DOE-EA-1332

Environmental Assessment

for Leasing Land for the Siting, Construction and Operation of a Commercial AM Radio Antenna at Los Alamos National Laboratory

Los Alamos, New Mexico

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ACRONYMS AND TERMS

ac	*acre*
BLM	*Bureau of Land Management*
BNM	*Bandelier National Monument*
CEQ	*Council on Environmental Quality*
CFR	*Code of Federal Regulations*
cm	*centimeter*
County	*Los Alamos County*
DOE	*Department of Energy*
EA	*Environmental Assessment*
EIS	*Environmental Impact Statement*
EMF	*electromagnetic field*
FCC	*Federal Communications Commission*
FONSI	*Finding of No Significant Impact*
ft	*feet*
ha	*hectare*
in.	*inch*
IRPA	*International Radiation Protection Association*
km	*kilometer*
km^2	*square kilometer*
kV	*kilovolt*
LANL	*Los Alamos National Laboratory*
L.L.C.	*Limited Liability Corporation*
m	*meter*
m^2	*square meter*
mi	*mile*
mi^2	*square mile*
NAAQS	*National Ambient Air Quality Standards*
NEPA	*National Environmental Policy Act*
NHPA	*National Historic Preservation Act*
NM	*New Mexico*
NPDES	*National Pollutant Discharge Elimination System*
NRHP	*National Register of Historic Places*
RF	*radio frequency*
RV	*recreation vehicle*
ROW	*right-of-way*
SHPO	*State Historic Preservation Officer*
SWEIS	*Site-Wide Environmental Impact Statement*
TA	*technical area*
TCPs	*Traditional Cultural Properties*
UC	*University of California*
U.S.	*United States*
USC	*United States Code*
USFS	*U.S. Forest Service*
USFWS	*U.S. Fish and Wildlife Service*

Measurement and Conversion Table

Multiply	By	To Obtain
Length		
inch (in.)	2.54	centimeters (cm)
feet (ft)	0.3048	meters (m)
yards (yd)	0.9144	meters (m)
miles (mi)	1.60934	kilometers (km)
Area		
acres (ac)	0.40469	hectares (ha)
square feet (ft^2)	0.092903	square meters (m^2)
square yards (yd^2)	0.8361	square meters (m^2)
square miles (mi^2)	2.58999	square kilometers (km^2)
Volume		
gallons (gal.)	3.7854	liters (L)
cubic feet (ft^3)	0.028317	cubic meters (m^3)
cubic yards (yd^3)	0.76455	cubic meters (m^3)
Weight		
ounces (oz)	29.574	milliliters (ml)
pounds (lb)	0.45385	kilograms(kg)
All conversions in this document have been rounded to the nearest decimal		

EXPONENTIAL NOTATION: Many values in the text and tables of this document are expressed in exponential notation. An exponent is the power to which the expression, or number, is raised. This form of notation is used to conserve space and to focus attention on comparisons of the order of magnitude of the numbers:

1×10^4	=	10,000
1×10^2	=	100
1×10^0	=	1
1×10^{-2}	=	0.01
1×10^{-4}	=	0.0001

EXECUTIVE SUMMARY

The United States (U.S.) Department of Energy (DOE) proposes to lease approximately 3 acres of land at the Los Alamos National Laboratory (LANL) on the southeast tip of Technical Area (TA) 54 for the siting, construction and operation of an AM radio broadcasting antenna. This EA has been developed in order to assess the environmental effects of the Proposed Action and No Action alternative.

The Proposed Action includes the lease of land for the siting, construction and operation of an AM radio broadcasting antenna in TA-54, just north of Pajarito Road and State Highway 4. The No Action Alternative was also considered. Under the No Action Alternative, DOE would not lease land on LANL property for the siting and operation of an AM radio broadcasting antenna; the DOE would not have a local station for emergency response use; and the land would continue to be covered in native vegetation and serve as a health and safety buffer zone for TA-54 waste management activities. Other potential sites on LANL property were evaluated but dismissed for reasons such as interference with sensitive laboratory experiments.

Potential visual, health, and environmental effects are anticipated to be minimal for the Proposed Action. The radio broadcasting antenna would be visible against the skyline from some public areas, but would be consistent with other man-made objects in the vicinity that partially obstruct viewsheds (e.g. meteorological tower, power lines). Therefore, the net result would be a modest change of the existing view. Electromagnetic field (EMF) emissions from the antenna would be orders or magnitude less than permissible limits. The proposed antenna construction would not affect known cultural sites, but is located in close proximity to two archaeological sites. Construction would be monitored to ensure that the associated road and utility corridor would avoid cultural sites.

1.0 PURPOSE AND NEED

1.1 Introduction

The National Environmental Policy Act of 1969 (NEPA) requires Federal Agency officials to consider the environmental consequences of their Proposed Actions before decisions are made. In complying with NEPA, the United States (U.S.) Department of Energy (DOE) follows the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR]1500-1508) and DOE's NEPA implementing procedures (10 CFR 1021). The purpose of an Environmental Assessment (EA) is to provide Federal decision makers with sufficient evidence and analysis to determine whether to prepare an Environmental Impact Statement (EIS) or issue a Finding of No Significant Impact (FONSI). In this case the decision to be made is whether to lease approximately 3 acres of land located in the southeastern portion of Technical Area (TA) 54 for the siting, construction and operation of a commercial AM radio broadcasting antenna owned by RealRadio, Limited Liability Corporation (L.L.C.), operating under the call letters "KRSN". RealRadio, L.L.C. must relocate its existing antenna and has requested a site on Los Alamos National Laboratory (LANL) property. The station serves communities in the Incorporated County of Los Alamos (Los Alamos County) and would be relied upon by DOE to relay information to the community during emergency situations.

The objectives of this EA are to (1) describe the underlying purpose and need for DOE action; (2) describe the Proposed Action and identify any reasonable alternatives that satisfy the purpose and need; (3) describe the baseline environmental conditions at the proposed radio broadcasting antenna site; (4) analyze the potential effects to the existing environment from leasing the land for siting, construction and operation of the radio broadcasting antenna; and (5) compare the effects of the Proposed Action to the No Action Alternative.

In addition, the EA process provides DOE with environmental information that can be used in developing mitigative actions, if necessary, to minimize or avoid adverse effects to the integrity of the human environment and natural ecosystems should DOE decide to proceed with leasing the land for the siting, construction and operation of the radio broadcasting antenna. Ultimately, the goal of NEPA and this EA is to aid DOE officials in making decisions based on understanding the environmental consequences of their decision.

1.2 Background

LANL is one of several national laboratories where DOE missions for national security, energy resources, environmental quality, and science are supported. LANL occupies about 43 square miles (mi^2)(111 square kilometers [km^2]) of land under administrative control of DOE. It is located in north-central New Mexico, about 60 mi (96.5 km) northeast of Albuquerque and 25 mi (40 km) northwest of Santa Fe (Figure 1).

