FINAL
ENVIRONMENTAL IMPACT REPORT
(SCH No. 2008041082)

LAZER BROADCASTING FACILITY

Prepared for:

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1.0 INTRODUCTION

1.1 OVERVIEW OF THE PROJECT AND ENVIRONMENTAL REVIEW PROCESS

Lazer Broadcasting Corporation is currently proposing the construction and operation of a radio broadcast facility to include a 43-foot tall monopole with attached antenna and a 10-foot by 10-foot single-story (nine-foot tall) equipment building on a 38.12-acre site located near Wildwood Canyon and Oak Gen Roads, west of Pisgah Peak Road in the unincorporated Yucaipa area of San Bernardino County.

The proposed monopole would be a self-supporting, fire-preventative treated wood pole that would either remain in a natural wooden "as-is" condition, painted a neutral color (light beige, sage) to blend with the surrounding environment or would be a painted metal pole in a non-metallic, weathered gray color. The monopole would support a 25-foot long antenna that would be mounted per industry standards on the monopole's southwesterly facing side. The antenna would extend from the surface of the monopole out to 21 inches and would be constructed of metal, and include four (4) "arms" that would extend from the main monopole support at 45 degree angles (see Figure 1-3 - Site Plan). The antenna would be approximately 4 inches in diameter and constructed of a non-glare, metallic material.

A "Determination of No Hazard to Air Navigation" is typically required for towers higher than 200 feet; unless the towers are located in close proximity to an airport. The nearest airport (Redlands Municipal Airport) is located over five miles northwest of the Project Site. Based on guidelines of the Federal Aviation Administration and Federal Communications Commission, the proposed monopole and attached antenna would not require lighting or the application of red/white striped paint.

The Project Site is situated in the steep foothills of the San Bernardino Mountains between the City of Yucaipa and the community of Oak Glen (see Figure 1-1 Regional Location). The Project Site is located west of Pisgah Peak Road approximately 1.5 miles north of its intersection with Wildwood Canyon Road within an unincorporated portion of San Bernardino County and in the Oak Glen Planning Area (see Figure 1-2 Vicinity Map).

The Project Site is located approximately 1.5 miles south of the San Bernardino National Forest, on a west facing slope below the ridgeline, and is currently vacant. In 2010, a demonstration pole was installed to identify the location of the monopole and represent the pole height; the pole was removed in 2015. The Project Site elevation varies from 3,850 feet above mean sea level (amsl) to 4,500 feet amsl. The entire Project Site consists of densely mixed chaparral and occurs on steep slopes greater than 30 percent.

A complete description of the Project is provided in Chapter 3.0 of the Draft Environmental Impact Report (Draft EIR) prepared and circulated for public review and comment between June 6, 2016 and July 20, 2016 (State Clearinghouse Number 2008041082).

This Final Environmental Impact Report (Final EIR) has been prepared to describe the disposition of environmental issues raised in the comments received on the proposed Project's

Draft EIR. Evaluating the potential impacts of the Project on the environment and responding to comments is an essential part of the environmental review process required under CEQA (California Public Resources Code (PRC) § 21000 et seq.). This Final EIR has been completed in accordance with CEQA and the CEQA Guidelines (Title 14 of Section 15132 of the California Code of Regulations (CCR) (14 CCR § 15132)).

1.2 FINAL EIR REQUIREMENTS

This Final EIR provides responses to comments received on the Draft EIR. Section 15132 of the CEQA Guidelines requires that the Final EIR consist of:

- The Draft EIR or a revision of the draft;
- Comments and recommendations received on the Draft EIR either verbatim or in summary;
- A list of persons, organizations, and public agencies commenting on the Draft EIR;
- The responses of the Lead Agency to significant environmental points raised in the review and consultation process; and
- Any other information added by the Lead Agency.

This Final EIR for the Project has been prepared to provide responses to comments received on the Draft EIR and is to be used in conjunction with, rather than in place of, the Draft EIR. Therefore, the information in this Final EIR, which incorporates the Draft EIR, fulfills state and County CEQA requirements for a complete EIR.

1.3 USE OF THE EIR IN THE DECISION-MAKING PROCESS

The EIR is an informational document designed to inform the public of the significant environmental effects of a project, identify possible ways to minimize or mitigate the significant effects, and describe reasonable alternatives to the project.

The County will use the EIR, together with economic, social, and technical information, to decide whether to approve the discretionary entitlements being requested. The County has made this Final EIR available prior to hearings on Project approval or denial to provide an opportunity for agency and public review of the complete EIR before decisions are made. In addition, the County provided each of the commenting agencies a CD copy of this Final EIR at least 10 days before the first Board of Supervisors hearing on the Proposed Project.

This Final EIR reviews the environmental consequences of the Project. The County will use the EIR, along with other information, in its consideration of the application.

Upon review of the Final EIR, and before rendering decisions on the discretionary actions, the County must certify that:

- The Final EIR has been completed in compliance with CEQA,

- The Final EIR was presented to the decision-making body of the Lead Agency, and
- The information was reviewed and considered before approving the project.

1.4 SIGNIFICANT AND UNAVOIDABLE IMPACTS

The analysis determined that with the exception of impacts from Aesthetics, all other impacts associated with the Proposed Project would be reduced to a less than significant level after mitigation. Impacts from Aesthetics associated with the monopole remain adverse and unavoidable even after implementation of mitigation measures. Therefore, a statement of overriding considerations is required for the Proposed Project.

2.0 CEQA PUBLIC REVIEW PROCESS

2.1 PURPOSES OF PUBLIC REVIEW

CEQA Guidelines Section 15201 states:

> *"Public participation is an essential part of the CEQA process. Each public agency should include provisions in its CEQA procedures for wide public involvement, formal and informal, consistent with its existing activities and procedures, in order to receive and evaluate public reactions to environmental issues related to the agency's activities. Such procedures should include, whenever possible, making environmental information available in electronic format on the Internet, on a web site maintained or utilized by the public agency."*

The County of San Bernardino (County) has invited public input during the EIR preparation process, including providing opportunities to review and comment during the notice of preparation and during Draft EIR circulation, as discussed further in Section 2.2.

CEQA (California Public Resources Code (PRC) § 21082.2(b)) explains that, "Statements in an environmental impact report and comments concerning an environmental impact report shall not be determinative of whether the project may have a significant effect on the environment." According to CEQA, it is the responsibility of the lead agency decision makers to "determine whether a project may have a significant effect on the environment based on substantial evidence in the record." Substantial evidence is defined as facts, fact-related reasonable assumptions, and expert opinion. "Substantial evidence" does not include arguments, speculation, unsubstantiated opinion or narrative, clearly erroneous evidence, or socioeconomic impacts not related to the physical environment (PRC § 21080(e), 21082.2(a), 21082.2(c), and CEQA Guidelines § 15384).

2.2 PUBLIC REVIEW PERIOD AND NOTIFICATIONS

In accordance with both the specific requirements and the intent of CEQA, the environmental review process for the Project has included substantial opportunities for public and agency review and comment on the environmental evaluations. The public review process for the Project EIR has included the following opportunities:

- A Notice of Preparation (NOP) was issued by the County to surrounding property owners, interested parties and local organizations in October 29, 2014 for a period of 30 days.
- A Notice of Completion for the Draft EIR was filed with the State of California Clearinghouse on June 6, 2016, and a Notice of Availability was posted on the County's Internet website and sent to property owners within a 700-foot radius of the Project Site, and interested parties, organizations and agencies that previously expressed interest in the Project.

- The Draft EIR was circulated for review and comment between June 6, 2016, and July 20, 2016.
- The Draft EIR was made available for public review at the County of San Bernardino Public Library, Yucaipa Branch, the County of San Bernardino Land Use Services, and on the County's Internet website.
- Copies of the Draft EIR were provided, upon request, to responsible, trustee, and other federal, state, and local agencies expected or known to have expertise or interest in the resources that the Project may affect.
- Copies of the Draft EIR or notices of the Draft EIR's availability were sent to organizations and individuals with special expertise on environmental impacts and/or who had previously expressed an interest in this Project or other activities.

This Final EIR has been provided to commenting agencies, organizations, and individuals either in hard copy or electronic form on CD prior to Project hearings before County decision makers. Notice of the availability of this Final EIR was also provided to agencies, organizations, and the public who have previously expressed an interest in the Project but did not comment on the Draft EIR.

2.3 SUMMARY OF PUBLIC INPUT

A total of seven (7) comment letters were received on the Draft EIR. Each comment letter is included in Appendix A of this Final EIR. A list of the commenters and dates of the comment letters is provided in Table 3-1 of this Final EIR.

Comments addressed a range of issues, including several on the content and analysis of the Draft EIR. Comments addressing the adequacy of the EIR or issues relevant to the environmental review included the following topics:

- Visual impacts
- Scope of construction activities
- Land Use/General Plan, Oak Glen Community Plan, and Development Code Inconsistency
- Alternatives analysis content
- Growth Inducement and Cumulative Impacts

Many of the comments submitted were general and asked questions already addressed in the Initial Study/Mitigated Negative Declaration dated October 26, 2011. For example, potential impacts to air quality and soil erosion due to the construction of the Lazer Broadcasting radio broadcast facility were previously assessed in the County's Initial Study/Mitigated Negative Declaration and determined to have a less than significant impact.

In October 2013, the Superior Court required the County to further evaluate and prepare a focused EIR on the potentially significant issues limited to: Aesthetics, Land Use, Hazards (Fire

Safety), and Recreation. All other issues were either determined to be have been adequately addressed in the Initial Study/Mitigated Negative Declaration or were not addressed and thus waived in the writ of mandate proceedings.

2.4 APPROACH TO RESPONSES

The Draft EIR was circulated to numerous agencies having jurisdiction over natural resources that could be affected by the Project or having expertise or interest in environmental resources. In addition, interested organizations and individuals received the documents or were notified of their availability. A total of seven (7) comment letters were received by the County, each including specific comments or opinions, based on review of the Draft EIR. and the primary expressed concern regarded visual impacts, biological resources, land use compatibility, cumulative impacts, and fire safety. County responses to these comments have been prepared and are included in Section 4.0 of this Final EIR. The responses are indexed to correspond to comments with each letter and the response to each letter follows the letter.

3.0 COMMENTS AND RESPONSES

This chapter of the Final EIR provides specific responses by San Bernardino County ("County") to each issue raised in comment letters received on the Draft EIR during the public review period in regard to the Draft Environmental Impact Report ("DEIR") for the proposal by Lazer Broadcasting Corporation to construct and operate a radio broadcast facility to include a 43-foot tall monopole with attached antenna and a 10-foot by 10-foot single story (nine-feet tall) equipment building (together the "Project") on a 38.12 acre site located near Wildwood Canyon and Oak Glen Roads, west of Pisgah Peak Road in the unincorporated Yucaipa area of the County.

The public comment period for the Draft EIR began June 6, 2016 and ended July 20, 2016. A total of seven (7) comment letters were received. These are listed in Table 3-1 and are identified by a number. Individual comments within each letter are identified with a unique numeric indicator. For example the comment letter from the City of Yucaipa, is Letter 2. The letter contains four comments identified as comments 2-1 through 2-4; responses are respectively numbered Response 2-1 and Response 2-4. All comment letters are provided in their original form in Appendix A, Comment Letters Received on the Draft EIR.

Table 3-1
Comment Letters Received on the Draft Environmental Impact Report

Letter	Name	Date on Letter
1	Yucaipa Valley Conservancy	June 8, 2016
2	City of Yucaipa	June 27, 2016
3	Wildlands Conservancy	July 20, 2016
4	City of Yucaipa	July 20, 2016
5	Citizens for the Preservation of Rural Living	July 20, 2016
6	California Native Plant Society	July 21, 2016
7	Citizens for the Preservation of Rural Living	July 21, 2016

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Letter 1
Yucaipa Valley Conservancy, June 8, 2016

Response to Comment 1-1: This is an introductory comment. No comment to the DEIR is made and no response is required.

Response to Comment 1-2: The entire 38.12-acre Project site is outside of the boundary of the Wildwood Canyon State Park ("WCSP") and is located to the east of WCSP. No protected species or their habitat were found during any surveys of the project area (conducted in 2006, 2007, 2009, 2010, 2012, and 2015).

The County utilized the three available and different federal agency-published methodologies to review and assess the visual impact of the Project. In each case, using the published methodologies, the visual impacts of the proposed Project were determined to be less than significant. A deed restriction prohibiting development of the portion of the 38.12-acre site not used for the Project development allows this additional open area for public use.

Response to Comment 1-3: The demonstration monopole was permitted by the County via a Temporary Use Permit. Section 4.1 of the DEIR provides visual simulations and an analysis of the visual impacts of the Project, including all of its constituent parts. The visual impacts of the proposed Project were determined to be less than significant, including the steep west facing slope nearby the project.

Response to Comment 1-4: No protected species or their habitat were found during any surveys of the Project area (conducted in 2006, 2007, 2009, 2010, 2012, and 2015). Recent photographs (including aerials) of Pisgah Peak Road were obtained in addition to field review of the Project area. No permanent impacts to specific flora or fauna, or their habitat would occur.

The County adopted Conditions of Approval related to soil erosion requiring measures to reduce water run-off, siltation, and promote slope stability (COA No.13).

The DEIR determined that in the event of a lightning strike, the installation of an earthing system, application of fire protective coating, and maintenance within the fuel modification area would reduce the potential for wildfires in association with lightning strikes at the monopole. Potential impacts from lighting and ultimately wildfires would be reduced to a less than significant level with the listed mitigation measures. This conclusion was substantiated by a third-party expert in fire behavior hired by the County.
A deed restriction prohibiting development of the portion of the 38.12-acre site not used for the Project development allows this additional open area for public use.

Response to Comment 1-5: Noted.

Letter 2
City of Yucaipa, June 27, 2016

Response to Comment 2-1: This is an introductory comment. Because no comment to the DEIR is made, no response is required.

Response to Comment 2-2: Regarding the possibility of additional towers in the project area, such a concept is highly speculative and indeed very unlikely. In the last 20 years, the County has had only one other application for a radio broadcast tower in the general vicinity of the Project site.

The area determined available for potential cumulative project development is limited to the area shown in DEIR Figure 5-1. Other potential cumulative project areas that were identified on Figure 5-1 are not in close proximity to the Proposed Project and are unlikely to create a cumulative land use impact. Any request for an additional tower would require appropriate analysis under the California Environmental Quality Act ("CEQA") on a case by case basis.

Response to Comment 2-3: The County hired a third-party independent expert in Federal communications Commission ("FCC") regulations to review the previously prepared reports submitted by both the Project applicant and those opposed to the Project. . The DEIR conclusions related to the alternative sites were based on the peer review conducted by the County's independent consultant. Even if the Commenter's suggested alternative sites were considered, there is nothing to suggest that they would be superior. The suggested alternative sites would both require towers significantly higher than the 43-foot tower proposed for this project. As a result, it might well be concluded by the other jurisdictions where those possible sites exist that the height of the towers would make them objectionable.

CEQA considers the possibility of disagreement between/among experts and states in Guidelines Section 15151: "Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure".

Response to Comment 2-4: Noted.

Letter 3
Wildlands Conservancy, July 20, 2016

Response to Comment 3-1: Introductory comment; no response required.

Response to Comment 3-2: None of the County's community plans, goals and policies are intended to prohibit development. If the County goal was to restrict any type for development, a zoning designation of Open Space, rather than Rural Living, would have been applied to this area within the referenced plans as are lands to the north, east and south. Although the referenced plans have goals to expand the Wildwood Canyon State Park, none of the community plans, goals and policies are intended to prohibit development. Consistent with current zoning, a single-family residence could be constructed on the Project Site without the need for any discretionary actions by the County. In addition, the WCSP to the west is zoned by the City of Yucaipa as Institutional rather than Open Space.

The deed restriction prohibiting development of the remainder of the 38.12-acre site allows this additional open area to be available for public use and guarantees the remainder of the property will remain vacant.

Response to Comment 3-3: Relating to comments about the possible expansion of WCSP, the County disagrees that the Project limits the opportunity for expansion, and, in fact, results, by way of the deed restriction, in additional like passive use of the remainder of the Project site. At the present time, the property is privately-owned and is not legally accessible to Park users. The property is not otherwise available for acquisition.

Regarding the "potentially dangerous" emissions from radio frequency (RF) electronic fields, and the FCC rule related to fencing properties with RF towers, the Project includes the installation of a fence around the area to be determined by FCC testing to be appropriate for eliminating non-compliant RF exposure to the public. The exact placement of the fencing will be in accordance with FCC regulations developed for the protection from RF emissions and included on the final site plan submitted for County approval. In addition, "Radio Frequency Emissions" signs would be posted along the fenced area. Therefore, any "danger" to Park trail users inadvertently coming onto the area of the property that may produce RF emissions would be eliminated. As provided in the Project Description on DEIR Figure 1-3, "Signage" and "Security Fencing" will be installed per FCC regulations as may be required to address any possible RF conditions.

