and transmission facilities. (See attached map.) This map also highlighted potential locations of 69

transmit and receive sites which our engineering department believes would satisfy USAF site requirements and which could also be reliably and economically served by CVEA. The site locations suggested by CVEA were not mentioned in the Draft EIS.

67 Copper Valley Electric Association is a Rural Electric Cooperative (REC) serving the needs of the Copper River Basin. As an REC, CVEA has the financial resources available to install any additional generation and transmission facilities necessary to service the OTH-B system. The USAF should be actively working with CVEA to determine potential site locations within the Copper River Basin which undoubtedly will prove to be advantageous to both parties. If necessary, we are willing to meet in Wasingthon, D.C., Alaska, or any other location you may desire to further discuss this matter.

If you have any questions or need further information, please do not hesitate to contact me.

Sincerely,

COPPER VALLEY ELECTRIC ASSOCIATION, INC.

David L. Highers
General Manager

cc: Colonel Lee/USAF
Senator Murkowski
Senator Stevens

USAFOTH-B.DLH/lr

Box 38
Chignik, AK 99567
Oct. 7, 1986

Lt. V.G. Brown
OTHB Systems Program Office

Dear Lt. Brown:

I wish to comment on the DEIS on the Alaskan OTH-B Radar Program.

I attended both the September meeting as well as the initial meeting in Anchorage. I am familiar with the proposed sites, especially with the one designated "Glenallen" since my wife and I have a cabin and 10 acre parcel in the area. 70

I feel that the impact on recreational and subsistance use of the "Glenallen" site (and probably Poker as well) has not been assessed accurately. The site designated "Glenallen" includes the vicinity of Crosswind Lake. Recreational and subsistance use of this area is already very high. Any further development in this area will certainly conflict directly with hunting and trapping in the area,

70 primarily as a consequence of a larger permanent population and also as a consequence of increased access thru road construction. In particular the concluding statement of section 4.8.4 on p. 4-27 is presented without adequate support and is, I believe incorrect. Since the permanent civilian employees will have subsistance rights by virtue of rural residency, they and their families can be expected to harvest caribou from the Nelchina herd. The wintering ground of this herd includes portions (and perhaps all) of the proposed "Glenallen" site. This kind of impact must be assessed fully and the existing DEIS does not address this problem adequately. I would note also that a single trapper (civilian or military) from the site would eventually claim a large area for his use. This would negatively impact opportunities for other trappers (myself included) who currently use the area for both recreation and subsistance.

I strongly recommend choice of a site closer to an already developed area. In this way, the impact from initial construction of the site and its associated power plant as well as the long-term operation and maintainence will be minimized. Of the proposed sites, construction near Tok would appear to produce the smallest negative impact, although the considerations mentioned above must be dealt with more fully for all sites.

Inadequate consideration has also been given to the degradation of air quality from the anticipated power plant. For the Glenallen site, considerable impact can be anticipated during the persistent winter inversions common to the entire Lake Louise basin. 71

Sincerely,

Daryl A. Douthet

TANGLE LAKES OUTFITTERS

Mike Tinker, Registered Guide & Outfitter

Box 25197
Ester, Alaska 99725
907-479-2561

OUTDOORS IN
ALASKA SINCE 1963

October 8, 1986

FAIR CHASE ONLY
◇
DALL SHEEP
CARIBOU
MOOSE
GRIZZLY
BLACK BEAR

HQ Electronics Systems Division/SCO
OTH-B Systems Program Office
Hanscom Air Force Base, MA 01731-5000

Attn: Lt. V.G. Brown

Dear Sir:

This letter is my written comment on the Alaskan OTH-B Radar System as requested at the Fairbanks Public Hearing (September 24, 1986).

MEMBERSHIPS
LIFE MEMBER
NATIONAL RIFLE ASSOCIATION
◇
ALASKA OUTDOOR COUNCIL
◇
ALASKA PROFESSIONAL HUNTERS ASSOCIATION
◇
FOUNDATION FOR NORTH AMERICAN WILD SHEEP

72

My family owns property in the Tangle Lakes area of the Denali Highway (Mile 20) and operates a tour/recreation business from that location. Since flying and airspace use is part of our livelihood, I am especially concerned about activities such as the OTH-B project which would limit our operations.

More importantly, in my opinion, is that many State and Federal agencies have exhaustive coordination on land use plans for the Denali Highway land area, the Copper River Basin and the Susitna-Cantwell area. In fifteen years of being directly involved in these planning efforts (some as recent as late 1985) there has never been a peep from the Air Force that some land would be desirable for a defense facility.

After a decade of land use planning for the Chistochina, Gakona, Gulkana, Tangle, MacLaren and Susitna drainages which all concluded the lands would best be used for its recreation, wildlife habitat and scenic resource value the U.S. Air Force just decides that a nice radar installation would fit right in.

LOCATIONS
BROOKS RANGE
&
ALASKA RANGE

I urge you to only consider sites that have year round access, utilities, and community acceptance. Your Tok or Glennallen sites seem to offer the most easily developable alternatives. I urge you to choose one of them.

Thank you for the opportunity to comment.

RIFLE OR BOW

Sincerely,

Mike Tinker

Mike Tinker

FISHING & CAMPING
FLOAT TRIPS
LAKE TROUT
GRAYLING
RAINBOW

cc: Representative Don Young
Senator Ted Stevens
Senator Frank Murkowski

Gakona Junction Village

Department of the Air Force
Air Force System Command
Hanscom AFB, Ma 01731

Attn: Lt. V. G. Brown

Re: DEIS - Proposed Alaskan Radar System
Over the Horizon Backscatter Radar Program - Alaska

Dear Lt. Brown:

It was with much interest and great pleasure that we in the Copper River Basin were given the opportunity to attend a briefing at the Glennallen, Alaska High School last week.

The meeting was well attended by a good cross section of the local community and the presentation was thourough.

Subsequent to the meeting I have received and reviewed the DEIS statement prepared in August 1986.

Of course, many questions arrise at the reading but most are from curiosity or from reading beyond my knowledge. From the information given at the meeting, the report and the charts it would appear that the Gulkana area would be a minority choice however I am writing to advise you that as a business person in the Gulkana community I have had the opportunity to speak to many of the residents and have with only one exception forund the attitude of the people to be very positive.

We have an honest and hard working community and the construction of such a facility in this community will strengthen virtually every household in this town as well as Glennallen, our nearest neighbor.

Gakona Junction Village is a hotel, restaurant, gift shop, and service station at the Tok Cut-off half way between the Gakona and Gulkana Villages. We have several acres suitable for a construction camp and the facilities to service the needs of any kind of construction in the area as they relate to housing, meals and fuel.

We, therefore encourage this area as a site selection and wish to let you know that you may expect a great deal of cooperation from this community.

Best regards, L. Alan LeMaster, Owner

Phone: (907) 822-3664 — P.O. Box 222 — Gakona, Alaska 99586

R.E. Paxson Lake, Ak-
East Side
Radar Site.

RECEIVED
16 OCT 86

Dear Lt. V.G. Brown,

I am writing you to express the feelings of myself + many others on your proposal to build a large radar site at Paxson - East side.
DO NOT DO it!!!!!!!!!.

Please!

I am a property owner in the area and I realize the heavy amount of recreational use this area receives. Lots of skiing, snowmachines, hunters, hikers etc.

Please listen to the wishes of the people who use this land.. If we had the chance to vote on it I'm sure it would be turned down.
So Please Don't pick

Paxson - East Side as a site for your radar.

Thanks for your Considerations -

Sincerely

P.S! please send me a final Draft of the Environmental Impact Statement! thanks.

CHISTOCHINA TRADING POST

Dennis & Terry, Owners
Chistochina Lodge Mile 32 Tok Hwy. Gakona, AK 99586 (907) 822-3366

Sir,

We are very interested to know if our area was suited for the Power program. Most people feel the Power plant would be a positive effect on the area, because of employment opportunities, also electricity for their homes.

Any information would be appreciated

Thank you

Sarah Winter

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

BILL SHEFFIELD, GOVER O

Northern Regional Offic
P. O. Box 1601
Fairbanks, Alaska 99707
(907) 452-1714

October 7, 1986

HQ Electronic Systems Division/SCO
Attn: Lt. V. G. Brown
Hanscom AFB, Massachusetts 01731

Dear Lt. Brown:

Re: Draft Environmental Impact Statement (EIS) for the Proposed Alaskan Radar System Over-the Horizon Backscatter Radar Program, August, 1986

73 We have reviewed the above referenced EIS and commend your efforts to present an environmental study which covers all aspects of the environment and the impacts that the proposed activity would have on it. At this early point in the planning process, we would like to take the opportunity to express our environmental concerns and questions, as well as to delineate for you our agency's involvement in this project. We will be happy to work with you to resolve any problems.

First of all, should the receive or transmit site/s occur north of Glennallen, the project would occur within the boundaries of our Northern Regional Office, Box 1601, Fairbanks, Alaska 99701, tel. (907) 452-1714. Should they occur at Glennallen or south of Glennallen, our Southcentral Regional Office, 437 E Street Suite 200, Anchorage, Alaska 99501, tel. (907) 274-2533, would coordinate with you. Of course, if both of our regions are involved, we would assign one office to coordinate with you. Mr. John Bauer, at the Tok District Office, P. O. Box 419, Tok, Alaska 99780, tel. (907) 883-4381 would be the department's representative whose office is closest to the proposed project sites.

Water Pollution Control

Gravel Extraction

This project will require 0.2 million to 15 million cubic yards each for the receive and transmit sites to be used for roads and gravel pads. We appreciate your statements that you will use existing pits if possible, that reclamation will occur and every precaution taken to avoid surface water siltation (4.2.1 and 4.5.2). We would like to be involved in your planning process for material site selection, mitigation measures (buffer zones, etc.) and reclamation efforts. Should these sites occur on state lands, we will work with you and the Department of Natural Resources, Division of Lands through its permitting process.

Wetlands Development

Under the provisions of the Clean Water Act, Section 401, our department is required to issue a Water Quality Certification for any fill activities which require an Army Corps of Engineers permit. The applicant need only apply to the Corps to initiate the permitting process and our agency becomes a part of this process. However, due to the scope of the project, we recommend that you request a pre-application meeting of all concerned agencies as soon as the receive and transmit sites are firm. This will expedite the permitting process.

We commend for the Sections 4.5.1 and 4.5.2., Alteration of Surface Drainage Patterns and Stream Siltation. By following these guidelines, adverse impact due to your project will be minimal. We have available a guidelines manual describing appropriate practices (Best Management Practices) to minimize sedimentation problems from road construction. This manual as an adjunct to the guidelines published by the Department of Transportation and Public Facilities, would serve a useful purpose to the contractor. In addition, Woodward-Clyde Consultants (1980) has completed a summary and detailed guidelines for gravel site selection, removal practices, and rehabilitation in arctic and subarctic floodplains in Alaska. Inclusion of, or at least reference to, these guidelines in the Information to Bidders section of the lease document would provide a focus for serious consideration of this important water quality issue.

Ref. Woodward-Clyde Consultants. 1980. Gravel Removal Studies in Arctic and Subarctic Floodplains in Alaska. Technical Report, U.S Fish and Wildlife Service. OBS-80/08.

Solid Waste

2.1.1.5.3 states that solid waste would be trucked to a landfill near the base camp. Cumbustible materials would first be reduced in an oil-fired incinerator. This meets with our Solid Waste regulations in the Alaska Administra-Administrative Code (18 AAC 60), provided that all incineration is smokeless and that hazardous wastes are not incinerated, but are backhauled to a site approved by the department. Should onsite solid waste disposal become an option, a Solid Waste Permit is required from our department.

We would like more information regarding the disposal of slash from the cleared areas: i.e., from roads, from the 1,200 acre receive site, the 1,300 acre transmit site, and the 5 acre each of staging area along the highway. Reference is made to salvaging white spruce for saw timber and fuel logs (4.3.1). We are concerned that improper disposal of trees (stockpiling over several seasons) would aggravate the existing bark beetle infestation problem in Alaska. It appears that approximately 3,000 acres will be cleared. If open burning of slash is anticipated, written approval must be obtained from the Department (18 AAC 50). Approval is not automatic and the applicant is required to evaluate all alternatives to burning and develop a smoke control plan.

Kitchen Facilities

If base camps with kitchen facilities are built at the construction sites, the project would have to be in compliance with our Environmental Sanitation Regulations (18 AAC 30), a copy of which is enclosed.

Water/Wastewater Systems

Plans for water acquisition and wastewater disposal should be sent to the appropriate regional office for review and approval prior to construction startup (18 AAC 72). Information regarding soil types, permafrost, and water table should accompany the engineering plans.

Fuel Storage and Transfer

Diesel fuel is anticipated to be stored at each site within a bermed area with an impermeable synthetic membrane and designed to hold 110% of the total tank storage volume. The Air Force will prepare and implement a Spill Prevention Control and Countermeasure (SPCC) Plan as required by the U. S. Environmental Protection Agency.

Alaska State Regulations (18 AAC 75) require the posting of an information placard at facilities which have an above ground storage in excess of 10,000 gallons or an underground storage in excess of 1,500 gallons of hazardous material (including petroleum products). Should underground storage tanks become an option, notification is required as per Section 9002 of the Resource Conservation and Recovery Act as amended.

18 AAC 75 also requires that the person in charge of a facility or operation notify the department when an oil spill occurs. Information to be included in this report is provided in 18 AAC 75.080.

We are enclosing the above referenced documents as well as a copy of our Recommendations for Fuel Storage and Handling Practices for your information.

Air

The receive and transmit sites will require 2-MW and 10-MW power, respectively. It is probable that power will have to be generated onsite.

The State of Alaska Ambient Air Quality Standards (18 AAC 50.020) establish maximum allowable increases in air pollutants above existing background levels in areas where air quality is already cleaner than ambient standards. The areas being proposed for the backscatter radar stations are currently classified as Class II (regions where considerably greater discharges of sulfur dioxide and total suspended particulate matter are allowable before the ambient standards will be exceeded). The intent of the law is to allow economic growth in a manner consistent with the Prevention of Significant Deterioration (PSD) of existing

air quality. New facilities will require a PSD review and an Air Quality Control Permit to Operate from the department if the size of fuel burning equipment, incinerator capacity and specific industrial process exceeds the appropriate criteria established in the department's regulations (18 AAC 50.300).

Thank you very much for giving us the opportunity to review this document. We look forward to working with you.

Sincerely,

Joyce Beelman

Joyce Beelman
Environmental Field Officer

enc.
cc: J. Bauer, Tok
T. Rumfelt, Anc.
B. McClarence, Anc.
H. Friedman, Anc.
T. Chapple, Juneau
J. Coutts
D. Dasher
A. Ott, ADF&G
J. Brossia, ADNR-Lands

Alaska State Legislature

Representative Mike Davis

P.O. Box V
Juneau, Alaska 99811
(907) 465-4930/4941

Interim Office:
P.O. Box 81435
Fairbanks, Alaska 99708

October 13, 1986

Lt. V.G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Dear Lt. Brown:

I would like to submit my comments on the draft environmental impact statement for the Alaskan Radar System.

Interior Alaska welcomes military projects and the economic development they bring to our communities. However, area residents are deeply concerned about the use of non-resident workers in the construction and operation of government facilities. This concern is not unfounded given the use of out-of-state contractors and employees on the recent Ft. Wainwright Army Base housing project.

74

I would ask that the economic and social impact of employing Alaskans in the Alaskan Radar System be compared to non-resident labor in the E.I.S. I hope that construction of the new Air Force system will improve our severe unemployment problem as well as our national defense.

Sincerely,

Mike

Rep. Mike Davis

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

BILL SHEFFIELD, GOVERNOR

333 RASPBERRY ROAD
ANCHORAGE, ALASKA 99518-1599
PHONE: (907) 344-0541

October 15, 1986

Lt. V. G. Brown
ESD/SCO
Hanscom AFB, MA. 01731

Dear Lt. Brown:

Re: Draft Environmental Impact Statement
Alaskan Over-the-Horizon Backscatter Radar

The Alaska Department of Fish and Game (ADF&G) has reviewed the August 1986 Draft Environmental Impact Statement (DEIS) for the Alaskan Over-the-Horizon Backscatter Radar System. In general, we find that the DEIS is adequate in providing information and discussing potential impacts for general areawide considerations but it does not provide adequate information to properly evaluate site specific issues. For example, the affected environment section (section 3) of the document describes the resources present in each of the five major study areas; however, it would be impossible for anyone to predict which of these resources might be impacted by the proposed project based on the level of detail provided. 75

Of major concern to the department in reviewing the DEIS, is the preparation of site specific environmental assessments proposed in Section 2.1.2.4 on page 2-21. The department is concerned that the proposed assessments may not adequately evaluate alternatives and potential mitigation measures and that agency and public input will be short changed in this process. The department believes that a supplemental EIS should be prepared to properly evaluate site specific concerns and alternatives and to adequately develop specific mitigation measures.

The following specific comments are provided to aid in the revision of the DEIS. Incorporation of these comments will make the EIS adequate to allow an evaluation of alternatives based on areawide considerations, but it will remain inadequate in allowing a proper evaluation of site specific alternatives.

Sec. 3.4.1.1.1, page 3-42: Chinook salmon enter fresh water from early May rather than early June. 76

Table 3-1: There are no chum salmon in the Glennallen, Gulkana or Indian Creek areas, no coho salmon in the Gulkana or Indian Creek areas, no

sockeye salmon in the Tok area, no steelhead in the Indian Creek area, no humpback whitefish in the Indian Creek area. There are round whitefish in all areas, and lake whitefish are also present in all areas.

76

Page 3-43: Sockeye salmon enter fresh water from early May through August.

Sec. 3.4.1.1.1.1, page 3-49: There are no known coho salmon present in the Gulkana and Tazlina River systems. There is no known sport fishing for sockeye salmon in Tolsona Creek.

Sec. 3.4.1.1.1.2, page 3-49: There are no known coho salmon in the Gulkana or Gakona Rivers. Tolsona should be Tulsona. There is no known sport fishing for sockeye or chinook salmon in the Gakona River. There is no sport fishing for coho salmon in the Copper River; however subsistence fishing does occur. The catch by individual species from the Gulkana River has been documented in the statewide harvest survey since 1977.

Sec. 3.4.1.1.1.3, page 3-49: There are no known coho or sockeye salmon or steelhead in Indian Creek.

Sec. 3.4.1.1.2, page 3-50: The Gulkana Hatchery produces 30 million sockeye per year, not per day.

Sec. 3.4.1.2.1.1, page 3-52: There are no rainbow trout in Crosswind Lake.

Sec. 3.4.1.2.1.2, page 3-53: There are no rainbow trout in Tulsona Creek. As previously described there is no known sport fishing in the Copper or Gakona Rivers because of the glacial silt load. The sport fishery of the Gulkana River has been well documented.

Sec. 3.4.2.1, page 3-57: No mention is made of any of the owl species in this section on raptors. At a minimum, great horned, great gray, boreal, and hawk owls should be discussed.

Sec. 3.4.3.1, page 3-68: The October 1985 census for the Nelchina caribou herd revealed 27,528 animals, with 13,771 cows, 7464 bulls, and 6293 calves.

Page 3-69: The department encourages food handling practices which prevent bear-human conflicts. "Troublesome" bears are not eliminated without first attempting to correct the attraction problem.

Sec. 3.4.1.1, page 3-69: The Twin Lakes area is a particularly productive moose habitat and is a very popular hunting area.

Sec. 3.4.3.2, page 3-75 and all specific furbearer sections: When citing furbearer population statistics it needs to be made very clear that population densities are cyclic and extremely variable.

Sec. 3.8.3, page 3-110: The discussion of subsistence harvests by Slana area residents is based on data collected by the department before a major population increase which occurred as a result of a federal homestead program. We are not aware of any data on resource harvests by Slana homesteaders. The EIS should note this lack of data, which may be especially significant if the Indian Creek area is chosen. 76

Sec. 4.1, page 4-1: As previously discussed, the lack of site specific detail makes any accurate prediction of potential site specific impacts or mitigation of those impacts impossible.

Sec. 4.2.1, page 4-1: The department believes that the availability of suitable material sources is a potentially limiting factor for this project. The development of material sources, including access roads, is one of most potentially significant impacts of this project. We believe that this assessment of potential impacts is extremely cursory and that this topic deserves a more detailed discussion. At a minimum, potential material sources should be identified. We believe that material sources and disposal sites could impact far more than 20 acres, including areas outside of the study areas. This topic should be addressed in detail in a supplemental EIS after specific site information is developed. 77

Sec. 4.3.2, page 4-5: Special mitigation measures cannot be expected to eliminate adverse impacts on wetlands. Wetlands will be altered or eliminated as a result of this project. Mitigation can reduce or compensate for these impacts.

Sec. 4.4.1, page 4-6: This section provides excellent documentation on the potential for significant adverse impacts on birds through collisions. Because there are no proven techniques to eliminate collisions, migration routes and concentration areas should be avoided.

Sec. 4.4.2, page 4-10: The department is mandated to protect anadromous and resident fish habitats and populations and will work closely with the Air Force to do so. The development of material sites in floodplains is one of most potentially damaging activities to aquatic habitats and should be discussed in this section. 77

Appendix D, page D-7: The department is also responsible for administering AS 16.05.840 which requires that in all streams frequented by fish (resident or anadromous), efficient passage shall be maintained. A permit issued by the department is required for activities (culverts, low water crossings, stream diversions, dams) which may effect fish passage. The department also administers State Critical Habitat Areas, Refuges and Sanctuaries. None are presently located within any of the study areas as we understand them. 76

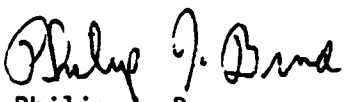
The department is ready to assist the Air Force in evaluating site specific issues, alternatives and potential mitigation measures at any time. If you

desire any clarification of these comments or additional information please contact Phil Brna at (907) 267-2284.

Thank you for the opportunity to comment on this document.

Sincerely,

Dennis D. Kelso, Deputy Commissioner



BY: Philip J. Brna
Habitat Biologist
Habitat Division
(907) 267-2284

cc: M. Hayes, ADNR
T. Rumfelt, ADEC
R. Bowker, USFWS
R. Morris, NMFS
B. Sumner, EPA

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF ADMINISTRATION
DIVISION OF TELECOMMUNICATIONS OPERATIONS

5900 EAST TUDOR ROAD
ANCHORAGE, ALASKA 99507-1296
907-269-5744

October 10, 1986

Lt. V. G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Dear Lt. Brown:

Enclosed is the Division of Telecommunications Operations' response to the OTH-B Draft EIS. Any questions regarding this response should be directed to:

John Morrone, Deputy Director
Dept. of Administration
Div. of Telecommunications Operations
Anchorage, AK 99507
(907) 269-5744

Sincerely,

John Morrone
Deputy Director

JM/ss

Enc.

STATE OF ALASKA

DEPARTMENT OF ADMINISTRATION

DIVISION OF TELECOMMUNICATIONS OPERATIONS

RESPONSE TO

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PROPOSED

ALASKAN RADAR SYSTEM

OVER-THE-HORIZON BACKSCATTER RADAR PROGRAM

AUGUST 1986

1.0.0 The Role of Telecommunications Operations

- 1.0.1 Mission
- 1.0.2 Scope
- 1.0.3 Responsibility

2.0.0 General Comments to Draft EIS

- 2.0.1 Limitation of comments
- 2.0.2 Lack of sufficient specifics

3.0.0 Specific Comments to Draft EIS

- 3.0.1 Page S-5, last paragraph
- 3.0.2 Page S-6, 2nd & 7th paragraph
- 3.0.3 Page S-7, 4th paragraph
- 3.0.4 Page G-5
- 3.0.5 Page C-10
- 3.0.6 Page 2-1, 2nd paragraph
- 3.0.7 Page 2-24, 5th paragraph
- 3.0.8 Page 4-39, last paragraph
- 3.0.9 Page 4-43, 2nd paragraph
- 3.1.0 Page 4-43, 3rd & 4th paragraph
- 3.1.1 Page 4-44, 1st paragraph
- 3.1.2 Page 4-44, 2nd paragraph
- 3.1.3 Page 4-44, 3rd, 4th & 5th paragraph
- 3.1.4 Page 4-45, 3rd paragraph
- 3.1.5 Page 4-45, 4th paragraph
- 3.1.6 Page 4-46, 3rd paragraph
- 3.1.7 Page 4-46 & 4-47
- 3.1.8 Page 4-47, 4th paragraph
- 3.1.9 Page 4-47, 5th paragraph
- 3.2.0 Page A-1, 1st paragraph
- 3.2.1 Page A-3, Table A-1
- 3.2.2 Page A-9, paragraph A-7
- 3.2.3 Appendices B & C

4.0.0 Study Areas

- 4.0.1 Tok Study Area
- 4.0.2 Glennallen Study Area
- 4.0.3 Paxson East Study Area
- 4.0.4 Indian Creek Study Area
- 4.0.5 Gulkana Study Area

Appendix I - FCC PR Docket No. 83-464
Alaska Fixed Service

1.0.0 THE ROLE OF TELECOMMUNICATIONS OPERATIONS

1.0.1 The State Division of Telecommunications Operations within the Department of Administration is statutarily tasked with the engineering, design, and installation of telecommunication systems for all executive branch agencies. The Division is also tasked with the administration and technical support of the Rural Alaska Television Network. The Division provides services to nonexecutive branch agencies by request (i.e. University System, Legislative Affairs Agency).

1.0.2 The Division provides a broad spectrum of services ranging from HF/SSB radio to wide band data communication services. We are responsible for the property control of more than ten thousand items of equipment throughout the State. The Division manages more than two thousand FCC licenses. Of these licenses, approximately five hundred are related to television broadcasting.

78 1.0.3 The Division considers its responsibility to provide quality telecommunication services its primary mission. Based on prior experience with high power transmitters located proximal to existing facilities, we feel that these facilities must be considered before the fact rather than after services vital to the protection of life and property have been disrupted.

Further, it is our view that there may be fiscal considerations that should be addressed, i.e. who pays the bill for corrective measures that can be costly in terms of manpower and material

2.0.0 GENERAL COMMENTS

2.0.1 Our comments will be limited to four areas:

(a) The potential EMI which we feel could seriously impair our ability to provide high reliability telecommunication services to our client agencies.

(b) What we feel are the very real fiscal considerations associated with site hardening and clean-up arising from the EMI.

(c) Areas where we disagree with methodology engineering assumptions, or conclusions reached in the draft EIS.