The viability of at least one radio station in Los Alamos County is of importance to DOE for the purpose of providing LANL information to the community, such as road closure information and weather-related closures. In the event of an emergency, LANL's Emergency Operations Center, which has direct access to the local area communications media, would broadcast emergency information to the communities within Los Alamos County.

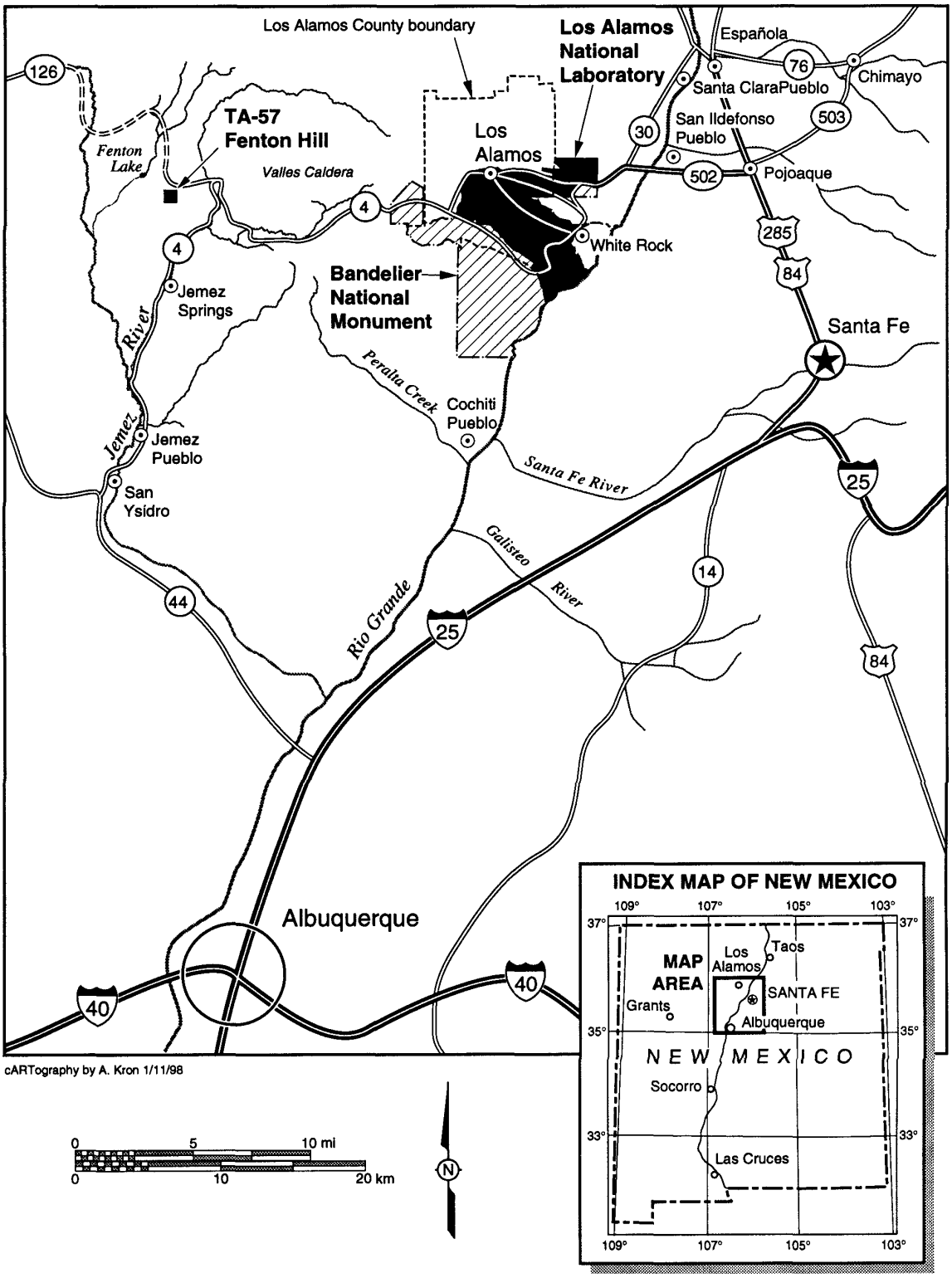

Figure 1 Location of Los Alamos National Laboratory

Currently, KRSN AM radio station is the sole commercial radio station present within Los Alamos County. This radio station is owned and operated by RealRadio, L.L.C., which is in the process of relocating their antenna due to the loss of their current lease. They have approached DOE with a request to lease land on DOE-administered property within Los Alamos County that meets their suitability criteria. KRSN currently broadcasts from a site on North Mesa. The lessor of the present antenna site is in the process of terminating the lease. RealRadio, L.L.C. must relocate their radio broadcasting antenna, but has been unable to obtain alternate antenna sites on other privately owned land or County land.

1.3 Purpose and Need for Agency Action

DOE needs to consider a request by RealRadio, L.L.C. to lease DOE-administered land for the purpose of siting, constructing and operating a commercial AM radio antenna. As stated, KRSN is currently the sole commercial radio station in Los Alamos County and provides a community service in the dissemination of information of interest about LANL activities to local communities. In addition, this local radio station is important to DOE as an element of its emergency response program to disseminate emergency information to Los Alamos County area residents. Consequently, DOE has an interest in maintaining a viable radio station within Los Alamos County as a supporting element of its multiple missions of national security, energy resources, environmental quality, and science.

1.4 Scope of This EA

A "sliding-scale" approach (DOE 1993) is the basis for the analysis of potential environmental and socioeconomic effects in this EA. That is, certain aspects of the Proposed Action have a greater potential for creating environmental effects than others; therefore, they are discussed in greater detail in this EA than those aspects of the action that have little potential for effect. For example, implementation of the Proposed Action could affect visual resources. This EA, therefore, presents in-depth descriptive information on this resource to the fullest extent necessary for effects analysis. On the other hand, implementation of the Proposed Action would cause only a temporary and minor effect on air quality during installation activities. Thus, a minimal description of the potential effects regarding air quality is presented.

When details about a Proposed Action are incomplete, as a few are for the Proposed Action evaluated in this EA (for example, the exact location of access roads has not been determined), a "bounding" analysis is often used to assess potential effects. When this approach is used, reasonable maximum assumptions are made regarding potential emissions, effluents, waste streams, and project activities (see Sections 2.0 and 4.0 of the EA). Such an analysis usually provides an overestimation of potential effects. In addition, any proposed future action(s) that exceeds the assumptions ("bounds") of this effects analysis would not be allowed until an additional NEPA review could be performed. A decision to proceed or not with the action(s) would then be made.