In development of the Project design, the Applicant contracted with firms with extensive expertise in radio communication facilities to insure compliance with FCC regulations. None of these experts expressed any concern whatsoever about dangerous RF exposure being possible from the proposed Project.

As the Commentor notes, there are FCC rules and regulations regarding protection of the public from possible RF radiation exposure. Compliance with the terms of any FCC permit will ensure that the Project has eliminated all reasonable hazards. The failure to comply with these regulations would result in a denial of a permit from the FCC. The fact that the FCC issued a permit is clear indication that compliance with FCC rules has been accomplished.

Response to Comment 3-4: The monopole location is along an area, which appears scraped, and is the form of a line down the slope. However, the majority of the scraping is temporary in nature as no extensive excavation occurred and vegetation would be allowed to regenerate. The vegetation was damaged by equipment utilized to perform geotechnical, and other due diligence studies on the site. This scarred area extends beyond the tower site and is part of a forked trail that starts at the curve of Pisgah Peak Road. It is apparent from the extension of the trail that this disturbance pre-dates the installation of the demonstration pole. Other disturbances include the other trail leading from the fork just west of Pisgah Peak Road.

The monopole location is on mostly bare dirt along the pre-existing trail. It is surrounded by a mixed chaparral habitat. The equipment shed location is in a less dense mixed chaparral community. Shrub species surrounding the site were similar to those found at the tower location (see DEIR Appendix F-4: August 17, 2015 Biological Resources Assessment, Photo 3).

Based on the Site Plan provided for the biological survey and assessment, the Project would result in temporary disturbance of already disturbed areas. However under baseline conditions, the pathway for installation of the utility line between the monopole and the equipment shed, which would also be used for foot-access maintenance, would result in new disturbance. In addition to the existing scraped area, the amount of vegetation to be removed for implementation of the required fuel modification zone around the equipment shelter and the monopole would partially be a new disturbance. The Project design seeks to minimize impacts to existing vegetation while providing for facility installation and the required fuel modification area. The fuel modification area will require regular maintenance to deter vegetation growth.

Portions of the Project Site that are currently disturbed and that may be disturbed during site construction shall be revegetated at the direction of a County-approved biologist in accordance with DEIR Mitigation Measure AES-2 as discussed below (underlining emphasis added):

> **Mitigation Measure AES-2:**
>
> *The Project Proponent shall revegetate the portion of the ridge where the demonstration pole was placed. During placement of the demonstration pole and conducting geotechnical field testing, vegetation was removed. The scraped area, which appears in the form of a line down the slope, and any other areas that may be disturbed during site development shall be revegetated at the direction of a County-approved biologist prior to issuance of occupancy permits.*

The County determines that this mitigation reduces the level of significance to a less than significant level.

Response to Comment 3-5: The revegetation plan will be subject to the approval of a County-approved biologist as noted above. If irrigation by water truck is deemed necessary (due to drought or other limiting conditions) until vegetation is established, that would be included in the plan. As is provided in any revegetation plan, success criteria will be established and establishment of vegetation will be required.

Response to Comment 3-6: Comment noted.

Letter 4
City of Yucaipa, July 20, 2016

Response to Comment 4-1: Introductory comment; no response required.

Response to Comment 4-2: The subsection "Utility Service" within DEIR Section 3.4 discusses in detail the 6,700 linear feet (LF) off-site and the 650 LF on-site utility installations. The construction activity associated with utility installation would not require a grading permit to be issued by the County. Soil/material would be excavated, the utility line would be laid, and the trench would be backfilled. Minimum depth of excavation for the line in Pisgah Peak Road would be 36 inches (per SCE requirements), and the trench depth of the on-site 650 feet would be at depth of 18 inches.

Regarding the assessment of potential impacts related to project construction, the Commentor asks for specifics related to construction equipment, methods, number of workers, truck routes, etc. The precise number of workers could vary somewhat from day-to-day, however, it is obvious from the minor activities required for completion of the Project that heavy equipment will not be used, either for transportation or construction. Certainly, the roadway will not be burdened with large trucks or equipment, nor will there be truck routes established through neighborhoods. Pisgah Peak Road will not be widened.

The County had developed Conditions of Approval (COA) for prior iterations of the proposed Project that include a Dust Control Plan for construction activities. That COA was based on the anticipated construction elements listed below.

- Approximately 25 days of construction over an 8-week period;
- No use of heavy equipment on-site (i.e. dozers, loaders, or graders);
- Use of a helicopter on approximately three days to deliver and hoist the pole;
- Use of the helicopter within the three days and/or the use of a 4-wheel drive vehicle to deliver building material, fencing, utility pipes/wiring, concrete and small mixer, and water;
- Grading by manual labor approximately 50 cubic yards of soil;
- Drilling by mechanical drill auger transported by helicopter or behind the four-wheel drive vehicle;
- Trenching by small hand-controlled ditch digger, back filled be hand and compacted by a hand-controlled compactor; no excess trenching material is expected; and
- Estimated approximately four trips per day for a four-wheel drive vehicle and trailer to deliver supplies and transport construction crew of up to 8 workers;

Additionally the County will at a minimum adopt the same COAs and provide for the discretionary use of either a helicopter or a 4-wheel drive vehicle.

Any construction-related impacts would be minimal and cause no impact even temporarily.

The stated objectives of the Project include more than expanding the radio broadcast coverage of the radio station. Additional objectives listed in DEIR Section 3.3.5 include:

- Increase County's broadcast coverage of above emergency broadcast and public service announcements to include an additional estimated 1 million Spanish-speaking listeners.
- Increase San Bernardino City Unified School District's listening audience (Spanish-speaking) for its educational show ("Buenas Escuelas, Buenas Noticias").
- Increase Casa de San Bernardino's and other social programs' listening audience (Spanish-speaking) for social educational information.
- Contribute to the expansion of WCSP through the implementation of a passive, not active, land use. As a passive land use broadcast towers have been implemented in many California State Parks
- Create long term buffering of passive land uses within and adjacent to the eastern WCSP boundary through dedication of development rights and/or transfer of ownership in fee of an area equal to approximately four percent of the current WCSP land area.

The DEIR analysis related to Alternatives was specifically focused on the broadcast coverage and compliance with FCC and other relevant regulations. The objectives related to passive use of a portion of the private property and a deed restriction were evaluated in several sections of the DEIR.

Response to Comment 4-3: The County agrees that any visual assessment is, indeed, subjective. The County has utilized all three of the available and different federal agency-published methodologies to review and assess the visual impact of the Project. In each case, using the published methodologies, the visual impacts of the proposed Project was determined to be less than significant. The conclusion of the DEIR, however, is that the controversy and public testimony in opposition to the Project may lead to a final determination of "significance".

The analysis within the DEIR, addressed the site with a baseline of "pre-pole conditions" at a time when the entire Project site remained undisturbed. Field notes within the earlier Visual Assessments did not use this baseline.

Response to Comment 4-4: The County hired a third-party independent expert in FCC regulations to review the previously prepared reports submitted by both the Applicant and the opposition. The DEIR conclusions related to the alternative sites were based on the peer review conducted by the County's independent consultant. The number of alternative sites selected for evaluation were indeed limited by a number of siting criteria. Additionally, under Guidelines Section 15126.6(f)(1), it is beyond the scope/jurisdiction of the County to weigh the merits and demerits of an alternative site/project that involves another jurisdiction's goals and policies.

Response to Comment 4-5: Camera settings are listed in the lower left hand corner of each visual simulation figure presented in the DEIR. The simulation images were scaled to the paper size to visually represent true distances while holding a print-out of figure at arm's length. Additionally, the lens focal length does not change when used on a different sized sensor; only

the angle of view changes. A 50 mm lens is always a 50 mm lens, regardless of the sensor type. The APS-C camera does not actually magnify the image any more than the full frame. Instead, the impression that it is zoomed in comes from the way it crops off the outsides of the scene.

Response to Comment 4-6: The Project Site is located approximately 1.5 miles south of the San Bernardino National Forest and over one-mile northwest of Oak Glen Road; a County designated Scenic Route. Due to topography the Project site is not visible from these roadways. As noted in the DEIR Section 4.1.2, during a field visit, the monopole was not visible from Wildwood Canyon Road or Oak Glen Road; thus, no photographs, analysis, or simulations were presented or required in the DEIR. It would not have been logical to provide photographs at every location from which the monopole was not visible.

Response to Comment 4-7: The proposed Project will not require the widening of Pisgah Peak Road. The trenching for utility installation will be a temporary impact with no native vegetation removal; and therefore, no visual impacts. Backfilling the trench will result in the return of the road to its pre-construction condition, which is currently a dirt road. No permanent impacts to the visual environment of the roadway would result.

Response to Comment 4-8: As noted in the Project's likely COA under Condition No. 13 "Continuous Maintenance" the property owner is required to continually maintain the property so that is it visually attractive, and includes that all facets of the development are regularly inspected, maintained, and that any defects are repaired in a timely manner. Elements to be maintained include but are not limited to: annual maintenance and repair of all structures, fencing/walls, walks, parking lots, driveways, and signs; removal of debris and graffiti on a weekly basis, maintenance of landscaping and erosion, and architectural control including maintenance of materials and colors. No additional mitigation or revisions to mitigation, as presented in the DEIR, is warranted.

As noted in Condition No. 4, "All of the conditions of this project are continuously in effect throughout the operative life of the project for the use approved. Failure of the property owner, tenant, applicant, developer or any operator to comply with any or all of the conditions at any time may result in the County pursuing an enforcement action that may include a public hearing and revocation of the approved land use…"

Response to Comment 4-9: As discussed in Comment 4-7, the proposed Project will not require the widening of Pisgah Peak Road. The entire length of Pisgah Peak Road is already disturbed and denuded of vegetation. A review of recent photographs (including aerials) of that road was conducted in addition to a field review of the Project area. The trenching for utility installation will be a temporary impact with no native vegetation removal. Backfilling the trench will result in the return of the road to its pre-construction condition. No permanent impacts to flora or fauna, or their habitat would occur. The Commentor does not provide any evidence to support his assertion that biological resources would be impacted.

Response to Comment 4-10: The Geotechnical Report from 2007 was prepared for the then-proposed Project which was a 120-foot high steel lattice tower with piers installed to depths of 28 feet. The current Project involves a wooden monopole at a maximum height of 43 feet which

will not require piers. Although the current tower design and footprint has been significantly reduced, the background data related to geology and soils is still valid, and was, therefore, used in preparation of the DEIR.

There will be no ground-borne vibration associated with installation of the monopole. Regarding nesting season requirements, the California Department of Fish and Wildlife's expressed policy is concerned with peak nesting periods and does not formally address year-round nesting.

Response to Comment 4-11: As previously noted, the Project would not require the widening of Pisgah Peak Road during construction. Construction activities would require a 4-wheel drive vehicle only and would not require the use of heavy equipment on-site (i.e., dozers, loaders, or graders) as all grading/earthwork will be conducted manually. Similarly, trenching shall be by a hand-controlled ditch digger, back filled by hand and compacted by a hand-controlled compactor. In addition, construction activities would be temporary and would not interfere with emergency vehicles including fire access.

According to County Fire, the steep access road to the Project site would be considered adequate because the Proposed Project would be an unmanned tower and fire crews would not travel to the Project site to suppress a fire at the facility (DEIR pg. 4.4-15). County Fire determined that the requirements for access road and water supply are not applicable requirements for unmanned structures that would not require evacuation or fire defense. COA will require that the equipment building have a multi-hour fire rating and a built-in fire suppression system that utilizes an inert gas.

Response to Comment 4-12: The Project does not propose the use of a back-up generator. With regard to the monopole, the demonstration pole was still in place at the time of the DEIR preparation and once it was removed the referenced text was not amended as it should have been prior to release of the DEIR for public review. Elsewhere in the DEIR, it is clear that the evaluation was finalized with the demonstration pole being removed.

Response to Comment 4-13: The Project itself would not interfere with the fire suppression capabilities of fire agencies responding to a wildland fire that could threaten inhabited structures, no matter what the cause of the fire. See Response to Comment 4-11 above.

Response to Comment 4-14: The underground electrical line extending to the proposed site from the existing KRBQ tower was determined in the DEIR to not be cumulative or growth inducing. The service extension, which the commentor alludes to as having the potential for being growth inducing, will be private. The DEIR determined that the provision of service to the Project site to not be growth-inducing because the service extension will be just that – a service lateral sized only to provide the necessary utility demand of the proposed Project. There would not be sufficient capacity available for any other users.

With the combined application of the criteria used to establish the cumulative broadcast tower Project area, the County General Plan, Development Code, and the Oak Glen Community Plan, the area available for potential cumulative Project development is limited to the area shown in Figure 5-1. Other potential cumulative Project areas that were identified on Figure 5-1 are not in close proximity to the Proposed Project and are unlikely to create a cumulative land use impact.

Additionally, any other project would be subject to individual, detailed CEQA analysis before such a permit could be issued.

The potential cumulative Project area utilized in the DEIR analysis (see Figure 5-1) was an approximate area defined to identify other projects that could share direct and indirect aesthetic impacts both individually and cumulatively. Other potential cumulative impacts for Air Quality, Biological Resources, Cultural Resources, and Greenhouse Gasses were analyzed on both a project and cumulative basis. Potential cumulative impacts analyzed for Aesthetics and Hazards were limited to the south and west facing slopes of the San Bernardino Mountains surrounding the Oak Glen Community.

For most projects (any requiring discretionary permits) that would conflict with the General Plan or any other land use parameter, CEQA review would be required before: 1) approval of the Project, 2) adoption of CEQA Findings, 3) issuance of a CUP, and 4) issuance of COA. It is typical in the issuance of a CUP that a project would then be consistent with the General Plan and therefore cumulative land use impacts would be unlikely.

Response to Comment 4-15: Broadcast towers, since they are generally of greater height than cell towers, were analyzed as a worst-case scenario. Thus, any tower, whether cell or broadcasting, would still meet the analysis presented in the DEIR including the possibility of development of up to seven (7) additional towers. As concluded in the DEIR, this does not in any way indicate there would ever be any applications for such uses, and would, among other things, assume a need for such a facility and suitable land for its installation.

With regarding the possible proliferation of communication towers in the Project area, such a concept is highly speculative and, indeed, very unlikely. In the last 20 years, the County has had only one other application for a radio broadcast tower in the area. Any request for an additional tower would require appropriate CEQA analysis on a case-by-case basis.

With regards to clarifying the “private line”, as stated in Section 5.0 of the DEIR, “The proposed Southern California Edison (SCE) utility extension from the existing power source nearest Wildwood Canyon Road extending to the equipment building is considered a “private service extension.” As such there will be no future tie-ins or connections to this utility permitted, and therefore electrical service would not be extended from this line to any other adjacent parcels. The extension of electrical service is and therefore not considered growth-inducing as it does not increase the capacity or availability of service to the general area, only to the Proposed Project.

Response to Comment 4-16: CEQA discusses disagreement between experts and states in Guidelines Section 15151: “Disagreement among experts does not make an analysis inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure”.

The County hired a third-party independent expert in FCC regulations to review the previously prepared reports submitted by both the Applicant and the opposition. The DEIR conclusions related to the alternative sites were based on the peer review conducted by the County’s

independent consultant. Even if the Commentor's suggested alternative sites were considered, there is nothing to suggest that they would be superior. The suggested alternative sites would both require towers significantly higher than the 43-foot tower proposed for this Project. As a result, it might well be concluded by the other jurisdictions where those possible sites exist that the height of the towers would make them objectionable.

Under Guidelines Section 15126.6(f)(1), it is beyond the scope/jurisdiction of the County to weigh the merits and demerits of an alternative site/project that involves another jurisdiction's goals and policies.

Response to Comment 4-17: The County hired a third-party independent expert in FCC regulations to review the previously prepared reports submitted by both the Applicant and the opposition. The DEIR conclusions related to the alternative sites were based on the peer review conducted by the County's independent consultant. Even if the Commentor's suggested alternative sites were considered, there is nothing to suggest that they would be superior. The suggested alternative sites would both require towers significantly higher than the 43-foot tower proposed for this Project. As a result, it might well be concluded by the other jurisdictions where those possible sites exist that the height of the towers would make them objectionable.

Under Guidelines Section 15126.6(f)(1), it is beyond the scope/jurisdiction of the County of San Bernardino to weigh the merits and demerits of an alternative site/project that involves another jurisdiction's goals and policies.