(d) Documentation of our facilities in each specific study area for consideration in specific siting.

2.0.2 Lack of specific background information. 79

Although the draft EIS takes into account FAA and SAR facilities, it fails to address other telecommunications facilities in the study areas. Section 4 of this response provides a detailed inventory of the state's telecommunications facilities in each of the study areas. The correlation of data obtained from the operation of the ERS to the operation of OTH in the Alaskan environment would seem to pose more questions than it answers.

The draft EIS totally ignores the fact that the use of HF/SSB in the State of Alaska is far more common than in other areas of the country.

The State of Alaska uses HF/SSB in many areas for public safety, local government and maintenance communications. In addition, transmitters in the Alaska private fixed service are used by both the public and private sectors.

It should be noted that the listing of non-state telecommunications facilities, undoubtedly present in the study areas, is beyond the scope of this document.

3.0.0 SPECIFIC COMMENTS TO THE DRAFT EIS.

80 3.0.1 Page S-5, last paragraph. This paragraph omits the mention of the Alaska public fixed service. The Alaska public fixed service provides HF/SSB communications to very remote points in Alaska from Anchorage, Fairbanks, Juneau, Ketchikan and Kodiak. See Appendix #1.

81 3.0.2 Page S-6, 2nd paragraph, last sentence. The ERS was operational intermittently for 900 hours over a period of more than a year primarily at the diurnal transition. Since 900 hours is about only 10% of a year, and channels may not be in use at sunrise and sunset, little can be inferred from this data.

Page S-6, 7th paragraph. See commentary, 3.0.2.

82 3.0.3 Page S-7, 4th paragraph. It would seem that the need for remedial action could be mitigated by taking into account existing facilities prior to a problem developing.

83 3.0.4 Page G-5. The micro mho is an antiquated unit. Seimens S is the unit of conductivity.

84 3.0.5 Page C-10. Boreal: pertaining to northern tundra and forests.

85 3.0.6 Page 2-1, 2nd paragraph, sentence 1. I believe it is stretching the trut.. to say that the ERS and ARS are "quite similar" if this implies similar impact.

86 3.0.7 Page 2-24, 5th paragraph (2.3.2.2). This may well be the case; however, it is our opinion that the material presented in this response may render this statement to be untrue.

Here again, the HF/SSB point-to-point communications unique to Alaska is omitted from mention.

3.0.8 Page 4-39, last paragraph. See comments of 3.2.3.

87 3.0.9 Page 4-43, 2nd paragraph. From this statement it is not clear if existin facilities in the study areas are being subjected to engineering review, or, if the Air Force is simply satisfying an IRAC requirement.

88 3.1.0 Page 4-43, 3rd & 4th paragraph. Again, there is no mention of the HF/SSB services unique to Alaska.

3.1.1 Page 4-44, 1st paragraph. This paragraph again raises several questions:

89 (a) The fact that a channel is momentarily unoccupied does not indicate that it is not used.

90 (b) On page S-7, paragraph 3, the statement is made that the Air Force has developed an "operational plan for interference avoidance". This is contradicted on page 4-44 where it is stated that the plan "is being developed". Which statement is correct? How may one obtain a copy of and/or suggest input t. this plan? There would seem to be some question as to the credence that should be attached to data gathered from the ERS as stated in 3.0.2.

3.1.2 Page 4-44, 2nd paragraph. The fact that the HF noise floor is affected as far as 100 to 200 miles from the radar would indicate that the use of HF communications would be impaired across a large area of the state. 91

3.1.3 Page 4-44; 3rd, 4th, & 5th paragraph. The veracity of general statements made in these paragraphs regarding antenna directivity, spurious and harmonic radiation, and adjacent channel interference is above question. However, one important fact has been omitted; the OTH-B operates at power levels in the range from hundreds of kilowatts to several megawatts. These power levels could yield unwanted radiation in the order of hundreds of watts to hundreds of kilowatts. 92

Most communications systems would be easily disabled by in-band power levels in the order of a few picowatts. Even the best designed systems would be disabled by signals in the order of a few microwatts.

3.1.4 Page 4-45, 3rd paragraph. This paragraph clearly demonstrates a lack of understanding of Alaska's telecommunications environment. The statements made here favoring the fixed bands for OTH-B operation as opposed to the broadcast bands, coupled with the statement that these bands are "thought to be sufficiently uncrowded" serves again to demonstrate the speculative and generic nature of the Draft EIS. 93

3.1.5 Page 4-45, 4th paragraph. While the Air Force's effort to design a "polite" radar is laudatory, this scenario does not stand close examination. See comment 3.1.1 (a) and 3.0.2. 94

3.1.6 Page 4-46, 3rd paragraph (Adjacent Services). Here again the importance of the fixed users seems to be secondary to the broadcast and amateur services. 95

3.1.7 Pages 4-46 and 4-47 (Television interference). The State of Alaska operates a system of low power television transmitters fed by satellite. This system provides the only television reception in many of the study areas. We are very concerned by the lack of detail regarding television services in the affected areas. Section 4 of this document provides area by area specifics. 96

The Division of Telecommunications Operations receives all trouble calls for the State Television Project. One of our major concerns is the impact that the OTH-B will have in television reception, and the consequent increase in the number of trouble calls. Therefore, we feel that television service should be considered in the final siting of the OTH-B.

3.1.8 Page 4-47, 4th paragraph. The State operates a large number of low band mobiles and base stations in the study areas. These systems are detailed in Section 4 of this document. We feel that this site specific data should be included in the siting criteria for the OTH-B. 97

3.1.9 Page 4-47, 5th paragraph. The State operates ground to air VHF radios in or adjacent to some of the study areas. See Section 4 for details.

3.2.0 Page A-1, 1st paragraph. As we have stated earlier in this document, we are not convinced that ERS operation at reduced power, in a remote part of Maine on a reduced band of frequencies, for 10% of a year is sufficient to infer similarity with the ARS. 81

98 3.2.1 Page A-3, Table A-1. Table A-1 does not contain the frequencies presented in Section 4 or Appendix I of this response. We believe they should be added to the list.

99 3.2.2 Page A-9, paragraph A-7. We are not convinced that a pair of ten kilowatt 2-30 MHz swept transmitters should be classed as "making a negligible contribution" as far as EMI is concerned.

100 3.2.3 Appendices B & C. We have examined the calculations contained in these appendices and discussed the assumptions with the Electrical Engineering Dept. a the University of Alaska in Fairbanks. We have also suggested to the Geophysica. Institute that they obtain and review a copy of the Draft EIS with particular emphasis on these appendices.

It is our feeling that some dialogue needs to be established and maintained between the Air Force, the UAF Electrical Engineering Dept.* and the Geophysical Institute*.

We are of the opinion that the predictions made in the Draft EIS and the appendices may be based on insufficient practical data. Our first estimates indicate that the ground conductivity and dielectric constants assumed by the preparers of the Draft EIS are inaccurate. A number of papers have been published that deal more specifically with the behavior of waves over frozen or stratified ground. In addition, a good deal of work dealing with the measurements of ground conductivity and dielectric constant at northern latitudes has been done at the UAF and the Geophysical Institute. Although there are a number of published works on these subjects, a complete listing is beyond the scope of this response. Below are two articles that may be of use.

Wait, 1953. Radiation from a vertical dipole over stratified ground transactions IRE Pg. Ap. 1

Wait, Frazier, 1953. Radiation from a vertical dipole, over stratified ground transactions, Part 2 IRE Pg. Ap.

*Individual contacts:

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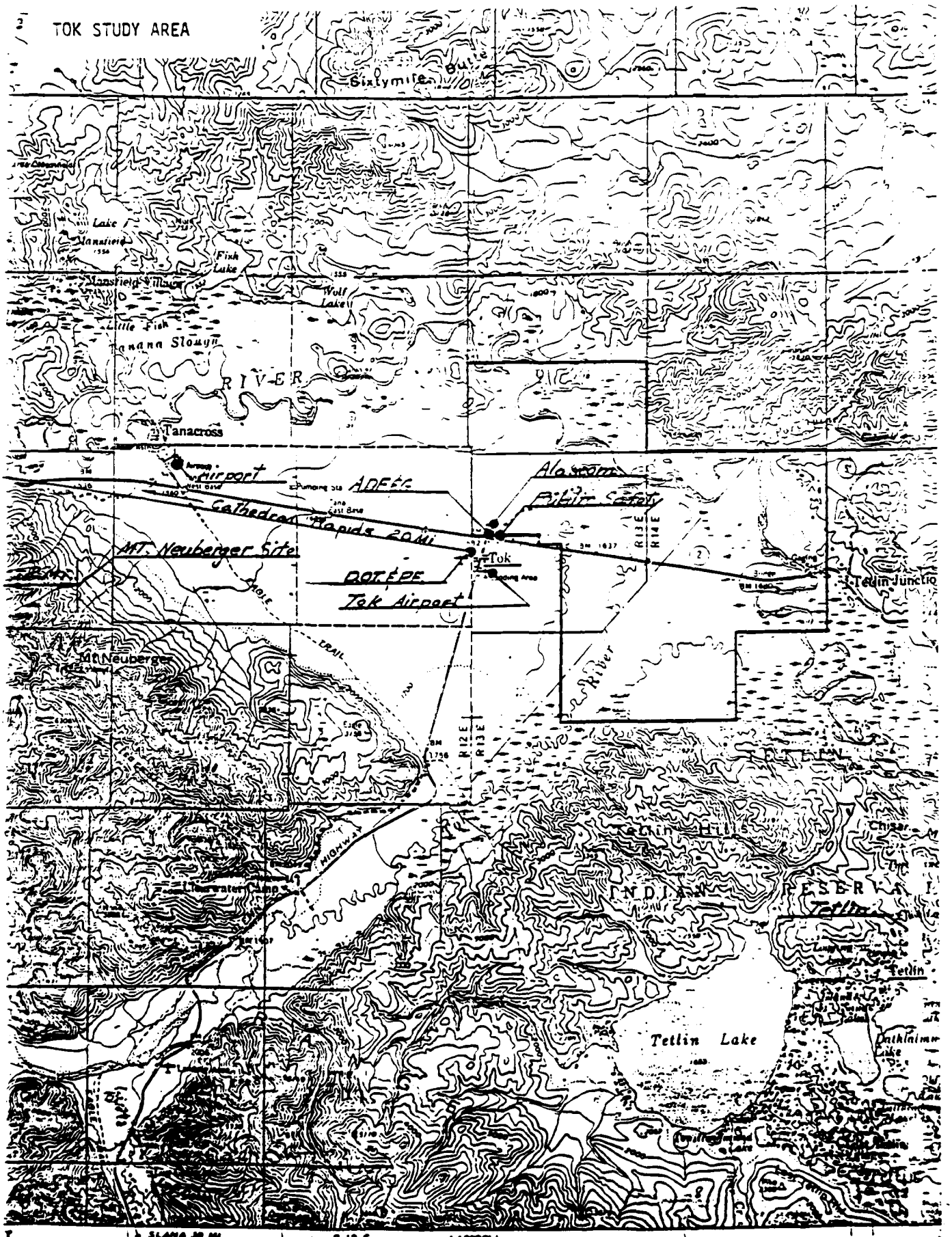
TOK STUDY AREA

Agency	Frequency		Location
AK Dept of F & G	HF/SSB	2512.0 kHz	ADF & G
		3201.0	
		3230.0	
		3449.0	
		4645.0	
		5195.0	
		5472.0	
	Vhf(LB)	45.00 MHz	
		45.04	
AK State Troopers	HF/SSB	2264.0 kHz	Public Safety
		4460.0	
		5135.0	
		7480.0	
	Vhf(LB)	45.020 MHz	
	Link	75.980/72.100MHz	Alascom
	Vhf(HB)	155.160	DOT & PF
		155.250	
	Repeater	155.730/161.13	
		155.790/161.01	
Dept. of Transportation	HF/SSB	2264.0 kHz	DOT & PF
		4460.0	
		5195.0	
	Vhf(LB)	47.040 MHz	
		47.160	
	Vhf(AM Acft)	122.400	
	Vhf(HB)	156.120	
H & SS	Vhf(HB)	155.160 MHz	DOT & PF
DNR - Forestry	Vhf(AM Acft)	132.450 MHz	DOT & PF
	Vhf(HB)	155.255	
		164.525	
Television Service	Ch. 7		DOT & PF
	Ch. 7		Tetlin
	Ch. 11		Tetlin
	Ch. 13		DOT & PF
Microwave		1895.0 MHz	DOT & PF
		1955.0 MHz	DOT & PF
		1975.0 MHz	Cathedral Rapids

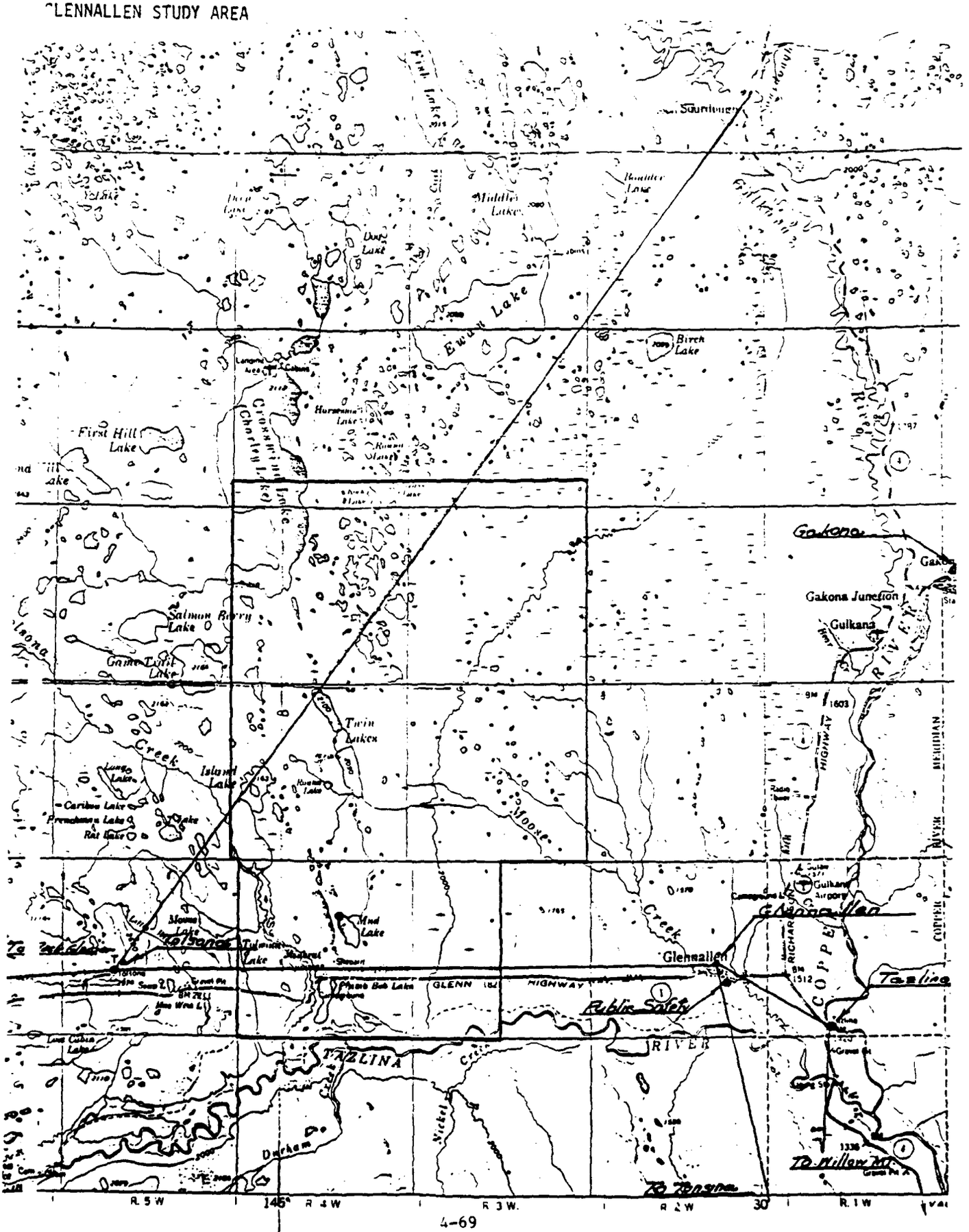

TOK STUDY AREA
Sixtymile
Lake
Mansfield
Fish Lake
Mansfield Village
Wolf Lake
Tanana Slough
RIVER
Tanacross
Airport
ADF&G
Alascom
Cathedral Rapids 20 Mi
Mt. Neuberger Site
DOT&PF
Tok Airport
Tok
Tetlin Junctio
Mt Neuberger
TRAIL
River
R12E
R13E
Tetlin Hills
HIGHWAY
Chisana
INDIAN RESERVA
Tetlin
Tetlin Lake
SLANA 30 MI.
GULKANA 103 MI.
R.12 E.
143°00'

4.0.2

GLENNALLEN STUDY AREA

Agency	Frequency		Location
AK Dept. Fish & Game	HF/SSB	2506.0 kHz	Public Safety
		3201.0	
		3230.0	
		3449.0	
		4645.0	
		5167.5	
		5195.0	
		5472.0	
	Vhf(LB)	45.000 MHz	Glennallen
		45.040	
AK State Troopers	HF/SSB	2264.0 kHz	Public Safety
		3230.0	
		4460.0	
		5195.0	
		7480.0	
	Vhf(LB)	42.020 MHz	
	Links	72.180	Tolsona
		75.420	
		75.540	
	Vhf(HB)	155.250	
		155.550	
	Repeater	155.415/161.130	
	Uhf	453.775 MHz	
Dept. of Transportation	HF/SSB	2264.0 kHz	Tazlina
		4460.0	
		5195.0	
	Vhf(LB)	47.040 MHz	Tolsona
		47.160	
Health & Social Services	Vhf(HB)	155.160 MHz	Tolsona
DNR - Forestry	Link	72.340 MHz	Tolsona
		75.740	
	Vhf(AM Acft)	132.450	
		133.450	
	Vhf(HB)	159.315	
		154.830	
	Uhf	453.350	
		458.500	
Dept. of Education	Vhf(LB)	37.100 MHz	
Dept. of Administration		453.900 MHz	
		458.900	

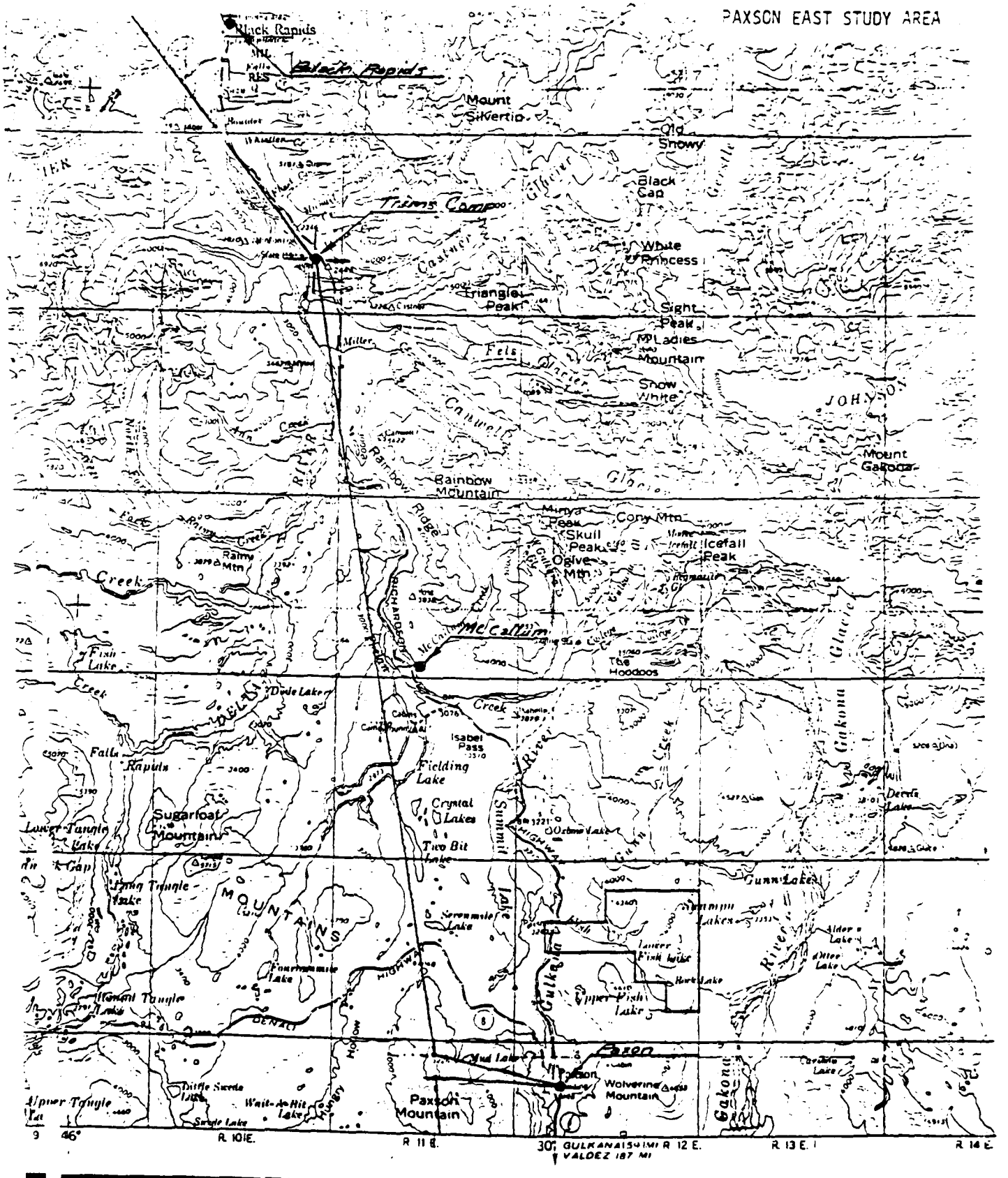
Agency	Frequency	Location
Television Service	Ch 3	Gakona
	Ch 9	Tolsona
	Ch 11	Gakona
	Ch 11	Tolsona
	Ch 12	Copper Center
Microwave	2146.00 MHz	Glennallen
	2196.00	
	12700.00	
	12862.50	
Microwave	1855.00	Sourdough
	1875.00	Glennallen
	1955.00	Tolsona
	2146.00	Glennallen
	2181.00	Glennallen
	2196.00	Glennallen
	6585.00	Tolsona
	6675.00	Sourdough
	12700.00	Glennallen
	12862.50	Glennallen


GLENNALLEN STUDY AREA
Sourdough
Middle Lake
Dorothy Lake
Eureka Lake
Birch Lake
First Hill Lake
Gakona
Gakona Junction
Gulkana
Salmon Berry Lake
Twin Lakes
Island Lake
Moose Creek
Mud Lake
Glennallen
GLENN HIGHWAY
Tazlina
TAZLINA
RIVER
Public Safety
Nickel Creek
Durham
To Valdez
To Willow Mt.
To Tonsina
R 5 W
R 4 W
R 3 W.
R 2 W
R 1 W
14S
30

4.0.3

PAXSON EAST STUDY AREA

Agency	Frequency		Location
AK State Troopers	Link	72.180 MHz	McCallum
		72.180	Black Rapids
	Vhf(HB)	155.415/161.01 MHz	
		155.730/161.13 MHz	Paxson
	Uhf	452.225	
Dept. of Transportation	HF/SSB	2264.0 kHz	Paxson
		5195.0	
		2264.0	Trims Camp
		5195.0	
	Vhf(LB)	47.04 MHz	Black Rapids
		47.04	Paxson
	Uhf	452.800	Black Rapids
		462.400	Paxson
Television Service	Ch. 4		Paxson
	Ch. 11		
Microwave		6545.000 MHz	Trims Camp
		6545.000	Black Rapids
		6715.000	
		6655.000	Trims Camp
		6815.000	Paxson
		6835.000	



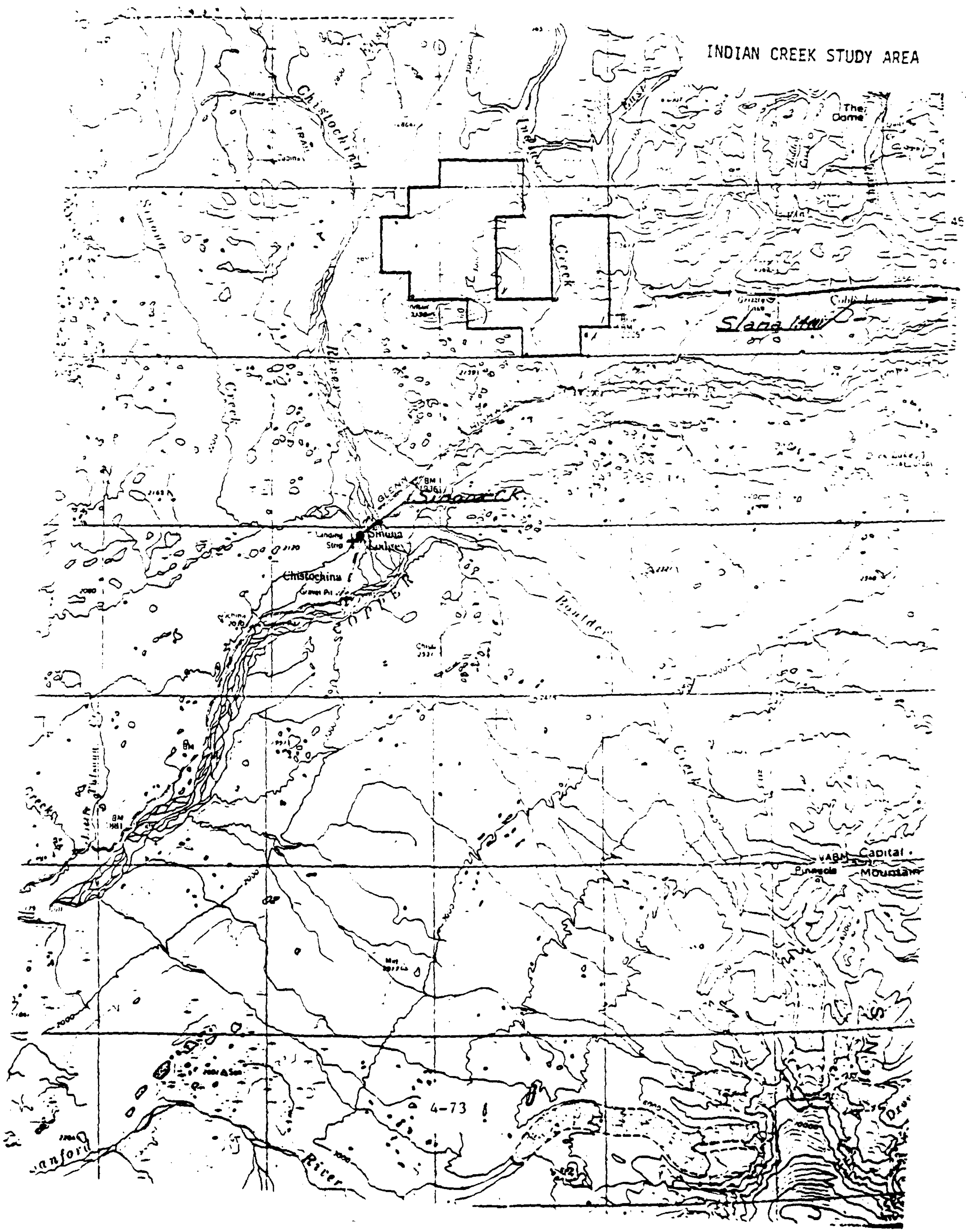
4-71 SCALE 1:250000

5 0 5 10 15 20

4.0.4 INDIAN CREEK STUDY AREA

Agency	Frequency		Location
Dept. of Transportation & Public Facilities	Vhf(LB)	47.04 MHz 47.16 47.38	Salana
Television Service	Ch. 4		Salana
	Ch. 7		Sinona Cr.
	Ch. 9		
	Ch. 13		Salana