1.5 Public Involvement

DOE provided written notification of this NEPA review to the State of New Mexico, the four Accord Pueblos (San Ildefonso, Santa Clara, Jemez, and Cochiti), the Mescalero Apache, and to over 30 stakeholders in the area on January 12, 2000. On January 28, 2000, a copy of the predecisional EA was sent to the Los Alamos and Albuquerque DOE public reading rooms, the State of New Mexico, the four Accord Pueblos, and the Mescalero Apache. Additionally, letters announcing the availability of the

predecisional EA were sent out to more than 50 stakeholders in the area. An advertisement announcing the availability of the predecisional EA was placed in local newspapers and the document was placed on the World Wide Web Computer Internet System. A review period of 17 days ended on February 14, 2000. The Pueblo of San Ildefonso sent the sole letter received by DOE in response to the predecisional EA; the letter stated the Pueblo did not identify any impacts on historic properties and that the provisions in the EA were protective of the Pueblo's interests.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section discusses the Proposed Action, a No Action Alternative, and alternatives considered but dismissed.

2.1 Proposed Action

The Proposed Action involves the siting, construction and operation of a new commercial AM radio broadcasting antenna on DOE land under a lease agreement with RealRadio, L.L.C., operating under the call letters "KRSN". The proposed location is on the far east end of TA 54 near the northwest corner of State Highway 4 and Pajarito Road (see Figure 2). The property is bounded by Pajarito Road on the south, an unpaved access road on the west that leads to a 160-ft-tall (49-m) meteorological tower, a 115-kilovolt (kV) power line to the north, and undeveloped DOE land to the east.

The lessee proposes to erect a 180-ft-tall (55-m) radio antenna from which the radio station would broadcast throughout the Los Alamos County area. The antenna construction would include a small, approximately 220 sq ft (20 sq m) building at the base of the antenna to house the transmitter and ancillary equipment. The building would require a 3-phase, 220-volt power supply and a telephone line. The broadcasting antenna would be grounded utilizing a system of fifty, 180-ft-long (55-m) wires arranged radially around the base. The antenna grounding wires would be buried at a shallow depth of approximately six inches below grade. Placement of the radial wires would not have to be exact; the buried wire can be placed such as to avoid trees, boulders and other obstacles (KRSN 1999). Hence, the land disturbance would be a maximum of about one acre for construction of an unpaved access road and erection of the antenna base and transmitter building. Radio station workers would be on the site for periodic maintenance only. A fence, which would be approximately 6 feet tall and likely constructed from chain link, would be installed approximately 10 ft (3.3 m) from the base of the antenna. Additionally, extra protective measures would be taken, such as installation of an engineered climb stop to prevent trespassers from climbing the antenna.

The radio broadcasting antenna base would be triangular in cross section approximately 18 inches (45.7 cm) on a side. It would be attached to a concrete foundation and secured by 12 guy wires, 3 on a side at four different elevations. The radio broadcasting antenna would be less than 200 feet tall and would not require artificial lighting, consistent with Federal Communication Commission (FCC) requirements. The antenna would be painted a green or blue non-metallic color in a matte finish or manufactured out of non-reflective materials so as to minimize visual impacts.

The radio broadcasting antenna would be constructed by June of 2000. As a stipulation of the lease, RealRadio, L.L.C. will be required to follow all applicable environmental, health and safety regulations during the construction and operation of the radio broadcasting antenna. For example, the construction contractor would be required to follow best management practices for control of storm water runoff by utilizing such controls as hay bales and silt fences. During construction, a LANL archaeologist would be on site to monitor construction near any cultural resource sites. Clearing or excavation activities during site construction have the potential to generate dust and to encounter previously buried materials. If buried material or remains of cultural significance are encountered during construction, activities would

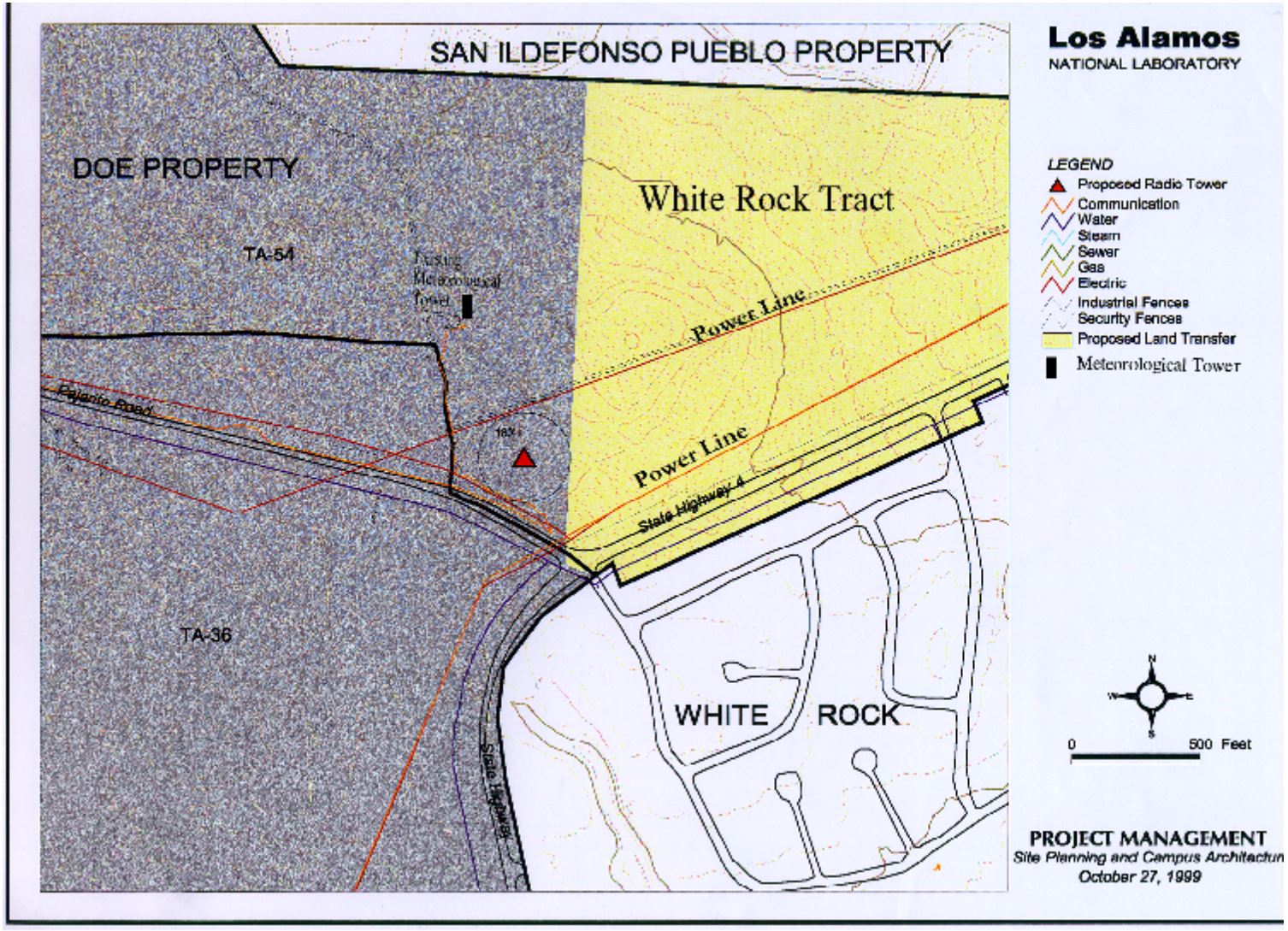

Figure 2. Site Map for Proposed Radio Antenna

cease until their significance was determined. Standard dust suppression methods (such as water spraying) would be used to minimize the generation of dust during all phases of construction activities. Following construction, the disturbed areas around the base of the antenna would be regraded and reseeded to restore the site to its natural condition.