Response to Comment 4-18: Comment noted; Impacts to aesthetics for the No Project Alternative and the Proposed Project would be less than significant. However as stated in Section 4.1 Aesthetics of the EIR, this area of CEQA is highly subjective and public comments previously received by the County Board of Supervisors indicate a high level of viewer sensitivity to the monopole's visual impact. In consideration of this and the alternatives analysis showing that no other feasible Project Sites could avoid such impacts, although the project is considered highly beneficial, the County determines that the visual impact, at least to some portion of the population, is significant and unavoidable.

With regards to EIR Section 4.2 Biological Resources and the mention of a wooden pole, at the time of the site visit and analysis, the wooden pole was in place, but it has subsequently been removed.

The following statement that site constraints (i.e., access, utilities and policies) would prohibit development of a single-family home within the vicinity of the proposed tower, appears to be in error, since a single-family residence on a 20-acre or larger parcel is possible under the existing land use designation.

Response to Comment 4-19: Comment noted. The County disagrees that fire service impacts would be less than significant for the alternative site, simply because it is zoned single-family residence. The current project location is also zoned for residential and having the designation of residential does not necessarily imply that access would be accessible for fire services, but appropriate fire access would need to be provided to construct a single-family residence.

Also see Responses to Comment 4-4 and 4-16 above.

Response to Comment 4-20: Comment noted

Letter 5
Chatten-Brown & Carstens representing Citizens for the Preservation of Rural Living

Response to Comment 5-1: Comment noted and disputed, see detail below

Response to Comment 5-2: Although the referenced plans have goals to expand the WCSP, none of the community plans, goals and policies are intended to prohibit development. Consistent with current zoning, a single-family residence could be constructed on the Project site without the need for any discretionary actions by the County. Further, if the County goal were to restrict all types of development, a zoning designation of Open Space would have been applied to this area within the referenced plans, rather than that of Rural Living, as are the lands to the north, east, and south. In addition, the WCSP to the west is zoned by the City of Yucaipa as Institutional rather than Open Space.

The deed restriction prohibiting development of the remainder of the 38.12-acre site allows this additional open area to be available for public use. The County disagrees that this is inconsistent with the goals and objectives of the Oak Glen Community Plan related to open spaces, parklands, and other recreational opportunity. A Radio Broadcast Facility is, in fact, an allowed use within both the applicable General Plan and Community Plan land use designations.

Response to Comment 5-3: The subject property is privately-owned and may not be required by the County to remain undeveloped or limited to recreational uses without possibly requiring the exercise of eminent domain. The deed restriction has been a condition of the Project since 2012 and it will ensure that additional development on the site does not occur.

The County has stated in the DEIR that conflicts with the goals and policies of the County General Plan and the Oak Glen Community Plan are "potentially significant". However, after evaluation presented, and the application of a deed restriction as mitigation, potential impacts were determined to be less than significant. The deed restriction allows for passive use of the private property on undeveloped land adjacent to the WCSP.

Response to Comment 5-4: Regarding the allegation of "failing to provide substantive analysis", in addition to how the use of Mitigation Measure LU-1 does not purportedly mitigate inconsistency with the Conservation Goal, the County contends that the deed restriction is, in fact, consistent with the Conservation Goal OG/CO-1. It allows for passive use of the property; without the Project, the public use of this undeveloped land would not be possible.

Response to Comment 5–5: With regards to BLM classification (i.e., Class I); such lands are not prohibited from development. Areas adjacent to the Project site are developed and include development with greater visual impacts than the subject Project. The County has utilized all three of the available and different federal agency-published methodologies to review and assess the visual impact of the Project. In each case, using the published methodologies, the visual impacts of the proposed Project was determined to be less than significant. The conclusion of the DEIR, however, is that the controversy and public testimony in opposition to the Project may lead to a final determination of "significance".

In reference to the trial court saying: "The property at issue is undeveloped land 'in a pristine wilderness area", the DEIR, Section 4.1, states that the relative scenic value of a landscape is classified as: Class A - distinctive; Class B - typical; and Class C – indistinctive. The scenic attractiveness of the Project Site area, set near the eastern portion of the City of Yucaipa, is considered Class B and does not have any distinctive features and is typical of the landscape for the area. The subject property is privately-owned and County requiring the property to remain undeveloped, or limited strictly to recreational uses may require the exercise of eminent domain. The County concurs that a policy of the County's plan(s) is that the area near WCSP is intended to provide a "pristine wilderness experience to park visitors", but that is not the only use allowed under the County's plan(s). Again, the Project is not inconsistent with the General Plan or Oak Glen Community Plan policies where Open Space is not the designated land use.

Response to Comment 5-6: The County hired a third-party independent expert in FCC regulations to review the previously prepared reports submitted by both the Applicant and the opposition. The DEIR conclusions related to the alternative sites were based on the peer review conducted by the County's independent consultant. Even if the Commentor's suggested alternative sites were considered, there is nothing to suggest that they would be superior. The suggested alternative sites would both require towers significantly higher than the 43-foot tower proposed for this Project. As a result, it might well be concluded by the other jurisdictions where those possible sites exist that the height of the towers would make them objectionable. Under Guidelines Section 15126.6(f)(1), it is beyond the scope/jurisdiction of the County to weigh the merits and demerits of an alternative site/project that involves another jurisdiction's goals and policies.

None of the referenced community plans, goals and policies are intended to prohibit development, including development within wilderness areas. If the County goal were to restrict all types of development, a zoning designation of Open Space, rather than Rural Living would have been applied to this area within the referenced plans, as are the lands to the north, east, and south. The WCSP to the west is zoned by the City of Yucaipa as Institutional, not Open Space.

Relating to comments about the possible expansion of the WCSP, expansion is provided by way of the deed restriction, with additional like passive use of the remainder of the Project site. At the present time, the property is privately-owned and is not legally accessibly for WCSP users. The property is not otherwise available for acquisition.

Response to Comment 5-7: The field survey assessment provided by Goodman and Associates provided an estimation of slopes at the location of the tower and equipment shed as being about 40%. The actual survey data plotted and signed off by a licensed surveyor confirms that the buildings and structures that are proposed to be constructed on-site are in conformance with the Development Code and are located on less than 40% slopes.

Grading pads for the parking space and the equipment shed are required to be on land with slopes not exceeding 40%; this is shown on conceptual site plan (DEIR Figure 1-3). The engineering data submitted to the County and provided as exhibits in the DEIR have been verified by a licensed surveyor using flown topographic mapping verified by field survey data to confirm that all of the Project's facilities are to be located on slopes less than 40%. A final site

plan and grading plan showing compliance with the County's requirements will be submitted by the Applicant for approval by the County prior to construction.

With regard to erosion control, the current project had been previously approved by the Board of Supervisors, and Conditions of Approval in that regard were issued in 2012 to address potential air quality impacts. This objection was considered and rejected by the Court and therefore, is not to be brought up again as a new issue. The DEIR is intended only to cover those items which the Court found to be in need of further review. Per Condition of Approval Nos. 12 and 14, grading permits (if necessary) and continuous maintenance of the site are required which include erosion control measures.

Response to Comment 5-8: The County disagrees that there is no substantial evidence provided in the analysis of cumulative impacts. With the combined application of the criteria used to establish the cumulative broadcast tower Project area, the County General Plan, Development Code, and the Oak Glen Community Plan, the area available for potential cumulative Project development is limited to the area shown in Figure 5-1. Other potential cumulative Project areas that were identified on Figure 5-1 are not in close proximity to the proposed Project and are very unlikely to create a cumulative land use impact. Additionally, any other project would be subject to individual, detailed CEQA analysis before such a permit could be issued.

The potential cumulative Project area utilized in the DEIR analysis (see Figure 5-1) was an approximate area defined to identify other projects that could share direct and indirect aesthetic impacts both individually and cumulatively. Other potential cumulative impacts for Air Quality, Biological Resources, Cultural Resources, and Greenhouse Gasses were analyzed on both a project and cumulative basis. Potential cumulative impacts analyzed for Aesthetics and Hazards were limited to the south and west facing slopes of the San Bernardino Mountains surrounding the Oak Glen Community.

With regard to erosion control, the current project has already been approved by the Board of Supervisors and COA were issued in 2012 to address potential air quality impacts. This objection was considered and rejected by the Court and therefore, is not to be brought up again as a new issue. The DEIR is intended only to cover those items which the Court found to be in need of further review. Per COA Nos. 13 and 43, erosion control permits and continuous maintenance of the site are required which include erosion control measures.

Response to Comment 5-9: Related to the comment that the DEIR fails to analyze General Plan consistency and a project requiring a General Plan Amendment, the Plan's policies are used to guide development; it is not necessary that every project conform to every aspect of a general plan goal or policy. Instead that determination is left to the administrative body (here the County) to determine general conformance. A finding that a particular project is consistent with the general plan requires only that the proposed project be "*compatible* with the objectives, policies, general land uses, and programs specified in" the applicable plan. (Emphasis added.) Government Code §66473.5. The courts have interpreted this provision as requiring that a project be "in agreement or harmony with the terms of the applicable plan, not in rigid conformity with every detail" of it. *San Franciscans Upholding the Downtown Plan v City* & *County of San Francisco* (1st Dist. 2002) 102 Cal. App. 4th 656, 678 (administrative record

supported city's finding, as required by general plan, that Emporium Building retained no substantial market value in its existing condition). Similarly, the Oak Glen community is developed and continues to be further developed (frequently with only ministerial approvals) with projects that have greater visual impacts than the subject Project. Accordingly, it is seen that the Oak Glen Community Plan does not preclude development of private property.

As discussed in the preceding comments, there has been no new information provided, no need to revise the Project description or the impact determinations, no new or revised mitigation measures are proposed for adoption, and no new feasible alternatives have been identified. Therefore, there is no need to recirculate the DEIR (CEQA Section 15088.5).

Letter 6
California Native Plant Society, July 21, 2016

Response to Comment 6-1: Introductory comment; no response related to the DEIR is required.

Response to Comment 6-2: The County intends to require the use of locally-sourced plant species native to the site. The County welcomes input from CNPS regarding plant species to be selected.

Letter 7
Mirau, Edwards, Cannon, Lewin & Tooke representing Citizens for the Preservation of Rural Living, July 21, 2016

Response to Comment 7-1: Introductory comment; no response required.

Response to Comment 7-2: Comments will be entered into County's official administrative record for the Project.

Response to Comment 7-3: The new and current project is significantly different from the 2007 proposal and this current Project has already been approved by the Board of Supervisors. Res judicata was not raised at the earlier trial and should not be raised now. *Silverado Modjeska Recreation and Park District v. County of Orange* (2011) 187 Cal. App. 4th 282. Instead, this EIR is intended to cover only those items which the trial Court found to be in need of further review. The potential for disrupting scenic views from WCSP was addressed in the DEIR and the impacts were determined to be significant and unavoidable.

Response to Comment 7-4: The legal doctrine of collateral estoppel does not apply here, but even if it did, the doctrine cannot be asserted by a third party (the Commentor), but is the County's defense if it elects to assert it. The California Supreme Court has listed five threshold requirements that must be fulfilled to establish collateral estoppel, the first two of which are apropos. *Pacific Lumber Co. v. State Water Resources Control Board* (2006) 37 Cal. 4th 921. First, the issue sought to be precluded from relitigation must be identical to that decided in a former proceeding. Although the current Project has rudimentary similarities to the project considered previously, it is not identical. Because the current Project is different from the previous project, the second requirement is also unmet, namely, the issues were not actually litigated previously.

The County has provided in the Development Code that the same or substantially the same project may be resubmitted, either with prejudice (Development Code § 86.06.080(a)) or without prejudice (Development Code § 86.06.080(b)), the only difference being time limitations for projects denied with prejudice. No other limitations for the exercise of discretion are imposed on the reviewing authority, a factor of particular import when more recent and more complete information becomes available.

Response to Comment 7-5: This comment is mistaken since Section 3.5 of the EIR is simply providing a history of the evolution of the current Project. That portion addressing the need for a major variance is not applicable to the current Project, but was applicable to a prior and larger project, again showings that the current Project is significantly different than the previously proposed project.

Commentor objects because DEIR Section 3.5 does not mention County Building and Grading permits as being among those required. In DEIR Section 3.5 it is specifically noted that the permits set forth therein are not all inclusive. However, in DEIR Section 2.6 entitled: Required Permits and Approvals, both the grading and building permits are listed.

In DEIR Section 4.4, a major variance for fire protection is listed as a discretionary permit, which was correct at the time the current Project application was submitted to the County (2010). Prior to completion of the DEIR analysis on this Project (June 19, 2014), the County Development Code was amended allowing the Fire Marshal discretion to determine whether a variance is needed. Following review by the County's Fire Marshal, it was determined that a variance is not needed for this Project, as is indicated in DEIR Section 4.4.3.

Response to Comment 7-6: The subsection "Utility Service" within DEIR Section 3.4 discusses in detail the 6,700 LF off-site and the 650 LF on-site utility installations. This construction activity (of either leg) would not require that a grading permit be issued by the County. Soil /material would be excavated, the utility line would be laid, and the trench would be backfilled. Minimum depth of excavation for the line in Pisgah Peak Road would be 36 inches (per SCE requirements), and the trench depth of the on-site 650 feet would be at depth of 18 inches). The off-site utility trenching activity (in Pisgah Peak Road) does not require a grading permit to be issued by the County.

Response to Comment 7-7: Although the County concurs that the Open Space Policy Area No. 47 seeks to preserve resources and provide for public opportunities to enjoy open space, however, Open Space Policy Area No. 47 does not prohibit or limit development. The proposed Project was evaluated in light of its compliance with this Policy and was determined in the DEIR analysis to not conflict with the policy because of the Project's extremely limited impact on the Oak Glen area and surrounding open space that is available for recreational use. Furthermore, the subject property is privately-owned and could not be required by the County to not be developed or limited to recreational uses without possibly requiring the exercise of eminent domain.

None of the referenced community plans, goals and policies are intended to prohibit development. If the County goal were to restrict all types of development, a zoning designation of Open Space, rather than Rural Living would have been applied to this area within the referenced plans, as are the lands to the north, east, and south. The WCSP to the west is zoned by the City of Yucaipa as Institutional, not Open Space.

Response to Comment 7-8: The field survey assessment provided by Goodman and Associates provided an estimation of slopes at the location of the tower and equipment shed as being about 40%. The Commentor uses citations from the biological resources assessment as alleged confirmation of greater slope angles. The biologist did not use topographic survey methods to determine slopes, but rather estimated the slope angle based on a site visit and review of USGS maps. The actual survey data plotted and signed off by a licensed surveyor confirms that the buildings and structures that are proposed to be constructed on-site are in conformance with the Development Code and are less than 40% slopes.

Grading pads for the parking space and the equipment shed are required to be on land with slopes not exceeding 40%; this is shown on conceptual site plan (DEIR Figure 1-3). The engineering data submitted to the County and provided as exhibits in the DEIR have been verified by a licensed surveyor using flown topographic mapping verified by field survey data to confirm that all of the Project's facilities are to be located on slopes less than 40%. A final site

plan and grading plan showing compliance with the County's requirements will be submitted by the Applicant for approval by the County prior to construction.

Response to Comment 7-9: The commentor conflates the role of the courts in CEQA jurisprudence vis a vis lead agencies, and confuses their role in our system of government generally. The EIR was prepared to address the concerns that the court had regarding incomplete analysis. In so far as the matter involves a potential conflict with the goals of the Oak Glen Community Plan, the EIR presents evidence that can support a determination of community plan consistency. See Section 4.5 Land Use and Planning, pages 4.5-10 through 4.5-13.

Although the standards of review set forth in Public Resources Code §§21168 (administrative mandamus) and 21168.5 (ordinary mandamus) are superficially different, courts have interpreted them to impose the same two tests in any action to review a CEQA determination. Under Public Resources Code § 21168, the court is limited to determining "whether the act or decision is supported by substantial evidence in light of the whole record." Under Public Resources Code § 21168.5, the test is whether the agency committed a "prejudicial abuse of discretion," which may be shown "if the agency has not proceeded in a manner required by law or if the determination or decision is not supported by substantial evidence."

Thus, the court ruling at issue goes only to the extent that the courts are empowered by CEQA to interpret and direct lead agency actions, namely, whether the agency's action is supported by substantial evidence or the agency has abused its discretion. Otherwise, "[w]hen an administrative agency has been delegated quasi-legislative authority, excessive interference with its quasi-legislative actions would conflict with the principle that the legislative branch is entitled to deference from the courts because of the constitutional separation of powers (Cal. Const., art. III, § 3)." *Western States Petroleum Association v. Superior Court* (1995) 9 Cal. 4th 559, 572.