INDIAN CREEK STUDY AREA

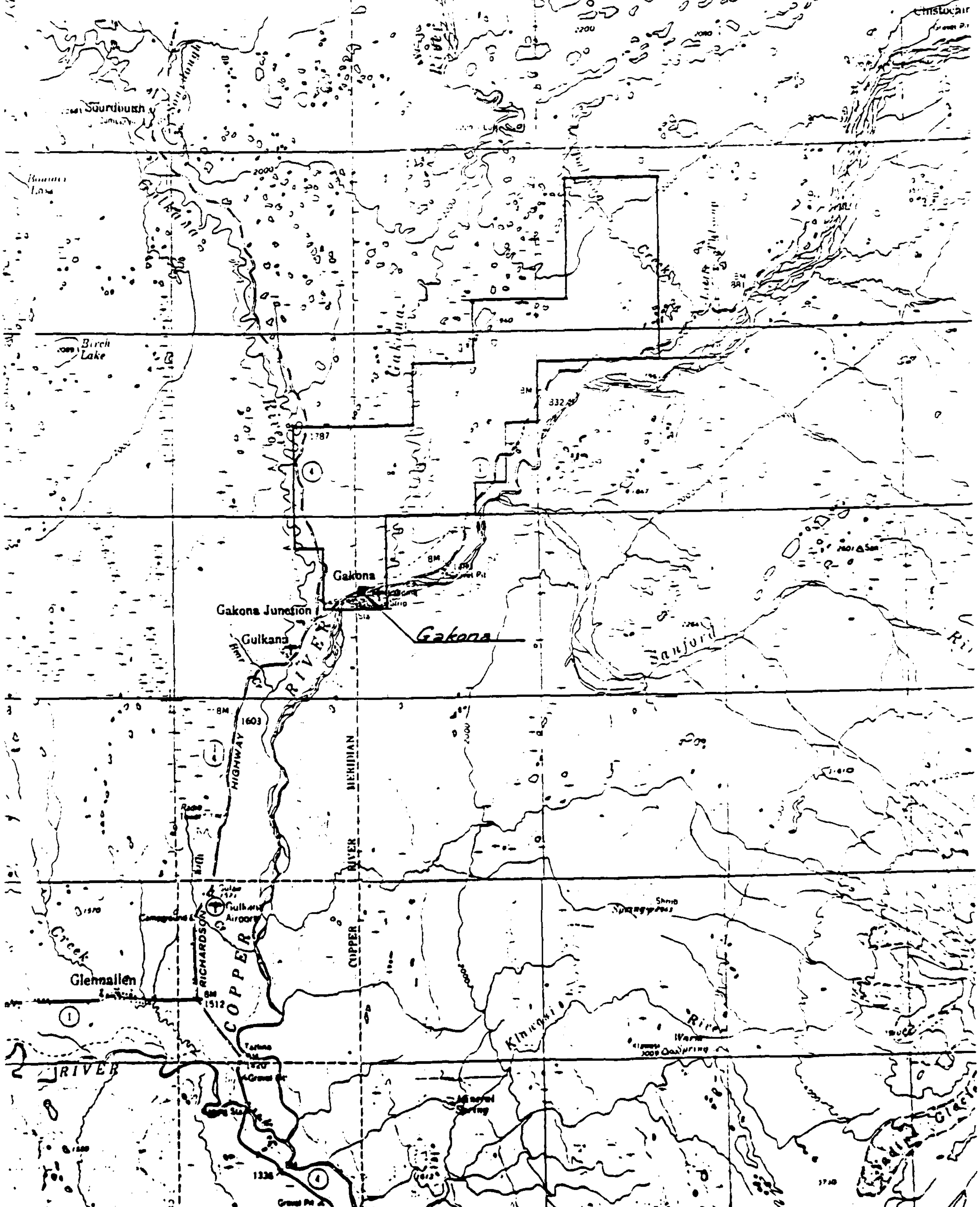


4.0.5 GULKANA STUDY AREA*

Television Service	Ch. 3	Gakona
	Ch. 11	

*For additional data on the surrounding area see Glennallen Study Area.

GULKANA STUDY AREA



APPENDIX #1

Before the
Federal Communications Commission
Washington, D. C. 20554

Note: Only the first page of this 24-page document is included here.

In the Matter of	)	
	)	
Amendment of Parts 2, 81, 83, 87, 90, and 97 of the Commission's Rules and Regulations to implement changes in the Alaska Fixed Service.	)	PR DOCKET NO. 83-464

REPORT AND ORDER

Adopted: JUL 30 1984 ; Released: AUG 3 1984

By the Commission:

SUMMARY

1. This Report and Order revises the rules governing the Alaska Fixed Service. That service uses frequencies in the 3 to 30 MHz range or "HF" for point-to-point communications in Alaska. Many individuals in remote parts of the State rely on their HF radios as the only available form of communications. Three common carriers also operate in this service, tieing the private users into the public switched communications network.

BACKGROUND

2. The Alaska Fixed Service is a direct descendent of the Air Force's Alaska Communications System (ACS). Pursuant to the Alaska Communications Disposal Act, the ACS was sold to RCA Alaska Communications, Inc., in 1969, and then to Alascom, Inc. (Alascom). Three licensees, including Alascom, continue to offer common carrier service to six locations, although Alascom has indicated it will discontinue its HF service as soon as more sophisticated technology (e.g. satellites and microwave) becomes available in its remaining locations.

3. The Alaska Fixed Service serves the unique needs of Alaska's "bush" communities which have no form of conventional telephone service available to them, and who must rely on the nearest cannery or fishing village's HF radio transceiver for communications facilities. The Alaska Fixed licensees operate on marine frequencies because most of them originally settled along the Alaskan coastlines. The typical private Alaska Fixed licensee provides a communications link from the "bush" to the nearest population center, or to one of the common carrier Alaska Fixed licensees.

LD-86-U-1.2

October 13, 1986

Lt. V.G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Re: Comments on DEIS for Construction/Operation of an OTH-B Alaskan Radar System

Lt. Brown:

I am sorry that these comments are late in arriving, but I hope that they will be of some value to you in assessing the impacts of this proposed project in our remote area. I also hope that you enjoyed your recent trip to Alaska. It certainly is "different" from the east coast.

Let me begin our comments by describing a little bit about what Ahtna, Inc. is. We are an Alaska Native business-for-profit corporation established in 1972 under the Alaska Native Claims Settlement Act of 1971. We presently own approximately 1.53 million acres of land, sand, gravel, and minerals in the region proposed for this project. This proposed project impacts our lands at the Glennallen, Gulkana, and Indian River sites. Consequently, we have a very deep personal interest in it.

Ahtna is totally in support of the project, and we feel that it will have positive impacts on our region. We feel that the negative impacts can be mitigated, and we are willing to work closely with the U.S. Air Force and U. S. Army Corps of Engineers in doing so if our lands are affected by this project. The Ahtna people have lived in this country for thousands of years, and we know it well.

Historically speaking, the military hasn't had a good record in this region. In the past, particularly during World War II, several of our villages were relocated without compensation or notification. These memories are still strong in the minds of our elders, and in many instances will color their thinking in regards to the current Air Force project. However, we feel that, inasmuch as the Air Force is attempting to accommodate as much of the region's concerns as possible within the DEIS, it may very well be that this project can be brought to a mutually beneficial conclusion.

Although many of our concerns have been identified in the DEIS and at the public meetings for this project, we would like to make some comments concerning your DEIS as follows:

- Of course, the volume was very general in nature, and very general regional information was largely relied on in preparing it. It is difficult to make significant comments given this level of generality. We will be able to be more helpful once the two specific sites are chosen.

- We applaud your use of Alaskans knowledgeable about the State in preparing the DEIS.

- The concern expressed about protecting the nesting and rearing habitat of the Trumpeter swans is legitimate. Approximately 25 percent of the world's breeding population relies on the Copper River Basin for those purposes. Much of this habitat is found in the Glennallen Study Area and the area to its immediate west and south (east of Tazlina Lake). We would also be concerned about how the antenna array might affect their flights and mortality from collisions with it.

- Editorially speaking, much of your treatment of vegetation seemed unnecessarily long, rigid, and cumbersome. I also question the necessity of identifying as many separate black spruce communities as you did, particularly at this "macro" DEIS level. These distinctions might be a bit more appropriate at the site specific impact level.

101 - On Page 3-93, the population figures for Slana should be much higher - perhaps more than 200.

- On Page 3-96, other Native communities should also be added - Gakona, Chitina, Tazlina.

- There are several technical errors throughout the document needing correction. For example, there is no Municipality of Anchorage Borough - only Municipality of Anchorage (the Borough and the City merged several years ago). Also, the Anchorage Community Planning Department should be the Municipality of Anchorage Planning Department.

- On Page 4-1, section 4.2, Land and Minerals, we suggest
102 that "development of roads" should also be included on the list and treated as a factor creating adverse impacts. Not only will drainage be altered and the permafrost disturbed, but access may be opened-up in areas previously not heavily used by man. This may have impacts on resource use (fish and game, firewood, gravel, etc.) as well as foster trespassing on lands adjacent to the road(s). Results of public meetings in the Copper River Basin over the last two years have shown that access to lands is the dominant resource management concern of both Basin residents and non-resident Basin users.

- As you are probably aware, public power supplies are frequently "down" in the region, and not very reliable.

- We would also like to highlight one of your comments in the DEIS, that is, that this project will increase competition for already limited regional fish and game resources by placing additional users in the area. This is a very important concept to remember since use of these resources is limited by land status, various legal considerations, and increasing numbers of people pursuing the same fish and game populations.

- We are very concerned about negative impacts to any of our historical/cultural sites. You are correct in your assessment that little archaeological work has been done in our region, and that unknown sites are likely to exist in the study areas. Ahtna has its own program to identify and document these areas, and we can assist you in identifying such sites and mitigating any possible impacts. These areas are very important to us. 103

- As you noted, ground fog can create visibility problems in the region at times. This is especially true in spring and fall where many water bodies are present, and air temperatures are either generally warming or cooling, relative to the water temperatures. This may create hazards for waterfowl which might collide with the antennas with greater frequency during these times if a site were located in such an area.

- It should also be noted that your references to land designated "NP" are misleading. These are now <u>privately owned</u> lands, not <u>federal lands</u> conveyed to a Native corporation.

These items highlight our comments on your DEIS. We hope that they have been useful. Thank you very much for this opportunity to participate in this decision-making process.

If we can be of additional assistance to your efforts, don't hesitate to contact me.

Respectfully,

Larry S. Lau

Larry S. Lau
Resource Manager

cc: Roy S. Ewan, President
Wilson Justin, Operations Manager
Robert Marshall, Shareholder Relations Officer
Land Committee
Gulkana Shareholder Committee
Gakona Shareholder Committee
Tazlina Shareholder Committee
Land Department Staff
Backscatter Committee
Bruce Pozzi, Public Relations
Moolin & Assoc.

October 10, 1986
Larry M. Huff
P.O. Box 774148
Eagle River, Alaska 99577

Lt. V.G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Dear Lt. Brown:

In Alaska it is often difficult to receive requested items in a timely manner so as I expedite this letter, I trust you will give this due consideration even though it will arrive in Maine after October 13, 1986.

There are several line items I wish to call to your attention speaking against locating the BSR system at the Paxson east site.

104

1. Paxson has no basis of operation, no hospitals, schools, troopers, local labor pool, or adequate communication facilities.

2. Paxson east site has a marginal level grade which would not be cost effective for construction purposes.

3. Private land is relatively scarce.

4. ELS page 3-86 indicates non-potable water.

5. The Richardson Highway is substandard and relatively unsafe per requirement ELS page 2-3.

6. Environmentally the Alaska Dept. of Fish and Game has gone on record against Paxson being a site.

7. Power plant emissions from diesel generators would severely impact the wildlife, ELS 4-16.

8. BLM claims that many resources are saturated in the Paxson area re: recreational resources, ELS 4-27.

These are a few items I have found that make Paxson a poor choice given the other options. Please weigh all considerations carefully before permanently altering an environment. Thank-you.

Sincerely,

Larry M. Huff

4-80

LARRY M. HUFF

LMH/bah

[Enclosure]

10-1-86

Property owner:

Hearings have been held on the proposed back scatter radar (BSR) system. One possible site is Paxson east - about 15 air miles from the lake. The air force has five areas: Paxson east, Gulkana, Glennallen, Tok, and Indain Creek.

Many factors would indicate that Paxson east is a poor choice. Written comments are due in Maine by Oct. 13, 1986. Below are listed many considerations. Please send your letters to:

LT. V . G. Brown ESD/SCO Hanscom AFB, MA 01731

All comments are the public record and hence may be published.

1. Few facilities are available at Paxson ; no hospital, schools, troopers, shopping etc.
2. The local hire issue doesn't make good logic; only about 40 people live in the area.
3. Very little private land is available for employee residences
4. The Alaska Dept. of Fish & game has proposed that Paxson east not be a site.
5. On page 2-3 EIS, a state highway system is needed for the site. The Richardson Highway is in very poor condition and many have rated the highway- unsafe.
6. With increased highway use, excessive highway animal kills would result in this rich game area.
7. The Paxson east site has a marginal level grade for site construction - almost unsuitable.
8. EIS page 3-86, indicates drinking water below human standards.
9. Permafrost in the area is likely to increase construction costs.
10. EIS page 3-110 indicates local subsistence use. With a huge influx of employees, severe over use would result.
11. Power plant emissions from diesel generators (NO_x) may have a severe impact on wildlife. EIS 4-16
12. EIS 4-27, suggests that impact of employees on recreational resources would be small. This is misleading. The BLM claims that many resources are saturated in the Paxson area: Delta River, Gulkana River

MEMO:

TO: HQ Electronics Systems Division/SCO
OTH-B Systems Program Office
Attn: Lt V.G. Brown
Hanscom AFB MA. 01731-5000

From: Noel Newberg
Amateur Radio Station K7GHC
18234 Driftwood Bay
Eagle River, Alaska 99577

Subject: OTH Radar EIS

The electromagnetic spectrum is a natural resource and should be treated as such. Spread spectrum modulation techniques with effective radiated power (ERP) levels of up to 384 megawatts at High Frequencies (HF) do not coincide with good frequency management practices. The power levels being used for the Over The Horizon (OTH systems are excessive and will, by the Air Force's own admission in their EIS not only cause possible harmful interference to some nearby 105 aviation navigational systems but also to low band Very High Frequency (VHF) communications equipment and adjacent channel interference to HF communications equipment on nearby frequencies. ANY HF and some VHF communications systems in close proximity to the OTH transmitter site will suffer severe receiver front end overload severely hampering reception due to reduced receiver sensitivities. ALL HF receivers and possibly some VHF receivers will suffer some desensitization from the internal Automatic Gain Control (AGC) circuits trying to compensate for the increased noise floor which will be present across a large portion of the electromagnetic spectrum. Overall, there will be receiver degradation from the lower signal-to-noise ratio's resulting from the OTH systems. Because of the worldwide propagation of the HF spectrum interference may also be a world wide problem. Amateur radio use of HF communications will possibly be affected by the OTH radar or rendered totally useless. The only alternatives to HF would then become VHF or satellite communications. Both VHF and Satellite based systems are extremely costly. This seems to be indicative of the present administration's flagrant disregard of the environment and total disregard for the users of the high frequency (HF) electromagnetic spectrum. Although amateur radio is just one of the many users of the HF 106 spectrum I think the Air force should use the AWAC's they have since the life expectancy of the OTH is only 10 years. LETS keep the electromagnetic spectrum clean and save the tax payers millions of tax dollars.

Sincerely Yours
Noel Newberg K7GHC

Noel Newberg

tastee-freez

Glennallen Tastee Freez
BOX 365 · GLENALLEN, ALASKA 99588 · (907) 822-3923

October 9, 1986

HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
ATTN: Lt. V. G. Brown
Hanscom AFB, MA 01731-5000

Dear Sir:

Enclosed are the signatures of approximately 300 residents of the Copper River Basin. They endorse the selection of our area for the Over the Horizon Backscatter Radar Transmit and Receive subsystems. The favorable local sentiment is based on the belief that this project will have a positive social and economical impact on our community while playing a significant role in our national defense.

As a representative of the local business community and author of this "petition", I assure you no where will the military and contractor personnel assigned to this project be better treated or received than in the Copper River Basin.

Sincerely,

Robert Niebrugge

Robert Niebrugge

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
Andrew R. Zajac	A. Zajac	Box 208 Copper Center, AK
[illegible] O Bishop	[illegible] Bishop	Box 367 Glennallen AK 99588
Jana J Becker	Jana J Becker	Box 467 Glennallen AK 99588
Evelyn M French	Evelyn M French	Box 31 Glennallen AK 99588
John M. Boalke	John M. Boalke	Box 605 Glennallen, AK 99588
Mark S Callis	Mark S. Callis	Box 211 Glennallen AK 99588
Paul White	Paul White	Box 123 Glennallen AK 99588
Katheryn Unfreid	Katheryn Unfreid	Box 373 Glennallen 99588
Reba Sprecker	Reba K. Sprecker	Box 373 Glennallen 99588
Sheldon S Sprecker	[signature]	" "
Denise A Foley	Denise Ann Foley	Box 391 Glennallen 99588
Gene Belden	Gene Belden	Box 166 Glennall-
Reeves Robert	Robert Reeves	SR Box 143 Copper Cent.
~~[illegible]~~ E Colleen Hickman	E Colleen Hickman	Box 361 Glennallen, AK
Mona L Carter	MONA L CARTER	PO 214 Glennallen
Timothy J. Davey	Timothy J. Davey	Box 289 Glennallen, AK
Betty Viersen	Betty Viersen	Box 22 Glennallen AK
Susan McIntosh	SUSAN McINTOSH	Box 327 Glennallen
Vickie Nelson	VICKIE NELSON	Box 48 Glennallen
Edna Charley ⟷	Edna Charley	Box 284 Glennallen
William P. Bowler	William P. Bowler	Box 329 Glennallen
Barbara Blood	Barbara Blood	Box 557 Glennallen
Don LeBlanc	P.O. Box 657	Glenn 99588
Hallie Williams	P.O Box 91	Hallie Williams Glenn
Cathy Knighten	S.R. Box 340 Gakona 99586	Cathy Knighten
CLARA (BILLIE) LEWIS	Clara (Billie) Lewis	P O Box 232 Glennallen AK 99588
Chmielowski's (5)	Box 223	Gakona AK 99586

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NAME (Print)	SIGNATURE	ADDRESS
Tom KEESECKER	Tom Keesecker	MILE 147.5 RICH HWY.
Rhonda Brown	Rhonda Brown	MILE 110.5 RICH HWY.
MARLA BLASKO	Marla Blasko	Box 389 MILE 188.5 GLENN
DAN BOGDANSKY	Dan Bogdansky	Box #426 Glennallen
Mike Johnson	Mike Johnson	Box 523 Glennallen
Sue Price	SUE PRICE	Box 554 Glennallen
Mike Sparks	MICHAEL J. SPARKS	Box 294 Glennallen
Julie Smith	Julie Smith	Box 163 Gakona
James M. Miller	James M. Miller	Box 467 Glennallen
CATHY L. SMITH	Cathy L. Smith	S.R.C. Box 8539-C Palmer
Jon Callis	Jonathan D Callis	Box 575 Glennallen
Leisa Callis	Leisa R. Callis	Box 575 Glennallen
~~Jacquelyn Solomon~~ Jacquelyn Salomon	Jacquelyn Salomon	Glennallen
ALBERT CHARLEY	Albert Charley	Glennallen
TERRY ALLEN	Terry Allen	Glennallen
PATRICIA OLIVER	Patricia Oliver	PO Box 216 Glennallen
Lisa Mehl	Lisa Mehl	Box 309 Copper Ctr AK
CHERYL CONKLE	Cheryl Conkle	Box 152 Glennallen
Regina Bolden	Regina M Bolden	Box 166 Glennallen
JESS HARTMAN	Jess Hartman	Box 346 Glennallen
Ed Tellman	Ed Tellman	Box 205 Glennallen
Julie Williamson	Julie Williamson	S.R Box 300 GAKONA
JAMES BUCCINI	James Buccini	Box 359 Copper Center AK.
Jackie Lowsworth	Jackie Lowsworth	Box 41 Glennallen AK
Susan L Holschuh	Susan L Holschuh	SR Box 230 Copper Ctr AK

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NAME (Print)	SIGNATURE	ADDRESS
Harold E. Childs	Harold E Childs	Box 163 Glennallen
Geraldine Gallegos	Geraldine Gallegos	Box 463 Glennallen
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
DAN Bogdanesky	Dan Bogdanesky	Box #426 Glennallen
MARY MAYHEW	Mary Mayhew	Box 289 Glennallen
DUSTE Bowin	[illegible]	Bx 126 Copper Cent
Joyce Straight	Joyce Straight	Paxson Alt 9973
Robin Klapp	Robin Klapp	Bx 124 Gakona 995

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
Robert Niebrugge	Robert Niebrugge	Box 365 Glennallen, Alaska
Linda Kelly	Linda Kelly	Box 342 Glennallen Alaska
Jeannette Faren	JEANNETTE FAREN	POBox 326 Glen 99588
JACK FAREN	Jack Faren	Box 326 Glennallen 99588
Anita L. Kindel ←	Anita L Brown	Box 158, Gakona, AK 99586
Steve Meeks	Steve Meekin	Box 633 Glennallen AK
Ken Broeg	KEN BROEG	Box 153 GLENNALLEN AK
Karen Hartman	Karen Hartman	Box 253 Copper Center Ak.
Randall R Patrick	Randall R Patrick	Box Del Glennallen
[illegible]	[illegible]	P.O Box 614 Glennallen
David Bruno	David Bruno	Box 276 Glennallen
PEGGY S. Donahoe	Peggy A Donahoe	Box 544 Glennallen
Stanna L Wilson	[illegible]	Box 10 Copper Cente
Sylvia Ann Ireland	Sylvia Ann Ireland	Box 291 Glennallen
SHAN L Bishop	[illegible]	BOX 3676 Glennallen
[illegible]	[illegible]	[illegible]
Judy Olsen	JUDY Olsen	Box 129 Glennallen AK
Eleanor Brown	Eleanor Brown	S.R. Box 275 Copper Center AK 99573
Rocky O Mault	Rocky O Mansell	PO Box 217 Copper Center AK 99573
SHAUNALIE WILSON	SHAUNALIE WILSON	Box 10 Copper Center, AK 99573
RAYMOND E. KELLY	Raymond E Kelly	BOX 342 GLENNALLEN AK
Kenneth Hughes	Kenneth H Hughes	Box Gakona AK 99586
BLAKE W. BEAUDOIN	Blake W. Beaudoin	Box 33 Glennallen, AK 99588
JACQUIE BEAUDOIN	Jacquie Beaudoin	Box 33 Glennallen, AK
DAVID J BROWN	David J Brown	Box 275 Copper Ce...

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
Donald R Horrell	Donald R Horrell	PO Box 364 Glennallen 995
N. Maxine Becker	N. Maxine Becker	HC Box 369 Copper Center AK
Arnold Olsen		Box 129 Glennallen AK
Connie Heath	Connie Heath	Box 311 Glennallen AK
LaVern R Acker Jr	LaVern R Acker	Box 236 Glennallen Ak
Dorothy S Howard	Dorothy S Howard	Dr. #1 Copper Center AK
Kinny Young	Kinny Young	S R Box 304 Glennallen
Harvey E Donahoe	Harvey E Donahoe	SR 130 x 285 Kenny Lake
Wendell E Rush	Donald E Rush	Box 266 Glennallen Ak
Edwin G Church	Edwin G Church	Box 292 Glennallen AK 99588
Dana L Becker	Dana L Becker	Box 14 Copper Center
Randall G Rawson	Randall G Rawson	Box 277 Glennallen, Alaska 995
Bill Gilliam	Bill Gilliam	Box 221
W. Joyce Horrell	W. Joyce Horrell	Box 364 Glennallen, Ak 995
C. Gene Burnett-Grove	C Gene Burnett-Grove	Box 363 Glennallen, AK 99588
Jacquee L Kramer	Jacquee L Kramer	Box 645 Glennallen
Wanda Fisher	Wanda Fisher	Box 31 Glennallen
Mike Boyd	Mike Boyd	Box 101 Gakona
Cliff Gray	CLIFF GRAY	Box 259 Copper Center
John L. Becker	John L Becker	Box 339 Copper Center AK
Dru O'Hare	Dru L. O'Hare	Box 655 Glennallen Ak
Jerri Huddleston	Jerri Huddleston	B42 Copper Center, AK
Lee Sutherland	Lee Sutherland	Gen Del Glennallen
Judy Tollman	Judy Tollman	Box 305 Glennallen
Carl M. Dann	Carl M. Dann	S.R. Box 289, COPPER CENTER
Jim V. Lee	Jim V. Lee	S.R. Box 299 Copper Center
Paula Schenbeck	Paula Schenbeck	P.O Box 152 Copper Center

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
[illegible] S. [illegible]	[illegible]	SR 216 [illegible] 99573
PAUL V. LEWIS	Paul [illegible]	BOX 273 GLENNALLEN
DRUCILLA ALLAIN	Drucilla Allain	BOX 134 Glennallen
TERRY GILMORE	Terry Gilmore	SR BOX 216 COPPERCENTER
[illegible] J Bishop	[illegible] Bishop	BOX 526 GLENNALLEN
Sam L Bishop Jr.	[illegible]	Box 526 Glennallen
CARL PORTWOOD	Carl Portwood	BOX 332 GLENNALLEN
LARRY M SINE	Larry M Sine	SRPC Box 8888 PALMER
[illegible]	[illegible]	SRC BOX 8295 PALMER
JACQUELYN SOLOMON	Jacquelyn Solomon	Anchorage, Alas
JON BREIVOGEL	Jon Breivogel	SR BOX 106 C.C. Ak 99573
GARY MARTINEK	[illegible]	BOX 217 GLENNALLEN 99588
Karen A. Martinek	Karen Martinek	Box 217 Glennallen 99588
Charles W. Laughlin	Charles W. Laughlin	Box 288 Glennallen 99588
ARNOLD [illegible]	[illegible]	Box 129 Glennallen
DAVE BROWN	David R Brown	Box 875007 Wasilla
Jim Redding	Jim Redding	738 S. Klevin Anch 99508
CHARLES ROSEQUIST Charles Rosequist	Charles Rosequist	Box 631 VALDEZ, ALASKA

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
SHANNON SALCEDA	Shannon Salcedo	Box 391 Glennallen 995

OTH Back scatter Radar

Print	Signature	Address
Bill THOMAS	Bill Thomas	Box 265 Glennallen
Jan & Taylor	Box 265 Glennallen	
Jan Knett	John Knett	Box 569 Copper Center
Sandy Fillman	Sandy Fillman	Box 332 Glennallen
T. B Willey	T B Willey	Box 463 Glennallen
Rebecca M Willey	R. M Willey	PO Box 463 Glennallen
Steven Falkenstein	Steven Falkenstein	PO Box 93 Copper Ctr.