The radio broadcasting antenna would commence operation as soon as construction activities are completed and would be operated at 1 kilowatt. The expected lease period would be 5 to 10 years (to be negotiated). Upon expiration of the lease, the antenna would be dismantled and removed along with the support building, fencing, concrete pad, guy wires, and grounding wires. The entire site, including the access road, would be reseeded to restore the site to its natural condition.

2.2 No Action Alternative

The No Action Alternative describes existing conditions and serves as a baseline for comparing the potential environmental effects of the Proposed Action. It must be considered even if DOE is under a court order or legislative command to act [10 CFR 1021.32(c)]. Under the No Action Alternative, DOE would not lease land to RealRadio, L.L.C. for the siting, construction and operation of a commercial AM radio broadcasting antenna. The land would remain covered with native vegetation and would continue to be used as a health and safety buffer for TA-54 waste management activities located on Mesa del Buey. DOE would not have a local radio station from which to broadcast information about LANL in the case of an emergency. Broadcast services would likely be provided by more distant radio and television stations in Santa Fe (40 miles) and Albuquerque (60 miles).

2.3 Alternatives Considered but Dismissed

Siting of an AM radio broadcasting antenna requires generally open, relatively flat land for effective transmission of the signal via the antenna and the buried radial grounding wires. Canyon bottoms are not desirable if steep walls are nearby that could affect radio transmission. Per the conditions of the operator's FCC license, the antenna must be located within Los Alamos County.

Siting of the AM Radio Broadcasting Antenna at Other LANL Locations

DOE considered other sites at LANL that would meet the stated basic criteria for siting an AM radio antenna. DOE added to the general siting criteria a specific requirement that radio antenna operations must not interfere with sensitive LANL experiments in order to protect DOE mission-related activities. This requirement specifies a minimum buffer of two miles from experiments with an acute sensitivity to radio frequency (RF) sources. It is important to recognize that LANL was chosen for many of these sensitive experiments because of its remote location and freedom from RF signal interferences (LANL 1999a).

Additionally, DOE attempted to minimize visual impacts by examining sites adjacent to existing laboratory antennas, specifically meteorological antennas at TA-49, TA-53 and TA-54. Land currently under consideration for land conveyance and transfer actions was not included in the potential siting considerations (see Section 2.4.1 for further discussion). Although all of these properties may not be conveyed or transferred by the end of the allotted time period, namely November 2007, the lease of a portion of the land for the construction of the radio antenna could prejudice DOE's decision.

Table 2-1 on the following page lists some of the sites considered by DOE. Each site was rejected for reasons shown in the table. The TA-54 east end site was identified as the only acceptable location at LANL for the Proposed Action.

Utilizing One Tower for Meteorological Instrumentation and as a Radio Antenna

DOE considered utilizing a single tower for the dual purpose of mounting existing meteorological instrumentation and for use as a radio transmission antenna. Existing LANL meteorological towers are located at TA-49, TA-53 and TA-54. DOE investigated the feasibility of removing the existing meteorological tower and erecting a new radio broadcasting antenna that would serve a dual purpose. The meteorological instruments would then be attached to the radio antenna. However, the meteorological instrumentation is extremely sensitive and cannot be shielded from the AM radio signals. Unlike FM transmission which emanates from a single transmitter on an antenna, AM radio is transmitted via the entire antenna and grounding cables. The antenna acts as one big amplifier and LANL meteorologists could not find a way to isolate their instruments if they were attached to an AM radio broadcasting antenna. Therefore, this scenario was dropped from further consideration in this EA.

2.4 Related DOE NEPA Actions

2.4.1 Final EIS for the Conveyance and Transfer of Certain Land Tracts at Los Alamos National Laboratory (DOE/EIS-0293)

The *Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory, Los Alamos and Santa Fe Counties, New Mexico* (CT EIS) was issued on January 24, 2000. A Record of Decision is expected no sooner than 30 days after issuance of the Final EIS in about the March 2000 time frame. DOE needs to meet requirements legislated under Section 632 of Public Law 105-119, *The Departments of Commerce, Justice, and State, The Judiciary, and Related Agencies Appropriations Act of 1998,* (42 United States Code [USC] §§ 2391) (the Act), to convey and transfer certain identified tracts of land. To be conveyed or transferred, these tracts must not be necessary for DOE mission-related required use and must have undergone any necessary environmental restoration or remediation activities. The CT EIS analyzes the potential impacts associated with conveying and transferring ten tracts of land identified as potentially suitable under the provisions of the Act; one of these tracts is the White Rock Tract located at the intersection of State Highway 4 and Pajarito Road. The Proposed Action considered in this Land Lease EA would be conducted on DOE property immediately adjacent to the identified White Rock Tract, which is a 98.7 acre site triangular in shape. The White Rock Tract is bordered by TA-54 (and the site of the Proposed Action) on the west, Pueblo of San Ildefonso lands to the north, State Highway 4 on the east, and Pajarito Road on the south. The White Rock Site is being contemplated for future commercial use (e.g., a recreation vehicle [RV] park) and residential use (e.g., high density development) and to a lesser degree for cultural preservation. In accordance with the provisions of the Act, the Incorporated County of Los Alamos and the Pueblo of San Ildefonso have recently issued their agreement for tract allocation (January 6, 2000) whereby the two parties indicated their plan to share the tract as follows: the majority of the tract would be used by the County, and a 100-ft wide strip of land immediately adjacent to the San Ildefonso Indian Reservation Sacred Area, together with a small area perpendicular to State Highway 4 at the northeast end of the tract, would be administered by the Secretary of the Interior in trust for the Pueblo of San Ildefonso (CTY 2000).

Table 2-1. Sites Considered But Dismissed

LANL SITES INVESTIGATED	REASONS FOR REJECTION
TA-61 Landfill Site	Proximity to Sensitive Experiments at TA-3
TA-53 Meteorological Tower Site	Proximity to Sensitive Experiments at TA-53
TA-53 East End/South Side	Proximity to Sensitive Experiments at TA-53
TA-54 East End	Proximity to Sensitive Experiments at TA-33
TA-54 Meteorological Tower Site	Unable to Locate Satisfactory Site While Maintaining a 200 ft Separation from Existing Meteorological Tower
TA-49 East End Near Meteorological Tower	Safety Issues Concerning Strong RF Signals Emanating within HE Buffer Zone; Bandelier Visibility Issues
TA-70 and TA-71	Proximity to Sensitive Experiments at TA-33; Canyon Walls
TA-36	Proximity to Sensitive Experiments at TA-15 and TA-16
Sigma Mesa End	Proximity to Sensitive Experiments at TA-3, TA-35 and TA-55

3.0 AFFECTED ENVIRONMENT

3.1 Regional Setting

The Proposed Action would be located on DOE-administered land within Los Alamos County near the community of White Rock.