Response to Comment 7-10: The proposed Project would impact an estimated 425 square feet (sf) of land for the installation of the tower, the equipment shed, parking area, and on-site utilities. The 1+ mile of the electrical undergrounding referenced in Commentor's letter would occur on an existing dirt roadway, already completely disturbed and devoid of vegetation. Construction of the utility easement would not extend beyond the existing, unimproved roadway easement. The 1+ mile of Pisgah Peak Road is not a part of the entire 38.12-acre property referred as the Project site. The utility alignment within the private road is an off-site utility extension and was evaluated by the DEIR for impact to biological resources.

That portion of the 38.12-acre property that is to be deed-restricted to the Park was intended to support expansion of the Park and provide for passive use of the property.

Response to Comment 7-11: Regarding the "potentially dangerous" emissions from radio frequency (RF) electronic fields, and the FCC rule related to fencing properties with RF towers, the County concurs that the Lazer tower site is potentially accessible from the trails within the WCSP, trails within the City of Yucaipa, and from Pisgah Peak Road. The Project includes the installation of a fence around the area to be determined by FCC testing to be appropriate for eliminating non-compliant RF exposure to the public. The exact placement of the fencing will be

in accordance with FCC regulations developed for the protection from RF emissions and included on the final site plan submitted for County approval.

"Radio Frequency Emissions" signs would be posted on the fenced area. Therefore, any "danger" of Park trail users inadvertently coming onto the area of the property that may have RF emissions would be eliminated. As provided in the Project Description on DEIR Figure 1-3, "Signage" and "Security Fencing" will be installed per FCC regulations as may be required to address any possible RF conditions.

In development of the Project design, the Applicant contracted with firms with extensive expertise in radio communication facilities to insure compliance with FCC regulations. None of these experts expressed any concern whatsoever about dangerous RF exposure being possible from the proposed Project.

As the Commentor notes, there are FCC rules and regulations regarding protection of the public from possible RF radiation exposure. Compliance with the terms of any FCC permit will ensure that the Project has eliminated all reasonable hazards. The failure to comply with these regulations would result in a denial of a permit from the FCC. The fact that the FCC issued a permit is clear indication that compliance with FCC rules has been accomplished.

Response to Comment 7-12: Comment noted. Although the referenced plans have goals to expand the WCSP, none of the community plans, goals and policies are intended to prohibit development. Consistent with current zoning, a single-family residence could be constructed on the Project site without the need for any discretionary actions by the County. Further, if the County goal were to restrict all types of development, a zoning designation of Open Space would have been applied to this area within the referenced plans, rather than that of Rural Living, as are the lands to the north, east, and south. In addition, the WCSP to the west is zoned by the City of Yucaipa as Institutional rather than Open Space.

Response to Comment 7-13: The deed restriction prohibiting development of the remainder of the 38.12-acre site allows this additional open area to be available for public use. The County disagrees that this is inconsistent with the goals and objectives of the Oak Glen Community Plan related to open spaces, parklands, and other recreational opportunity.

Relating to the allegation that DEIR ignored the radio frequency waves, see Response to Comment 7-11.

Relating to the contention that the DEIR ignored "an industrial facility" disturbing a "pristine, open-space view" that is not something contemplated by the General Plan, or Oak Glen Community Plan, communication tower use is, in fact, an allowed use within both applicable the General Plan and Community Plan land use designations.

Relating to the comment that "the monopole being proposed below the ridgeline", the DEIR refers to the most prominent, noteworthy peak of the mountain range when looking northeast from a trail southwest of the Project site, as is shown in Figure 4.1-5. Based on the photos used in the visual assessment for the DEIR, several vantage points are presented, all varying in what

portion of the mountain range is visible. A ridgeline is typically defined as the highest point of a mountain ridge, and this definition was used for purposes of the DEIR analysis. Because the monopole is to be placed well below the highest points of the mountain range, as viewed from several vantage points, it is seen from the photos and simulations that the monopole location is well below the "ridgeline". Photographs taken of the demonstration pole were used in Figure 4.1-5.

Relating to comments about the possible expansion of the WCSP, the County disagrees that the Project limits the opportunity for expansion, and, in fact, results, by way of the deed restriction, in additional like passive use of the remainder of the Project site. At the present time, the property is privately-owned and is not legally accessible to Park users. The property is not otherwise available for acquisition.

Response to Comment 7-14: The Commentor appears to misunderstand the procedures that the County follows. Most projects (any requiring discretionary approvals) would not be entirely consistent with the General Plan if there weren't COA to make the Project consistent. A project application, if requiring permits, may require CEQA review before: 1) approval of the Project, 2) adoption of CEQA Findings, 3) issuance of a CUP, and, 4) issuance of Conditions of Approval. It is typical in the issuance of a Conditional Use Permit that a project would then become consistent with the General Plan.

Regarding the allegation of "misplacement" of Mitigation Measure LU-1 in that it purportedly does not mitigate inconsistency with the Conservation Goal, the County contends that the deed restriction is, in fact, consistent with the Conservation Goal OG/CO-1. It allows for passive use of the property; without the Project, the public use of this undeveloped land would not be possible.

Response to Comment 7-15: Aesthetics – The Pisgah Peak Open Space Policy Area 47 does not mention scenic resources. The primary goal of the policy is to support the diversity of species including large mammals and maintaining habitat values. It is the County Staff's determination, based in part on the Biological Resources Assessment, that due to the relatively small size of the Project, it will not be in conflict with the Pisgah Peak Open Policy Area 47. The General Plan and its policies are used to guide development; it is not necessary that every project conform to every aspect of a general plan goal or policy. Instead that determination is left to the administrative body (here the County) to determine general conformance. A finding that a particular project is consistent with the general plan requires only that the proposed project be "*compatible* with the objectives, policies, general land uses, and programs specified in" the applicable plan. (Emphasis added.) Government Code § 66473.5. The courts have interpreted this provision as requiring that a project be "in agreement or harmony with the terms of the applicable plan, not in rigid conformity with every detail" of it. *San Franciscans Upholding the Downtown Plan v City* & *County of San Francisco* (1st Dist. 2002) 102 Cal. App. 4th 656, 678 (administrative record supported city's finding, as required by general plan, that Emporium Building retained no substantial market value in its existing condition).

Contrary to the position of the Commentor, Open Space Policy Area 47 does not speak to scenic vistas.

Regarding the possible proliferation of high towers in the Project area, such a concept is highly speculative and, indeed, very unlikely. In the last 20 years, the County has had only one other application for a radio broadcast tower in the area. Moreover, any request for an additional tower would require appropriate CEQA analysis on a case-by-case basis.

Regarding efforts by conservancies to acquire and expand open space areas (and the Park), those long-range plans may not come to fruition and, by no means, guarantee acquisition. Such a contingency does not, in any way, preclude legal development of private property (such as the Project site) in the meantime.

Response to Comment 7-16: The scenic area referenced includes U.S. Forest Service (USFS) lands; such lands are not prohibited from development. In fact the USFS maintains land use plans that allow for development to occur within the forest. In addition, as stated in Response to Comment 7-15 above, the General Plan and its policies are used to guide development; it is not necessary that every project conform to every aspect of a general plan goal or policy. Instead that determination is left to the administrative body (here the County) to determine general conformance. *Save our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal. App. 4th 99 Oak Glen community is developed and continues to be further developed (frequently with only ministerial approvals) with projects that have greater visual impacts than the subject Project. Accordingly, it is seen that the Oak Glen Community Plan goal is not intended to preclude development of private property.

Response to Comment 7-17: The statements in the DEIR related to the Project being located below the ridgeline is correct in that the reference is to all portions of the Project being below the most prominent ridgeline as seen from WCSP. Figure 4.1-2 (and all other simulations in this section of the DEIR) points to the area of placement of these facilities. These exhibits clearly identify the location of the facilities, not the specific placement related to elevation. The arrows on the simulations point to the location, not the elevation of the structures. Regardless, even if the Project were to be located at/on the ridgeline, (which it is not) there is nothing in County Code prohibiting placement of a tower "on a ridgeline".

Response to Comment 7-18: The analysis discussed in the EIR, disclosed that although portions of the project maybe visible from certain vantage points, the impacts as determined by the three established visual assessments indicate that they are not substantial. However, as further indicated in the EIR, because of the significant public responses obtained, it was concluded in Section 4.1 Aesthetics, page 4.1-25 that:

> "The Lead Agency determines that implementation of Mitigation Measures AES-1 and AES-2 would reduce potential visual impacts at the Wildwood Canyon State Park and nearby sensitive receptors including residences and trail users to a less than significant level. This is supported by the analysis that relied on the USFS model and other federal agency models for determining and ranking visual changes in the environment. However, this area of CEQA is highly subjective and public comments previously received by the County Board of Supervisors indicate a high level of viewer sensitivity to the monopole's visual impact. In consideration of this and the alternatives analysis showing that no other feasible

> Project Sites could avoid such impacts, although the project is considered highly beneficial, the County determines that the visual impact, at least to some portion of the population, is significant and unavoidable."

The County will ensure that the administrative record compliances with Public Resources Code Section 21167.6, which governs the content of administrative records.

Response to Comment 7-19: The County agrees that any visual assessment is, indeed, subjective. The County has utilized all three of the available and different federal agency-published methodologies to review and assess the visual impact of the Project. In each case, using the published methodologies, the visual impacts of the proposed Project were determined to be less than significant. The conclusion of the DEIR, however, is that the controversy and public testimony in opposition to the Project may lead to a final determination of "significance".

Response to Comment 7-20: Mitigation Measure AES-1 reduces the level of significance of the impact; this is a feasible mitigation measure. Regularly changing the paint color on the monopole based on weather or seasonal conditions would not be feasible.

Response to Comment 7-21: The access between the tower and the equipment shed was included as an unvegetated dirt access in the visual simulations model. It is most clearly seen in Figure 4.1-4. The discussion of impact is, indeed, limited; the access, being a foot path, is similar to trails located throughout this area of the mountain range. Likewise, the fuel modification zone was also included in the visual simulations model, but is not a prominent feature from the viewpoints modeled.

Response to Comment 7-22: The concept of visual impact is extremely subjective. As set forth in the DEIR, the experts utilizing all accepted methodologies came to the conclusion that the visual impacts would be less than significant. However, because it is subjective a different conclusion could be reached.

Response to Comment 7-23: The Commenter's opinion is noted. The comment provides no reference to the DEIR and therefore, no further response is warranted.

Response to Comment 7-24: The deed restriction has been a part of the Project since 2009. CEQA objectives are often a combination of both the Applicant's and the Lead Agency's objectives.

Response to Comment 7-25: A No Project Alternative is not intended under CEQA to be limited to a total lack of development, but can also be potential development within the present land use designation that could be done on a ministerial basis. The example cited in the DEIR complies with the existing land use designation of Rural Living and meets the intent of providing an appropriate No Project Alternative analysis.

The Commentor suggests that the No Project Alternative be analyzed with the assumption that the property would be used for open space purposes; such a land use would require a General Plan Amendment which would not be considered "No Project". Keeping the property vacant as

an appropriate No Project Alternative would fail to recognize that the property is capable of development within existing zoning and building requirements.

Regardless of the size of the residence chosen for construction, the visual impacts would likely be greater than those of the proposed Project because such development could include structures exceeding the mass and/or height of the proposed Project. The fact that residential construction is discouraged does not mean that it is prohibited on an individual basis.

Response to Comment 7-26: CEQA discusses disagreement between experts and states in Guidelines Section 15151: "Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure."

The County hired a third-party independent expert in FCC regulations to review the previously prepared reports submitted by both the Applicant and the Project opponents. The DEIR conclusions related to the alternative sites were based on the peer review conducted by the County's independent consultant. Even if the Commentor's suggested alternative sites were considered, there is no credible evidence to suggest that they would be superior. The suggested alternative sites would both require towers significantly higher than the 43-foot tower proposed for this Project. As a result, it might well be concluded by the other jurisdictions where those possible sites exist that the height of the towers would make them objectionable.

Under Guidelines Section 15126.6(f)(1), it is beyond the scope/jurisdiction of the to weigh the merits and demerits of an alternative site/project that involves another jurisdiction's goals and policies.

Response to Comment 7-27: As discussed immediately above, CEQA accommodates disagreement between experts. There is always the possibility of avian collisions with any structure. This does not prohibit the construction of structures in most areas. Instead, the interim guidelines suggested by the U.S. Fish & Wildlife Service (USFWS) acknowledge the potential for collision and make recommendations to minimize collision impacts when it is not possible to avoid those impacts because of other considerations. The comment that co-locating the tower elsewhere, per the interim USFWS guidelines was not recommended. The USFWS recommendations are simply that, they are not a requirement. There are many other considerations that affect the tower placement other than bird collision impacts.

Co-location was not evaluated because there was no suitable existing tower site available that would meet the Project objectives. Co-location would require a number of factors, not the least of which is obtaining the consent of an existing pole's owner. Further, there is no existing "antennae farm" where most of the Project's objectives could be met.

Response to Comment 7-28: It is not required, and not always necessary, to conduct a four-season survey for a given project. The purpose of the surveys conducted for the Project was to evaluate site conditions and determine whether any legally protected species or suitable habitat for those species were present in the Project area and/or would be impacted by the Project. Had

any of these conditions prevailed within the Project area, the general biological assessments would have recommended appropriate focused studies for those protected resources. None of the legally-protected species or their habitat were found during any surveys of the Project area (conducted in 2006, 2007, 2009, 2010, 2012, and 2015).

Response to Comment 7-29: The entire length of Pisgah Peak Road is already disturbed and denuded of vegetation. A review of recent photographs (including aerials) of the road was conducted in addition to a field review of the Project area. The trenching for utility installation will be a temporary impact with no native vegetation removal. Backfilling the trench will result in the return of the road to its pre-construction condition. No permanent impacts to flora or fauna, or their habitat would occur. The Commentor does not provide any evidence to support his assertion that biological resources would be impacted.

Response to Comment 7-30: Regarding the assessment of potential impacts related to Project construction, the Commenter asks for specifics related to construction equipment, methods, number of workers, truck routes, etc. The precise number of workers could vary somewhat from day-to-day, however, it is obvious from the minor activities required for completion of the Project that heavy equipment will not be used, either for transportation or construction. Certainly, the roadway will not be burdened with large trucks or equipment, nor will there be truck routes established through neighborhoods.

The County has developed COA for prior iterations of the proposed Project that include a Dust Control Plan for construction activities. That COA was based on the anticipated construction elements listed below.

- Approximately 25 days of construction over an 8-week period;
- No use of heavy equipment on-site (i.e. dozers, loaders, or graders);
- Use of a helicopter on approximately three days to deliver and hoist the pole;
- Use of the helicopter within the three days and/or the use of a 4-wheel drive vehicle to deliver building material, fencing, utility pipes/wiring, concrete and small mixer, and water;
- Grading by manual labor approximately 50 cubic yards of soil;
- Drilling by mechanical drill auger transported by helicopter or behind the four-wheel drive vehicle;
- Trenching by small hand-controlled ditch digger, back filled be hand and compacted by a hand-controlled compactor; no excess trenching material is expected; and
- Estimated approximately four trips per day for a four-wheel drive vehicle and trailer to deliver supplies and transport construction crew of up to 8 workers;

Additionally, the County will at a minimum adopt the same COAs and provide for the discretionary use of either a helicopter or a 4-wheel drive vehicle.

Any construction-related impacts would be minimal and considered temporary in nature (See: City of Arcadia v. State Water Resources Control Board (4th Dist. 2006) 135 Cal. App. 4th 1392).

Regarding the Geotech Report, the 2007 report was prepared for the then-proposed Project which was a 120-foot high steel lattice tower. The report was prepared for use by the Applicant in the evaluation of the property and to assist engineers in design of Project plans and specifications. Although the current tower design and footprint has been significantly reduced, the background data related to geology and soils is still valid, and was, therefore, used in preparation of the DEIR. The current Project involves a wooden monopole at a maximum height of 43 feet which is approximately 1/3 of the height and far less weight than the tower evaluated in the geotechnical report.

The installation of a 43-foot monopole, that was previously placed by a way of lawful Temporary Use Permit does not require substantial drilling or digging within dense bedrock. The prior demonstration monopole was installed without any guy wires, or mechanical equipment use. The pole was set and was subsequently removed.

Therefore, the concerns expressed by the Commentor are not applicable to the current Project.

Response to Comment 7-31: Construction of the utility line within Pisgah Peak Road is described in Response to Comment 7-6.

Response to Comment 7-32: The current Project has already been approved by the Board of Supervisors and COA were issued in 2012 to address potential air quality impacts. This objection was considered and rejected by the Trial Court and therefore, is not to be brought up again as a new issue. The DEIR is intended only to cover those items which the Trial Court found to be in need of further review.