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
Vera Blair	Vera Blair	P.O. Box 168 Glennallen
Cheryl L. Sparks	Cheryl L. Sparks	Box 214 Glennallen
Paul Rikard	Paul Rikard	Box 67 Glennallen
Bob Coiner	[illegible]	Box 226. Glennallen.
Curt Smith	Curtis Smith	SRC Box 8839-C Palmer
John B Johnson	John B. Johnson	SRC. Box 8887 Palmer
Shelli Coiner	Shelli Coiner	Box 226 Glennallen
Darcy Blomstrom	[illegible]	Box 272 Glennallen AK
Susan Becker	Susan Becker	Box 369, Copper Center, AK

O T H BACK SCATTER RADAR [Enclosure]

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NAME (Print)	SIGNATURE	ADDRESS
Carol R. Neeley	Carol R Neeley	P.O. Box 165 Glennallen
Sharon R Neeley	Sharon R Neeley	PO Box 513 Glennallen, AK
Rhonna L. Gilmore	Rhonna L. Gilmore	PO Box 258, Copper Center, AK
Douglas W. Neeley	Douglas W Neeley	PO Box 165 Glennallen AK
Jerry A. Tallman	Jerry A. Tallman	PO Box 377 Glennallen, AK
Don Bedlick	Don Bedlick	PO Box 236 Cakoona AK
Tom Williams	Tom Williams	P.O. Box 62 Glennallen
Terry G Fisher	Terry G Fisher	Box 131 Glennallen
J C Richey	J C Richey	Box 517 Gln. AK

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
Sarah Strauss	Sarah Strauss	Box 531 Glennallen AK
Scott Strauss	Scott Strauss	Box 531 Glennallen
[illegible]	[illegible]	[illegible]
Judy Becker	Judy Becker	Box 357 Copper Center
MaryAnn G Ward	MaryAnn G Ward	Box 23 Glennallen
Vera Roberson	Vera Roberson	Box 375 Glennalle
Tyler Tollman	Tyler Tollman	Box 377 Glennallen
Pat Williams	Pat Williams	Box 62 Glennallen, AK
Rebecca Odell	Rebecca Odell	Box 207 Copper Center
Ray Lee	[illegible]	Box 335 Glennallen
Carol Hand	Carol Hand	Box 348 Copper Center, AK
Jane Callis	Jane Callis	Box 211 Glennallen AK 99588

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
AL SMITH	Al Smith	Box 395 Glenn
TERRY HAND	Terry Hand	Box 348 Copperc
Charlotte Highbargin	Charlotte Highbargin	Box 373 Glennallen
Michael Neumann	Michael R. Neuman	Box 74 Glennallen
Bill Taylor	Bill Taylor	Box 341 Nabesna
Moss Patty	Patty Moss	Box 518 Glennallen
Tom Becker	Tom Becker	Box 467 Glennallen
Marvin Carter	Marvin Carter	Box 214 Glennallen
Lowell Highbargin	Lowell Highbargin	Box 373 Glennallen
~~Burt Ward~~ Burt Ward	Burt Ward	SRC Box 8916 Palmer
L Alpine Lemmerer		Gakona Jct Village PO Box 222 - Gakona 995
Randy Acker	Randy Acker	P.O. Box 236 Glenn Allen 995
DOREENA BEAUDIN	Doreena Beaudin	PO Box 281 C.C Ak 995
Julie Greene	Julie E Greene	P.O. Box 495 Glennallen 995
Tom Bishop	Tom Bishop	Box 663 " "
TERRY L. MEHAFFEY	Terry L. Mehaffey	Box 455 Glennallen 995
Paul RIKARD	Paul Rikard	Box 67, Glennallen 9

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
FRANK BETTING	Frank J Betting	P.O. Box 558, GLENNALLEN, AK 99588
JOSEPH C VIRGIN	Joseph C Virgin	SRC Box 8640, PALMER AK 99645
Lorraine Radigan	Lorraine Radigan	Box 277 Glennallen AK 99588
ROBERT A. WILKINSON	Robert A. Wilkinson	Box 202 Glennallen, AK 99588
LYNDA S. DONAHOE	Lynda S. Donahoe	BOX 5441 Glennallen AK 99588
Linda L. Lanegan	Linda L Lanegan	Box 28 Glennallen, AK 99588
JAMES D. Allen	James D. Allen	BOX 51 Glennallen AK
Harmon Hall	Harmon Hall	Box 1007 VALDEZ AK
LISELOTTE A. SPARKS	Liselotte A. Sparks	BOX 235 GLENNALLEN
HARVEY L. DONAHOE	Harvey L Donahoe	Box 25 Kenny Lake 99573
Daniel E. Bloomer	Daniel E Bloomer	Box 34 Glennallen AK 99588
Ann L Smith	Ann L. Smith	Box 155 Copper Center, AK 99573
HERMAN J. SCHLIESING	Herman J Schliesing	Box 276 Glennallen, AK 99588
Catherine C Nagengast	Catherine C Nagengast	Box 135, Copper Center 99573
Alan H Leger	Alan H Leger	Box 676 Glennallen 99588
George Hargreaves	George Hargreaves	Box 617 Glennallen 99588
David C. Higlens	David C. Higlens	Box 52 Glennallen 99588
Mary E Blandford	MARY E BLANDFORD	Box 1788, Valdez, AK 99686

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
...rtis Finch	[illegible]	Box 30? Glenallen
Floyd WHARTON	Floyd Wharton	Box 496 Glennallen
Jim L. Allen	Jim L. Allen	Box 109 Glennallen
Theodore J Lombard	Theodore J Lombard	Box 2757 Kenai Ak
CAROL LAUGHLIN	Carol Laughlin	Box 288, Glennallen
Mark Wurtschick	Mark Wurtschick	BOX 225 GLENNALLEN, Ak
Jr Robert Vaunman		P.O. Box 193 Chitina, Alaska 99581
JANET Wharton	Janet Wharton	Box 496 Glennallen
ERIC L CRAIG	Eric Lee Craig	Box 154 GLENNALLEN Ak
Shellie Allen	[illegible]	Box 109 - Glennallen
[illegible]		
JERRY Charley JR	Jerry Charley Jr	Box 243 Chistochina
CAL JUSTIN	Cal Justin	NABESNA AK
KAREN ESKILIDA	Karen Eskilida	Box 121 Copper Ctr
Roy Eskilida Jr	ROY ESKILIDA	Box 121 Copper Center
Patrick Ireland	Patrick Ireland	BOX 291 Glennallen
Regina L. Fisher	Regina L. Fisher	Box 313 Glennallen
J. G. HALL	J.G. Hall	Box 372 Glennallen
Dallas K. NELSON	Dallas K. Nelson	Box 418 "

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
[illegible], VERNON		PO BOX 327 GLENNALLEN, AK 99588
GERLACH, ROBERT	Robert Gerlach	BOX 466 GLENNALLEN AK 99588
Don Campbell (DON Campbell)		Box 248
Merritt E. Tegeler	Merritt Tegeler	Bx 306 Glennallen 99588
Viola M. Johnson	Viola M. Johnson	Box 344 Glennallen
[illegible]	[illegible]	[illegible]
William Beaver		
Richard Nalos	Richard Nalos	Box 576 Glennallen
DORRIS STEVENSON	Dorris Stevenson	Box 528 Glennallen

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
ROBERT E SUNDER	[illegible]	Copper Center, AK
Katherine H. Vance	[illegible]	Anchorage, AK 995
ROBIN A. LEE	[illegible]	Copper Center, Ak
Lisa Wuitschick	→ LISA WUITSCHICK	Copper Center
Donna R. Miller	Donna Miller	Copper Center
DON COOLEY	Don Cooley	COPPER CENTER
Constance Badger	Connie Badger	Copper Center
Edmond E. Badger		Copper Center
BRUCE GORDON	[illegible]	SR Copper Center Ak
C.K. Goddard	C.K. GODDARD	Copper Center Alaska
[illegible]		Copper Center, Alaska
JOHN A EATON	[illegible]	Copper Center Ak.
N. Jerkins		Glennallen A.K.
Gayle Kildal	Gayle Kildal	Glennallen AK
Harry A. Johns Sr		Copper Center Alaska
Jean Schilling		Copper Ctr. Ak.
Shirley Miller		Copper Center, Ak.
Austin MAHALKEY	Austin Mahalkey	GLENNALLEN
Michael McCrary	Mickey McCrary	Box 127 Copper Center AK
Ken Johns	[illegible]	Box 187 Copper Center AK
Ferne Swisher (Ferne Swisher)	Ferne Swisher	Box 341 Copper Center AK
WILLIAM C. GILLIAM JR	Wm Gilliam Jr	PO Box 221 G.A. 99588
Robert M. Gallatin	ROBERT GALLATIN	S.R. Box 1476 Copper Center 99573
SEAN P GALLATIN	[illegible]	SR BOX 1476 Cop. Ctr 99573
[illegible]		[illegible]
[illegible]	Sean [illegible]	SR Box [illegible] CC 99573
[illegible]	[illegible]	SR BOX 281 CC

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
[illegible]	[illegible]	[illegible]
SARAH Rush	Sarah Rush	Box 366 [illegible]
Robert W. Lohse	ROBERT LOHSE	Box 310 Copper Center
Dan Pete	DAN PETE	Box 7 Copper Center
Richard L. Rondeau	Richard L. Rondeau	SRB 157 Copper Center
Marcia Patrac	Marcia Patrac	Box 261 Copper Center
[illegible]	Kathy Portwood	Box 332 Glennallen
[illegible]	David E Stephenson	Box 23 Copper Center
SANDRA J HUDDLESTON	Sandra J Huddleston	Box 337 Copper Center
Ruth Boyd	Ruth BOYD	Box 124 [illegible]
Kenneth B. Smith	KENNETH B SMITH	BOX 35 COPPER C.
CINDY SMITH	Cindy Smith	BOX 35 " " "
Marianna Williams	marianna williams	SR 100 Copper Center
Sylvia Holmes	Sylvia Holmes	P.O. Box 78 Copper Ctr, AK
Warren Miller	Warren Miller	Copper Ctr AK
Gail E. Niebrugge	GAIL NIEBRUGGE	Glennallen, AK

O T H BACK SCATTER RADAR [Enclosure]

I support and encourage selection of sites in the Copper River Basin for the OTH Backscatter Radar transmitter and receiver.

NAME (Print)	SIGNATURE	ADDRESS
Leland Dishman	Leland Dishman	Po Box 243 Glenn[illegible]
[illegible]	[illegible]	[illegible]
Amy L. Dishman	Amy Dishman	P.O. Box 24[illegible]
Martin N. Finnesand	Martin N. Finnesand	P.O. Box 92 Copper Center, AK. 9957[illegible]
Roy Hartman	Roy Hartman	P.O. Box 253 Copper Center 9[illegible]
Mona Hartman	Mona Hartman	Po. Box 253 Copper Center 9[illegible]
Shirley Hobson	Shirley Hobson	P.O. Box 231 Gakona, AK 9958[illegible]
Sally J Rhodes	Sally J Rhodes	SRC Box 8725 [illegible]
Mrs. Henry Johnson		SRC Box 8725 Pa[illegible]
Damion Haley	Damion Haley	Box 555 Glennallen AK
[illegible] Thomas[illegible]	[illegible]	PO Box 1913 [illegible]
[illegible]	[illegible]	PO Box [illegible]

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

RECEIVED 9 OCT 86

In Reply Refer To:
ER-86/1272

OCT 3 1986

Virginia G. Brown, Lieutenant
Department of the Air Force
OTH-B Environmental Planning Manager
Over-the-Horizon Radar Systems Directorate
Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base, Massachusetts 01731-5000

Dear Lieutenant Brown:

This is in regard to your transmittal of September 3, 1986, requesting the Department of the Interior's review and comments on the draft environmental statement concerning the Alaskan Radar System Over-the-Horizon Backscatter (OTH-B) Radar Program.

This is to inform you that the Department will have comments but will be unable to reply within the allotted time as we have just received your submittal of duplicate copies to satisfy our intradepartmental distribution needs. Please consider this letter as a request for an extension of time in which to comment on the statement.

Our comments should be available about October 31, 1986.

Sincerely yours,

Bruce Blanchard, Director
Environmental Project Review

United States Department of the Interior

OFFICE OF THE SECRETARY

P. O. Box 100120
Anchorage, Alaska 99510 - 0120

October 27, 1986

ER-86/1272

Virginia G. Brown, Lieutenant
Department of the Air Force
OTH-B Environmental Planning Manager
Over-the-Horizon Radar Systems Directorate
Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base, Massachusetts 01731-5000

Dear Lieutenant Brown:

We have reviewed the draft environmental statement concerning the Alaska Radar System Over-the-Horizon Backscatter (OTH-B) Radar Program and offer the following comments for your consideration.

General Comments

107 We understand and agree that the scope of this EIS is beyond the site specific. However, page 2-21, 2.1.2.4 states the analysis in the EIS will result in the selection of the transmit and receive study areas. An environmental assessment would then be completed to analyze the site specific locations within those two areas. We believe that the document requires additional information to allow a meaningful assessment of the alternative study areas and impacts of the proposed project before two of the five areas can be selected.

The document reflects a lack of on-site familiarity as evidenced by a number of errors and/or omissions. The document could be strengthened by greater use of available literature and contacts with people familiar with resources in the areas being considered for project location.

The following comments identify specific information needs which we believe are necessary to adequately evaluate the project and develop appropriate mitigation measures.

Specific Comments

Page 3-1, 3 Affected Environment: Follow-up environmental documentation would need to include a comprehensive literature survey in conjunction with detailed discussions with appropriate resource personnel in the areas of concern.

Page 3-36, Sec. 3.3.2 Vegetation Association: A detailed vegetation analysis could reveal an index to habitat quality for wildlife species in the areas. We therefore recommend that level 4 cover typing (see Vierick, et al. 1986), be completed for the proposed sites. Wetlands should be typed in accordance with Cowardin et al. (1979). The Fish and Wildlife Service (FWS) may be able to assist in this effort. Please contact Jon Hall at our National Wetlands Inventory Office in Anchorage for further assistance. 10

Page 3-38, 3.3.25 Wetlands: The project could potentially impact important wetlands at all sites, and these would need to be evaluated on an individual basis. As a general rule for planning purposes, however, an effort should be made to avoid encroachment and degradation of these resources. We are particularly concerned about those which are sedge-dominated and/or contiguous with fish-bearing lakes and streams. Specific state and federal permits may be required for the proposed project if wetland impacts are unavoidable. 1(

Once the cover typing (wetland classification) analysis is complete, contact should be made with the Corps of Engineers, Permits Branch, for a wetlands determination, based on their jurisdiction. This determination will indicate the need for a wetlands permit from that agency.

Page 3-40, 3.3.4 Endangered Species: Thirty Alaska plant taxa are currently considered candidates for possible future addition to the Endangered Species list by the FWS (50 FR 39526, 9/27/85). These species were not ". . . proposed as candidates by the U.S. Forest Service" as stated in the document. Since 1980, the FWS has been seeking volunteer information and has funded detailed status surveys on several of the subject species to determine their appropriateness for listing. The discussion of the three candidate plants that may occur in the study region is excellent. 11

Page 3-42, 3.4 Wildlife: We found this section to be generally adequate in describing the fish and wildlife resources which could be present. The section does, however, lack sufficient site-specific information necessary for a detailed review and comparison of the five study areas, particularly as to which species actually occur at the sites and how the project would impact those species. 1

Page 3-42, 3.4.1 Fish: Further environmental documentation should include specific information regarding habitat quality, abundance and use by recognized fish evaluation species, i.e. chinook, coho and sockeye salmon, and grayling. The following specific parameters should be addressed for all streams and lakes which would be impacted by the project: 1:

a. Dissolved oxygen, conductivity, pH, alkalinity/hardness. These data should be collected on a seasonal basis.

b. Life stage/use surveys of fish habitat to determine reproductive, overwintering, and rearing areas.

c. Develop an index of relative abundance of the fish species.

Page 3-57, 3.4.2.1 Raptors: This section contains many inaccuracies, and in general suffers from a reliance on dated literature such as Gabrielson and Lincoln (1959). In contrast to the first sentence which states that little is known about the 13 species of raptors occurring in the region, a great deal is known about selected species. Research has occurred on gyrfalcons, bald eagles, peregrine falcons and ospreys in the general area. Although these data may not be published in journals, it is available through resource agencies such as the FWS, the Bureau of Land Management (BLM) Resource Area Office at Glennallen and the University of Alaska-Fairbanks.

113

The non-migratory goshawk is a poor choice for use as an example of raptor breeding phenology in the area. As a resident bird, the goshawk will initiate and complete its breeding cycle well in advance of most other raptors, which are migratory and arrive later. Large raptors such as bald and golden eagles have extended nestling periods that may exceed 70 days compared to the 39-day nestling period given for goshawks.

Since the Swainson's hawk is a category 2 candidate species (47 FR 58454, 12/30/82), a discussion of this species should occur in section 3.4.4.

Rough-legged hawks are most common north of the boreal forest in arctic Alaska. Their occurrence in the study region is probably limited to seasonal migrations.

To our knowledge, there is no evidence that golden eagles utilize tree nests for breeding in Alaska. Biologists with the BLM, Glennallen Resource Area Office, have conducted detailed studies of the bald eagles in the Gulkana region. As an example, they have documented that significant numbers of bald eagles nest in the Gulkana River drainage and along lake shorelines in the vicinity of the Gulkana River. In addition, active bald eagle nests have been observed in the Copper River riparian zone in the vicinity of the Gulkana and Gakona River confluences. These data can be consulted for estimating breeding densities for this species.

Marsh hawks, now called northern harriers, are ground nesting birds of open country and marshes. They are undoubtedly a common breeder in the study region. Sharp-shinned hawks are also abundant and common breeders in the study region.

Further environmental documentation should include an index of habitat quality (built from available information) for recognized evaluation species for this area, i.e. red-tailed hawk, goshawk, and sharp-shinned hawk. This index could then be applied to the site areas by conducting seasonal aerial and foot surveys to specifically address:

a. Relative abundance of the evaluation species

b. Prey densities

c. Migration patterns

Page 3-58, 3.4.2.2 Waterfowl: As with raptors, an index for habitat quality would need to be developed for the waterbird evaluation species, i.e. mallard, pintail, and trumpeter swan. This index would then be seasonally applied through aerial surveys to specifically address: 114

a. Seasonal bird concentration areas

b. Local and seasonal movement patterns

Page 3-67, 3.4.3.1 Big Game: Big game species selected for evaluation include; caribou, moose, black bear, and brown bear. Information needs include: 115

a. Relative abundance of all species

b. An index of seasonal forage production, quality and availability

c. Seasonal distribution and movement patterns

d. Bear denning habitat

Page 3-78, 3.4.4 Endangered Species: We concur with your assessment that the endangered American peregrine falcon and Eskimo curlew are unlikely to be found nesting within the study area.

Page 4-1 Environmental Consequences: It appears that most of the anticipated adverse impacts have been identified. The weakness in this section is in the identification of specific mitigation measures to minimize these impacts. Various development agencies in Alaska have, over a period of years, developed specific mitigation measures for various impacts. The Fish and Wildlife Service included a list of references in their comments on the PDEIS to assist you in project planning. We see no reference to these or similar types of documents in the DEIS, therefore we will reiterate these references in the following comments. 116

Further analysis of environmental consequences and appropriate mitigation will depend heavily on the results of the studies previously identified. The FWS will evaluate the mitigation measures proposed against their mitigation policy statement prepared for this project (Appendix).

Page 4-1, 4.2.1 Development of Borrow Sources and Spoil Disposal Sites: Further analysis of borrow material needs, sources and area impacts is needed before the two study areas can be selected. Borrow site development (particularly new sites) and ancillary facilities, and disposition of excess spoil material can cause major impacts to fish, wildlife, recreation and water resources. Development of this project feature should follow the guidelines and recommendations as outlined in USFWS 1980; Alaska Power Authority (APA) 1985a, and APA 1985f. Disposal of excess material should occur on upland sites, avoiding wetland areas; and the area should be revegetated in accordance with recommendations made by the University of Alaska Plant Materials Center, Palmer, Alaska. 117

Further environmental analysis would include a detailed discussion of where material will be excavated and the quantity of material needed. Specific plans for disposal, and quantities of unwanted material should be identified.

118 Page 4-6, 4.4 Wildlife: It should be emphasized that the loss of 3,000 acres of wildlife habitat will have major adverse impacts on some species. It is not just a matter of altering or changing habitat conditions, but rather that, for many species, the sites will become totally inaccessible once the project is constructed. The magnitude of this impact should be discussed in the document, and appropriate mitigation measures developed.

Page 4-6, 4.3.3 Loss of Threatened or Endangered Species: We fully concur with your assessment.

119 Page 4-6, 4.4.1 Bird Collisions: The DEIS well documents the potential adverse impacts associated with bird collisions. It clearly supports the need to avoid high density bird concentration, migration and local movement areas, particularly since there are no validated mitigation techniques which could be implemented to substantially minimize this impact.

The Glennallen and Tok sites are well-documented high bird use areas, and we believe that bird collisions could be a significant impact. Since there are no proven mitigation measures to reduce such impacts we recommend avoidance of these sites. We are willing, however, to reconsider this recommendation should additional information become available. To assist in this regard we recommend that a risk assessment be conducted at the LORAN-C towers in Tok. This would include a sampling protocol that allows timely, systematic collection of bird collision mortality data.

Olendorf et al. (1981) provide guidelines for design and construction of transmission lines to avoid electrocution of avifauna, particularly raptors. The EIS should discuss how these design features will be incorporated to minimize these impacts.

120 Page 4-8, 4.4.2 Alteration of Aquatic Habitats: Identification and avoidance of potential impacts to fish streams should receive priority in the planning process. In areas where this cannot be done, other appropriate mitigation measures should be implemented (please see: APA 1985a, 1985e, 1985f). The document should discuss how these measures will be implemented.

121 Page 4-11, 4.4.3 General Human Disturbance: Further analysis should be provided for the impacts on local wildlife populations, distribution patterns, and affect on habitat resulting from the increase in human population. All human activity should be addressed, from hunting to other recreational activities such as ORV use and river rafting and the impacts these will have on the habitat and nesting swans, bald eagles, and key wildlife species. Regional impacts from human disturbances overall could be minor; however, on an individual study area basis they may be major, and specific mitigation measures should be implemented. In particular, we note the following: possession and use of firearms and potential problems of bear/human encounters

and garbage control. Some of these may be more important during construction rather than during operation since the project sites will be fenced.

We recommend that all construction camps also be fenced; no firearms be permitted in these camps; and that construction workers be required to attend an orientation program regarding bear encounters. An acceptable program was developed for the Terror Lake Hydroelectric Project (contact the APA). Other zoning and/or timing restrictions may be necessary dependent on specific site conditions. Other "biological stipulations" developed by the FWS are contained in Hosking (1984). To facilitate project development while minimizing environmental impacts during construction, we also recommend that the U.S. Air Force (USAF) plan to employ an on-site environmental monitor. Details of these mitigation measures should be developed prior to awarding of the construction contract, and be addressed in this document.

Page 4-10, 4.4.5 Increased Mortality: We anticipate that traffic volume could be quite heavy during construction and appropriate measures (i.e., timing of activity, speed controls) should be implemented to minimize this impact. The methods used to mitigate this impact should be discussed in this document. 122

Page 4-11, 4.5 Water Resources: See APA (1985a, 1985c, 1985e, and 1985f) for appropriate guidelines affecting these resources. The document should discuss what specific mitigation measures will be implemented to protect water resources.

Page 4-12, 4.4.6 Effects on Endangered Species: We concur with your assessment that there is minimal risk to the American peregrine falcon from the project as described. As suggested in the DEIS, the FWS will informally consult with the USAF on possible effects to this endangered species once the antenna sites have been identified. 123

Page 4-13, 4.5.5 Water Pollution From Petroleum Products & Other Contaminants: See APA (1985c and 1985d) for appropriate guidelines. The document should discuss specific mitigation measures to be implemented to control contaminants.

Page 4-25, 4.8.3 Subsistence: High subsistence use areas should be identified and avoided prior to final site selection. Because of the historic and traditional use of particular species there is essentially no way to replace a subsistence use area and/or resources. This concern should be a high priority in final site selection. 124

It would appear from page 4-25, paragraph 3, that an assessment to comply with Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) will be done only if the project is located on federal land. Even though Section 810 as written may not technically apply to projects proposed for private lands, the federal government will have to acquire some interest in the private land prior to beginning construction; therefore, an 810 evaluation

may be indicated. From our perspective, the major impact to subsistence users would result from the addition of people into the resident zone communities of the Wrangell-St. Elias National Park, as identified in 36 CFR, Part 13,
124 Subpart C, Section 13.73 (a) (1).