LANL is a government-owned, multidisciplinary research facility that is currently operated by the University of California (UC) on 43 mi^2 (111 km^2) of land in north-central New Mexico approximately 60 mi (96.5 km) north of Albuquerque. It comprises a large portion of Los Alamos County and extends into Santa Fe County. LANL is situated on the Pajarito Plateau along the eastern flank of the Jemez Mountains and consists of 49 TAs. The Pajarito Plateau slopes downward towards the Rio Grande along the eastern edge of LANL and contains several finger-like mesa tops separated by relatively narrow and deep canyons.

Commercial and residential development in Los Alamos County is confined primarily to several mesa tops lying north of the core LANL facility, in the case of the Los Alamos Townsite, or southeast, in the case of the communities of White Rock and Pajarito Acres. The lands surrounding Los Alamos County are largely undeveloped forested areas located to the north, west, and south of LANL that are administered by the U.S. Forest Service (USFS), Santa Fe National Forest; the National Park Service, Bandelier National Monument (BNM); and the Bureau of Land Management (BLM) to the southeast. Lands held in trust for the Pueblo of San Ildefonso by the U.S. Department of the Interior border LANL to the east.

Detailed descriptions of LANL's natural resources environment, cultural resources, socioeconomics, waste management, regulatory compliance record, and general operations are presented in the *Site-Wide Environmental Impact Statement for the Continued Operation of the Los Alamos National Laboratory* (DOE 1999) and the *Environmental Surveillance and Compliance at Los Alamos During 1998* (LANL 1999b) report. These documents may be found in the LANL library and are available on the world wide web at http://nepa.eh.doe.gov/eis/eis0238/eis0238.html and at http://lib-www.lanl.gov/la-pubs/la-13633.pdf, respectively. Additionally, the land surrounding the site for the Proposed Action is described in detail within the Final CT EIS, which may be accessed on the world wide web at http://tis-nt.eh.doe.gov/nepa/docs/.

3.2 Potential Environmental Issues

Based on the description of the Proposed Action, potential environmental issues were identified depending upon their individual applicability to the Proposed Action analyzed in this EA. Table 3-1 identifies the issues of interest and the subsection in the EA where these potential issues are discussed. Certain issues are regional in nature and may not have a direct correlation to the Proposed Action.

Table 3-1. Potential Environmental Issues

Environmental Category	Applicability	Described in Section
Visual Resources	Yes	3.3
Human Health	Yes	3.4
Cultural Resources	Yes	3.5

Potential environmental resources that may be affected by the Proposed Action were identified using the sliding scale approach as discussed in Section 1.4. Table 3.2 lists those environmental resources that were considered but not analyzed further because the Proposed Action is expected to have either no effect or a negligible effect on these resources.

Table 3-2. Environmental Issues Considered But Not Analyzed Further

Environmental Category	*Applicability*	*Described in Section*
Socioeconomics	The proposed radio broadcasting antenna would be constructed over a period of about 1 month. Total labor requirements for the proposed project are estimated to be fewer than 10 persons. Because of the relatively low number of workers and short time frame needed to construct the antenna, construction activities would have a negligible effect on the socioeconomic character of the surrounding communities. Maintenance and operation of the new antenna would be performed by the existing commercial organization and staff.	*NA*
Noise	Current noise levels produced by the existing radio antenna are consistent with background (ambient) noise levels in the North Mesa area. Noise levels generated by the new antenna are anticipated to be comparable to ambient noise levels at the White Rock/State Highway 4 area.	*NA*
Air Quality	The National Ambient Air Quality Standards (NAAQS) of the Clean Air Act for nonradioactive air emissions are regulated by the State of New Mexico for the U.S. EPA. None of the areas within LANL and its surrounding counties are designated as nonattainment areas. A nonattainment area has air quality worse than that designated by the NAAQS for one or more criteria pollutants. Construction activities would temporarily increase localized particulate (e.g., dust) and certain other criteria pollutants (e.g., vehicle emissions), but the amount of pollutants is expected to be minimal and temporary in nature.	*NA*
Ecological Resources, Federally-listed Threatened and Endangered Species Habitat, Wetlands, Floodplains	The 3-acre land area required for the Proposed Action consists primarily of a pinon–juniper savannah habitat. According to the LANL Threatened and Endangered Species Habitat Management Plan, all of LANL is foraging habitat for the bald eagle. The radio antenna would result in a negligible reduction in foraging habitat for this species. The area is not a suitable habitat for any other of the Federally listed threatened or endangered species that are likely to inhabit the LANL area. There are no wetlands or floodplains associated with this area.	*NA*
Water Quality	The 3 acres of land required for the Proposed Action do not contain any surface water features. Construction sites of less than 5 acres do not require National Pollutant Discharge Elimination System (NPDES) permits or the implementation of a pollution prevention plan. However, best management practices would be required at the antenna site to reduce the potential for surface water runoff and soil erosion.	*NA*
Land Use	The 3 acres of land required for the Proposed Action is currently a buffer zone for LANL operations, and is fenced to preclude unescorted visitation by the general public. No change to the land use of the site would occur.	*NA*

Waste Management	No solid waste management, treatment, or active disposal sites would be disturbed by the radio broadcasting antenna. Wastes generated during construction would either be recycled, left onsite (e.g. soils and rocks), or would go to an appropriate municipal solid waste landfill.	*NA*
Environmental Justice	Populations that are subject to environmental justice considerations are present within 50 miles of Los Alamos County. However, the site of the Proposed Action is located close to the community of White Rock, which does not have large minority or low-income populations.	*NA*
Environmental Restoration	There are no known environmental restoration sites on the land area for the Proposed Action.	*NA*

NA = Not Analyzed

3.3 Visual Resources

The proposed site of the radio broadcasting antenna would be located north of the intersection of Pajarito Road and State Highway 4. As stated, the site is adjacent to the identified White Rock Tract (Figure 2), which is under consideration for transfer from DOE to the Incorporated County of Los Alamos and the Pueblo of San Ildefonso. Viewsheds were analyzed in the CT EIS. Since the proposed antenna site is adjacent to the tract, the visual resources are identical to those analyzed in the CT EIS.

In the CT EIS, two scenic classes were assigned: Rating Unit 1 (low public value), which includes areas along State Highway 4 from the north edge of the White Rock Tract through the town of White Rock, and Rating Unit 2 (moderate public value), which includes the remaining area beyond the highway. The proposed radio broadcasting antenna location is most consistent with Rating Unit 2 (moderate public value) in the White Rock Tract. This area contains a 160-ft (49-m) tall meteorological tower, overhead power lines, and a few small structures. The vegetation is relatively dense pinyon-juniper woodland. There is a moderately interesting visual field with low light-colored cliffs contrasting with the dark greens of the woodland. In a few places, the lower parts of the Jemez Mountains can be seen in the background from White Rock.