Potential impacts to air quality due to the construction and operation of the Lazer Broadcasting radio broadcast facility were assessed in the County's Initial Study/Mitigated Negative Declaration (IS/MND) dated October 26, 2011 and determined to have a less than significant impact. Subsequently, in October 2013, the Superior Court required the County to further evaluate and prepare a focused EIR on the potentially significant issues of Aesthetics, Land Use, Hazards (Fire Safety), and Recreation. All other issues were either determined to be have been adequately addressed in the IS/MND or were not addressed and thus waived in the writ of mandate proceedings.

The IS/MND and the EIR dated May 2016 both describe the planned construction of the radio broadcasting facility. As therein provided, the construction of the site would include the following:

- Approximately 25 days of construction within an 8-week period;
- No use of heavy equipment on-site (i.e. dozers, loaders, or graders);
- Use of a helicopter on approximately three days to deliver and hoist the pole;

- Use of the helicopter within the three days and/or the use of a 4-wheel drive vehicle to deliver building material, fencing, utility pipes/wiring, concrete and small mixer, and water;
- Grading by manual labor slightly less than 50 cubic yards of soil;
- Drilling by mechanical drill auger transported by helicopter or behind the four-wheel drive vehicle;
- Trenching by small hand-controlled ditch digger, back filled be hand and compacted by a hand-controlled compactor; no excess trenching material is expected; and
- Estimated approximately four trips per day for a four-wheel drive vehicle and trailer to deliver supplies and transport construction crew of up to 8 workers;

The IS/MND determined that short-term minor construction emissions would occur during construction from soil disturbance and equipment exhaust. However, based on the short-term construction period, minor grading, no heavy equipment use, and the SCAQMD modeling results of similar construction activities, the Proposed Project would not exceed SCAQMD thresholds for PM_{10}. As with any construction within the South Coast Air Basin, any of the proposed Project's construction activities are subject to SCAQMD Rule 402 and Rule 403 for dust control.

Per COA No. 36, the developer is required to submit and comply with a dust control plan to minimize dust emissions.

Noise would not occur during operation of the facility. Per COA No. 32, construction would be limited to weekdays and Saturdays to the hours of 7 a.m. and 7 p.m., with no construction on Sundays.

Per COA Nos. 43 and 13, erosion control permits and continuous maintenance of the site are required which include erosion control measures.

Per COA No. 67 and Mitigation Measure AES-2, the developer shall implement a fire-resistant landscaping plan.

Response to Comment 7-33: The underground electrical line extending to the proposed site from the existing KRBQ tower was determined in the DEIR to not be growth inducing. The service extension will be private which the Commenter alludes to having the potential for being growth inducing. The DEIR determined the provision of service to the Project site to not be growth-inducing because the service extension will be just that – a service lateral sized only to provide the necessary utility demand of the proposed Project. There would not be sufficient capacity available for any other users.

Response to Comment 7-34: The Commentor states that neither the EIR nor the letter from Don Oaks discusses the impact of a brush fire caused by a lightning strike to the tower would have on adjacent neighborhoods and residential dwellings. DEIR Section 4.4 presents the County's General Development Standards as well as all other applicable standards that the Project is

required to comply with to reduce the risk of fire. Additional mitigation measures were also recommended to further reduce the risk of fire. These include:

Mitigation Measure HAZ-1: *The Project Proponent shall install an earthing system during the installation of the monopole. An appropriate system shall be selected based on the standards set forth by the United States National Electrical Code (NEC) or National Fire Project Association (NFPA) 70[1]. The County Building and Safety Officer shall inspect the system for compliance with these standards.*

Mitigation Measure HAZ-2: *The Project Proponent shall apply a latex-based, fire protective coating to the monopole. The selected coating shall have high adhesion quality and provide long-term protection.*

Mitigation Measure HAZ-3: *The existing monopole at the site shall be replaced with a new monopole that is free of the initial treatment of creosote or pentachlorophenol that is typically applied to wooden poles. These initial treatments may contain a preservative that could prevent the long-term adhesion of a latex base fire retardant.*

Mitigation Measure HAZ-4: *The fuel modification area shall be inspected on a quarterly basis throughout the life of the project to ensure the initial clearing area is maintained. Upon inspection, appropriate trimming and clearing shall be initiated. In addition, any fuel sources at the base of the monopole shall be removed.*

The DEIR determined that, in the event of a lightning strike, the installation of an earthing system, application of fire protective coating, and maintenance within the fuel modification area would reduce the potential for wildfires in association with lightning strikes at the wooden monopole. Potential impacts from lighting and ultimately wildfires would be reduced to a less than significant level with the listed mitigation measures. This was substantiated by a third-party expert in fire behavior hired by the County.

The Project itself would not interfere with the fire suppression capabilities of fire agencies responding to a wildland fire that could threaten inhabited structures, no matter what the cause of the fire. The existing 199-foot tall metal lattice KRBQ tower is not much further in distance from inhabited structures than the Project and the new Project with a lower height and wooden material would be far less attractive for lightning strikes.

Response to Comment 7-35: The Commenter indicates that surveys need to be completed for archaeological and paleontological resources based on the Project Application. Appendix B of the DEIR is the County's 2011 CEQA IS which determines there is "No Impact" to such resources because there are no such resources identified in the Project vicinity. No previous comments or evidence has been received from any agency or public member regarding the need to evaluate archaeological or paleontological resources.

[1] The National Electrical Code (NEC) or National Fire Project Association (NFPA 70), is a regionally adoptable standard for the safe installation of electrical wiring and equipment in the United States.

Response to Comment 7-36: The planning assumptions (which all are speculative) made in the DEIR for the cumulative impacts assessment included the assumption that biological impacts would likely be significant. The Commentor argues that this contradicts the conclusions related to the Project's impacts to biological resources. The Commentor seemingly misunderstands what was being presented. The significant cumulative impacts resulting from extension of utility service was based on the supposition of many towers and many individual service extensions being constructed. This was an absolute worst-case scenario (that is extremely unlikely to occur considering property size, location, and broadcasting requirements) with extension of lines through undisturbed lands (rather than within Pisgah Peak Road). (See DEIR Section 5). Thus, although less than significant impacts would result from the Project, potentially significant impacts could, (but are extremely unlikely to) result from cumulative projects in the area.

Response to Comment 7-37: The visual impacts of the proposed Project were presented using the published methodologies and were determined to be less than significant. The conclusion of the DEIR is that the controversy and public testimony in opposition to the Project may lead to a final determination of "significance" (see Response to Comment 7-19). Regarding cumulative impacts, the determination was made that impacts would be less than significant; the County does not concur that the analysis is flawed. The mere possibility of development of up to seven (7) additional broadcast towers does not, in any way, indicate there would ever be any applications for such uses, and would, among other things, assume a need for such a facility and suitable land for its installation. A complete analysis of possible additional towers was included in Section 5.0 Other CEQA Required Analysis, pages 5-7 through 5-9 of the EIR. However, such a possibility was expressly indicated there in, as being extremely unlikely to ever occur.

Response to Comment 7-38: See Response to Comment 7-29.

Response to Comment 7-39: The County disagrees that there is no substantial evidence provided in the analysis of cumulative impacts. With the combined application of the criteria used to establish the cumulative broadcast tower Project area, the County General Plan, Development Code, and the Oak Glen Community Plan, the area available for potential cumulative Project development is limited to the area shown in Figure 5-1. Other potential cumulative Project areas that were identified on Figure 5-1 are not in close proximity to the Proposed Project and are unlikely to create a cumulative land use impact. Additionally, any other project would be subject to individual, detailed CEQA analysis before such a permit could be issued.

The potential cumulative Project area utilized in the EIR analysis (see Figure 5-1) was an approximate area defined to identify other projects that could share direct and indirect aesthetic impacts both individually and cumulatively. Other potential cumulative impacts for Air Quality, Biological Resources, Cultural Resources, and Greenhouse Gasses were analyzed on both a project and cumulative basis. Potential cumulative impacts analyzed for Aesthetics and Hazards were limited to the south and west facing slopes of the San Bernardino Mountains surrounding the Oak Glen Community.

For most projects (any requiring discretionary permits) that would conflict with the General Plan or any other land use parameter, CEQA review would be required before: 1) approval of the Project, 2) adoption of CEQA Findings, 3) issuance of a COA, and 4) issuance of COA. It is

typical in the issuance of a COA that a project would then be consistent with the General Plan and therefore cumulative land use impacts would be unlikely.

Response to Comment 7-40: As discussed in the preceding comments, there has been no new information provided, no need to revise the Project description or the impact determinations, no new or revised mitigation measures are proposed for adoption, and no new feasible alternatives have been identified. Therefore, there is no need to recirculate the DEIR (CEQA Section 15088.5).

4.0 MITIGATION MONITORING AND REPORTING PROGRAM

4.1 INTRODUCTION

The Mitigation Monitoring and Reporting Program (MMRP) was prepared to implement the mitigation measures identified in the Lazer Broadcasting EIR. CEQA Section 21081.6 requires adoption of a monitoring program when mitigation measures have been identified that would reduce or avoid significant environmental effects.

CEQA requires adoption of a monitoring program for those measures or conditions placed on a project to mitigate or avoid adverse effects on the environment. The law states that the monitoring program shall be designed to ensure compliance during project implementation. When implemented, environmental effects associated with the development of the Lazer Broadcasting Facility will be reduced or eliminated.

The MMRP contains the following elements:

1. Measures that act to mitigate significant impacts on the environment are recorded with the action and the procedure necessary to ensure compliance.
2. A procedure of compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when, and to whom and when compliance will be reported.
3. The MMRP has been designed to provide focused, yet flexible guidelines. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendations by those responsible for the program.

4.2 RESPONSIBILITIES AND AUTHORITY

The County of San Bernardino (County) will be the primary agency responsible for implementing the mitigation measures. In some cases, the County may contract with others to implement measures. The County's role is to monitor and ensure the implementation of the measures.

4.3 MONITORING PERSONNEL

The County is responsible for ensuring that the mitigation measures in this Final EIR are implemented. The County reserves the right to hire technical experts and professional to help in evaluating compliance. These may include but are not limited to biologists, archaeologists and planning professionals.

For impacts related to construction of the Project, the project planner or responsible County department has the authority to stop the work of construction contractors if compliance with any aspects of the MMRP are not occurring after written notification has been issued.

If any impacts require long-term monitoring, the applicant shall provide the County with a plan for monitoring the mitigation activities at the project site and reporting the monitoring results to the County.

MITIGATION MONITORING REPORTING PROGRAM

Project: Lazer Broadcasting Facility **Applicant:** Lazer Broadcasting Corporation

Lead Agency: County of San Bernardino **Date:** April 2017

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
Aesthetics					
AES-1: The monopole, antenna and shed shall be painted olive green to blend with the surrounding vegetation. In addition to this first layer of treatment, a second layer of paint shall be worked in a random pattern in colors of deep olive, light sage and light brown to further mimic a vegetative pattern or camouflage effect. The random pattern shall be applied in a stippling or sponging manner to avoid sharp lines.	County of San Bernardino Land Use Services	After paint application	Prior to commencing operations	On-site Inspection	
AES-2: The Project Proponent shall revegetate the portion of the ridge where the demonstration pole was placed. During placement of the demonstration pole and conducting geotechnical field testing, vegetation was removed. The scraped area, which appears in the form of a line down the slope, and any other areas that may be disturbed during site development shall be revegetated at the direction of a County-approved biologist prior to issuance of permits.	County-approved biologist	After construction	After submittal of CCRF and issuance of final County permits and prior to commencing operations	On-site Inspection	
Biological Resources					
BIO-1: Biology Monitoring: In order to reduce or eliminate direct mortality to Blainville's horned lizard, San Diego mountain kingsnake, and the northern red diamond rattlesnake during construction, a biologist will pre-survey the construction site and access road each day prior to the start of work and periodically throughout the day during construction. These or other wildlife incidentally observed, found to be in harm's way, will be relocated to a safe place.	County-approved biologist	Each day prior to start of construction work and throughout workday	Prior to commencing construction	On-site inspection	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
BIO-2: Nesting Bird Surveys: If construction is scheduled during bird nesting seasons (February 1 to August 31), a qualified biologist shall survey the area within 200 feet (or up to 300 feet depending on topography or other factors and 500 feet for raptors) of the construction activity to determine if construction would disturbing nesting birds. If observed in the Project impact area, occupied nest shall not be disturbed unless a qualified biologist verifies through non-invasive methods that either: (a) the adult birds have not begun egg-laying and incubation; or (b) the juveniles from the occupied nests are foraging independently and are capable of independent survival. If the biologist is not able to verify one of the above conditions, then no disturbance shall occur within 300 feet of non-raptor nests, and within 500 feet of raptor nests, during the breeding season so as to avoid abandonment of the young (CDFW 2012b). This mitigation measure does not apply if construction occurs during the non-nesting season, September 1 through January 31.	County-approved qualified biologist	Survey to be conducted if construction is scheduled during bird nesting season (February 1 to August 31).	Prior to construction if scheduled during bird nesting season	On-site inspection	
BIO-3: The proposed project meets all four criteria for reducing avian mortality as recommended in the Longcore report. The proposed monopole is not proposed to be located on a peak or ridgeline; at 43 feet, it would be below the County Development Code standard and below the APLIC recommendations; it would not be lighted; and there would be no supporting guy wires.	County of San Bernardino Land Use Services, Building Inspector	Prior to issuance of final occupancy	During review of grading/building plans	On-site inspection	
Geology and Soils					
GS-1: Prior to issuance of grading and/or building permits for the Proposed Project, the Project Proponent shall submit a Geologic Investigation Report and an Updated Geotechnical Report. Recommendations included in all geologic and geotechnical reports prepared for the Proposed Project shall be implemented.	County of San Bernardino Building and Safety Division	Prior to issuance of grading /building permits	Prior to issuance of grading /building permits	Memo documenting report review.	

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
GS-2: The proposed development shall be completed in accordance with the requirements of the latest edition of the California Building Code as well as the recommendations included within the geologic investigation report and updated geotechnical report required prior to issuance of grading and/or building permits.	County of San Bernardino Building and Safety Division	Prior to issuance of grading /building permits	Prior to issuance of grading /building permits	Memo documenting report review.	
GS-3: To ensure the structural safety of the Proposed Project in the event of an earthquake, the Proposed Project shall be designed and constructed in accordance with the seismic design requirements of the latest edition of the California Building Code.	County of San Bernardino Building and Safety Division	Prior to issuance of grading /building permits	Prior to issuance of grading /building permits	Memo documenting report review.	
GS-4: All on-site excavation activities shall be conducted in accordance with Cal-OSHA regulations. Adequate moisture content shall be maintained within the removed and recompacted fill soils to improve stability.	County of San Bernardino Building and Safety Division	Prior to issuance of grading /building permits	Prior to issuance of grading /building permits	Memo documenting report review.	
GS-5: A National Pollutant Discharge Elimination System permit shall be obtained before construction is started. In addition, a Water Quality Management Plan and Storm Water Pollution Prevention Program must be submitted to the County and shall show how storm waters will be controlled through Best Management Practices to avoid off-site sedimentation.	County of San Bernardino Building and Safety Division	Prior to issuance of grading /building permits	Prior to issuance of grading /building permits	Memo documenting report review.	
Fire Safety Hazards					
HAZ-1: The Project Proponent shall install an earthing system during the installation of the monopole. An appropriate system shall be selected based on the standards set forth by the United States National Electrical Code (NEC) or National Fire Project Association (NFPA) 701. The County Building and Safety Officer shall inspect the system for compliance with these standards.	County Building and Safety Officer	During installation of monopole	Prior to commencing operations	Review of system	

1 The National Electrical Code (NEC) or National Fire Project Association (NFPA 70), is a regionally adoptable standard for the safe installation of electrical wiring and equipment in the United States.