People associated with construction, operation and maintenance of the project will move into the subsistence residence zone communities of the park and will thus qualify to use and compete for limited subsistence resources. This would occur regardless of whether the project facilities were located on federal, state or private lands.

Permanent residents of the resident zone communities of Chisana, Chistochina, Chitina, Copper Center, Gakona, Gakona Junction, Glennallen, Gulkana, Kenny Lake, Lower Tonsina, McCarthy, Mentasta Lake, Nabesna, Slana, Tazlina, Tok, Tonsina, and Yakutat are not required to obtain a permit before engaging in subsistence activities within the park. With the influx of new families (associated with the project) into these communities, there is potential for many more people to become eligible to hunt, fish and gather plant materials in the park simply because they live in a designated resident zone community.

The long-term residents (those with a history of customary and traditional subsistence use within the park) would then complete for limited resources with more people than at present. The result could be more limited seasons, instigation of ANILCA Section 804-Subsistence Priority, deletion of resident zone status to communities or, possibly, an intensive and extensive permit procedure coupled with additional investigative time and enforcement.

We suggest, that in the best interest of the proposed project and in order to better evaluate the potential impacts on the subsistence resources, an ANILCA Section 810 evaluation be completed, or this section of the document be expanded to a comparable level, prior to the final environmental statement. Lou Waller, National Park Service (NPS) Subsistence Liaison at the Alaska Regional Office (telephone 271-2685), would be pleased to provide technical assistance in such an effort.

125 **Page 4-27, 4.8.4 Recreation: An important impact which should be addressed is the potential loss of recreational opportunity with the project. This could mean approximately four square miles of area will not be available for hunters. Development of this project will at least double the number of recreation users in any of the areas considered. Further analysis would need to comprehensively evaluate this impact on existing use. User surveys should be initiated. This analysis would also address the specific mitigation measures which will be implemented to minimize this impact.**

126 **Page 4-43, 4.13.2.1 The Addition to Environment.....: The project has the capability to be very disruptive to our existing and planned high frequency (HF) communications throughout the state when operating in the 5-8 MHZ range.**

Page 4-44, paragraph 1, states that the OTH-B will operate in the 5-28 MHZ frequency range, and that detailed plans for interference avoidance will be developed. THE NPS and BLM commonly use frequencies between 3 and 5 MHZ except when long distances and ionospheric conditions require using 6 or 8 MHZ. We believe that operation of the OTH-B in the 9-28 MHZ range would avoid major disturbance and suggest the use of this range be address in this section. 126

It would appear that our continued use of the high band very high frequency (VHF) communications would not be adversely affected by the proposed project.

For further information on our communication needs we suggest you contact Noel Newberg, Communications Specialist at the NPS Alaska Regional Office (telephone 271-2600).

Summary Comments

We believe there is a potential significant impact from bird collisions at the Glennallen and Tok sites. Unitl more information becomes available showing this is not the case, we recommend that these sites be excluded from further consideration.

We suggest that an ANILCA Section 810 evaluation, or its equivalent, be completed to better evaluate the potential impacts on subsistence resources in the study areas and within the Wrangell-St. Elias National Park.

The USAF has indicated that there is a need for further environmental analysis to address site-specific issues. We believe our recommendations, if implemented, will provide a good basis for this analysis. We believe that initiation of these investigations should begin in a timely manner in order to avoid project delays.

We appreciate the opportunity to review and comment on this document.

Sincerely,

Regional Environmental Officer

Enclosures

[Enclosure]

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_____. 1985f. Susitna Hydroelectric project - Drainage Structure and Waterway Design Guidelines. Alaska Power Authority, Anchorage, Ak. 150 pages.

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Over the Horizon Radar System - Alaska [Enclosure]

Revised Draft Mitigation Statement

Under the Fish and Wildlife Coordination Act (FWCA) and the National Environmental Policy Act (NEPA) regulations, the Fish and Wildlife Service (FWS) has responsibilities to insure that project-related losses to fish and wildlife resources are identified and mitigated. As part of our participation in the planning and evaluation of the Over the Horizon Radar System (OTH-B), a mitigation statement has been developed in accordance with the FWS Mitigation Policy (FR Vol. 46, No. 15, January 23, 1981). It is prepared to provide guidance for evaluating and mitigating impacts of the proposed project to fish and wildlife. Much of the background support and documentation has been taken directly from Cuccurese, 1986.

Essentially, the mitigation statement has been developed by first selecting important fish and wildlife evaluation species from among the full range of species occurring within the proposed sites to be impacted by both direct as well as indirect impacts. Evaluation species are chosen either because they represent resources which are most characteristic of the area or because the FWS has mandated responsibilities for them. By narrowing the scope in this way, the analyses can focus on areas where significant changes are most likely to occur and not be unduly burdened by inclusion of areas with low wildlife value.

Selection of evaluation species has an important role in determining the extent and type of habitat mitigation achieved. A combination of two sets of criteria is typically used to choose species for this purpose. The first is to pick species with high public interest, subsistence, or economic values while the second is to select species which utilize habitats having significant ecological values.

Fish and wildlife habitats for each evaluation species are then assigned one of the four Resource Categories delineated in the FWS Mitigation Policy (Table 1). Designation of habitat into Resource Categories ensures that the level of mitigation recommended in consistent with the value of that habitat and its relative abundance on an ecoregion or national basis.

Species or guilds of species (i.e., species that use closely associated ecological niches) have been selected as the basis for evaluating impacts and formulating mitigation requirements for the OTH-B project (Table 2). Available information indicates that high value habitat for each evaluation species is found within the study area but that none is considered unique or irreplaceable. Therefore, the habitat for all species have been assigned to Resource Categories 2 or 3.

The determination of the relative scarcity or abundance of evaluation species habitat from the national perspective is based upon 1) the historical range and habitat quality and 2) the current status of that habitat. A significant reduction in either the extent or quality of habitat for an evaluation species indicates that it is scarce or becoming scarce, while maintenance of historical quantity and quality is the basis for considering it abundant.

Specific ways to achieve the mitigation goal for Resource Category 2 when loss of habitat value is unavoidable include, 1) physical modification of replacement habitat to convert it to the same type lost; 2) restoration or rehabilitation of previously altered habitat; 3) increased management of similar replacement habitat so that the in-kind value of lost habitat is replaced; or 4) a combination of these measures. By replacing habitat value losses with similar habitat values, populations of species associated with that habitat may remain relatively stable in the area over time.

The mitigation goal of in-kind replacement of lost habitat, however, cannot always be achieved. When opposition to a project on that basis alone is not warranted, deviation from this goal may be appropriate. Two such instances occur when either different habitats and species available for replacement are determined to be of greater value than those lost, or when in-kind replacement is not physically or biologically attainable in the ecoregion. In either case, replacement involving different habitat kinds may be recommended, provided that the total value of the lost habitat is compensated.

For Resource Category 3, in-kind replacement of lost habitat is preferred though not always possible. Substituting different habitats or increasing management of different habitats so that the value of the lost habitat is replaced may be ways of achieving the planning goal of no net loss of habitat value.

Identification of evaluation species and designation of Resource Categories represent the first of several steps to be taken toward the completion of a mitigation plan. Using socio-economic trend analysis, the types of fish and wildlife habitats potentially impacted by project-induced growth may be delineated and quantified, which will permit secondary, as well as direct, impacts to be evaluated. Upon completion of an analysis that quantifies impacts, a data base will be available from which a mitigation plan can be formulated.

Table 1. Resource Categories and Mitigation Planning Goals.[1/] [Enclosure]

Resource Category	Designation Criteria	Mitigation Planning Goal
1	Habitat to be impacted is of high value for evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section.	No loss of existing habitat value.
2	Habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section.	No net loss of in-kind habitat value.
3	Habitat to be impacted is of high to medium value for evaluation species and is relatively abundant on a national basis.	No net loss of habitat value while minimizing loss of in-kind habitat value.
4	Habitat to be impacted of medium to low value of evaluation species.	Minimize loss of habitat value.

[1/] Taken from FWS Mitigation Policy (FR Vol. 46, No. 15, 23 January 1981).

Table 2. Evlauation species[1/] for the OTH-B Project and Resource Category Designations of Associated Habitat. [Enclosure]

Common Name	Scientific Name	Resource Category of Associated Habitat
Black Bear	Ursus americanus	3
Brown Bear	Ursus arctos	2
Caribou	Rangifer tarandus	3
Moose	Alces alces	3
Chinook salmon	Oncorhynchus tshawytscha	2
Coho salmon	Oncorhynchus kisutch	2
Sockeye salmon	Oncorhynchus nerka	2
Grayling	Thymallus arcticus	3
Mallard/Pintail	Anas platyrhynchos/A. acuta	3
Trumpeter swan	Cygnus buccinator	2
Red-tailed hawk	Buteo jamaicensis	3
Goshawk	Accipiter gentilis	3
Sharp-shinned hawk	Accipiter striatus	3

1/ The bald eagle meets several of these tests but was not included as an evaluation species for mitigation purposes because it is specifically protected by the Bald Eagle Protection Act (16 U.S.C. 668-668c).

Appendix. OTH-B Evaluation Species [Enclosure]

Terrestrial Species

1. Moose (Alces alces). Moose habitat, relative to its historical range, is considered abundant from both a national and ecoregional basis.

   In terms of hunting pressure, moose is probably the most important big game species in Alaska. Historically, moose were a source of food, clothing, and implements along the major rivers. On a local, regional, and state-wide basis, this species continues to be an important source of food and recreation. Spending by moose hunters results in benefits throughout the State's economy and is compounded by the number of non-resident hunters. Moose also have a high non-consumptive value in that observations are valued by photographers and hikers.

   Moose are widely distributed throughout each of the proposed project sites (ADF&G, 1986). In general, they can be considered part of transitory subpopulations, which are relatively small in size in response to the limited carrying capacity of climax lowland habitats together with intensive wolf and bear predation on young-of-the-year. Density varies by season and by physical features of each proposed project area. Moose are sparse in the alpine habitat of the Paxson East site compared to a relatively high density in the Copper River and Tanana River lowlands.

2. Caribou (Rangifer tarandus). Caribou habitat, relative to its historical range, is considered abundant from both a national and ecoregional basis.

   The Nelchina and Fortymile caribou herds, 2 of 22 major herds in Alaska, would be affected by the project. These herds are of major importance to subistence and sport hunters because of their relative abundance and accessibility to population centers in southcental and interior Alaska. The Mentasta and Chisana caribou herds, two minor herds, could also be affected by the proposed project.

   The Fortymile herd once numbered several hundred thousand and declined to several thousand animals during the late 1970s (ADF&G, 1986). This decline was attributed to combined factors, including wolf predation, liberalized hunting regulation, and fire suppression (periodic burning is required to arrest succession of lichen-dominated communities). The herd appears to be increasing slowly (Kelleyhouse, 1985). A photo census, conducted in June 1984, provided a minimal estimate of 12,536 animals (Kelleyhouse, 1985). A total of 200 caribou were taken in 1983-84, primarily by hunters who reside proximal to State Game Management Unit 20E. Modest harvests are intended to allow the herd to attain a population objective of 50,000 animals (ADF&G, 1976).

   According to Skoog 1968, the small Mentasta and Chisana herds are remnants of the Fortymile herd that ranged in the Mentasta Mountains and the Nabesna-White River country, respectively, until the early 1930's. Small bands of these caribou could conceivably be affected by the proposed project in that some have reportedly (Cuccarese, AEIDC) wintered in the Northway-Tetlin Flats area during recent winters.

Both herds are relatively stable in population size, with the Mentasta herd consisting of about 2,800 animals and the Chisana herd of about 1,000 animals (Kelleyhouse 1985).

3. Brown Bear (Ursus arctos). This species is considered to be a valuable big game animal and attracts numerous resident and non-resident hunters. The non-consumptive value of brown bears is exemplified by the state operated McNeil River Sanctuary. Hundreds of people yearly submit applications to obtain an opportunity to observe brown bears in th sanctuary. A lottery system limits the number of observers at the sanctuary to minimize disturbance to the bears.

   Although not considered threatened or endangered in Alaska, the brown bear is listed as threatened under the Endangered Species Act in the 48 conterminous states. As such, it can be considered a species of particular national interest and one whose habitat has been significantly reduced in extent and quality from the national perspective. Accordingly, it is considered scarce on that basis.

   Brown bears are present in the proposed project areas. Species density varies with physiographic features of the Copper and Tanana lowlands and the Alaska Range regions. Extensive open plateau and moist tundra habitats apparently afford marginal conditions compared to elevated places or broad valley bottoms such as occur in the Copper and Tanana drainages. Many bears inhabiting proposed project site localities can, like moose, be viewed as members of transitory subpopulations.

   Although brown bears are seasonally common in open and heavily timbered lowlands, alpine and subalpine habitats are more frequently used. Intensive use of lowland drainage systems occurs when migratory fish are present and during early spring when bears emerge from winter dens. Important spring foods are grasses, sedges, and other herbaceous plants. Brown bears concentrate on streams such as Fish Creek and the Gulkana River during summer and fall salmon runs.

   As with other big game animals, good road access and the ability of hunters to cover remote areas in southcentral and interior parts of Alaska enable the harvest of brown bear. No standard surveys of brown bears ranging in the Lake Louise Plateau, the Gulkana and Tanana River valleys, or Indian Creek areas have been conducted by the Alaska Department of Fish and Game. General observations and recent harvest levels indicate brown bears occur at low to high densities in suitable habitat (Kelleyhouse, 1984). The species occasionally infringes on human settlements and troublesome animals are eliminated to protect life and property.

4. Trumpeter Swan (Cygnus buccinator). Although never considered abundant, trumpeter swans were historically found throughout much of northcentral North America in summer and along the Mississippi River and the Atlantic, Gulf, and Pacific Coasts in winter (Bartonek, 1983). As a result of commercial and sport hunting and habitat destruction during the 19th century, trumpeter swans were nearly extirpated from Canada and the 48 contiguous states (Banko, 1960). Their favorable response to recent management efforts and, perhaps, amelioration of climate, has made removal

from the Threatened and Endangered Species list possible. The 1980 census indicated 7,696 trumpeter swans, representing 88 percent of the world population, were on the breeding grounds in Alaska (King and Conant, 1981).

Swans in Alaska nest and rear in wetlands and ponds found, primarily, along the major river systems in the southern half of the state. Trumpeter swans are very susceptible to disturbance impacts during nesting and rearing of cygnets. Approximately two-thirds of all trumpeter swan habitat in Alaska is held in private ownership and therefore potentially available for development. Similar land ownership patterns occur in the project area.

Based on all information available at that time, Evans and Cuccarese (1977) rated the Nelchina Plateau as being high density trumpeter swan breeding habitat; then-current estimates indicated as many as 600 trumpeter swans nested there (Hansen et al. 1971). In the intervening years, the Alaska trumpeter swan population has grown dramatically; today around 2,000 birds nest on the Nelchina Plateau (USFWS 1985a). The center of distribution and abundance for this species occurs roughly within the boundaries of the Glennallen site. The total Alaska population of trumpeter swans is between 8,000 and 10,000.

Few trumpeter swans currently breed in the upper Tanana River Valley; today, six pairs nest on the whole of the Tetlin National Wildlife Refuge (USFWS 1985b). This may change, however, if the Alaska population continues the dramatic growth seen over the past 15 years.

5. Mallard (Anas platyrhynchos) and pintail (Anas acuta). The most widely distributed and numerous game duck in North America, the mallard occurs throughout much of Alaska. From 1972 to 1981 the average breeding population in surveyed areas in Alaska was approximatley 250,000. This represents less than three percent of the continental population (USFWS 1983). Depending upon production in a given year, pintails are either the second or third most abundant duck in North America. They are more abundant than mallards in the Pacific Flyway and in Alaska (Bellrose 1976).

Mallards breed in low densities in many forest and tundra wetland habitats. Nesting sites are usually selected at the edge of sloughs, lakes, and reservoirs, but sometimes may be far from water on higher ground. Pintails select open areas for their nests where vegetation is either low or sparse. Nest sites also tend to be farther from water than other species of ground-nesting ducks.

Interest in the mallard and pintail is high because of their value for hunting and viewing. Approximately 35 percent of all ducks harvested in the Pacific Flyway are mallards (USFWS 1983) and 16 percent are pintails (Carey et al. 1983), and even with strict regulatory measures, demand exceeds the supply. Management efforts are directed at satisfying as much of the demand as possible within the constraints of habitat losses and other conflicts (USFWS 1983).

Habitat for mallards and pintails is common within the project sites. Of concern, however, are the 1982 population estimates for pintails in Alaska which showed a 46 percent decrease from the 1981 figures and were 30

percent below the ten-year average. It is uncertain whether this decline is significant, as pintails tend to disperse north in drought years on the prairies and several drought years are included in the average (King and Conant 1983). In 1985, however, breeding duck populations in North America reached their lowest numbers in 30 years, with pintail populations reaching record low numbers. Loss of nesting cover, wetland drainage, and degradation of migration and wintering habitat have contributed to long-term downward trends in several duck populations (Draft North American Waterfowl Management Plan 1985). The pintail population, on a regional basis, has also been on the decline (Conant and Hodges, 1985).

Based on review of more than 25 years of trend data compiled by the USFWS, and input from James King, USFWS flyway biologist, Evans and Cuccarese (1977) rated the majority of the Nelchina Plateau as being low density duck breeding habitat. A small area east and south of Crosswind Lake, however, supports nesting densities of ducks which are, on average, slightly greater than $25/mi^2$; this area was rated medium. Principal breeding species of the Nelchina Plateau are wigeon, mallard, pintail, and lesser scaup (Bellrose 1976).

The Tetlin National Wildlife Refuge supports, on average, around 40,000 breeding ducks (USFWS 1985); most of these nest in and immediately adjacent to the floodplain of the upper Tanana River. Principal breeding species here are lesser scaup, white-winged scoter, green-winged teal, wigeon, mallard, and ring-necked duck. Evans and Cuccarese (1977) rated this area as low density nesting habitat.

6. Red-tailed hawk (Buteo jamaiacensis). Habitat conditions for red-tailed hawks is considered abundant from a national and ecoregion perspective. The species was selected for evaluation because it represents a variety of habitats and is easily observed.

   Red-tailed hawks can be used as indicators for habitat conditions of prey species as well (e.g., rabbits, rodents and some birds). As with several species of raptors, red-tailed hawks have been subject to mortality from collisions with transmission lines and electrocution. Both of these potential impacts are apparent with this project.

   Red-tailed hawks appear to be fairly common breeders in the study region (Gabrielson and Lincoln 1959, Yocum 1963), but again, nothing is known of their breeding density. The species prefers the tallest trees for nest purposes.

7. Goshawk (Accipiter gentilis). Habitat conditions for goshawks is considered abundant from a national and ecoregion perspective. The species was selected for evaluation because it represents a variety of forest habitats, and is a year-round resident.

   Goshawks can be used as indicators for habitat conditions of prey species as well (e.g., ptarmigan, grouse, rabbits, rodents and some birds). As with several species of raptors, goshawks have been subject to mortality from collisions with transmission lines and electrocution. Both of these potential impacts are apparent with this project.

Goshawks appear to be fairly common breeders in the study region (Gabrielson and Lincoln 1959, Yocum 1963), but again, nothing is known of their breeding density. The species prefers the tallest trees for nest purposes.

8. Sharp-shinned hawk (Accipiter striatus). Habitat conditions for sharp-shinned hawks is considered abundant from a national and ecoregion perspective. The species was selected for evaluation because it represents primarily forest habitat.

   Sharp-shinned hawks can be used as indicators for habitat conditions of prey species as well (primarily small birds). As with several species of raptors, sharp-shinned hawks have been subject to mortality from collisions with transmission lines and electrocution. Both of these potential impacts are apparent with this project.

   Sharp-shinned hawks appear to be fairly common breeders in the study region (Gabrielson and Lincoln 1959, Yocum 1963), but again, nothing is known of their breeding density.

Aquatic Species

1. Chinook Salmon (Oncorhynchus tshawytscha). Chinook salmon are distributed from southern California north to Point Hope, Alaska. Development of hydroelectric potential in the northwestern United States has resulted in the loss of a significant portion of the salmon spawning habitat. On a national basis, interest is very high in minimizing losses to chinook salmon, and, if possible, expanding existing stocks. Maximizing populations of this prized commercial, recreational, and subsistence species is also desired by State and local entities.

   Chinook salmon are present in nearly all major tributaries of the Yukon and Copper Rivers. This species is second in abundance in the Yukon drainage next to chum salmon. Migrations occur from May through August with spawning occurring from July through September. Up to 60 days are required for spawners to migrate from the mouth of the Yukon to spawning grounds upriver. Preferred spawning habitat is the mainstem of larger rivers, altough smaller tributaries are also utilized. Incubation occurs throughout the winter with hatching occurring in later winter or early spring. Emergence occurs later when fry emerge as free swimming, feeding juveniles.

   Juvenile chinook salmon feed in the stream for one or more years. Young-of-the-year generally move to portions of the stream with larger substrate in the fall prior to overwintering.

   Chinook salmon occur in the Tok, Indian Creek, Glenallen, and Gulkana sites.

2. Coho Salmon (Oncorhynchus kisutch). On a national level, hydroelectric development in the northwestern United States has resulted in a significant depletion of coho salmon stocks. Coho salmon is also a highly prized sport fish.

The upper Tanana River drainages provide the bulk of the coho spawning grounds in the Yukon basin which have been documented to date (ADF&G 1983). This species in-migrates during mid-July through November, seeking spring-fed tributaries as preferred spawning grounds. Although spawning may occur in larger rivers, smaller tributaries or side channels are preferred (ADF&G 1977). Spawning occurs between September and January (ADF&G 1977). Mature spawners are generally four or five years of age. Incubation occurs during winter months with hatching and emergence occurring in spring; most fry emerge during April to June.

Young coho disperse and take up residence along the stream banks where they form schools. Juveniles remain in the stream environment predominantly for one year then out-migrate the following summer.

The Copper River is the major stream providing access for coho salmon bound for habitats contained in the four study areas south of the Alaska Range. Coho are the second most numerous species of salmon in the Copper River. Coho salmon occur in the Tok, Indian Creek, Glenallen, and Gulkana sites.

3. Sockeye Salmon (Oncorhynchus nerka). Past depletion of sockeye salmon stocks in the Pacific Northwest, as well as in Alaska, has resulted in major interest in this species. Restoration programs have been ongoing in Alaska for several years. Thus, there is considerable national, state, and local interest in avoiding adverse impacts to sockeye, the most commercially important fo the Pacific salmon. Sockeye salmon is also considered an important species to sport and subsistence fishing interests.

   Sockeye salmon enter fresh water from late May through July. Peak spawning occurs from early July through late October. Sockeye salmon spawn in lakes, streams, sloughs, and springs. In certain springs of the Gulkana River, sockeye spawning occurs later, up to November (ADF&G 1986). Smoltification occurs the following summer as the juveniles out-migrate from the system.

   An ADF&G sockeye salmon streamside incubation system operates in the upper Gulkana River. Thus, artificially enhanced sockeye populations occur in the Gulkana River.

   Sockeye are the most abundant salmon species in the Copper River, and occur in the Paxson East, Indian Creek, Glenallen, and Gulkana sites.

4. Arctic Grayling (Thymallus arcticus). From a national and regional perspective, grayling populations and habitats are considered abundant. Arctic grayling are the most abundant and ubiquitous species of fish in interior Alaska. They are found in nearly all freshwater habitats, lakes, and streams in the region; they are usually more abundant in streams (ADF&G 1978). Grayling prefer clear, cold streams and lakes and different life stages occur in different locations within a drainage. Summer feeding areas often occur in streams that freeze solid in winter; thus, they overwinter elsewhere. Juveniles will prefer stream or lake margins early in life, moving into faster or deeper waters as they grow larger. Grayling occur in all five sites.

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U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

OCT 15 1986

REPLY TO
ATTN OF M/S 443

Lieutenant V. G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Dear Lieutenant Brown:

We are currently reviewing the Alaska Radar System, Over-the-Horizon Backscatter Radar Program Draft Environmental Impact Statement. In order to complete our review we are requesting an extention of two weeks to October 28, 1986. This extention was discussed with Lee Slick in Anchorage.

The contact person for this project is Wayne Elson at (206) 442-1463.

Sincerely,

Daniel Steinborn

Daniel I. Steinborn, Chief
EIS and Energy Review Section

cc: Lee Slick, HQ Alaska AC

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

OCT 28 1986

REPLY TO ATTN OF M/S 443

Lieutenant V. G. Brown
ESD/SCO
Hansom AFB, Massachusetts 01731

Dear Lieutenant Brown:

In accordance with our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act we have reviewed the Draft Environmental Impact Statement (DEIS) for the Alaskan Over-the-Horizon Backscatter (OTH-B) Radar Program proposed by the U.S. Air Force. The Alaskan OTH-B Radar System will require the construction of transmitter and receiver stations covering a total of approximately 2,500 acres of land at two different sites. In addition, an unspecified number of roads, work camps, and borrow pits would be constructed.

127 The DEIS describes the proposed construction and operation of a major new surveillance and tracking radar system for Alaska. Each of the facility siting study areas described in the document contains numerous waterways and large tracts of wetlands. It is anticipated that these waters of the United States will be affected by the project. Based on our review we have rated the DEIS EC-2 (Environmental Concerns - Insufficient Information). The DEIS does not contain sufficient information upon which to make a reasonable decision relative to EPA's responsibilities under Section 404 of the Clean Water Act.

Each of the five study areas considered for facility siting, Glennallen, Gulkana, Indian Creek, Paxton East, and Tok, include special aquatic sites important to waterfowl using the Copper River and Tanana River flyways, and important to local anadromous fisheries. Facility siting could directly eliminate important fish and wildlife habitat, block or interfere with fish and waterfowl migration corridors, and degrade local water quality through construction site erosion and subsequent sedimentation. Unfortunately, the quantification of these anticipated impacts is precluded by the large size of the study areas described in the DEIS (i.e., Paxton East-11 square miles (SM); Indian Creek-20 SM; Tok-80 SM; Gulkana-50 SM; and Glennallen-200 SM) and the lack of detailed facility siting information. Correspondingly, any alternatives assessment of local facility siting and accompanying mitigation is impossible. The DEIS simply presents, in a programmatic fashion, the case of whether or not to site a radar system in Southcentral Alaska.