Figure 3 is a representation of the viewshed from the southeast corner of Highway 4 and Pajarito Road using a digitally-imposed radio antenna.

3.4 Human Health

Human health concerns for LANL workers and the general public in the vicinity of the proposed site of the radio broadcasting antenna are primarily associated with biological organisms (e.g. snake bites, spider bites, and insect bites), possible traffic accidents along Pajarito Road and State Highway 4, and electromagnetic field (EMF) exposures associated with the two 115 kV electric power lines that parallel State Highway 4. EMF exposure levels are not routinely monitored at LANL.

3.5 Cultural Resources

Cultural resources include prehistoric and historic sites and traditional cultural properties (TCPs). A prehistoric site is defined by structural sites, game traps, petroglyphs, steps and roads, water-catching devices, habitation areas, terraces, shrines, and artifact scatters. Lone projectile points, stone tools and debris (lithic flakes), and potsherds obviously derived from the same vessel, are considered to be isolated occurrences. Historic cultural resources that predate 1943 or from the years 1943 to 1956 were also

Figure 3. Digitally-imposed radio antenna (right) next to existing meteorological tower (left) from SE corner of SR4 and Pajarito Road

identified during field surveys of the proposed radio antenna site. TCPs, which are resources of cultural or religious importance to Native Americans and other area community members, are identified by those communities.

Under the National Historic Preservation Act of 1966 (NHPA) (16 USC 470 et seq), cultural resources undergo an evaluation process that determines if the resource is eligible for listing on the National Register of Historic Places (NRHP). Resources that are already listed, determined eligible for listing, or that are not yet identified are considered to have undetermined eligibility. These include subsurface archaeological deposits, unrecorded burials, and unidentified TCPs. A more detailed description of cultural resources in the immediate area of the proposed radio antenna site is found in Section 14.1.8 of the CT EIS. A thorough discussion of the cultural resources found throughout LANL is contained in Volumes I and III of the DOE LANL Site-Wide Environmental Impact Statement (DOE 1999).

Surveys performed for the nearby tracts of land proposed for conveyance to the Incorporated County of Los Alamos or transfer to the Secretary of the Interior in trust for the Pueblo of San Ildefonso have identified a number of cultural resource sites eligible or potentially eligible for the NRHP. The Proposed Action locates the radio broadcasting antenna within a 3 acre area that was surveyed for cultural resources in support of the CT EIS. Two prehistoric archaeological sites are located within the proposed antenna site. These sites will be recommended to the New Mexico State Historic Preservation Officer (SHPO) as eligible or potentially eligible for listing in the NRHP. The SHPO concurred with a finding of no effect for this undertaking since no cultural resources would be affected by the proposed construction project.

Government-to-government consultation with the four Accord Pueblos (San Ildefonso, Jemez, Cochiti, and Santa Clara) associated with the CT EIS is ongoing. This interaction provides an opportunity for the protection of archaeological resources and TCPs in the area surrounding the White Rock Tract.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Proposed Action

The three potential environmental issues identified in Section 3.2 are discussed in the following sections.

4.1.1 Visual Resources

The Proposed Action would affect the visual environment in the vicinity of the project both during and after construction. During construction, there would be short-term visual effects caused by creation of a construction staging area and equipment used during the construction process. Revegetation after construction would return the disturbed area to a more natural condition within a few years. After construction, the radio broadcasting antenna would be visible to a number of homes and businesses in the nearby community of White Rock. The radio broadcasting antenna would be visible from the San Ildefonso Indian Reservation Sacred Area and potentially visible from any identified TCPs. The radio broadcasting antenna would not have artificial lighting.

Overall Effects: The radio broadcasting antenna would introduce features (a vertical line and, possibly colors) that would contrast with the natural contours, shapes, and colors of the landscape. The capacity of the viewsheds to absorb the visual effect of the antenna is relatively low. Non-reflective materials or coatings that mimic the colors of vegetation and sky, such as a non-metallic blue or green paint in a matte finish, would be used. In a letter to DOE dated January 12, 2000, the Pueblo of San Ildefonso stated they find the proposed site for the antenna would have little impact to the immediate environment in reference to aesthetics (SAN I, 2000).

Effects on viewsheds of the community of White Rock: The community of White Rock has scenic vistas and pleasant views in many directions, but only a few homes on the higher areas of the southern part of White Rock are likely to have a scenic view that includes the proposed antenna location. These homes are predominantly in the area of La Vista Street, where the terrain is higher, and along State Highway 4 between Piedra Loop and Grand Canyon Drive. Other areas of White Rock are too low in elevation or have intervening vegetation and development that obscure scenic views in the direction of the White Rock Tract and the proposed antenna location.

The proposed radio broadcasting antenna would likely result in a modest alteration of the existing view. The degree of change in the view would probably be small due to the presence of the meteorological tower and power lines in the area. The visual quality of the area immediately around the antenna would probably not be degraded to low public value classification.

Effects on viewsheds on the San Ildefonso Indian Reservation Sacred Area: The views from the higher parts of the San Ildefonso Indian Reservation Sacred Area (Sacred Area) would include scenic vistas in nearly all directions. These views include an approximate 60-degree field of view to the south and southeast that includes the meteorological tower, the power lines, and most of the community of White Rock. From the Sacred Area to the north, the proposed radio broadcasting antenna would be visible from several of the mesa tops and benches. The Sacred Area is not permanently occupied but does receive occasional visits by members of San Ildefonso Pueblo. Although the antenna would be a noticeable addition to the vistas from the Sacred Area, the degree of change would be modest since the antenna would be integral with the existing meteorological tower, power lines, and the community of White Rock.

Effects of viewsheds from State Highway 4: Travelers along State Highway 4 through White Rock would notice the radio broadcasting antenna, as well as the shorter meteorological tower, primarily while passing through White Rock. Scenic views in this area occur primarily when a vehicle approaches White

Rock from the south. The antenna would be visible and would modify scenic views of perhaps moderate public value over about a stretch of one mile south of White Rock. The number of persons affected would be relatively high but travelers would typically only see the antenna briefly.

4.1.2 Human Health Risks

Adverse health effects to LANL workers and members of the general public are not expected as a result of the Proposed Action. The current use of the proposed site is a buffer zone, with infrequent LANL worker occupancy of the land near the proposed radio broadcasting antenna site. In this EA, human health considers the effects of the construction and operation of the radio broadcasting antenna on nearby LANL workers and the general public residing in the vicinity of White Rock. The lease would stipulate that the radio station would ensure that all applicable worker health and safety regulations are followed during the construction and operation of the radio broadcasting antenna. The human health effects on radio station employees or their contracted workers are not included in this EA. There would be no workers occupying the antenna site. Workers would be there on a periodic basis only.

Since FCC regulations require that radio broadcasting antenna and support facilities be fenced to prevent vandalism and to be protective of members of the general public, accidents such as electrocution or falls are not considered credible (1×10^{-6}). Therefore, the risks of such accidents and related health effects were not analyzed.