Mitigation Measures No. / Implementing Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date /Initials
HAZ-2: The Project Proponent shall apply a latex-based, fire protective coating to the monopole. The selected coating shall have high adhesion quality and provide long-term protection.	County Building and Safety Officer	During installation of monopole	Prior to commencing operations	On-site inspection	
HAZ-3: The existing monopole at the site shall be replaced with a new monopole that is free of the initial treatment of creosote or pentachlorophenol that is typically applied to wooden poles. These initial treatments may contain a preservative that could prevent the long-term adhesion of a latex based fire retardant.	County Building and Safety Officer	During installation of monopole	Prior to commencing operations	On-site inspection	
HAZ-4: The fuel modification area shall be inspected on a quarterly basis throughout the life of the project to ensure the initial clearing area is maintained. Upon inspection, appropriate trimming and clearing shall be initiated. In addition, any fuel sources at the base of the monopole shall be removed.	County Fire Marshal	Quarterly throughout the life of the project	Quarterly throughout the life of the project	On-site inspection	
Land Use					
LU-1: Since the Project Site is located directly adjacent to Wildwood Canyon State Park and to ensure development of the site does not prevent the expansion of the Park to include Pisgah Peak, the Project Proponent shall be required to deed restrict the unused portion of the 38.12-acre Project Site for passive use by visitors to the Wildwood Canyon State Park (AR 5:188:3243).	County of San Bernardino Land Use Services	Prior to construction	Prior to issuance of building permits	Acceptance of grant deed	

FINAL
ENVIRONMENTAL IMPACT REPORT
(SCH No. 2008041082)

LAZER BROADCASTING
FACILITY

APPENDIX A

COMMENTS RECEIVED ON DRAFT EIR

LETTER 1

Yucaipa Valley Conservancy

June 8, 2016

Kevin White, Senior Planner
County of San Bernardino
Land Use Services Department, Planning Division
385 No. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0187

Project Title: Lazer Radio Broadcasting Facility
State Clearinghouse Number 2008041082
Project No.: P201000215

Re: Draft Environmental Impact Report

Dear Mr. White:

Yucaipa Valley Conservancy, under the direction of Mr. Francis O. Sissons, was originally formed in 1999 to specifically save the 850 acres (approx.) that is now Wildwood Canyon State Park (WCSP). WCSP is directly adjacent to and overlooked by the proposed Lazer FM Tower project and directly impacted. The site is readily visible from the majority of the WCSP hiking, mountain biking, and equestrian trails. 1-1

The Lazer FM Tower site breaks and disturbs the eastern boundary of the WCSP, causing habitat disturbance and destruction and breaking up the pristine and aesthetic eastern ridge of the entire WCSP, which is enjoyed daily by the many hikers, mountain bikers, equestrians, bird watchers, and general nature lovers. 1-2

Although the illegal demonstration pole that once existed was (falsely) utilized by Lazer Broadcasting to indicate a minimal disturbance of the area, Lazer failed to properly demonstrate the actual impact to the steep west facing slope by the FM tower, equipment building, parking area, fencing, and fuel modification clearing. 1-3

We object to the entire project at this location as it posses environmental hazards from plant and habitat destruction on a large portion of a steep slope. The project raises erosion and fire danger concerns that should not be waived and a major variance in a fire overlay area should not be approved. It also scars the very purpose of WCSP, which is to provide its many users escape from their urban life and vital reconnection with nature. 1-4

The City of Yucaipa, its citizens, and many, many visitors of WCSP have long objected to and opposed the Lazer FM Tower project next to our hard-won Wildwood Canyon State Park. 1-5

The Board of Directors of Yucaipa Valley Conservancy hereby object to and condemn the proposed Lazer Radio Broadcasting Facility in its' current proposed form, and in any revised form hereafter, at this location. 1-5 Cont.

David Miller, Chairman
Yucaipa Valley Conservancy
34233 Sherwood Drive
Yucaipa, CA 92399

(909)797-2040

cc: Supv. James Ramos
Atty. John Mirau
City Mgr. Ray Casey

LETTER 2

CITY OF Yucaipa

June 27, 2016

Kevin White, Senior Planner
Current Planning Division
Land Use Services Department
County of San Bernardino
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415 - 0182

Regarding: Lazer Radio Broadcasting Facility (Project No. P201000215); Notice of Availability of a Draft Environmental Impact Report (SCH No. 2008041082)

Thank you for the opportunity to respond to the Draft Environmental Impact Report (DEIR) for the above-referenced project. The primary concerns for the City of Yucaipa are included in the staff report dated November 26, 2012, Resolution 2012-71, and correspondence dated September 29, 2010 and September 19, 2012 (attached). A signed copy of Resolution 2012-71 adopted by the Yucaipa City Council opposing the Lazer Radio Broadcasting facility has been attached for your records. The concerns and requests contained in the attached documents continue to be valid. This letter is intended to reiterate these concerns and based on those concerns, request that the County deny the proposed Project. A second letter will be provided with questions pertaining to the environmental analysis of the DEIR. In addition to the concerns set forth in the attached correspondence, the City of Yucaipa requests that the County address the following issues/concerns: 2-1

1. Address the cumulative impacts as well as the growth inducing impacts associated with multiple antennas at this location. If this facility is constructed, it is almost certain that the County will receive additional applications for more communication towers and/or co-located facilities and therefore, the cumulative impacts/growth inducing impacts associated with this project also must be considered as significant. 2-2

2. The Notice of Preparation states that alternative site locations for the Lazer Radio Broadcasting facility will be contemplated. The City of Yucaipa still believes that alternative sites analysis is incomplete and that better locations exist. The City rejects the notion that only one alternative site, 30-acre property located near the community of Cherry Valley, adequately meets the alternatives analysis required under the California Environmental Quality Act. 2-3

In addition to responses to the above comments, please provide the City with any future notices in regards to the processing of the Project, and direct all CEQA related correspondence to our attention. 2-4

City of Yucaipa
34272 Yucaipa Boulevard, Yucaipa, CA 92399-9950
909/797-2489 ♦ FAX 909/790-9203 ♦ e-mail: city@yucaipa.org

Sincerely,

Denise Hoyt
Mayor

Greg Bogh
Mayor Pro Tem

David Avila
Councilmember

Dick Riddell
Councilmember

Bobby Duncan
Councilmember

City of Yucaipa
34272 Yucaipa Boulevard, Yucaipa, CA 92399-9950
909/797-2489 ♦ FAX 909/790-9203 ♦ e-mail: city@yucaipa.org

LETTER 3

THE WILDLANDS CONSERVANCY

July 20, 2016

Mr. Kevin White, Project Planner
San Bernardino County Land Use Services Department
Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

RE: Project No. P201000215/CF - Radio Tower Application
Lazer Parcel - APN 0325-011-19-0000
Draft EIR - SCH No. 2008041082

Dear Mr. White:

Founded in 1995, The Wildlands Conservancy is dedicated to preserving the beauty and biodiversity of the earth and to providing programs so that children may know the wonder and joy of nature. In working to achieve this mission, TWC has established the largest nonprofit nature preserve system in California, comprised of fifteen preserves encompassing 147,000 acres of diverse mountain, valley, desert, river, and oceanfront landscapes. These preserves are open to the public free of charge for passive recreation, including camping, hiking, picnicking, birding, and so much more.

Ultimately, saving our treasured landscapes from development means educating and instilling a love for nature in future generations. For this reason, TWC is also the state's nonprofit leader in providing free outdoor education opportunities for California youth. Through these programs and our reverent stewardship of preserves—visited by nearly half a million people per year—we foster a love and respect for life in all of its magnificent forms. 3-1

TWC has been active for close to 20 years in the Yucaipa and Oak Glen communities promoting conservation values and purchasing land for public enjoyment and open-space purposes. TWC is frequently recognized as a resource in the community relating to open-space issues. Because of this reputation, TWC is specifically mentioned in the Oak Glen Community Plan policies and goals:

- Policy OG/OS 1.2: County is committed to supporting and actively pursuing the expansion of WCSP, including cooperation with open space community groups such as The Wildlands Conservancy and Yucaipa Valley Conservancy.

39611 Oak Glen Road #12 • Oak Glen, CA 92399 (909) 797-8507 • Fax (909) 797-4337
www.wildlandsconservancy.org

TWC owns several thousand acres of land in the Oak Glen and Pisgah peak area, and thus has a keen interest in the Lazer radio tower project that may be constructed immediately adjacent to Wildwood Canyon State Park. In reviewing the Draft EIR for the Lazer project, TWC noted that the following project objectives were included relating to Wildwood Canyon State Park:

- Contribute to the expansion of Wildwood Canyon State Park (WCST) through the implementation of a passive, not active, land use. As a passive land-use, broadcast towers have been implemented in many CA State Parks.
- Create long-term buffering of passive land uses within and adjacent to the eastern WCSP boundary through dedication of development rights and/or transfer of ownership in fee of close to 4% of the current WCSP land area. 3-2

As one of the two Conservancy's specifically mentioned in the Oak Glen Community Plan policy OG/OS 1.2, TWC feels an obligation to comment on these supposed "goals" of the Lazer tower project. TWC has consistently opposed the Lazer radio tower, because that radio tower is incompatible with the surrounding open spaces of Wildwood Canyon State Park, as well as other lands owned by open-space conservancies, including TWC. Having monitored the Lazer tower project since 2008, it is clear that the goal of the project is to expand coverage of Lazer's radio station, regardless of broad and vast community opposition to the project where over 17,000 citizens wrote letters or signed petitions in opposition to this radio tower project.

TWC does not believe Lazer's business desire is to expand the audience of its radio tower into a supposed "goal" of expanding Wildwood Canyon State Park. It is clear to TWC that rather than facilitating expansion of the park, the radio tower will actually prevent it. It is our understanding that Yucaipa Valley Conservancy and Citizens for the Preservation of Rural Living own property in the surrounding area, which they intend to eventually dedicate as open-space and incorporate into the Wildwood Canyon State Park. However, by building a radio tower, equipment shed, fencing, and parking space in the middle of these open-space lands, that expansion of the park will be marred by the radio tower project. It is inconceivable to understand how Lazer and/or the County could take the position that constructing a radio tower and associated facilities in any way helps to expand Wildwood Canyon State Park. The fact that Lazer is proposing to provide an open-space easement over the area of their property surrounding the radio facilities does not in any way facilitate expansion of the park. The radio tower emits radiofrequency waves, which are considered dangerous and should not be in the middle of a state park. In addition, the radio tower and equipment constitute blight on the scenic views from Wildwood Canyon State Park and TWC's Oak Glen Preserve. 3-3

The draft EIR recognizes that the baseline condition of the Lazer Project is the condition of the project prior to Lazer carving out a 650-foot trail from Pisgah peak road down to the proposed site of the radio tower. That 650-foot trail alone constitutes a significant adverse aesthetic impact to the scenic views from Wildwood Canyon State Park and surrounding open-space properties. The draft EIR purports to completely mitigate this significant aesthetic damage with the following: 3-4

- Mitigation Measure AES – 2: The Project Proponent shall revegetate the portion of the ridge where the demonstration poll was placed. During placement of the demonstration poll and conducting geotechnical field testing, vegetation was removed. The scraped area, which appears in the form of a line down the slope, and any other areas that may be disturbed during site development shall be re-vegetated at the direction of the County - approved biologist prior to issuance of occupancy permits.

3-4 Cont.

TWC has protected over 1250 square miles of open space land and manages more than 200 square miles of land throughout the State of California. TWC has been involved in extensive work involving restoration of deserts, wetlands, rivers, forests and other sensitive wildlife habitat. Because of this extensive work involving restoration of a wide variety of habitat, TWC believes they are an expert in analyzing effective versus ineffective restoration of damaged habitat.

Based upon TWC's extensive experience with restoration of habitat, it is our opinion that the proposed mitigation measure requiring revegetation of the approximate 650-foot trail down the side of the slope on the Lazer Property will very likely be unsuccessful. In the immediate area of Pisgah Peak, several years ago an owner of a property illegally graded the top of a peak leaving a scar on the mountaintop. Attempts were made to revegetate that property, but they were unsuccessful. In this case, due to the lack of any method of watering, drought conditions, and erosions when there is hard rain despite the drought, it is unlikely that the vegetation will successfully root and cover the scar left by the foot trail down the slope. In any event, if the revegetation was eventually successful, it is likely that it could take 5 to 10 years before the revegetation would cover the scar caused by scraping of the footpath trail. As a result, the visual impact of the scraping of the foot trail will be visible for many years. Based on our experience, the analysis in the Draft EIR that revegetation of the scarred foot trail will be fully mitigated by revegetation is not entirely accurate and should not be relied upon.

3-5

TWC continues to support the opposition to the Lazer Radio project from thousands of local residents, visitors, tourists, City of Yucaipa, Yucaipa Valley Conservancy, and the Citizens for the Preservation of Rural Living.

3-6

Very truly yours,

Dana Rochat

Dana Rochat
Acquisitions Director

Cc: Supervisor James Ramos, County of San Bernardino
Mayor Denise Hoyt, City of Yucaipa
Mr. John Mirau, Citizens for Preservation of Rural Living
Mr. David Miller, Yucaipa Valley Conservancy

LETTER 4

July 20, 2016

Kevin White, Senior Planner
Current Planning Division
Land Use Services Department
County of San Bernardino
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415 - 0182

Regarding: Lazer Radio Broadcasting Facility (Project No. P201000215); Notice of Availability of a Draft Environmental Impact Report (SCH No. 2008041082)

Thank you for the opportunity to respond to the Draft Environmental Impact Report (DEIR) for the above-referenced project. Concerns for the City of Yucaipa are included in the staff report dated November 26, 2012 (attached), Resolution 2012-71, and correspondence dated September 29, 2010 and September 19, 2012 (attached). A signed copy of Resolution 2012-71 adopted by the Yucaipa City Council opposing the Lazer Radio Broadcasting facility has been submitted for your records and should already be included in the Administrative Record. The concerns continue to be valid, and the City requests that the County deny the proposed Project. 4-1

The following provides the City of Yucaipa's comments and concerns regarding the deficiency of the EIR relative to important environmental concerns associated with development of the proposed radio tower.

Project Construction:

The analysis within the EIR fails to consistently identify the total scope of construction activities that will be necessary to complete the Project. The City recognizes that the proposed Project will require the installation of 6,700 linear feet of underground cable to serve the proposed facility. As noted in the EIR, undergrounding of the utility would require the preparation of an 8-foot wide trench, which would result in a disturbance of approximately 1.22 acres. The electrical cable would generally run along the Pisgah Peak Road, which the analysis states is a previously-disturbed dirt road. However, the analysis fails to consider that the roadway is narrow and rugged, and that the trenching activities necessary to underground utilities may likely require widening of the pathway to support construction traffic, equipment, and provide adequate width for fire and related personnel. As noted in the EIR, Pisgah Peak Road is 12 feet wide, and with trenching, there would be a remaining 4 foot wide section to accommodate vehicles during construction which is grossly inadequate. Please note that City Staff had sent a message to the project representative, as directed by Kevin White with the County of San Bernardino, to visit the project site and observe the existing field conditions pertaining to access. No responses were received. 4-2

This issue is dismissed from all analysis related to the construction of the Project. In addition, grading may be necessary to provide an adequate roadway width during construction. Therefore, the potential impacts related to widening of the roadway needs to be addressed within all pertinent topics of the EIR to adequately disclose project-related environmental impacts. 4-2 Cont.

Project Objectives:

The City contends that the proposed Project objectives, which relate to current programs offered by the proposed radio station, is not an accurate set of objectives for the purposes of CEQA. Radio programming is not static, and the radio format and programming will change over time based on market demand. Therefore, the ancillary programs provided by the radio station are not a valid objective to be used for assessing the environmental impacts for the proposed Project, and highlighting a small educational program segment is misleading in establishing the framework for an objective environmental analysis. The statement of objectives should include the underlying purpose of the project, which is simply to expand the radio broadcast coverage of a radio station.

Aesthetics:

The City concurs that the proposed Project will result in significant and unavoidable impacts, even with mitigation. However, the discussion undermines the potential visual impacts. The EIR states:

> "This is supported by the analysis that relied on the USFS model and other federal agency models for determining and ranking visual changes in the environment. However, this area of CEQA is highly subjective and public comments previously received by the County Board of Supervisors indicate a high level of viewer sensitivity to the monopole's visual impact. In consideration of this and the alternatives analysis showing that no other feasible Project Sites could avoid such impacts, although the project is considered highly beneficial, the County determines that the visual impact, at least to some portion of the population, is significant and unavoidable." 4-3

This does not provide an unbiased and objective conclusion, and instead undermines the potential impacts that would be generated by development of the Project. In a poor attempt to 'disclose' impacts, the EIR concludes that it will be significant impact, but only as so far as in an attempt to appease commenters. The fact remains that the visual quality of the site will be impacted and visible from several different vantage points, and approving the Project would disrupt a pristine wilderness. In addition, the Visual Assessments prepared for the Project note a 'moderate visual quality' at the site as a result of "previous geotechnical/field work" for the Project. The field notes demonstrate that the site work for the Project has already diminished the site's once-pristine visual environment.

The City also disagrees with the statement that there were no other feasible Project Sites could avoid the visual impacts, as the City disagrees that one alternative site provides an adequate 4-4

assessment, and contends that the analysis for that alternative site defers the discussion, noting a separate visual impact assessment would be required to determine the significance of impacts. Therefore, given the visual sensitivity and environment of the Project site, and that there is likely other sites with reduced viewer sensitivity, the statement that there are "no other feasible Project Sites could avoid such impacts" is conclusory without substantiation. 4-4 Cont.