The general nature of the DEIS is acknowledged in the document. It indicates that an environmental assessment of the selected sites (study areas) will be prepared before project construction. We agree that a detailed environmental analysis is required to ascertain the overall environmental acceptability of the project, complete an alternative site comparison, and determine the level of mitigation needed to protect the ecological integrity

of affected special aquatic sites, including wetlands. At this point in the project review, even the selection of an environmentally preferred "study area" must be withheld given that local facility siting within each of the study areas may or may not be acceptable. Until a detailed document is completed and coordinated with EPA, we cannot provide favorable site specific project comments relative to Section 404 permitting.

We recommend that the U.S Air Force consider the subject DEIS and subsequent Final EIS a programmatic document. A new site specific EIS that supplements the general information included in this programmatic DEIS will be needed once specific project site(s) have been identified within project study area(s). The site specific EIS should include a thorough environmental evaluation of alternative sites. To aid the preparation and review of a site specific EIS, we recommend that the "programmatic" Final EIS (expected in November, 1986) include or address the following topics within the body of the report or as appendices. 128

1. Provide a work schedule for the site specific EIS, including provisions for agency scoping and coordination, and the expected date for the submission of permit application materials. 129

2. The U.S. Fish and Wildlife Service presently is preparing a Technical Assistance Report (TAR) for the radar project. How will the findings and recommendations of the TAR be considered in the NEPA process? 130

3. Prepare an aquatic resource mitigation strategy; perhaps similar to that of EPA Region 10 (enclosed). 131

4. A description of the field studies "in progress" should be made available, along with a synthesis of habitat preference information for targeted species of concern (e.g., trumpeter swan and sandhill crane). 132

5. A discussion of the methodology that will be used to assess the environmental consequences of any proposed discharge of dredged or fill material in wetlands in the site specific EIS. 133

6. A discussion of the methodology for alternative site analysis, particularly the criteria the Air Force proposes to use in assessing whether the proposed discharge sites are acceptable. 134

We have also reviewed the project for possible health hazards associated with the radiofrequency (RF) radiation aspects of the proposed systems. Our review has revealed nothing which would represent an environmental problem relative to RF exposure of the general population outside the proposed exclusion fences. The proposed systems should not represent a hazard to the general public if constructed as described in the DEIS.

Our wetland concerns were related to U.S. Air Force staff in a meeting held in Anchorage on October 10, 1986. Should you have any questions about our review please contact Wayne Elson in Seattle at (206) 442-1463 or Rich Sumner in Anchorage at (907) 271-5083.

Sincerely,

Robert S. Burd
Director, Water Division

Enclosure

cc: Lee Slick, Elmendorf AFB
U.S. Fish and Wildlife Service, Anchorage
U.S. Army Corps of Engineers, Anchorage

U.S. Environmental Protection Agency - Region 10 [Enclosure]

404 Mitigation Policy

Purpose and Need

This document establishes EPA Region 10 policy on mitigating adverse environmental impacts of projects permitted under Section 404 of the Clean Water Act (33 U.S.C. §1251 et seq.). This policy will: (1) help ensure consistent mitigation recommendations, allowing the Corps of Engineers and 404 applicants to anticipate EPA recommendations and plan for mitigation early in the permit process; (2) help avoid project delays and ensure proper consideration of aquatic resources prior to 404 application submittals; (3) provide guidance to Region 10 personnel during project review. This policy incorporates sufficient flexibility to allow variations in mitigation recommendations as required by differences in individual project proposals. This mitigation policy will be modified as necessary to reflect compliance with new laws, national EPA policy or significant new information.

Authority

This policy is established in accordance with the following major authorities:

A. Clean Water Act (33 U.S.C. §1251 et seq.)

1. Section 1251: "The objective of this chapter is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter . . .
   (1) It is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985...."

B. The §404(b)(1) Guidelines (40 CFR Part 230) developed pursuant to §1344(b)(1) of the Clean Water Act.

1. 40 CFR §230.1(c): "Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern."

2. 40 CFR §230.10(a): ". . .no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem . . ."

3. 40 CFR §230.10(b): "No discharge of dredged or fill material shall be permitted if it . . . causes or contributes . . . to violations of any applicable state water quality standard; . . . Violates any applicable toxic effluent standard . . . Jeopardizes the continued existence of species listed as endangered or threatened, or results in likelihood of the destruction or adverse modification of a habitat which is determined . . . to be critical habitat.

4. 40 CFR §230.10(c): ". . . no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States."

5. 40 CFR §230.10(d): ". . . no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem . . ."

C. The National Environmental Policy Act (42 U.S.C. §4321 et seq.) states, in part, "The Congress authorizes and directs that, to the fullest extent possible . . . all agencies of the Federal Government shall . . . Identify and develop methods and procedures...which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations . . ."

D. Environmental Protection Agency Statement of Policy on Protection of Nation's Wetlands (38 FR 10834; March 10, 1973):

> "Policy (b) It shall be the Agency's policy to minimize alterations in the quantity or quality of the natural flow of water that nourishes wetlands and to protect wetlands from adverse dredging or filling practices, solid waste management practices, siltation or the addition of pesticides, salts, or toxic materials arising from nonpoint source wastes and through construction activities, and to prevent violation of applicable water quality standards from such environmental insults."

Scope

This policy applies to all EPA Region 10 reviews of activities permitted by the Corps of Engineers under §404 of the Clean Water Act (33 U.S.C. §1344) and to EPA review of any other projects involving the discharge of dredged or fill material into waters of the United States. This policy, however, will not be used to approve permits for discharges of dredged or fill material which will cause or contribute to significant degradation of the waters of the United States, consistent with the requirements of 40 CFR §230.10(c) or for projects not otherwise in compliance with the §404(b)(1) Guidelines.

Definition

EPA Region 10 hereby adopts the definition of mitigation given in the CEQ regulations at 40 CFR §1508.20:

"Mitigation includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensation for the impact by replacing or providing substitute resources or environments."

Mitigation Policy Statement

EPA Region 10 will actively promote and support mitigation for all projects subject to Section 404 of the Clean Water Act, in accordance with the heirarchical system envisioned in the CEQ regulations (§1508.20), the U.S. Fish and Wildlife Service Mitigation Policy, the §404(b)(1) Guidelines (40 CFR §230.10), EPA national policy and the policy set forth below. Recommendations will be consistent with, but not limited to, the mitigative actions specified in subpart H of the §404(b)(1) Guidelines (40 CFR §§230.70-230.77). All mitigation plans must be implemented prior to or simultaneous with any construction activities.

I. EPA will seek mitigation in the following sequence:

A. EPA will actively promote project alternatives which avoid all adverse environmental impacts associated with the proposed action, consistent with 40 CFR §230.10(a). For proposed discharges of dredged or fill material for nonwater-dependent activities in special aquatic sites, the burden of proof shall be on the applicant to demonstrate that practicable, less environmentally damaging alternatives are not available. For all other proposed discharges, EPA will request information demonstrating the proposed action is the only available practicable alternative. In the absence of this information, EPA will recommend denial or modification of the §404 permit.

B. EPA will actively promote alternatives which reduce or minimize adverse environmental impacts. This may include recommendations to reduce the amount and extent of fill (or dredging), and to modify the timing and methods of construction.

C. For unavoidable adverse environmental impacts in waters of the United States, EPA will actively promote and support compensation by complete, in kind replacement of aquatic site functional values or the provision of substitute resources or environments of equal or greater value. In developing recommendations, EPA will give great weight to the resource categories and mitigaton goals listed in the mitigation policy of the U.S. Fish and Wildlife Service (Federal Register, vol 46, no. 15, pages 7644-63, January 23, 1981).

II. EPA will recommend no net loss of aquatic site functional value for all projects. EPA will actively promote and support in kind aquatic site replacement in close proximity to the project site. Functional values will be calculated using the Habitat Evaluation Procedures of the U.S. Fish and Wildlife Service (1981 or as subsequently amended), the Method of Wetland Functional Assessment of the Federal Highway Administration (March 1983 or as subsequently amended), any subsequent professionally-recognized aquatic site assessment document and/or the best professional judgment of designated representatives from EPA and appropriate state and federal resource agencies.

While EPA will seek a one-for-one aquatic site functional values replacement, this may often translate into a greater than one-for-one acreage ratio because: (1) success rates of creation, enhancement and restoration projects are often less than 100% and (2) there is a transition interval for creation and enhancement projects before they fully provide their intended functions. There may also be circumstances under which a replacement acreage ratio of less than one-for-one is acceptable due to the higher functional values of the replacement aquatic site.

III. EPA will actively promote the inclusion of mitigation as an integral part of projects permitted under §404 of the Clean Water Act, either as part of the project description or as a condition of the §404 permits unless it is clear that the permitting authority (the State or Corps of Engineers) can revoke or suspend the permit for failure to implement the acceptable mitigation. EPA will consider elevation under §404(q) of the Clean Water Act for all projects proposed for permitting by the State or Corps of Engineers, which do not meet the mitigation requirements of the §404(b)(1) Guidelines or this policy.

IV. EPA will require information as delineated in 40 CFR §230.11 in order to evaluate the environmental impacts of and mitigation required for dredge and fill projects. EPA will then evaluate project compliance with the §404(b)(1) Guidelines. If the project does not include appropriate and practicable steps to minimize potential adverse impacts on the aquatic ecosystem, EPA will recommend denial of the §404 permit and shall state the reasons, in writing, to the permitting authority and the applicant. Where feasible, EPA will also recommend steps that may be taken to bring the project into compliance with the §404(b)(1) Guidelines, including appropriate mitigation.

V. EPA will automatically consider prohibiting the specification of the area as a disposal site pursuant to §404(c) of the Clean Water Act and, when appropriate, shall prepare the reports necessary for taking such action for aquatic sites with significant resource values (e.g., U.S. Fish and Wildlife Service Resource Category I; local, tribal, state or federally designated significant aquatic habitats; and EPA identified high priority aquatic sites). The Regional Administrator will recommend action under §404(c) unless it can be demonstrated that the discharge of dredged or fill material will not have unacceptable adverse environmental impacts.

VI. EPA will maintain sufficient flexibility in its approach to allow for innovative solutions to compensate for unavoidable adverse impacts. In some circumstances, it may be desirable from an ecological perspective to mitigate one kind of aquatic site functional loss with a different aquatic site functional gain. The final recommendation will favor that alternative or mitigation plan which provides the greatest benefits to the functional values of the aquatic site.

VII. EPA does not subscribe to any resource value tradeoff calculation that may be provided in the scientific or regulatory literature. The ecological characteristics of each aquatic site are unique and can only be mitigated by resource value judgments tailored to the site. EPA will cooperate with other resource agencies in developing site-specific mitigation plans and will abide by mitigation decisions made by resource agency representatives, provided such decisions are consistent with the §404(b)(1) Guidelines and other statutory or regulatory requirements. EPA may recommend different or additional mitigative actions.

VIII. EPA will use where feasible the following functions and values in assessing project impacts and requiring compensation:

- Groundwater Recharge and Discharge
- Flood Storage and Desynchronization
- Shoreline Anchoring and Dissipation of Erosive Forces
- Sediment Trapping
- Nutrient Retention and Removal
- Food Chain Support
- Habitat for Fisheries
- Habitat for Wildlife
- Active Recreation
- Passive Recreation and Heritage Value

IX. EPA will actively pursue, through its authority under sections 308 and 309, mitigation and appropriate penalties for violations of §301 of the Clean Water Act in the following sequence:

A. Complete site restoration (removal of dredged or fill material with appropriate functional value replacement) and civil or criminal penalties.

B. Creation of a functionally equivalent aquatic site nearby (on-site, in-kind replacement) with civil or criminal penalties.

C. Creation of a functionally equivalent aquatic site or other aquatic site (out-of-kind replacement) at a distant (functionally separated) site with civil or criminal penalties. Recommendations may include aquatic site enhancement in conjunction with or in lieu of aquatic site creation.

D. Contribution to a mitigation banking fund of sufficient magnitude to purchase an aquatic site of comparable quality (i.e., functional value) to that lost to the unauthorized fill, with civil or criminal penalties.

E. Appropriate civil or criminal penalties. The magnitude of the penalty should be based upon the value of the lost resource and the previous knowledge of the applicant. Where feasible, resource values will be based upon the contribution of the aquatic site over its natural lifetime to ecosystem functioning.

X. EPA will actively promote and support monitoring and maintenance for all mitigative actions for aquatic site creation, enhancement or restoration. The period of monitoring will be determined on a case-by-case basis in consultation with appropriate state and federal resource agencies, and will be of sufficient length to adequately assess, and assure project success.

XI. EPA will actively promote and support site restoration for abandoned projects in order to minimize long-term adverse environmental impacts. Recommended actions could include, but are not limited to, fill removal, vegetative plantings, fish restocking, and creation of functionally equivalent wildlife habitat. Site restoration must be a part of the project, a condition of the permit or the subject of an agreement between the applicant and an appropriate state or federal resource agency.

XII. EPA will actively promote and support pre-permit mitigation agreements between applicants and appropriate state and federal resource agencies for projects otherwise in compliance with the §404(b)(1) Guidelines. These agreements must provide for complete replacement of aquatic site functional values. EPA will recommend that such agreements be made a condition of the §404 permit.

XIII. EPA will actively promote and support the preservation of existing aquatic resources separate from any specific project proposals. When reviewing projects for compliance with the §404(b)(1) Guidelines, preservation of aquatic resources will not be considered mitigation for aquatic functional values to be damaged by construction projects. Such a policy would sanction an irretrievable net loss of aquatic resources.

XIV. EPA will actively promote and provide technical support for research on unproven but promising mitigation methods.

XV. EPA will recommend pilot studies for any mitigative action which has not been scientifically demonstrated to be successful and/or about which there is significant resource agency uncertainty. The pilot studies must be completed, the results reviewed, and the mitigation plan accepted as viable by EPA and appropriate state and federal resource agencies before EPA will agree to the proposed discharge.

XVI. EPA will recommend and actively promote the fee title transfer of mitigation sites to the state or federal resource agency with management responsibility for the created or preserved aquatic resource.

XVII. EPA will actively promote and support mitigation banking and will provide technical assistance to federal and state agencies seeking to establish a banking program. EPA will not support the use of a mitigation bank to justify a project which is not otherwise in compliance with the §404(b)(1) Guidelines.

XVIII. EPA will coordinate mitigation activities with the U.S. Fish & Wildlife Service, the National Marine Fisheries Service, the Corps of Engineers, and appropriate tribal, state and local agencies in order to maximize concensus and avoid duplication of effort.

XIX. EPA will work with the Corps of Engineers and appropriate federal, state, tribal and local agencies to identify in advance acceptable dredged material disposal sites and appropriate mitigation pursuant to 40 CFR §230.80.

XX. EPA will actively promote pre-application conferences and field inspections to develop acceptable mitigation proposals, including the exploration of reasonable alternatives which avoid or minimize adverse environmental impacts on the aquatic ecosystem.

Ernesta B. Barnes
Regional Administrator

SEP 4 1985
Date

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administrati
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

November 5, 1986

Lt. V. G. Brown
ESD/SCO
Hanscom AFB, MA 01731

Dear Sir:

This is in reference to your draft environmental impact statement for the Alaskan Radar System, an Over-the-Horizon Backscatter. Enclosed are comments from the National Oceanic & Atmospheric Administration.

We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

David Cottingham

David Cottingham
Ecology and Conservation Division

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 1668
Juneau, Alaska 99802

DATE: October 30, 1986

MEMORANDUM FOR: PP2 - David Cottingham

FROM: F/AKR - Robert W. McVey

SUBJECT: Draft Environmental Impact Statement - Proposed Alaskan Radar System Over-the-Horizon Backscatter Radar Program, August 1986 DEIS 86-10.09

The Draft Environmental Impact Statement (DEIS) for the Over-the Horizon Backscatter Radar System (OTH-B) has been reviewed by the National Marine Fisheries Service, Alaska Region.

Our concerns for this proposal relate to the streams and adjacent wetlands that may support anadromous fish species.

We do not believe the DEIS is specific enough to allow for a properly detailed response concerning possible environmental impacts and potential alternatives. Accordingly, we recommend the following items be included in any DEIS revisions and the FEIS:

1. Site specific information evaluating relative seasonal abundance and life stage/habitat-use including descriptions of reproductive, rearing, and overwintering habitat for fish species in the affected areas

2. Provisions for bridging creeks rather than use of culverts, and

3. Description of borrow sites and planned spoil disposal sites, with a perspective toward avoiding the filling of wetlands.

135

COMMUNICATIONS
RADIO BROADMOOR SUPPLY

Drawer 73650 • Fairbanks, Alaska 99707
Telephone (907) 452-2491 / 456-

December 1,1986

ATTN: Lt. V.G. Brown
Dept. of the Air Force, OTH-B
HQ's Electronic Systems Division (AFSC)
Hanscom AFB , Mass. 01731-5000

RECEIVED
9 Dec 86

Subject: Comments Environmental Impact Analysis
Alaskan OTH Radar System

As way of background, Communications Supply LTD. dba Radio Broadmoor operates a HF Radio Common Carrier (RCC) system in Alaska. The HF RCC is located in the City of Fairbanks, Alaska and provides emergency and regular communications to the general public throughout the entire State of Alaska. It has done so for several years on a daily basis.

In the analysis of the systems used by our service the main form of our communications is by way of HF sky wave and to a lesser extent ground wave communications; indeed precisely what the OTH-B system i configured to utilize in its operations. The frequencies utilized by our existing RCC, licensed by the Federal Communications Commission include the following as continuously operational for transmit and receive; 3167.5 KHz , 3354.0 KHz , 4791.5 KHz , 5207.5 KHz , and oth frequencies as requested from time to time per attached FCC Adopted Docket 83-464, dated July 30,1984.

136 Within your environmental impact statement none of the frequencies in this FCC Docket 83-464 are referred to either individually or by service user identification; in Table A-1 as Distress, Calling and Guarded frequencies,(page A-3 of Enviornmental Impact Analysis Process Draft of August 1986), nor is any reference made to these frequencies in the service of Alaska Public Fixed or Alaska Private Fixed allocations.

In as much as these frequencies are available for use from fifty mil off the Alaskan coast to throughout the State of Alaska at various permanent and temporary fixed sites, a requested guard band of +/- fifty kilohertz of each of these frequencies used by the Radio Commo Carrier is requested to be included within the operational paramenters of the OTH B Alaskan System and the Oregon/California system which will be overlapping part of our service area of Alaska with first and second hop propogation.

TACTEL

In January 1986 at the Fairbanks OTH-B Scoping meeting, I spoke with Sidney J. Everett, Manager of the SRI International Enviornmental Technology Program and indicated to him our frequencies of operation and use thereof. In the subsequent Environmental Impact Analysis Draft of August 1986 no mention was made of our frequencies or those of the services Alaska Public Fixed and Alaska Private Fixed, nor the Amateur Radio Service frequency bands adopted by ITU Treaty. The frequency bands 10.100 - 10.150 MHz, 18.068 - 18.168 MHz, and 24.890 - 24.990 MHz are within the frequency band of interest to OTH B and allocated to the Amateur Radio Service but specifically not mentioned in the Impact Statement.In addition the frequencies of 7.000 - 7.300 MHz, 14.000 - 14.350 MHz, 21.000 - 21.450 MHz and 28.000 - 29.700 MHz are also within the window of OTH-B operating frequency limits. These last frequency groups are even more active bands of the Amateur Radio Service than those just previously mentioned. It is suggested that an additional 50 KHz guard band be established above and below the indicated Amateur Radio Service bands to lessen the impact of potential interference to those users.

The particular importance to Radio Broadmoor and its customers in the Alaska Public Fixed and Alaska Private Fixed spectrum is the fact that we and our customers maintain monitoring positions at all times throghout the day and/or night, being alert for incoming traffic of either a regular or emergency nature. My understanding of the proposed utilization of the OTH-B system is that it will transmit on those frequencies which it determines have no traffic on them, which could obviously include those frequencies which we and our customers usually will be monitoring. This could have a deleterious effect on the level of service which can be provided and significant negative financial impact on operating revenues generated by our service.

The HF radio equipment in the field in Alaska typically has broadband receivers, thereby allowing all signals within a range of several tens of kilohertz to pass freely to the early stages of receiver selection. The sensivity of the equipment is on the order of less than a half microvolt and the antennas are usually a standard dipole. What I am describing is the fact that it is critical that the frequencies with whatever guard bands that can be established be initiated and included in your operating parameters.

I appreciate your consideration in this matter and look foreward to your reply to these comments at your earliest convenience.

Note: The enclosure is the same as provided by John Morrone. See p. 4-76.

Sincerely,

4-137

Donald R. Etheredge
General Manager

Enclosure docket 83-464

cc Fred Brown, Attorney
Counsel for C/S

September 29, 1986

HQ Electronic Systems Division/SCO
OTH-B Systems Program Office
Hanscom AFB, MA 01731-5000

Attention: Lt V.G. Brown

Dear Sir:

This is a letter directed to the members of the panel holding hearings regarding the location of the OTH-B radar system for Alaska. This letter has been prepared by a group of landowners, business owners and users of the land at and around Summit Lake, Alaska. Summit Lake private properties are located less than three miles from the possible transmitter site known to you as Paxson East. It is apparent after reading the first environmental impact draft that we have been remiss or negligent in giving your panel very much information regarding the Summit Lake area. The great majority of people we have talked with had never heard of any radar site for our area and were tremendously surprised to learn that a mile long antenna on a six hundred acre site might soon be situated in the heart of our recreational area and in our backyard, so to speak. Had a few of us known of this project a couple of weeks before the hearing in Fairbanks we would have had a minimum of two hundred people attend to show our feelings against using the Paxson East site.

There are approximately sixty-five private lots in the Summit Lake area all located close together between the Alyeska pipeline and Summit Lake near the Summit Lake Lodge. The lodge owners have sold eight condominiums and have room to build twenty-four more as the demand arises. People are building recreation and retirement homes on these lots and none that we know of would like a six hundred acre radar site with seventy permanent employees in our backyard.

The state of Alaska just let forty-four lots come available and all but about ten have been purchased and three have been built on already. Fielding Lake is located another three or four miles to the northeast and there is another ten or fifteen private cabins and recreational landowners located there. All of those landowners we have talked to from Fielding feel the same way we from Summit do.

We only wish we could show you an aerial photo of the area in question and within a five mile radius on a nice March or April weekend. If that was possible, you might see three hundred snowmobiles and a few skiers out enjoying the country.

Paxson East would be expensive to build with no power in the area and would be expensive to keep open in the winter with its deep snows and high winds. It is those deep snows and high winds that drift the countryside that make the area such a great place to snowmobile from October to late May.

We understand both Tok and Glennallen are receptive to this very necessary program and we certainly hope you give these small communities your main consideration.

Sincerely,

Art & Lyanne Carroll
999 Copper
Fairbanks Alaska

cc
Sidney J Everett

Note: Copies of this letter were also submitted by the following people:

Richard E. OBeid, Jr.
W. Ronald Keyes
Michael J. Helmbrecht
Constance Bradbury
Francine Bush
Rance & Debra Berggren
Patrick M. Straetz
Michael L. Borman
John MacCheyne
Richard & Sue Gregory
Kirk & Donna Hebard
Mike Anderson
Jeff Gregory
John Sauer
L. K. Virgin
Marianne L. Haynes
Cathy J. Hodges
Loa D. Carroll
James W. Linzner
Richard Hodges
Henry & Wyan Grant

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5 RESPONSES TO COMMENTS

Public comments on the Draft EIS are contained in the transcript of the public hearings (Sections 3.1 through 3.4), on the comment sheets submitted at the hearings or later by mail (extracted and printed in Section 4.1), and in the letters (Section 4.2). Responses to those comments follow. The location of the comment in this document is referenced at the beginning of each response.

1. (See pp. 3-16 and 3-84). The proposed action documented in the Draft and Final EISs is the construction and operation of the ARS, which consists of the operations center, transmit site, receive site, and associated facilities for operation and support. Included within the total funding programmed by the Air Force for the ARS are funds for the construction of a government power plant to supply 10 MW of electrical power for the transmit site. Accordingly, the Draft EIS includes a description of the environmental consequences of an ARS that includes the 10-MW power plant. Consistent with the intent of Congress, the Air Force will also evaluate the alternative of third-party financing to provide the power required at the transmit site. For this alternative, the Air Force will specify the power requirements at the transmit site. Respondents to the Air Force's Request for Proposal (RFP) to supply this power will determine how those requirements will be met, through expansion or improvement of existing power facilities or through construction of a new power generation facility, and will propose the price to be paid by the Air Force for the required power. The decision to proceed with the programmed government power plant or to contract for power as proposed in the third-party financed proposal will be based on a total life-cycle cost comparison of the two alternatives. This decision is expected in late 1987 consistent with submission of the proposed FY 89 Defense Budget Request to Congress. The Air Force plans to release the RFP for third-party financed power after it selects the transmit site area in March 1987.

2. (See p. 3-44.) See Response No. 1.

3. (See p. 3-45.) The International Telecommunications Union does not set health standards for exposure to RFR. The International Radiation Protection Association (IRPA) has issued guidelines that, although they do not have official standing, are often viewed as an international standard. The Draft EIS (on pp. 4-60 and 4-61) presents and discusses the IRPA exposure guidelines. For the general population, the IRPA exposure limit varies from 0.4 to 0.2 mW/cm^2 over the OTH-B frequency range of 5 to 28 MHz. This compares with the current ANSI standard of 1 mW/cm^2 and the EPA's proposal of 0.1 mW/cm^2, which is the most stringent of the three (see Response No. 36).

The value of 0.01 microwatt per square meter converts to 0.000000001 mW/cm^2, which is far below any known standard, including the former Soviet exposure limit for the general population of 0.005 mW/cm^2. This suggests an error in identifying the stated value as a world standard or in the specification of the value.

4. (See p. 3-51.) The land requirements for an OTH-B site would affect current recreational use in the Paxson East area if that area were selected for the transmit site. The extent and magnitude of the effects are difficult to assess, however, because reliable data on current use are not available and because projections of future use are speculative. The nature and extent of potential impacts on recreational activity will depend on the site layout (including the location of the security fences) and the degree to which site employees become recreationally active.

Although recreational activity on the selected site would be restricted, both permanent residents and visitors would continue to have access to adjacent areas such as Summit Lake. For example, a restricted aviation zone around the transmit site would be defined to maintain approximately a 1-mile separation in front of and one-half mile to the sides and rear of the transmit antennas. Beyond these distances, the ARS would not affect light aircraft operations.