Both LANL workers near the antenna site and the general public would have the potential for EMF exposures as a result of radio broadcasting operations. The nearest LANL workers are located about 4,000 feet (1,210 m) to the northwest from the proposed antenna site. Currently, the nearest residences from the proposed antenna site are located about 650 ft (200 m) to the southeast. EMF emissions from the radio broadcasting antenna are projected to be less than International Radiation Protection Association (IRPA) general public exposure limits of 100 mW/cm^2 for the 0.9-1.5 MHz frequency range (IRPA 1998) to both of these populations (Appendix A). Immediately outside the fence the expected EMF exposures would be only 1.35×10^{-2} mW/cm^2, which are less than the IRPA permissible limit stated above. Thus, adverse human health effects would not be expected from the operation of the radio broadcasting antenna.

4.1.3 Cultural Resources

The proposed radio broadcasting antenna site would be located within an area that contains potential construction effects to two archaeological sites, and is in close proximity to the boundary of the San Ildefonso Indian Reservation Sacred Area. Adverse effects to archaeological resources are not expected under the Proposed Action, as the ground wires would be placed so as to avoid these sites. The radio broadcasting antenna and any associated road or utility corridor would also be located to avoid all known cultural sites. Additionally, construction would be monitored by a qualified archaeologist. As stated, clearing or excavation activities during site construction have the potential to encounter previously buried materials. If buried material or remains of cultural significance are encountered during construction, activities would cease until their significance was determined.

As outlined in the CT EIS, consultations with the four Accord Pueblos are ongoing. The 3-acre land parcel in the Proposed Action is not known to contain Native American TCPs and, therefore, no effects are anticipated. The Pueblo of San Ildefonso (in the above mentioned letter) encourages continued consultation with regards to the antenna's effects on TCPs.

4.2 No Action Alternative

Under the Proposed Action, the land would not be leased to allow for construction and operation of the radio broadcasting antenna. The radio antenna would be either be located on non-DOE land or the radio station would be forced to terminate operations. The DOE might need to develop other methods to provide emergency and routine information to members of the Los Alamos community. Under the No Action Alternative, there would be no change to the visual resources of the area, and there would be no EMF exposures from operation of the radio broadcasting antenna. Under the No Action Alternative, there would be no effects on cultural resources or TCPs.

5.0 CUMULATIVE EFFECTS

Cumulative effects on the environment result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes them. These effects can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7). This section considers the cumulative effects of the AM radio broadcasting antenna together with other actions occurring within and directly adjacent to the potentially affected region (approximately 1 mile). The principle issue associated with the Proposed Action is visual effects (see section 4.1.1), although cumulative effects on TCPs, cultural resources, and human health effects are also examined.

The cumulative visual effect of implementing the Proposed Action would be small. As stated, the area in which the Proposed Action would be located contains a 160-ft tall meteorological tower, overhead power lines, and a few small support structures. The scenic class in which the Proposed Action would be located is moderate public value. The antenna would be most consistent with this rating and its introduction would not likely degrade this rating. Although there are no known plans for future antenna placement in the area of influence, proposed future uses of the adjacent White Rock Tract, when transferred, are assumed to be commercial and residential development (e.g., RV parking and multi-story high density residential development), which would modify this rating to a condition similar to that of Rating Unit 1, low public value. While the Proposed Action would add an additional visual element to the region of influence, its impact, when combined with reasonably foreseeable future actions, would be small and would not contribute to a degradation of the scenic class rating.

The cumulative human health effects of implementing the Proposed Action would be negligible. EMF exposures at the boundaries of the antenna fence would be less than IRPA permissible exposure limits. The potential future use of the adjacent White Rock Tract for commercial and residential development would increase the chances that members of the general public would climb over the fence and onto the antenna, providing a scenario where EMF exposures could exceed permissible limits or where injuries from a fall could occur. This scenario is highly speculative and unmeasurable, and its associated effect is assumed to be small, due in part to the installation of an engineered climb stop on the antenna as part of the proposed action. Greater EMF exposure risks would be expected from the two nearby existing 115-kV electric power lines.

The cumulative effect of implementing the Proposed Action on TCPs and cultural resources would likely be small. As stated, the antenna would be sited and constructed under the supervision of a qualified archaeologist, in order to avoid known cultural resources sites. The future use of the adjacent White Rock Tract for commercial and residential development would have a high potential for disturbing cultural resources sites and affecting TCPs. The siting, construction, and operation of the antenna would not contribute to the disturbance of TCPs or cultural resources expected from the commercial and residential development.

In summary, the effects of the Proposed Action, when combined with those effects of other actions defined in the scope of this section, do not result in cumulatively significant impacts.

6.0 AGENCIES CONSULTED

The following State agency was consulted during the preparation of this EA.

State Agencies

- New Mexico Office of Cultural Affairs, Historic Preservation Division

The NM SHPO has been requested in a letter dated January 25, 2000 to concur with DOE's determination of "no effect" to cultural resources pursuant to Section 106 of *The National Historic Preservation Act* (16 USC 470 et seq). The NM SHPO concurred with DOE's finding of "no effect", completing the formal consultation process.

Other Government Agencies

- Pueblo of San Ildefonso

DOE consulted with the Pueblo of San Ildefonso on the Proposed Action's effects on viewsheds, cultural resources, and TCPs, and received a letter dated January 12, 2000, stating their lack of viewshed concerns. Consultation is ongoing for the Proposed Action's affects on TCPs. As noted in section 1.5, the Pueblo also sent a letter to DOE after reviewing the predecisional EA, concluding there were no identified impacts on archaeological or cultural resources.

- Incorporated County of Los Alamos

DOE consulted with the Incorporated County of Los Alamos on potential antenna sites and received a letter from the County dated December 8, 1999, stating County support for the site of the Proposed Action.

7.0 REFERENCES

CTY 2000	Letter from Perry Martinez, Governor of San Ildefonso Pueblo, and Christine Chandler, Los Alamos County Council Chair, to Secretary William Richardson regarding allocation of land transfer land tracts, January 7, 2000.
DOE 2000	U.S. Department of Energy, Final *Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the Department of Energy and Located at Los Alamos National Laboratory, Los Alamos and Santa Fe Counties, New Mexico*, DOE/EIS-0293, Los Alamos Area Office, Los Alamos, New Mexico, January 2000.
DOE 1999	U.S. Department of Energy, *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory*, DOE/EIS-0238, Albuquerque Operations Office, Albuquerque, New Mexico, 4 Volumes, January 1999.
DOE 1993	U.S. Department of Energy, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*, Office of NEPA Oversight, May 1993.
KRSN 1999	Letter from Mark Bentley, general partner of RealRadio, L.L.C., to Dennis Martinez, Deputy Area Manager of DOE-LAAO, regarding a formal request to lease DOE land for siting, construction and operation of a commercial AM radio antenna, April 12, 1999.
LANL 1999a	Memo from Mike Baker, LANL DLDOPS, to Dennis Martinez, DOE-LAAO, regarding screening sites for a commercial AM radio antenna, June 28, 1999.
LANL 1999b	Los Alamos National Laboratory, *Environmental Surveillance at Los Alamos during 1998*, Los Alamos National Laboratory Report LA-13633-ENV, Los Alamos National Laboratory, New Mexico, 1999.
LANL 1998	Los Alamos National Laboratory, *Environmental Surveillance at Los Alamos during 1997*, Los Alamos National Laboratory Report LA-13487-ENV, Los Alamos National Laboratory, New Mexico, 1998.
LANL 1996	Los Alamos National Laboratory, *Environmental Surveillance at Los Alamos during 1995*, Los Alamos National Laboratory Report LA-13210-ENV, Los Alamos National Laboratory, New Mexico, 1996.
SAN I 2000	Letter from Perry Martinez, Governor of San Ildefonso Pueblo, to David Gurule, Area Manager of DOE-LAAO, commenting on siting a radio antenna adjacent to San Ildefonso Pueblo lands, January 12, 2000.