The City also requests clarification regarding the camera and setting used to take the photos for the photosimulations provided in the 2012 Visual Assessment. The Assessment notes a 50-mm lens was used to provide the best representation of a human eye. However, a 50-mm lens on an APS-C sensor offers a substantially different range of perception than that of a 'full frame' 35mm film equivalent camera. In addition, please provide the aperture setting used. 4-5

The City questions why the Visual Impact Assessment prepared for the project does not include vantage points along Wildwood Canyon Road and Oak Glen Road, both of which are designated at Scenic Corridors by the City of Yucaipa. This concern aligns with the comment provided by CPRL's NOP response. The EIR states that it was not visible during a November and May field visit, but no photos are provided to substantiate the claim or to address any potential conditions that may have interfered. As noted previously, City Staff attempted to visit the project site, which would have provided an opportunity to view the line of sight to those vantage points. As currently presented, the discussion is conclusory, and does not provide the substantial evidence necessary to support the conclusion. 4-6

In addition, the concerns presented above regarding the required widening of Pisgah Peak Road to accommodate construction activities during trenching of the underground cable would also result in a substantial change to the visual quality of the site which was not analyzed in the EIR or supporting Visual Assessments. The modification of the roadway may result in irreparable damage to the area, further exacerbating the significant visual quality impacts from the proposed Project. 4-7

The City also requests that Mitigation Measure AES-1 be modified to include the maintenance and touch-ups for the facility. UV light will degrade the quality and condition of the paint, especially along the metallic surfaces of the antenna, resulting in eventual re-exposure of the metal surfaces of the antennas. Without provisions for the maintenance of the site, the measure will be ineffectual over long-term use of the site, resulting in even more significant impacts to the visual quality of the scenic areas. 4-8

Bio:

The concerns presented above note that there may be the need to widen of Pisgah Peak Road in order to accommodate construction activities during trenching of the underground cable. The impacts associated with the widening, including removal or disruption of plants and animals, as well as onsite grading necessary to ensure the safe movement of construction equipment, has not been provided. Additional detail is necessary to conclude a less than significant impact resulting from construction activities. This detail includes a discussion of the short-term impacts associated with widening, as well as any long-term impacts. 4-9

The City also requests if any preliminary details for the installation of the tower is available. As noted in Impact GS-1, a geotechnical investigation is required to address issues such as slope instability. The studies provided with the EIR (Appendix G) note that piers may be installed to a depth of approximately 28 feet. This activity may result ground-borne vibration during construction, which may have the potential to impact sensitive species nearby, including migratory birds that may be in trees within the vicinity of the project, but not necessary within the scope of Measure BIO-2. In addition, the EIR describes the "breeding season" as February 1 through August 31. Please note that the California Department of Fish and Wildlife does not recommend relying on seasonal restrictions alone as nesting dates vary from year to year and some species may nest year-round. Instead, the Department recommends that a qualified ornithologist conduct nesting surveys prior to initiating vegetation removal and/or ground disturbing activities even outside of the peak nesting season, but encourages projects to schedule ground-disturbing activities outside of the peak nesting season to reduce the changes of the discovery of an active nest. 4-10

Fire Safety:

The concerns presented above note that there may be the need to widen of Pisgah Peak Road in order to accommodate construction activities during trenching of the underground cable. Does the applicant intend to widen the roadway to allow for access during construction? It should be noted that unpaved roads help to provide a line of defense to the Fire Department for the surrounding communities (including Oak Glen and the City of Yucaipa). The obstruction of access caused by an 8 foot-wide trench in the middle of a 12 foot-wide (or less) roadway during the Project's construction may result in significant issues to providing a fire break of line of defense during a fire emergency. 4-11

The City also requests a confirmation that a backup generator is not proposed at the site should electrical service be interrupted. If a generator is proposed, ensure that appropriate mitigation measures are included to ensure safe storage of fuel and other combustible materials stored onsite to address hazards associated with fire safety. The City also requests clarification for Mitigation Measure HAZ-3: what existing monopole needs to be removed? 4-12

In addition, it is our understanding that Fire Departments need to be able to defend any structures from fire danger, regardless if the structure is manned or unmanned. Please elaborate on how access will be obtained should the structure need to be defended. Given the location of the facility and access along Pisgah Peak Road, it is reasonable that the Yucaipa Fire Department would be dispatched to address any fire-related incidents onsite. 4-13

Cumulative:

The City questions why a future tie into the extended electrical line for the proposed project was not considered as part of the cumulative impact analysis. Further, what is the basis of assumption to establish a 2,000 foot radius around the project site for the cumulative analysis? It is possible and highly reasonable to assume that projects would be integrated with the new conduit 4-14

installation, and that with approval of the proposed Project, other towers may begin to infiltrate the pristine environment. Further, the EIR had concluded that the proposed Project would result in significant and unavoidable impacts to visual quality. The addition of 7 new towers, even with the unreasonable assumptions provided in the analysis, would certainly contribute to an already significant impact and increase the severity of the overall impact. The City disagrees that impacts would not be significant. 4-14 Cont.

Growth Inducing:

The City's concerns regarding growth inducing impacts and cumulative impacts of new towers is not limited specifically to radio towers. Permits for cellular towers are more frequent, and are a similar use. Approval of this Project within the Pisgah Peak area may inevitably lead to future towers proposed, and would make it difficult for the County of San Bernardino to deny such projects based upon the established precedent resulting from approval of this Project. 4-15

The City also requests clarification regarding the "private line" for electricity connection for the Project. Unless specific details are provided, including mitigation measures that are enforceable and offer absolute certainty, it seems reasonable and prudent to consider tie-ins to the proposed electrical line be used for other potential Projects.

Alternatives:

The City questions why only one alternative site, a 30-acre property located near the community of Cherry Valley, was used as part of the Alternative analysis. The City recognizes that Case law suggests that the discussion of alternatives need not be exhaustive, but for this EIR, consideration of a single site provides an inadequate assessment for comparison for the Project. In this case, there is not a reduced project alternative and the EIR does not provide some other effective metric for decision makers to accurately assess the merits of this project and compare environmental impacts, nor does it provide an effective discussion on an environmentally superior project. Further, the CEQA Guidelines note that public agencies should not approve projects as proposed if there are feasible alternatives which would substantially lessen the significant environmental effects of such projects. 4-16

The City suggests that additional alternatives be provided that considers the development of two towers, similar to other regional radio stations, to address the needs of the proposed applicant, which would avoid impacting the environment as currently proposed. Further, this would meet the project objectives, which is to expand the radio broadcast coverage of a radio station, while reducing environmental impacts proposed by the Project. In addition, the City questions the alternatives analysis parameters for providing coverage specifically within the City of Hemet, when the project Goals and Objectives relate towards new coverage to the County of San Bernardino. 4-17

In addition, the alternative analysis section should be updated to correctly and accurately describe the project impacts. For instance, the No Project Alternative notes that aesthetic impacts would be less than significant similar to the proposed project, which does not match the analysis in Section 4.1, and the Biological Resources references impacts resulting from an existing 4-18

wooden pole. Further, the City disagrees with the scenario presented in the impact discussion: topography, access, utilities, and a variety of other physical factors, in addition to General Plan policies, would prohibit development of a single family home within the vicinity of the proposed tower. Therefore, the No Alternative Project would not result in impacts that are as substantial as those that would result from approval of the Project. 4-18 Cont.

Please note that Fire Service Impacts would also be less significant for the alternative site compared to the proposed Project, because development of a tower on a single family property would likely provide far greater access for the Fire Department, which is non-existent with the proposed Project. Please update the conclusions in the Alternatives Analysis to accurately reflect the potential impacts. 4-19

Conclusion:

The City of Yucaipa would like to reiterate that it opposes the Project, and requests that the County Planning Commission and Board of Supervisors deny the Project. Expansion of the radio station can be accomplished without the unnecessary degradation of the scenic nature of the proposed Project site. Further, if this facility is constructed, it is almost certain that the County will receive additional applications for more communication towers and/or co-located facilities and therefore, the cumulative impacts/growth inducing impacts associated with this project also must be considered as significant. 4-20

If you have any questions, please feel free to contact me at 909-797-2489 x.231 or jlambert@yucaipa.org.

Sincerely,

CITY OF YUCAIPA

Joseph M. Lambert
Director of Development Services

cc: City Council
Ray Casey, City Manager

Agenda Item No. 13

CITY OF YUCAIPA
AGENDA REPORT

TO: Honorable Mayor and City Council

FROM: Raymond A. Casey, City Manager

FOR: City Council Meeting of November 26, 2012

SUBJECT: Lazer Broadcasting Antenna Site Near Wildwood Canyon State Park

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RECOMMENDATION:

That City Council adopt Resolution No. 2012 – 71, encouraging the San Bernardino County Board of Supervisors to again deny Lazer Broadcasting's proposal to erect a radio tower adjacent to the City of Yucaipa and Wildwood Canyon State Park.

BACKGROUND:

In June of 2007, Lazer Broadcasting, Inc. submitted an application to the San Bernardino County Land Use Services Department for a Conditional Use Permit to construct an FM radio broadcast facility (call letters: KXRS) consisting of a 140-ft tall lattice tower to support a 25-ft tall x 42-in diameter 6-bay FM broadcast antenna. Included in the project were a 250 sq ft equipment building, a 20kW generator, and a 500-gallon fuel tank. The facility was to be located on the company's 38-acre parcel immediately adjacent to Wildwood Canyon State Park, and utility services were to be provided by installing 33 new 40-ft tall utility poles on Pisgah Peak Road.

On July 31, 2007, staff responded to the County's Project Notice with a fairly routine letter based on the limited information that we had received. Our comments noted some concerns with the proposed power lines and indicated that the project could have a significant effect on the visual resources of the State Park. In April of 2008, staff received the Initial Study from the County detailing their environmental review of the project, and the tower had been reduced to 100-ft in height, and the utility lines were going to be placed underground. This was an improvement from the original plan, but the cumulative impact of having additional towers at this location was still not being addressed, and in our April 17, 2008, letter staff again submitted comments suggesting that an environmental impact report should be prepared.

In October of 2008, the County circulated a Revised Initial Study, with the proposed tower reduced to 80-ft in height, but it did not address staff's earlier concerns regarding the cumulative impacts associated with the potential proliferation of multiple towers, and we advised the County of our concerns in a letter dated October 16, 2008. On November 6, 2008, the County Planning Commission voted 4-1 to approve the project, and this action was then appealed to the County Board of Supervisors. On November 10, 2008, the Mayor informed the Council of this matter during the Mayor and Councilmember Business portion of the City Council meeting, and the consensus of Council was that staff should prepare a letter for the Mayor's signature expressing their opposition to the project.

DISCUSSION:

In December of 2008, after carefully reviewing the administrative record, and encountering substantial opposition from a large number of concerned citizens in the East Valley, the County Board of Supervisors voted unanimously to overturn their Planning Commission's approval of the project. At this point, nothing occurred until June of 2010, when staff received a Project Notice from the County for a Conditional Use Permit to construct a 43-ft tall lattice tower and a 100 sq ft equipment building. The generator and the fuel tank had been removed from the project, and the application also included a Major Variance to reduce the fuel modification zone from 100 ft to 30 ft in order to reduce the amount of disturbed area.

Staff responded to this Project Notice with a letter dated June 14, 2010, which once again expressed our concerns regarding the environmental review procedures being used by the County. Because of the potential for this project to adversely affect the significant scenic resources of Wildwood Canyon State Park, staff believes that an environmental impact report needs to be prepared to fully evaluate this situation, and equally important, to conduct an independent evaluation of alternative sites for the broadcast antenna. The applicant has stated that there are no alternative sites, but staff is aware of at least one professional study that has identified various alternative locations that are away from Wildwood Canyon State Park.

At the September 27, 2010, Council meeting, staff provided the Council with all of the letters that had been previously submitted for this project, and Council directed that another comment letter (see attached) be prepared for the latest proposal. Staff then received a revised environmental assessment of the project's potential impacts, and it concluded that all such impacts could be mitigated to a less-than-significant level. While it provided a more detailed analysis of the project's effect on the environment, it still does not address the City's key issues – the cumulative impacts associated with multiple antennas at this location, and the ability to develop the project on at an alternative location. These specific issues would only be addressed in an Environmental Impact Report, which our letters have been requesting from the beginning, and if Council is still concerned about these issues, we should reiterate our previous comments.

In September of this year, the County Planning Commission conducted a public hearing to review the latest incarnation of Lazer Broadcasting's proposal for a radio broadcast antenna, and once again the City submitted a comment letter to reiterate our on-going concerns with this project. Unfortunately, the project was again approved by a 4 – 1 vote, but an appeal of this action was filed in a timely manner, and the project is once again being reviewed by the Board of Supervisors. It is virtually the same project that was unanimously rejected by the Board of Supervisors in 2008, but the City Council may wish to take this opportunity to once again go on record in opposition to the project. The attached resolution also requests that the Board strongly consider the position of local cities when reviewing land use projects.

Attachments: Resolution No. 2012 - 71
9-19-12 Comment Letter
09-29-10 Comment Letter

RESOLUTION NO. 2012-71

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF YUCAIPA, CALIFORNIA, ENCOURAGING THE SAN BERNARDINO COUNTY BOARD OF SUPERVISOR TO AGAIN DENY LAZER BROADCASTING'S PROPOSAL TO ERECT A RADIO TOWER ADJACENT TO THE CITY OF YUCAIPA AND WILDWOOD CANYON STATE PARK

WHEREAS, the City of Yucaipa believes that local control on local land use issues should be respected by all government entities; and

WHEREAS, the City of Yucaipa believes that local municipalities have a strong understanding of potential impacts to their residents and communities related to land use proposals; and

WHEREAS, the City of Yucaipa supports other cities in San Bernardino County in their efforts to advocate for land use issues that are of importance to their local constituents; and

WHEREAS, land use issues in the County can have a significant impact on nearby City residents' quality of life; and

WHEREAS, the City of Yucaipa recommends that the San Bernardino County Board of Supervisors strongly consider the position of local cities when reviewing land use projects; and

WHEREAS, the City of Yucaipa has opposed for years the proposal of Lazer Broadcasting to build a radio tower that would cause irreparable harm to the scenic vistas and open spaces surrounding Wildwood Canyon State Park; and

WHEREAS, the placement of one communication tower can create a precedent for the future development of communication towers in open space areas near other San Bernardino County communities; and

WHEREAS, the San Bernardino County Board of Supervisors has denied similar proposals in the past and should remain consistent in their decision-making;

NOW THEREFORE, BE IT RESOLVED that the City of Yucaipa encourages the San Bernardino County Board of Supervisors to again deny Lazer Broadcasting's proposal to erect a radio tower adjacent to the City of Yucaipa and Wildwood Canyon State Park.

RESOLUTION NO. 2012-71

BE IT FURTHER RESOLVED, that this resolution be noted in the Minutes of this Council and that a copy be presented to the San Bernardino County Board of Supervisors.

Executed this 26th day of November, 2012, by the Council Members of the City of Yucaipa.

PASSED. APPROVED and ADOPTED this 26th day of November 2012.

DICK RIDDELL, MAYOR

ATTEST:

JENNIFER SHANKLAND, CITY CLERK

September 19, 2012

Honorable Chair and Members
of the Planning Commission
San Bernardino County
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415 - 0182

RE: Lazer Broadcasting FM Radio Broadcast Facility (Project No. P201000215/CUP)

Dear Chairwoman Mathews and Members of the Commission:

The project referenced above represents the re-submittal of an application that was unanimously rejected by the Board of Supervisors in December of 2008. Although the current application now proposes the construction of a smaller tower and ancillary equipment structure, they would still be located on the border of Wildwood Canyon State Park, but at a higher elevation to make up for the reduced tower height. This nearly pristine natural area was chosen for State Park status primarily because of its exceptional aesthetic and natural values, and it should go without saying that the presence of a very prominent monopole antenna and its equipment building in this environment is entirely contrary to the mission of the State Park.

All available evidence indicates that this project will result in significant adverse impacts on the environment, but County staff members have downplayed this evidence. Without question, this antenna monopole will have a substantial adverse effect on a major scenic vista (Wildwood Canyon State Park), and it will substantially degrade the existing visual character or quality of the site and its surroundings. In addition, once utilities are extended to this facility, it is almost certain that the County will receive additional applications for more communication towers, and therefore, we believe the cumulative impacts associated with this project also must be considered as significant.