Also see Response No. 70.

5. (See p. 3-55.) The estimated total cost for the ARS is $450 million. If the decision is made to proceed with the project, funds for construction will be requested in the annual Defense Budget Requests to Congress, who would have the responsibility for authorizing the program and appropriating the required funds.

6. (See p. 3-65.) The Draft EIS considered the Tok study area as a possible transmit site location because there did not appear to be any place within the Tok study area where the two receive antenna sectors could be located adjacent to one another (the receive antenna is 8,000 ft long; the transmit antenna is 4,000 ft long). As a result of the questions and discussions during the public hearings, the Air Force further investigated potential receive sector locations that would support consideration of Tok as a receive site. See Section 2 of the Final EIS.

7. (See p. 3-80.) The Cobra Dane and OTH-B radars serve two distinct missions. The role of the Cobra Dane radar, which is a UHF rather than an HF over-the-horizon radar, is to detect and monitor intercontinental ballistic missiles in the upper atmosphere. In contrast, the OTH-B is used to detect, track, and provide early warning of aircraft and cruise missiles.

8. (See p. 3-87.) See Response No. 6.

9. (See p. 3-91.) See Response No. 6.

10. (See p. 3-114.) See Response No. 1.

11. (See p. 3-117.) The operations and maintenance concept for the ARS requires contractor personnel to provide operations and maintenance support throughout the life of the system. The Air Force estimates that approximately 30 contractor-hired support personnel would be required at the transmit site and a similar number at the receive site. The system contractor, who will build, install, and check-out the ARS, will also have the responsibility for providing these personnel, including any training required. In specifying the initial contract requirements for the ARS, the Air Force will include requirements for the contractor to establish a training program to provide local area personnel with opportunities for these operations and maintenance positions. Certain minimum qualifications, however, e.g., some technical background or maintenance experience, would still be required to qualify for this training.

12. (See p. 3-129.) See Response No. 1.

13. (See p. 4-1.) The Air Force will cooperate with the FAA and any other concerned agency to help in search and rescue operations or unusual civilian air traffic control situations. The ARS is designed as a surveillance and tracking radar to provide early warning to military users. Because of its wide coverage area, the system may also be useful in certain search and rescue activities and for unusual civilian air traffic control situations.

14. (See p. 4-2.) After the public hearing was held in Anchorage, Mr. Morrone provided additional specific commentary and information (his letter is reproduced on pp. 4-56 through 4-74). This information will be considered in the site-selection process and in planning to avoid or minimize potential interference.

15. (See p. 4-2.) The Air Force recognizes the greater potential for interference with telecommunications systems in Alaska and will cooperate with state and federal agencies in identifying and correcting potential interference problems caused by operation of the ARS. An EMI survey to determine potential interference effects will be conducted prior to system operation. To the extent that the operating characteristics of the ARS cannot be tailored to eliminate specific interference complaints, the Air Force will identify and implement other corrective actions.

16. (See p. 4-3.) The Air Force appreciates this information. Design of the exclusion fence will take into account the specific challenges of the Alaskan setting and will take advantage of prior experience.

17. (See p. 4-3.) Aircraft warning lights on the antenna structure may be appropriate depending on the specific site location and its proximity to other facilities such as airports and landing fields. This issue will be addressed by the FAA. The type of warning lights considered, however, should also take into account the problem of potential bird collisions with the antennas.

18. (See p. 4-4.) Meteorological conditions have no effect on the operation of an OTH-B radar, so its effectiveness is not diminished by bad weather. (However, an OTH-B radar is affected by changes in the conditions in the ionosphere, a region of the atmosphere well above the zone of weather.)

19. (See p. 4-4.) The alternative of using satellite surveillance systems was discussed in Section 2.2.2.2 of the Draft EIS.

20. (See p. 4-5.) See Response No. 4.

21. (See p. 4-5.) The potential air quality effects of generating electrical power were addressed on pp. 4-16 through 4-21 of the Draft EIS. No significant effects are expected from operation of the power plant.

Because the power plant is likely to consist of diesel-powered generators, no water should be required (except perhaps for minor amounts for maintenance work). Fuel storage and handling create the potential for polluting surface or subsurface water. However, the Air Force would store the fuel in above-ground tanks surrounded by lined dikes and would prepare plans to control spills (see p. 2-8 of the Draft EIS).

The possible effects of construction and power plant noise and other general human disturbance on wildlife were addressed on pp. 4-11 and 4-12 of the Draft EIS.

22. (See p. 4-6.) The ARS will differ from the Soviet "Woodpecker" in several important respects. First, it will be an FM-CW system, not a pulse-type radar. The ARS signal, as noted in the Draft EIS, will be confined within a narrow band about the specific frequency on which it operates and will be operated with attention to possible interference with other users of the high-frequency (HF) spectrum. The Woodpecker has a broad, extremely noisy signal and appears to operate without concern for interference to users worldwide. The Air Force, on the other hand, will listen before and while transmitting on any frequency in an effort to avoid interfering with other users. As a result of the differences in the systems and the Air Force's interference policy, the ARS, unlike the Woodpecker, will not create noise or other interference.

23. (See p. 4-7.) The site selection process and criteria that led to the study areas under consideration were described in Section 2.1.2.1 of the Draft EIS. Federal lands whose use would be compatible with existing activities were specifically considered. After the transmit and receive study areas are selected, potential sites within these areas for the transmit and receive antennas will be identified and evaluated. Both nonenvironmental and environmental factors, including possible effects on wildlife, will be considered in the identification of sites and in the site-specific environmental assessment that will follow. See also Responses No. 1, 31 and 67.

24. (See p. 4-9.) See Responses No. 1 and 67.

25. (See p. 4-9.) See Response No. 23.

26. (See p. 4-9.) Recreation is discussed in Sections 3.8.4 and 4.8.4 of the DEIS. See also Response No. 70.

27. (See p. 4-9.) Ice fog is discussed on pp. 4-20 and 4-21 of the Draft EIS, where its role in safety is mentioned. The Draft EIS also notes the following measures that could be used to reduce the formation of ice fog or minimize its effects: (1) locating the power plant at a higher elevation than the antennas, site buildings, and access roads, and (2) separating the power plant from the site area by a natural barrier. Other possible measures include covering water storage lagoons to reduce evaporation and cooling combustion exhaust gases before releasing them to the atmosphere. The need for such measures and the most appropriate measures for the selected sites will be determined during detailed site design.

28. (See p. 4-10.) The Air Force has contacted the Coast Guard at the Tok Transmitting Station and at the Juneau office. Potential interference effects will be investigated in coordination with the Coast Guard for the specific sites selected.

29. (See p. 4-10.) The staff at the transmit and receive sites will be almost completely civilian, with only 2 to 3 military personnel at each location. About half of the staff will be maintenance and operations personnel hired by the prime contractor that is responsible for operating the system. The remainder of the staff will be security personnel. If the same approach that is used at the East Coast Radar System is used for the ARS, the security positions will be federal wage-grade civil-service jobs. Local residents will clearly have an opportunity to fill the civil service positions, which will number about 30. Depending on their qualifications and the prime contractor's requirements and hiring and training plan, local residents may qualify for the maintenance and operations positions. Also see Response No. 11.

30. (See p. 4-10). See Response No. 7.

31. (See p. 4-12.) The Draft EIS focused on areas in which the ARS transmit and receive sites might be located. Based on the results of the impact analysis and on public and agency comments, the Air Force has identified the study areas it prefers for these sites (see Section 2 of this document). Following publication of the Final EIS and completion of the Record of Decision, the Air Force will plan and carry out additional environmental, engineering, and cost studies with the objective of identifying specific locations for the sites (see Section 1 of this document). Also see Response No. 23.

32. (See p. 4-15.) See Response No. 23.

33. (See p. 4-15.) See Response No. 42.

34. (See p. 4-20.) The cited report, "Bioeffects of Radiofrequency Radiation: A Review Pertinent to Air Force Operations" (USAFSAM-TR-83-1), was also cited in the Draft EIS. This sizable document expands on the summary of RFR bioeffects provided in the Draft EIS and includes specific references to the literature reviewed. Rather than attach a copy of this report to every Draft EIS, the Air Force chose to cite it, assuming that those individuals with special interest in this topic would request a copy.

35. (See p. 4-20.) A discussion of the EPA alternatives for controlling public exposure to RFR has been added to the text of the Draft EIS at p. 4-60. (See the Errata.)

36. (See p. 4-20.) A discussion of shock and burns has been added to the RFR bioeffects text at p. 4-72 of the Draft EIS following Section 4.14.2.4. (See the Errata.)

37. (See p. 4-21.) See Response No. 35.

38. (See p. 4-21.) The necessary text changes have been made on p. S-5 of the Draft EIS to state the bioeffects threshold in terms of SAR. (See the Errata.)

39. (See p. 4-21.) Changes to the text following the last paragraph on p. 4-42 of the Draft EIS have been made. (See the Errata.)

40. (See p. 4-21.) To state the power density more precisely, the text on p. 4-68 of the Draft EIS has been changed. (See the Errata.)

41. (See p. 4-22.) The siting and construction of the OTH-B facilities will be carried out to minimize environmental impacts to the extent possible. Also see Response No. 124.

42. (See p. 4-22.) The 1986 Federal Acquisition Regulation has a provision requiring the hiring of local residents on any federal construction contract. The 1986 Military Construction bill contains a local-hire provision specifically for Alaska. Implementation of this provision is based on the unemployment figures for each year. We cannot predict if similar provisions will be a matter of law when construction of the ARS begins. However, the Air Force will abide by any such provisions that may be in effect at the time of construction. Also see Response No. 11.

43. (See p. 4-23.) During the initial phase of the Environmental Impact Analysis Process for the ARS, the Air Force considered potential locations other than those addressed in the Draft EIS. One of these was known as the Slide Mountain study area and was partially in the Nelchina Public Use Area. However, after the public scoping meetings, Slide Mountain was eliminated from further consideration. No other current or previously considered study area is wholly or partly within the Nelchina Public Use Area. (Senator Kerttula's letter was answered directly on October 17, 1986.)

44. (See p. 4-27.) As far as is known, all bone-growth stimulators approved by the U.S. Federal Drug Administration (FDA) operate in the Extremely Low Frequency (ELF) and sub-ELF ranges (approximately 300 Hz or less). All claim to require a specific waveshape (i.e., amplitude variation with time) to be effective. The OTH-B system operates in the HF range (specifically, 5 to 28 MHz) and is frequency modulated, not amplitude modulated. It cannot, therefore, provide waveshapes comparable with those from bone-growth-stimulation devices. Furthermore, it is extremely unlikely that the very low-level fields from the OTH-B system outside the exclusion fence would influence clinical applications of bone-growth stimulators.

45. (See p. 4-27.) The reception and detection of RF signals by dental fillings and orthopedic implants appear to be extremely rare, despite the ubiquity of dental fillings in the general population. The mechanism of detection that has been suggested is rectification at the junction of two dissimilar metals or at a metal-electrolyte junction. If true, this would permit detection of the envelope of an amplitude-modulated signal. It would not demodulate a frequency-modulated signal such as that from the OTH-B system. The likelihood that the fields from the OTH-B system outside the exclusion fence would have any detectable effect on dental fillings or orthopedic implants is, therefore, very low.

46. (See p. 4-27.) Theories of animal migration that indicate that animals make use of the earth's weak magnetic field are specifically concerned with the earth's geomagnetic field; that field is a DC or steady-state one. The electromagnetic field created by the OTH-B system is an AC one, between 5 and 28 MHz, and has no DC or steady-state component. No evidence exists that radar systems of any kind have adversely influenced the migration of any animals. Indeed, radar systems have been used by wildlife experts to track the migration of birds.

47. (See p. 4-27.) The energy delivered by the sun amounts to about 64 mW/cm^2. In contrast, the power density in the air at the outer edge of the groundscreen averages approximately 4 mW/cm^2. The power entering the ground is a fraction of the latter amount. Thus, the sun is a much more significant source of heat, and the OTH-B radar is unlikely to cause any noticeable thermal effect.

48. (See p. 4-28.) See Response No. 22.

49. (See p. 4-29.) The Air Force appreciates your continued interest and apologizes for failing to respond to your earlier correspondence. We will contact your organization for information after we have selected transmit and receive study areas and begun our detailed site planning.

50. (See p. 4-32.) The Air Force is aware that, compared to other communities, the Paxson area has relatively few facilities. This was noted in the Draft EIS, for example, in Section 4.9.1. This fact will be evaluated in the Air Force's decision-making process along with other support, operational, and environmental considerations (see Section 2 of this document).

51. (See p. 4-32.) Local hire is a matter of concern to many in Alaska. It is typically understood to refer to Alaskan vs. non-Alaskan residents. Clearly, with a very small population in the immediate area, the ARS could not be staffed solely by Paxson-area residents, but local residents seeking this type of employment would have the opportunity to do so. (See also Responses No. 11, 29, and 42.)

52. (See p. 4-32.) The Alaska Department of Fish and Game has not made such a proposal in any correspondence with the Air Force.

53. (See p. 4-32.) On p. 2-3, the Draft EIS states, "The ARS site would be connected by an access road from the nearest state highway." The access road would connect to the nearest existing state highway; a state highway system would not be required.

54. (See p. 4-32.) With construction and operation of the ARS, highway traffic would increase, but road kills are not expected to increase significantly. However, the Air Force will investigate this potential impact in greater detail after it has selected the transmit and receive study areas. Then, ARS-related traffic will be projected on specific highways, and road kill experience in Alaska will be applied.

55. (See p. 4-32.) Terrain is an important consideration in selecting a transmit or receive site because the ARS cannot operate with significant obstruction of the horizon and because earthmoving to level a site is expensive. Therefore, the operational and cost implications of area terrain will be considered in the site selection process; unacceptable sites will not be selected.

56. (See p. 4-32.) The Draft EIS notes that "iron and manganese exceed drinking water standards" and that this is common in the region. These two constituents are objectionable in drinking water because they impart a disagreeable taste and can stain plumbing fixtures. The standards referred to are secondary standards intended to protect human welfare and not the primary standards intended to protect human health. Thus, iron and managanese in the Paxson Lodge drinking water pose no threat to human health.

57. (See p. 4-32.) This is recognized by the Air Force. Design of the ARS facilities will account for permafrost, and estimates of the cost of building in different areas with different permafrost conditions will reflect this. Thus, these differences will be considered in the site selection process.

58. (See p. 4-32.) The influx of ARS employees may or may not have a significant effect on recreational or subsistence resources. Site locations and hiring practices, yet to be determined, will influence the number of workers required, where they live, and the fraction hired from the area. The current status of fish and game populations and human use at specific sites are the other major factors in assessing potential problems of overuse. The Air Force, with the cooperation and assistance of state and federal resource agencies, intends to assess recreation and subsistence implications in its site-specific environmental assessment (see Section 1.3 of this document and also Response No. 124).

59. (See p. 4-32.) Table 4-1 on p. 4-16 of the Draft EIS shows emission rates. The text in Section 4.6.1 summarizes the analysis that yielded Table 4-2, which shows estimates of the maximum concentration of pollutants emitted by the power plant. Comparing that table with Table 3-6 (p. 3-89) shows that the NOx standard would not be violated. Similarly, no adverse effects on wildlife from NOx or other power plant emissions are expected.

60. (See pp. 4-33 and 4-34.) The Air Force appreciates the summary information provided in your letter. It will be useful during both site selection and land acquisition.

61. (See p. 4-34.) The importance of sockeye salmon in the Fish Creek and Paxson East areas was described in Section 3.4.1.1.2 of the Draft EIS, and the potential effects on this resource were assessed in Section 4.4.2.

62. (See pp. 4-35, 4-37, and 4-38.) Corrections have been made. (See the Errata.)

63. (See p. 4-35.) The information about environmentally sensitive locations within the study areas will be useful during the selection of the transmit and receive sites. After the transmit and receive study areas are selected, additional environmental studies focusing on these areas will be carried out. Sensitive areas will be noted, and the potential impacts associated with constructing the OTH-B facilities at alternative specific locations will be evaluated.

64. (See p. 4-38.) The Air Force appreciates the references to more accurate vegetation maps. This information will be consulted after the transmit and receive study areas are selected and the site-specific environmental assessment is begun.

65. (See p. 4-38.) The DGGS report was used during the preparation of the Draft EIS; it is cited as Spartz (1985) in the references. Spartz indicates that known prehistoric site distributions in the Copper River Basin reflect Ahtna land use patterns, as discussed in Section 3.12.1.

66. (See p. 4-38.) Appendix D of the Draft EIS lists only those regulatory authorities that pertain to impacts on the natural environment. Land sale, lease, and exchange regulations were not included because they deal only indirectly with environmental effects.

67. (See p. 4-39 and 4-40.) The combination of extreme climatic conditions in Alaska and the Air Force's requirement for highly reliable power at the ARS transmit site makes it necessary for the Air Force to assume that a power plant will be built on the site. To meet Congressional intent, the Air Force must consider "third-party" bids to supply this power. (The draft Request for Proposal was issued on November 15, 1986, for industry comment.)

The Draft EIS addresses the nominal case of a diesel-powered power plant at the transmit site, which is the expected form of generation if an Air Force plant is constructed, and is one of the more likely forms of generation if a "third party" is chosen to supply the power. All "third-party" proposals submitted for the Air Force's consideration will be evaluated for their environmental consequences as part of the site-specific environmental assessment, which will be undertaken after the transmit and receive study areas are selected. At that time, the environmental aspects of the specific designs, including any variations from the assumed case, will be assessed. Also see Response No. 1.

68. (See p. 4-39.) The Air Force acknowledges that, under certain circumstances, the large load increase represented by the transmit site power requirement could have a beneficial effect on the electric rate schedule of the supplier. However, the feasibility of various concepts that would deliver such a benefit is undemonstrated, making the exercise of estimating any such effect (which could be negative under other conditions) highly speculative. If any "third-party" proposal to supply the power required by the Air Force demonstrates a rate benefit, that impact will be considered in the review of the power plant proposals.

69. (See p. 4-39.) The Air Force appreciates the information supplied earlier by CVEA. As suggested by Response No. 63, this information was used only as general background for the preparation of the Draft EIS. The Air Force expects that all pertinent information will be part of any bid by CVEA to supply power to the ARS and will very carefully review it.

70. (See p. 4-41 and 4-42.) The impacts on both recreational and subsistence use will be investigated in greater depth after the transmit and receive study areas are selected (see Section 1.3 of this document). See also Responses No. 58 and 124.

71. (See p. 4-43.) The potential degradation of air quality resulting from operation of the transmit site power plant was addressed in Section 4.6 of the Draft EIS. The frequent inversions were considered. Additional reviews of possible power plant impacts will be carried out (see Response No. 67).

72. (See p. 4-44.) Potential effects on flying and airspace use were discussed in Section 4.13.2.2.1.3 (beginning at the bottom of p. 4-47) and summarized on pp. S-6 and S-7 of the Draft EIS. Details appear in Appendix C of that document.

73. (See p. 4-48.) The Air Force greatly appreciates the extensive information about agency involvement. We are compiling a complete list of permit and approval requirements. After completion of the Final EIS, we will carry out additional site-specific environmental studies, and, while planning this work, will review permit and approval information requirements and seek other assistance from the Department of Environmental Conservation and other state and federal resource agencies.

74. (See p. 4-52.) See Responses No. 11, 29, and 42.

75. (See p. 4-53.) The site-specific environmental assessment will build on the area-specific EIS. To reduce the chance that the environmental assessment may not adequately evaluate alternatives and potential mitigation measures and that agency input may be short-changed, the Air Force will plan the assessment work with the help of state and federal resource agencies and will solicit their participation in advisory groups. See Section 1.3 of this document for specific studies under consideration.

76. (See p. 4-53, 4-54, and 4-55.) Corrections have been made. (See the Errata.)

77. (See p. 4-55.) General information on potential borrow sources was provided in Section 3.2.5 of the Draft EIS. Potential environmental effects associated with the development of borrow sources and the disposal of spoil were described in Section 4.2.1. These matters will be investigated further after transmit and receive study areas are selected. The site-specific environmental assessment will address borrow sources and disposal sites as well as the sites for the transmit and receive antennas and supporting facilities, including access roads.

78. (See p. 4-60.) Based on its experience with the East Coast Radar System, the Air Force does not anticipate serious problems of interference arising from operation of the Alaskan Radar System. However, the Air Force will contact and work with the State of Alaska during detailed investigation of the ARS sites. This should ensure that the Alaska Fixed Service and other telecommunications services unique to Alaska are taken into account. Also see Response No. 15.

79. (See p. 4-61.) The Draft EIS does not point out the more extensive use of HF bands in Alaska compared to the rest of the United States. The Air Force appreciates receiving the inventory provided in these comments. Also see Response No. 15.

80. (See p. 4-62.) The Alaska Fixed Service has been added to the list in this paragraph. (See the Errata.)

81. (See pp. 4-62 and 4-63.) The comment refers to a statement on p. C-17 of the Draft EIS which says that the Experimental Radar System (ERS) was "usually" operated during sunrise or sunset. This statement may unintentionally suggest that the radar was only operated at those times. In fact, the ERS was operated in 8- to 10-hour shifts beginning at various times around the clock without reference to the diurnal transition. Thus, when it was operating, the ERS was clearly often, if not usually, operating during the transition time. More recently, the first sector of the East Coast Radar System has been operating more extensively during various testing phases.

82. (See p. 4-62.) See Response No. 78. Given the frequencies provided in these comments, the ARS can be programmed to prevent use of these frequencies, thereby reducing the likelihood that remedial action will be required.

83. (See p. 4-62.) The newer term also appears in the Glossary on p. G-7 of the Draft EIS. A footnote calling attention to this change in terminology appears on p. B-10.

84. (See p. 4-62.) The suggested definition is an acceptable variant of that appearing in the Glossary.

85. (See p. 4-62.) The sentence in question was meant to apply to both the physical and operational aspects of the two systems, including their electromagnetic effects, both local ground-wave effects and distant sky-wave effects. Descriptions of the two systems provided in the Draft EIS show that they appear similar, operate similarly, and radiate similar signals (judged by strength, modulation, and range). A microwave radar, for example, is not similar to an OTH-B radar (see p. 2-1 of the Draft EIS).

86. (See p. 4-62.) See Responses No. 78 and 79. After the Air Force selects the transmit and receive study areas, potential interference problems will be investigated further, particularly to check potential problems with Alaska telecommunications services.

87. (See p. 4-62.) The paragraph in question identifies the managers of the radio spectrum and refers to the Air Force's application to IRAC. An engineering review of existing facilities is also being carried out as well.

88. (See p. 4-62.) The Draft EIS discussion has been modified to describe High-Frequency services in Alaska. (See the Errata.)

89. (See p. 4-62.) The ARS will monitor each channel it occupies all the time that it is operating on that channel.

90. (See p. 4-62.) The interference avoidance plan was being developed at the same time that the Draft EIS was being prepared. The observed inconsistency occurred because the plan was completed between the time that Section 4 was written and the time that the Summary was written. The inconsistency was not discovered during Draft EIS production. For information on this plan, contact the OTH-B Program Office.

91. (See p. 4-63.) The radar signal strength will be above the noise floor only on the frequencies in use. However, the ARS will be pregrammed to avoid established channels and to avoid interference on other frequencies by avoiding already occupied frequencies and by continuously monitoring frequencies it is using.

92. (See p. 4-63.) Spurious, harmonic, and out-of-band emissions will be highly controlled. Nevertheless, the ARS could interfere with other telecommunications systems if the radio energy is high relative to the ability of the equipment to detect the signal of interest. This potential problem will be mitigated by frequency selection, including avoiding frequencies that could create such problems, and other measures described in the interference avoidance plan. Also see Responses No. 78 and 86.

93. (See p. 4-63.) With the addition of the frequency-use information provided, the Fixed bands will be more occupied than previously thought. Nevertheless, the Fixed bands will still be preferred over the Broadcast bands.

94. (See p. 4-63.) See Responses No. 81 and 89.

95. (See p. 4-63.) This section has been revised to include explicit mention of the Alaska Fixed Service. (See the Errata.)

96. (See p. 4-63.) The Air Force will consider effects on TV reception during the siting process. Measurements in Maine near the ERS and more recently, the East Coast Radar System indicate no problems. Therefore, no interference is expected except for receivers near the ARS transmit site but far from the TV broadcast transmitter. If interference is experienced, the radar could avoid the offending frequencies.

97. (See p. 4-63.) The Air Force appreciates receiving the information about telecommunications facilities. The channels that fall into the frequency range used by the ARS can be deleted from the list of acceptable frequencies. Also see Response No. 15.

98. (See p. 4-64.) Table A-1 is a representative list. Because of unique circumstances, the Air Force will develop a list of excluded frequencies for use in Alaska. Also see Response No. 15.

99. (See p. 4-64.) Sounders are a common device and, by the nature of their operation, will cause interference for a few milliseconds as they pass through any given frequency.

100. (See p. 4-64.) The ground constant values used in the Draft EIS were obtained from a source familiar with propagation in frozen earth and with Professor Hunsucker's work. After receipt of this comment, Professor Hunsucker was contacted and concurred that the ground conductivity values used in the Draft EIS are probably higher than those that would encountered and, therefore, that the predicted values of RFR are probably conservative--i.e., higher than those that would be observed.

101. (See p. 4-78.) The Draft EIS used 1980 census data and 1983 survey data. The Air Force appreciates the more recent information. A footnote has been added to the table. (See the Errata.)

102. (See p. 4-78.) Development of roads has been added to the list. (See the Errata.)

103. (See p. 4-79.) The Air Force accepts Ahtna's offer of assistance and will consult with Ahtna when it plans a followup study as part of its site-specific environmental assessment (see Section 1.3 of this document).

104. (See p. 4-80.) See Responses 50 through 59.

105. (See p. 4-82.) The potential interference problems arising from operation of the ARS are manageable by frequency avoidance and other techniques outlined in the interference avoidance plan. See Responses No. 78, 82, 86, 89, 91, 92, and 97. Interference with amateur radio stations has not proven to be a problem (see Section 4.13.2.2.1.2 of the Draft EIS).

106. (See p. 4-82.) For planning purposes, the life of the ARS is projected to be at least 20 years. Use of AWACS is not cost-effective (see Section 2.2.2.1 of the Draft EIS).

107. (See p. 4-102.) The site-specific environmental assessment that will be carried out after the transmit and receive study areas are selected will be more detailed than this EIS. This assessment will be based on field studies, a comprehensive literature survey, a review of agency data, and contacts with knowledgeable resource personnel.