APPENDIX A: Summary of Studies on Health Effects from Exposure to Electric and Magnetic Fields

Radio waves are electromagnetic waves produced by reversal of current in a conductor at a frequency in the range from about 10 kHz to about 300,000 MHz. In radio transmissions, energy is transferred (or propagated) through space by electromagnetic radiation at these frequencies. For the proposed KRSN station, frequencies under consideration range from approximately 890 to 1490 kHz (personal communication, D. Davis). Although a long history of concern exists over potential biological effects from induced EMF generated by power lines and power stations as evidenced in the scientific literature, there is relatively little concern over EMFs from radio frequencies. Nevertheless limits for exposure to radiofrequencies were developed by the IRPA in 1988.

Derived exposure limits to radiofrequencies are expressed in terms of power density in the units milliwatts per square centimeter (mW/cm^2) (Glaser 1992). For the radio frequency range of 0.9 to 1.5 MHz, the IRPA maximum permissible power density is about 100 mW/cm^2 (Glaser 1992). At the upper power level of 5.0 kW, which exceeds the proposed power level under consideration for the KRSN radio station by a factor of 5, and using the Inverse Square Law for point sources (Shleien 1992), the calculated power density at the current nearest residence 650 ft (200 m) to the southeast is 1.27×10^{-2} mW/cm^2. At a distance of 200 ft (61 m) to the east-northeast ("Conveyance and Transfer White Rock Tract"), the calculated power density is 1.35×10^{-2} mW/cm^2. Thus, using these conservative assumptions, the potential public exposure doses at the two distances cited above are almost four and three orders of magnitude below the exposure limit.

REFERENCES:

Davis 1998 D. Davis of 809 Wellesley, N.E., Albuquerque, NM; personal communication, April 8, 1998 letter to M. Bentley of RealRadio, L.L.C., 1217 17th Street, Los Alamos, NM 87544.

Glaser 1992 Glaser, Z.R. *Non-Ionizing Radiation*, Electromagnetic Radiation and Fields (ELF); In: The Health Physics and Radiological Health Handbook, Revised Edition, B. Shlein (Ed.), Scinta, Inc., Silver Spring, MD, 734p.

Shlein 1992 The Health Physics and Radiological Handbook, Revised Edition, Scinta, Inc., Silver Spring, MD, 734p.

GLOSSARY OF TERMS

Accord Pueblos Accord refers to the written agreements signed by DOE and the four Pueblos on December 8, 1992, stating the basic understanding and commitments of the parties and describing the general framework for their working together. Subsequently, cooperative agreements between each Pueblo and DOE, and between each Pueblo and the University of California have been signed, which specify further details related to the accord agreements.
archaeological sites (resources) Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.
cultural resources Any prehistoric or historic sites, buildings, structures, districts, or other places or objects (including biota of importance) considered to be important to a culture, subculture, or community for scientific, traditional, or religious purposes or for any other reason. In the SWEIS, prehistoric cultural resources refer to any material remains and items used or modified by people before the establishment of a European presence in the upper Rio Grande Valley in the early 17th Century; historic cultural resources include all material remains and any other physical alteration of the landscape that has occurred since the arrival of Europeans in the region.
electromagnetic field (EMF) A field of force associated with an electric charge in motion.
Environmental Assessment (EA) A written environmental analysis that is prepared pursuant to the *National Environmental Policy Act* to determine whether a major federal action could significantly affect the environment and thus require preparation of an environmental impact statement. If the action would not significantly affect the environment, then a finding of no significant impact is issued.
Environmental Impact Statement (EIS) A document required of federal agencies by the *National Environmental Policy Act* for proposals for legislation or major federal actions significantly affecting the quality of the human environment. A tool for decision making, it describes the positive and negative environmental impacts of the Proposed Action and alternative actions.
National Environmental Policy Act (NEPA) A law that requires federal agencies to consider the environmental impact of their activities—including the impact on cultural resources; endangered, threatened, or sensitive species; and floodplains or wetlands—before deciding to proceed with those activities.
National Pollutant Discharge Elimination System (NPDES) Federal permitting system required for municipal and industrial effluents regulated through the *Clean Water Act*, as amended.
National Register of Historic Places (NRHP) A list of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or national significance maintained by the Secretary of the Interior. The list is expanded as authorized by Section 2(b) of the *Historic Sites Act of 1935* (16 U.S.C. §462) and Section 101(a)(1)(A) of the *National Historic Preservation Act of 1966*, as amended.
Site-Wide Environmental Impact Statement (SWEIS) A type of programmatic EIS that analyzes the environmental impacts of all or selected functions at a DOE site. As part of its regulations for implementation of NEPA, DOE prepares site-wide EISs for certain large, multiple-facility DOE sites; it may prepare EISs or EAs for other sites to assess the impacts of all or selected functions at those sites (10 CFR 1021.330 [c]).
State Historic Preservation Office(r) (SHPO) A position in each U.S. state that coordinates state participation in the implementation of the *National Historic Preservation Act* (16 U.S.C. §470 *et seq.*). The SHPO is a key participant in the Section 106 process, assisting in the steps of identification of eligible resources, evaluating effects of undertakings, and developing mitigation measures or management plans to reduce any adverse effects to eligible cultural resources.
threatened and endangered (T&E) species Animals, birds, fish, plants, or other living organisms threatened with extinction by human-produced or natural changes in their environment. Requirements for declaring species threatened or endangered are contained in the *Endangered Species Act of 1973*.
traditional cultural properties Significant places or objects associated with historical and cultural practices or beliefs of a living community that is rooted in that community's history and is important in maintaining the continuing cultural identity of the community.
technical area (TA) A geographic area at LANL containing land and facilities dedicated to one or more functions.
viewshed the area from which an observer can potentially view the Proposed Action Site.
wetland Land or areas exhibiting hydric (requiring considerable moisture) soil concentrations, saturated or inundated soil during some portion of the year, and plant species tolerant of such conditions.