108. (See p. 4-103.) The Air Force will work with federal and state resource agencies to develop a scope of work for the site-specific environmental studies. These studies will include a vegetation analysis to index habitat quality. The specific approach will depend on general vegetation characteristics and the importance of these characteristics as indicated by review of the literature and discussions with resource agency personnel. The National Wetlands Inventory Office in Anchorage will be among the organizations consulted.

109. (See p. 4-103.) The Air Force will attempt to avoid important wetlands in selecting the transmit and receive sites (see Sections 4.3.2 and 4.4.2 of the Draft EIS). The Corps of Engineers has already been contacted for permit information.

110. (See p. 4-103.) This correction has been made. (See the Errata.)

111. (See p. 4-103.) The information necessary to assess effects on wildlife in detail will be obtained during preparation of the site-specific environmental assessment.

112. (See p. 4-103.) In the site-specific environmental assessment, fish habitats that could be affected by the ARS will be addressed. The studies will be tailored to reflect the importance of the resource as determined from information available in the literature and from resource agency personnel.

113. (See p. 4-104.) The Air Force appreciates the additional information on raptor populations and ecology. The referenced information on raptors--available only at resource agency field offices and other locations--will be consulted during the preparation of the site-specific environmental assessment. Raptor field studies will be defined with the assistance of the resource agencies.

114. (See p. 4-105.) Waterfowl studies will be planned with the assistance of the resource agencies.

115. (See p. 4-105.) The Air Force will work with resource agencies to define big game studies. This work will probably include habitat assessments, forage quality and availability, relative abundance, and seasonal distribution and movement.

116. (See p. 4-105.) The Environmental Protection Agency and the Department of the Interior have provided guidance on mitigation strategies and measures. The Air Force recognizes the value of carefully planned mitigation and appreciates the agencies' assistance. General mitigation measures are described throughout Section 4 of the Draft EIS. Specific measures will be developed after more detailed information about prospective transmit and receive sites has been gathered during preparation of the site-specific environmental assessment.

117. (See p. 4-105.) Information on borrow sources was provided in Section 3.2.5 of the Draft EIS. Environmental effects associated with the development of borrow sources and the disposal of spoil were described in Section 4.2.1. These matters will be further investigated after the transmit and receive study areas are selected. The borrow and disposal sites will be included in the scope of the site-specific environmental studies. When feasible, existing gravel sources will be used, gravel extraction guidelines will be consulted, excess material will be disposed of on upland sites, and disturbed areas will be reclaimed.

118. (See p. 4-106.) Additional material has been added to Section 4.4.5 on p. 4-12 of the Draft EIS. (See the Errata.)

119. (See p. 4-106.) Fieldwork to support analysis of the potential bird collision problem and the development of mitigation measures will be incorporated into the environmental assessment studies.

120. (See p. 4-106.) The Air Force will endeavor to avoid or minimize impacts on aquatic habitats (see Responses No. 109 and 116.)

121. (See p. 4-106.) The general effects of increased human activity on wildlife were described in Section 4.4.3 of the Draft EIS. More specific effects will be assessed after additional, detailed wildlife information is gathered (see Responses No. 107, 109, 110, and 111). The Air Force appreciates DOI's recommendations regarding bear/human encounters. These and other biological mitigation measures will be evaluated after transmit and receive study area selection.

122. (See p. 4-107.) See Response No. 54.

123. (See p. 4-107.) General mitigation measures were described in Section 4.5 of the Draft EIS. Specific mitigation measures--including the APA and other guidance documents as appropriate--will be developed after the transmit and receive study areas are selected and site-specific information has been gathered and analyzed.

124. (See p. 4-107.) Potential effects on subsistence will be investigated as part of the site-specific environmental assessment (see Section 1.3 of this document). The Air Force recognizes the sensitive nature of subsistence activities, including the traditional use of species, their local distribution, and the potential for increased competition for limited resources. An evaluation consistent with Section 810 of ANILCA will be carried out, and the Interior Department, Alaska Department of Fish and Game, Native Corporations and associations, and others will be consulted.

125. (See p. 4-108.) Further studies of potential recreational impacts will be carried out for the site-specific environmental assessment. See Responses No. 58 and 70.

126. (See pp. 4-108 and 4-109.) See the responses to comments submitted by the Alaska Division of Telecommunications Services, especially Responses No. 78, 79, 86 and 92.

127. (See p. 4-124.) EPA will have an opportunity to review the Final EIS in conjunction with the Air Force plans for additional environmental studies, which will provide the information requested by EPA.

128. (See p. 4-125.) The Air Force is committed to carrying out site-specific studies after the transmit and receive site areas are selected. See Section 1 of this document and Responses No. 23, 31, and 75.

129. (See p. 4-125.) The Air Force is currently discussing data and analysis requirements for the site-specific environmental assessment. A work schedule and other information requested in this comment cannot be provided until planning is complete. The initial scope is described in Section 1.3 of this document.

130. (See p. 4-125.) Subsequent to receipt of this letter, the U.S. Fish and Wildlife Service advised the Air Force that it is not preparing a Technical Assistance Report because available site information is insufficient.

131. (See p. 4-125.) See Responses No. 112, 116, and 120.

132. (See p. 4-125.) No environmental field studies on specific sites are underway. The Air Force will conduct environmntal studies in cooperation with state and federal agencies. See Section 1.3 of this document and Responses No. 107, 108,, and 128.

133. (See p. 4-125.) For a given site, the locations requiring dredging, filling, or other distrubance will be outlined and surveyed to identify wetlands. The significance of the impacts will be assessed by considering the areal extent of the disturbance and the wetland resource values, as related to their major functions (e.g., fish and wildlife habitat, erosion). Federal and state resource agencies will be consulted throughout the wetlands assessment, especially relative to the development of site-specific mitigation measures to reduce or compensate for impacts. Also see Responses No. 108, 109, and 134.

134. (See p. 4-125.) After the transmit and receive study areas are selected, the Air Force will search for potential sites for the facilities. The Air Force's strategy will be to avoid important wetlands while also meeting operational requirements and minimizing costs. The Air Force will evaluate the potential sites considering environmental, operational, and cost tradeoffs. Criteria to evaluate discharge locations will include effects on water quality, fish and wildlife, water supplies, and other human uses.

135. (See p. 4-135.) See Responses No. 109, 112, 116, 117, 120, 123, 133, and 134.

136. (See p. 4-136.) Table A-1 in the Draft EIS is a representative list of excluded frequencies that was based on the East Coast and West Coast Radar Systems. Specific excluded frequencies will be determined for the ARS to avoid interference with other users of the frequency spectrum. Also see Responses No. 15, 89, 92, 95, 97, and 98.

6 ERRATA FOR PART I

The following errata pertain to the Draft EIS issued in August 1986. They include changes resulting from responding to submitted comments as well as from discovery of typographic and other copy errors. Fragmentary paragraphs at the top of a page are counted as paragraph 1.

Summary

p. S-5 para. 3, sent. 1: should read, "Most U.S. experiments with animals that yielded recognizable and repeatable effects of exposure to RFR were performed at whole-body average specific-absorption-rates (SARs) of more than about 4 W/kg (the basis for the ANSI standard)."

p. S-5 para. 5: replace the phrases "average power densities" and "incident average power densities" (which occur in three places) with "SARs." In addition, replace "1 mW/cm^2," which occurs in three places, with "4 W/kg".

p. S-6 para. 3, sent. 4: insert "the Alaska Fixed Service," following "other OTH-B radars."

Section 2

p. 2-17 line 2 under Gulkana: delete sections 13 and 14.

p. 2-20 para. 5, sent. 1-2: replace with, "The Gulkana study area covers approximately 50 mi^2 beginning near the junction of the Richardson Highway and the Tok Cutoff of the Glenn Highway. The Copper River flows along the southeast boundary, Tulsona Creek is near the eastern boundary, and the Gulkana River flows along the western boundary."

Section 3

p. 3-1 para. 5, sent. 3: replace with, "This plain contains primarily glacial lacustrine sediments and, in parts, is dominated by glacial moraines and bedrock ridges."

p. 3-3 para. 1, sent. 1: "relatively flat plain" should read "relatively flat glaciolacustrine plain."

p. 3-3 para. 2, sent. 1: "southwest-sloping plain" should read "southwest-sloping glaciolacustrine plain."

p. 3-3 para. 4, sent. 2: "Sustina" should read "Susitna."

p. 3-8 para. 5, sent. 1, line 5-6: should read, "State of Alaska, Department of Natural Resources (ADNR), Division of Lands--Land Status Plats and File Updates."

p. 3-8 para. 5, sent. 1, line 8: delete "(DGGS)."

p. 3-8 para. 5, sent. 1-2: insert between the two sentences, "Within the ADNR, the Division of Land and Water Management is responsible for managing state lands."

p. 3-8 para. 5, sent. 2: "and ADL land plats." should read "and ADNR land plats."

p. 3-8 add paragraph to end of page:

"Land patented to either the state or Native corporations is owned fee simple. Land tentatively approved to the state or interim conveyed to Native corporations is recognized by the state and federal government as having been transferred out of federal ownership subject only to the survey of exterior boundaries. Land with state or Native selections is federal land but will likely be transferred to either the Native corporation or the state."

p. 3-10 para. 1, sent. 2: should read, "The BLM and ADNR land status plats show a series of privately held 5- to 65-acre oil and gas, coal, and mineral right-of-way leases bordering the shoreline of Crosswind (Charley) Lake, although work conducted for the Copper River Basin Area Plan indicates that all oil and gas leases in this area have expired."

p. 3-10 para. 2, sent. 1: should read, "The eastern portion of the study area contains federal lands with Native and village corporation selections; final resolution of the status of these selections could take many years."

p. 3-10 para. 3, sent. 1: delete "federal."

p. 3-10 para. 3, sent. 3: "university-selected" should read "university owned."

p. 3-10 para. 3, sent. 4: should read, "A number of oil and gas right-of-way easements lie adjacent to the Glenn and Richardson Highways and the Copper, Gakona, and Gulkana rivers; as noted in Section 3.2.2.1, these leases have apparently expired."

p. 3-10 para. 4, sent. 1: delete "federal."

p. 3-10 para. 5, sent. 1: delete "federal."

p. 3-12 legend for Figures 3-7 to 3-11, Federal Land, line 7 (NP) and 9 (PRV): delete "Federal."

p. 3-16 para. 1, sent. 1: "now selected by" should read "now owned by."

p. 3-16 para. 1, sent. 3: "ADL" should read "ADNR."

p. 3-16 para. 1, sent. 4: "state-approved" should read "state-owned."

p. 3-16 para. 1, sent. 6: should read, "The remaining portion of the Tok study area lies within the Tanana Valley State Forest and state federal-grant lands with tentatively approved selection by the state."

p. 3-27 para. 2, sent. 1: replace "Alaska Division of Lands (ADL) and Division of Geological and Geophysical Surveys (DGGS)" with "ADNR."

p. 3-28 para. 3, sent. 2-3: insert between sentences 2 and 3, "Numerous geophysical exploration activities occurred in the 1960s and 1970s. According to records of the Alaska Oil and Gas Conservation Commission, a well was drilled in the area in 1963 and another in 1983, but both were subsequently plugged and abandoned."

p. 3-28 para. 3, sent. 3: should read, "Two natural seeps of oil, gas, or both occur within the southern part of the study area."

p. 3-34 para. 6, sent. 1: should read, "Permafrost is common on north-facing slopes and in valley bottoms that receive little solar radiation and experience little subsurface flow (Brown and Pewe, 1973)."

p. 3-34 para. 6, sent. 1-2: insert between sentences 1 and 2, "The Tok study area lies within a coarse textured relic Pleistocene alluvial fan which has enough subsurface flow to preclude permafrost; its edges are likely frozen near the surface."

p. 3-40 para. 4, sent. 1: "have been proposed as" should read "are currently considered."

p. 3-42 para. 6, sent. 1: "June" should read "May."

p. 3-43 Table 3-1 has been revised and is attached.

p. 3-43 para. 2, sent. 1: "late May through July" should read "early May through August."

p. 3-49 para. 2, sent. 5: replace with, "Coho salmon distribution in the Glennallen study area is unknown (ADF&G, 1986c)."

p. 3-49 para. 3, sent. 1: delete sentence.

p. 3-49 para. 4, sent. 1-2: replace with, "Chinook and sockeye salmon and steelhead trout are present in the Gulkana, Gakona, and Copper Rivers, all of which pass through the Gulkana study area. These species may also occur in Tulsona Creek, which passes through the eastern part of the study area."

p. 3-49 para. 5, sent. 2: replace with, "Sport fishing for sockeye salmon occurs in the Gulkana and Copper Rivers."

p. 3-49 para. 5, sent. 4-5: replace with, "Sport fishing for chinook and subsistence fishing for coho occur in the Copper River. The extent to which individual species are harvested from the Gulkana study area has been documented since 1977 in the statewide harvest survey."

p. 3-49 para. 6, sent. 1-3: replace with, "Indian Creek, a tributary to the Copper River, supports spawning and adult chinook salmon (ADF&G, 1986c). Indian Creek supports a sport fishery for chinook. The Copper River Basin Area Plan identifies fish and wildlife habitat and harvest as the primary surface values on state land in the northern and western parts of the Indian Creek study area."

p. 3-50 para. 1, sent. 3: replace "day" with "year."

p. 3-52 para. 7, sent. 1: replace with, "Crosswind Lake is an important habitat for nonanadromous fish, including lake trout, burbot, and Arctic grayling."

p. 3-53 para. 3, sent. 4: replace with, "Tulsona Creek is known to be used by grayling and is within the range of char and burbot."

p. 3-53 para. 4, sent. 1: replace with, "Sport fishing in the Gulkana River has been well documented, although no sport fishing is known to occur in the Copper and Gakona Rivers because of the glacial silt load."

p. 3-58 para. 7: insert the following five paragraphs after paragraph 7,

"Five species of owls breed in the study region: the great horned owl (Bubo virginianus), hawk owl (Surnia ulula), great gray owl (Strix nebulosa), boreal owl (Aegolius funereus), and short-eared owl (Asio flammeus) (Gabrielson and Lincoln, 1959; Kessel and Gibson, 1978). The great horned owl is one of the larger bodied owls of North America. This owl hunts mainly at night but is active in the day as well. Prey items range from shrews and small songbirds to larger items such a hares, mink, muskrat, porcupine, and geese (Terres, 1980; Angell, 1974). Great horned owls habitually feed in roost trees located near their nests; these roosts are often abandoned nests of other birds of prey.

"The hawk owl is a day hunter and often hovers in flight in a manner analogous to that of kestrels. The principal prey of hawk owls are small birds (young of many species as well as adult passerines) and rodents (especially lemmings). Nests are most often constructed in the tops of standing dead trees or in abandoned nests of other birds of prey (Terres, 1980).

"The great gray owl is known for its large wing span, but it is slightly smaller in weight than the great horned owl (Terres, 1980; Nero, 1980). This species hunts chiefly at night, preying on mice, shrews, hares, red squirrels, and small birds. As do many owls, the great gray owl often nests in the abandoned nests of other birds of prey.

"The boreal owl is a true nocturnal species hunting by night and taking shelter in dense foliage by day (Terres, 1980). Mice, small birds, and insects comprise the bulk of prey consumed. Nests are constructed in tree cavities.

"Short-eared owls are ground nesters often found in small colonies in open tundra settings. Short-eared owls hunt by night or day and are often seen circling close to the ground in a manner similar to that of marsh hawks."

p. 3-59 para. 3, sent. 3: add following sentence 3, "The protection of trumpeter swan nesting habitat has been one of the highest priorities expressed by the public at meetings and in surveys on the Copper River Basin Area Plan."

p. 3-68 para. 1, sent. 1: "females" should read "cows," and "males" should read "bulls."

p. 3-68 para. 1, sent. 1-2: insert between sentences 1 and 2, "The October 1985 census revealed 27,528 individuals, with 13,771 cows, 7,464 bulls, and 6,293 calves."

p. 3-69 para. 2, sent. 4: should read, "Both species occasionally infringe on human settlements, and troublesome animals are eliminated to protect life and property if the cause of the attraction cannot be corrected."

p. 3-69 para. 4, sent. 1: should read, "Site-specific information is lacking on the status of moose subpopulations of the Glennallen and Lake Louise Flats area, although the Twin Lakes area is known to provide a particularly productive habitat and a very popular hunting area."

p. 3-75 para. 2, sent. 4: add following sentence 4, "Furbearer population size can vary significantly from year to year due to natural cycles and other population variables. All population densities and harvest statistics presented below should be evaluated in light of such natural variation."

p. 3-93 Table 3-9: add footnote "f" to 1983 entry for Slana, "A more recent estimate puts the current population near 200 (Lau, 1986)."

p. 3-110 para. 3, sent. 4: add following sentence 4, "Since these statistics were compiled, the implementation of a federal homestead program resulted in a major population increase in Slana. Recent statistics reflecting the effect of this increase on subsistence harvest are unavailable."

p. 3-118 para. 1, sent. 2: add following sentence 2, "Crosswind Lake, at the northern end of the Glennallen area, is a very popular recreation area and has numerous private cabins."

p. 3-140 para. 1, sent, 1: insert at end of sentence, "(Spartz, 1985)."

Section 4

p. 4-1 para. 1, sent. 4: "repeatig" should read "repeating."

p. 4-1 para. 5, sent. 1: insert "development of roads" following "borrow pit development."

p. 4-3 para. 1, sent. 2: "USAF" should read "Air Force."

p. 4-3 para. 3, sent. 2-3: replace with, "The Glennallen study area contains the Ewan Lake Trail, and the Gulkana study area contains a power line right-of-way."

p. 4-3 para. 3, sent. 4: "National" should read "Natural"

p. 4-7 para. 1, sent. 1: "loads" should read "loadings."

p. 4-12 para. 5: insert a new paragraph after paragraph 5,

"The alteration of up to 3,000 acres of wildlife habitat for the radar facilities will adversely affect some species. Direct mortality will occur for small species and individual animals unable to avoid the construction activities. Many of the animals will be able to move away from the disturbed areas, but adjacent habitats are likely to become overpopulated, and mortality could result. Once the construction activities have ceased, some animals will be able to recolonize the disturbed areas, although population densities for most species will be lower than previously. After potential radar sites have been identified and site-specific information has been obtained, mitigation measures will be developed to minimize the adverse affects on important species in the site areas."

p. 4-16 para. 3, sent. 1: "plants" should read "plant."

p. 4-16 Table 4-1, footnote a: "generaion" should read "generation."

p. 4-17 para. 1, sent. 4: "exceed" should read "exceeds."

p. 4-17 para. 4, sent. 2: "sterage" should read "storage."

p. 4-20 para. 4, sent. 4: "on" should read "in."

p. 4-20 para. 4, last sent.: add a period following "programs."

p. 4-27 para. 3, sent. 1: "are" should read "is."

p. 4-32 para. 1, sent. 1: "transmitting" should read "transmit."

p. 4-32 para. 1, last sent.: "caes" should read "cases;" add ")" following the period.

p. 4-34 para. 3, sent. 3: "Glenallen" should read "Glennallen."

p. 4-36 para. 9, sent. 1: "visibile" should read "visible."

p. 4-36 para. 9, sent. 1: insert "on" following "as" and insert "in" following "and."

p. 4-42 last para.: insert following the last paragraph,

"In addition, the power density just outside the exclusion fence will also be lower than the most stringent option recently proposed by the EPA for controlling public exposure to RFR (see Section 4.14.1.3).

"Furthermore, the electric field associated with a power density of 0.02 mW/cm^2 is about 9 V/m. This is well below even the perception threshold (caused by localized warming) when considering potential hazards from shock and burns at the lower frequency end of the OTH-B operational band."

p. 4-43 para. 3, sent. 4: insert "the Alaska Fixed Service" following "the Amateur Radio Service."

p. 4-45 para. 3, last sent.: delete "or for amateur broadcasters."

p. 4-47 para. 1, sent. 4: "freuencies" should read "frequencies."

p. 4-47 para. 2, sent. 1: "Entertanment" should read "Entertainment."

p. 4-60 para. 2: delete last sentence and insert following paragraph 2,

"On July 30, 1986, the Environmental Protection Agency (EPA) announced four alternative approaches to limit the public's exposure to RFR (51 FR 27317-27339). Three of the approaches involve regulation. For frequencies above 3 MHz (which includes all of the OTH-B frequencies), alternatives 1, 2, and 3 would limit whole-body SARs to 0.04, 0.08, and 0.4 W/kg, respectively. In the fourth option, information and technical assistance programs would be conducted in lieu of adopting federal regulations.

"In the regulatory options, whole-body SAR would be directly related to frequency-dependent, incident power-density values. The Federal Register notice does not provide details on a proposed mathematical relationship between far-field power density and frequency that would specify the power density so as to limit the SAR to the values proposed in the three alternatives. The relationship might be the one employed in either the 1982 ANSI standard or the 1984 IRPA interim guidelines.

"If the ANSI standard is used, the most stringent option (0.04 W/kg) would limit environmental exposure to 3.6 mW/cm^2 at 5 MHz, falling to about 0.11 mW/cm^2 at 28 MHz. If the IRPA interim guidelines are used, the SAR values would imply limits of 0.2 mW/cm^2 at 5 MHz, falling to 0.1 mW/cm^2 at 28 MHz.

"Section 4.13.1.3 indicates that just outside an exclusion fence 4,000 feet from the OTH-B array, the power density would not exceed 0.02 mW/cm^2. Thus, even if the most stringent EPA alternative was adopted, public exposure to RFR from the OTH-B system would be lower than the permitted level."

p. 4-68 para. 3, sent. 1 & 2: should read, "Outside the exclusion fence, the average incident power densities will be 0.02 mW/cm^2 or less. The mean SARs and temperature rises would therefore be one-fiftieth of those cited above."

p. 4-72 para. 2: insert following paragraph 2,

"4.14.2.5 Shock and Burns

"There has been recent interest in identifying hazards from RFR in the 10-kHz to 3-MHz and somewhat higher frequency range. Such relatively low-frequency fields can charge capacitive objects such as ungrounded vehicles, fencing, metal roofing, and other ungrounded conductive objects such as the human body. When a grounded human makes contact with such a charged body, or when a charged human (initially ungrounded) makes contact with a grounded object, discharge current can flow, and electric shocks or RF burns are possible. Even when shocks or burns do not occur, excessively high, localized SAR can occur in the hands, wrists, or ankles.

"The threshold current for RFR burns occurring on the finger due to contact with a conducting surface is approximately 200 mA, and the threshold SAR for vigorous and possibly damaging local heating (based on diathermy treatment experience) is 50 to 120 W/kg. The highest current through the ankle of an adult human observed in the course of experiments at about 40 MHz was 12.7 mA/(V/m). At the 1982 ANSI standard of 1 mW/cm^2, this is equivalent to 780 mA. This, in turn, would give rise to an SAR of 24? W/kg in the ankles. ANSI specifies a maximum partial-body SAR of 8 W/kg. To meet this value, the power-density exposure would have to be reduced to approximately 0.13 mW/cm^2.

"Considerable experimental work has already been carried out by two independent research laboratories under Air Force sponsorship to define the potential hazards for RFR shock and burns better. However, additional work in these important areas is required. Preliminary indications are that the revision of the 1982 ANSI safety standard (publication of which is anticipated in 1987) will incorporate provisions for protecting against shock and burns.

"In the OTH-B system, exposures outside the exclusion fence will be limited to less than 1 mW/cm^2. At that level, the likelihood of hazard from shock is almost nonexistent because direct stimulation of nervous tissue cannot occur at frequencies greater than approximately 200 kHz. The likelihood of RFR burns is also very small. Finally, as indicated above, at exposure levels of less than about 0.13 mW/cm^2 (which will be the case outside the ARS exclusion fence), the highest localized SARs induced in the hands, feet, or ankles of a human will be less than those specified in the existing ANSI standard."

Section 5

p. 5-1 para. 2, line 4: replace "water resources" with "wildlife."

p. 5-1 para. 7, last sent.: should read, "Mr. Hensel prepared portions on wildlife in Sections 3 and 4."

p. 5-2 para. 2, line 2: replace "Ms." with "Mr."

p. 5-3 para. 1, line 4: replace "wildlife" with "fisheries."

p. 5-3 para. 3, line 4: replace "vegetation" with "fisheries."

Section 6

p. 6-1 last reference on page: add to entry, "Land Use Alternatives Map and Five Elements (Settlement, Subsurface, Transportation, Recreation, and Agricultural)."

p. 6-3 last reference: "Alaskam" should read "Alaska."

p. 6-10 reference 8: "climatalogical" should read "climatological."

Add the following references:

ACHP (Advisory Council on Historic Preservation), 1980. "Treatment of Archeological Properties: A Handbook," Washington, D.C.

Angell, T., 1974. Owls, University of Washington Press, Seattle, WA.

Lau, Larry T., Resource Manager, Ahtna, Inc., 1986. Letter to Lt. V.G. Brown, October 13.

Nero, R.W., 1980. The Great Gray Owl: Phantom of the Northern Forest, Smithsonian Institution Press, Washington, D.C.

Planning Assistance Team, 1985. "Planning Assistance Team: Elmendorf AFB, AK."

Terres, J. K., 1980. The Audubon Society Encyclopedia of North American Birds, Alfred A. Knopf, N.Y.

Appendix

p. D-7 line 5: insert following first entry [Department of Fish and Game (DF&G)], "Department of Fish and Game/ Alaska Statute 16.05.840; Fish in Streams/ DF&G is required to maintain efficient passage in all streams frequented by fish./ A permit is required for any activities (such as culverts, low water crossings, stream diversions, and dams) which may affect fish passage."

Table 3-1 (Revised)

FISH PRESENT IN THE FIVE STUDY AREAS

Species	Glennallen	Gulkana	Indian Creek	Paxson East	Tok
Anadromous[a]					
Chinook salmon	+	+	+		+
Chum salmon					+
Coho salmon	+				+
Sockeye salmon	+	+	+	+	
Steelhead trout	+	+			
Nonanadromous					
Arctic grayling	+	+	+	+	+
Burbot	+	+	+	+	+
Char	+	+	+	+	+
Humpback whitefish					+
Lake trout	+	+	+	+	
Lake whitefish	+	+	+	+	+
Rainbow trout	+	+	+	+	
Round whitefish	+	+	+	+	+
Northern pike					+
Sheefish (inconnu)					+

[a]Anadromous fish are those that swim upstream from the sea to spawn.

Source: ADF&G, 1986b.

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