We believe that these three issues alone warrant the preparation of a full environmental impact report, but equally important, and equally lacking from the current environmental assessment, is any discussion of alternative sites. An environmental impact report should be required to address this issue in detail, and we believe that the burden of proof is on the applicant to demonstrate that there are no alternative sites for this facility. Supposedly, this is the only location where they can reach their listeners, but we would submit that most, if not all of the residents in Hemet currently receive radio broadcasts, and none of them are originating from this location.

We have been advised that an independently prepared study (Kline Report) clearly demonstrates that other suitable locations exist for this broadcast antenna, either on existing antenna towers or other vacant property several miles to the east of the currently proposed site. We understand that

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the applicants would be required to lease space on an existing tower, or purchase additional property, but financial considerations do not overcome the obligation to consider alternatives which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives.

At a hearing held by our City Council on September 27, 2010, we observed considerable opposition to this proposal from many Yucaipa residents, as well as from representatives from the Supporters of Wildwood Canyon State Park, the Yucaipa Conservancy, and the Wildlands Conservancy. This facility is clearly inconsistent with their long-range goals for this natural area, and they indicated that over 2,500 people have signed their petitions opposing this project. This opposition was focused on the belief that the border of Wildwood Canyon State Park was simply the wrong location for this facility and that a less obtrusive site must surely exist somewhere else.

These sentiments were echoed by each of our Council members during the discussion of the proposal, and it was also noted that this proposal would be in direct violation of the City's policies and standards for ridgeline developments if it were subject to our jurisdiction. We understand that the Board of Supervisors adopted rather extensive Findings in their action to deny the previous proposal, including a Finding that the facility was inconsistent with the land use policies of the Oak Glen Community Plan, and we have not seen anything to date that would indicate that the current proposal will eliminate or even reduce any of the previously identified adverse impacts.

In summary, we believe that the negative visual impact of this antenna monopole is completely out of character with the existing environment, and that it will not be possible to mitigate the adverse impacts of this ill-conceived project to a less-than-significant level as required by the California Environmental Quality Act. Consequently, we are requesting that you deny this application, or at a minimum, require the preparation of a full environmental impact report to adequately address this issue, as well as the others, including the evaluation of alternative sites for this facility. We believe that this so-called "compromise" project does nothing to eliminate these negative impacts.

Very truly yours,

John McMains

John McMains, Director
Community Development Department

cc: Neil Derry, 3rd District Supervisor
Kevin White, Sr. Associate Planner

September 29, 2010

Honorable Chairman and Members
of the Planning Commission
San Bernardino County
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415 - 0182

RE: Lazer Broadcasting FM Radio Broadcast Facility (Project No. P201000215/CF)

Dear Chairman Cramer and Members of the Commission:

The project referenced above represents the re-submittal of an application that was unanimously rejected by the Board of Supervisors in December of 2008. Although the new application now proposes the construction of a smaller tower and ancillary equipment structure, they would still be located on the border of Wildwood Canyon State Park, but at a higher elevation to make up for the reduced tower height. This nearly pristine natural area was chosen for State Park status primarily because of its exceptional aesthetic and natural values, and it should go without saying that the presence of a very prominent metal tower and its equipment building in this environment is entirely contrary to the mission of the State Park.

All available evidence indicates that this project will result in significant adverse impacts on the environment, but County staff members have downplayed this evidence. Without question, this antenna tower will have a substantial adverse effect on a major scenic vista (Wildwood Canyon State Park), and it will substantially degrade the existing visual character or quality of the site and its surroundings. In addition, once utilities are extended to this facility, it is almost certain that the County will receive additional applications for more communication towers, and therefore, the cumulative impacts associated with this project also must be considered as significant.

We believe that these three issues alone warrant the preparation of a full environmental impact report, but equally important, and equally lacking from the current environmental assessment, is any discussion of alternative sites. An environmental impact report should be required to address this issue in detail, and we believe that the burden of proof is on the applicant to demonstrate that there are no alternative sites for this facility. Supposedly, this is the only location where they can broadcast to their listeners, but we would submit that most, if not all of the residents in Hemet currently receive radio broadcasts, and none of them are originating from this location.

We have been advised that an independently prepared study (Kline Report) clearly demonstrates that other suitable locations exist for this broadcast antenna, either on existing antenna towers or other vacant property several miles to the east of the currently proposed site. We understand that the applicants would be required to lease space on an existing tower, or purchase additional property, but financial considerations do not overcome the obligation to consider alternatives which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives.

At a hearing held by this Council on September 27, 2010, we observed considerable opposition to this proposal from many of our own residents, as well as from representatives from the Supporters of Wildwood Canyon State Park, the Yucaipa Conservancy, and the Wildlands Conservancy. This facility is clearly inconsistent with their long-range goals for this natural area, and they indicated that over 2,500 people have signed their petitions opposing this project. This opposition was focused on the belief that the border of Wildwood Canyon State Park was simply the wrong location for this facility and that a less obtrusive site must surely exist somewhere.

These sentiments were echoed by each of our City Council members during our discussion of the proposal, and it was also noted that this proposal would be in direct violation of the City's policies and standards for ridgeline developments if it were subject to our jurisdiction. We understand that the Board of Supervisors adopted rather extensive Findings in their action to deny the previous proposal, including a Finding that the facility was inconsistent with the land use policies of the Oak Glen Community Plan, and we have not seen anything to date that would indicate that the current proposal will eliminate or even reduce any of the previously identified adverse impacts.

In summary, we believe that the negative visual impact of this antenna tower is completely out of character with the existing environment, and that it will not be possible to mitigate the adverse impacts of this ill-conceived project to a less-than-significant level as required by the California Environmental Quality Act. Consequently, we are requesting that you deny this application, or at a minimum, require the preparation of a full environmental impact report to adequately address this issue, as well as the others, including the evaluation of alternative sites for this facility. We believe that this so-called "compromise" project does nothing to eliminate these negative impacts.

Very truly yours,

Dick Riddell
Mayor

Allan Drusys, D.V.M.
Mayor Pro Tem

Denise Hoyt
Councilmember

Tom Masner
Councilmember

Diane Smith
Councilmember

cc: Neil Derry, 3rd District Supervisor
Kevin White, Sr. Associate Planner

LETTER 5

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July 20, 2016

By e-mail (kwhite@lusd.sbcounty.gov); Original to follow

Kevin White, Senior Planner
County of San Bernardino
Land Use Services Department – Planning Division
385 North Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0187

Re: Comments on Draft Environmental Impact Report for Lazer Radio Broadcasting Facility

Dear Mr. White:

The law firm of Chatten-Brown & Carstens represents Citizens for the Preservation of Rural Living ("CPRL") on matters relating to the proposal to build a new radio broadcast facility adjacent to Wildwood Canyon State Park. CPRL is a public interest association that seeks to ensure that the open space and natural wilderness values of the Pisgah Peak and Wildwood Canyon State Park areas are preserved.

As discussed below, the Draft EIR suffers from numerous errors, flaws, and omissions resulting in a legally inadequate environmental review. Since an inadequate EIR was prepared for the Project, a revised Draft EIR must be prepared. 5-1

Land Use / General Plan Inconsistency

In response to Lazer's claim in the October 2011 Initial Study and Mitigated Negative Declaration (MND) that "the project will not conflict with any applicable land use plan, policy" because the developer has agreed to provide an open space easement to the Wildwood Canyon Park and relinquish future development rights for the greater portion surrounding the parcel," the trial court said: 5-2

> However, no analysis is provided to support this conclusion in light of prior findings that made reference to General Plan Goal LU2 and Oak Glen Community Plan goals related to preserving and improving the open space corridor and scenic vista attached to the Wildwood Canyon State Park,

> including Pisgah Peak. The property at issue is undeveloped land "in a pristine wilderness area." Given the prior findings, a fair argument in support of an inconsistency still exists, even if the proposed Project would "disturb only a small portion of the 38.12 acre parcel" and Lazer agrees to provide a open space easement to the Park. Construction including a monopole, equipment shelter, and fencing are proposed in the area intended to provide a "pristine wilderness experience to park visitors." Substantial evidence supports a fair argument the Project is inconsistent with the applicable General Plan and Oak Glen Community Plan policies.

5-2 Cont.

(Ruling, p. 31.)

The DEIR acknowledges, "The Proposed Project is in direct conflict with the goal and policies of the County of San Bernardino General Plan and the Oak Glen Community Plan." Yet, the County claims that the impact is "less than significant" after the implementation of the following mitigation measure:

> Since the Project Site is located directly adjacent to Wildwood Canyon State Park and to ensure development of the site does not prevent the expansion of the Park to include Pisgah Peak, the Project Proponent shall be required to deed restrict the unused portion of the 38.12-acre Project Site for passive use by visitors to the Wildwood Canyon State Park (AR 5:188:3243).

5-3

(DEIR, p. 1-20.)

The County failed to provide any substantive analysis as to why deed restricting the unused portion of the project site reduces the project's inconsistency with the Plan policies to a "less than significant" level. This omission is surprising in light of the fact that the trial court focused on the fact that no analysis was initially provided in the MND to support the same conclusion the County now makes in the Draft EIR.

5-4

Visual Impacts

The trial court stated:

> The facts remains that the Project site and monopole is visible from the State Park, which contradicts the State Park's goal of providing a pristine wildlife experience to users and the objective of a BLM Class 1 area: to preserve the existing character of the landscape.

5-5

(Ruling, p. 22.)

The Court of Appeal stated:

> In assessing the potential significance of an impact, setting is critical … It is undisputed the project site is undeveloped pristine ridgeline wilderness adjacent to a state wilderness park. The Lilburn studies conceded the project site must be treated as a BLM Class I Visual Resource, like National Wilderness Areas and wild sections of National Wild and Scenic Rivers, and as such an area designated for preservation of a natural landscape. Any change to the character of the landscape must be "very low and must not attract attention."

5-5 Cont.

(Opinion, p. 22.)

The DEIR does not refer to the BLM visual resource classification. Rather, the DEIR uses a different classification, focusing on the scenic value of a landscape:

> The relative scenic value of a landscape is classified as: Class A - distinctive; Class B - typical; and Class C - indistinctive. The scenic attractiveness of the Project Site area set within an unincorporated area of San Bernardino County near the eastern portion of the City of Yucaipa is Class B.

(DEIR, p. 4.1-20.) The DEIR further explains:

> The overall scenic integrity from the four (4) viewpoints selected and analyzed in the 2012 Scenic Report within the Wildwood Canyon State Park would not change and would remain at Moderate/Low levels for all views meeting the L[and] M[anagement] P[lan's] Aesthetic Management Standards.

(DEIR, p. 4.1-22.)

Similar to the previous simulations conducted, the photographs and simulations in the DEIR were taken from mostly distant viewpoints. These include photographs at 1.5 mile, 1.4 mile, approximately 1 mile, and approximately 1200 feet.

The DEIR states that portions of the Proposed Project would be visible along portions of trails within the Park. (DEIR, p. 4.1-2.) This is different from the MND, which said that it would be visible from 2/3 of the park.

The DEIR states that the aesthetic impacts of the project are "potentially significant" before mitigation, but "less than significant" after mitigation. (DEIR, p. 1-15.) Later, the DEIR states: 5-5 Cont.

> Since the Project would not have a significant number of views, would not create a significant change in the landscape and is considered a less intense land use than what could potentially be developed onsite (i.e., single- family unit and related uses), impacts are considered less than significant. However due to the sensitive receptors in the area including single-family residences and trail users, potential impacts may be considered significant and should be reduced … In consideration of this and the alternatives analysis showing that no other feasible Project Sites could avoid such impacts, although the project is considered highly beneficial, the County determines that *the visual impact*, at least to some portion of the population, *is significant and unavoidable*."

(DEIR, p. 4.1-25, *emphasis added*.)

After first stating that the visual impacts of the project are "less than significant" after mitigation (DEIR, p. 1-15), the EIR concludes that the visual impacts are "significant and unavoidable" (DEIR, p. 4.1-25). The DEIR fails to reconcile this disparity.

Alternatives

The DEIR states:

> From an FCC allocations perspective of the alternative sites evaluated, Alternative Site #2 (ASR# 1202850) is the only alternative that could potentially be acceptable. However, more than half of the City of Hemet remains shadowed (based on terrain models) from the proposed 400- foot tower that would need to be built at this location. It is clear that the proposed KXRS site location on Pisgah Peak, which has been accepted by the FCC, would provide greater coverage in both area and population over that predicted from Alternative Site #2. 5-6

(DEIR, p. 6-10)

The DEIR also states,

> However the "Other Location Alternative" would not meet the Project's objective of: 1) Contributing to the expansion of Wildwood Canyon State

> Park (WCSP) through the implementation of a passive, non-active land use; and 2) Creating long term buffering of passive land uses within and adjacent to the eastern WCSP boundary through dedication of development rights and/or transfer of ownership in fee of close to four percent of the current WCSP land area.
> …
> "the 'Other Location Alternative' although still subject to potentially greater aesthetic impacts, appears to be the environmentally superior alternative of the two considered."

5-6 Cont.

(DEIR, p. 1-14.)

The California Supreme Court has explained, "Under CEQA, the public agency bears the burden of affirmatively demonstrating that . . . the agency's approval of the proposed project followed meaningful consideration of alternatives and mitigation measures." (*Mountain Lion Foundation v. Fish and Game Commission* (1997) 16 Cal.4th 105, 134.) "'One of [an EIR's] major functions ... is to ensure that all reasonable alternatives to proposed projects are thoroughly assessed by the responsible official.'" (Laurel Heights I, 47 Cal.3d at 400.) While "[a]n EIR need not consider every conceivable alternative to a project, 'it must consider 'a reasonable range of potentially feasible alternatives...'" (Guidelines § 15126.6(a).)

This EIR considers a limited range of alternatives, analyzing only two potentially feasible alternatives – a "No Project/Single-Family Residence Development" and one "Other Location Alternative." The EIR rejects the "Other Location Alternative" on the basis that it does not meet the Project's objectives of contributing to the expansion of the Park and creating long-term buffering of land uses near the Park. However, the EIR fails to explain how developing this Project within pristine wilderness adjacent to a State Park helps the Park expand and/or protects the Park.

Erosion/Safety Impacts

The DEIR provides the following Site Standards for slopes with a weighted natural gradient of 30% - 40%:

> Development within this category shall be restricted to those sites where it can be demonstrated that safety will be maximized while environmental and aesthetic impacts will be minimized. Use of large parcels, variable setbacks, and variable building structural techniques (e.g., stepped foundations) shall be expected. Extra erosion control measures may be included as conditions of approval.

5-7

(DEIR, p. 4.5-7.)

The DEIR also provides:

> Review of the Project Site and project plans indicate that proposed development including construction of the equipment building, parking space and monopole would all take place on slopes that range from approximately 20.5 percent to 37.5 percent. Therefore, there are no slopes greater than 40 percent.

5-7 Cont.

(DEIR, p. 4.5-10.)

The EIR's conclusion that "there are no slopes greater than 40 percent" is not supported by the evidence in the record. An EIR must disclose the evidence supporting its conclusions, thereby showing the logical path from facts to conclusions. Merely stating that a "review of the project site and project plans" confirms that the slopes are not steeper than 37.5% is not supported.

Growth Inducing / Cumulative Impacts

In its ruling, the trial court explained:

> With respect to growth-inducing impacts, the evidence presented demonstrate that Lazer has stated that its goal is to promote the expansion of its radio station through the implementation of "a passive - not active" land use. It stated, "As a passive land use - Broadcast Towers have been implemented in many CA State Parks." (AR 5:196:3365.) Lazer also presented evidence of such towers in other parks. (AR 4:131 :2525.)

5-8

The EIR states:

> Based upon the plans, policies, and building guidelines associated with the County of San Bernardino General Plan, Development Code, and the Oak Glen Community Plan, much of the area surrounding the Proposed Project could not be developed with additional broadcast towers as steep terrain and limited access from Pisgah Peak Road becomes a development limiting factor.

(DEIR, p. 5-3.)

The DEIR assumes that up to seven (7) additional broadcast towers could be developed within the cumulative project area, even after including criteria that may apply to the land here (e.g. elimination of lands exceeding the 40 percent slope development requirements). 5-8 Cont.

The DEIR also states:

> In addition, project-specific mitigation measures for any other future tower development within the cumulative project impact area would ensure that any potentially significant aesthetic related impacts would be mitigated individually and therefore cumulatively. Applying the criteria listed in Section 5.2.4, no more than seven (7) towers would be constructed in the vicinity and all would be subject to potentially limiting access issues due to Pisgah Peak Road being private and due to power source availability. Therefore, cumulative impacts to aesthetic resources would not be considered significant.

(DEIR, p. 5-7.)

The EIR's claim that much of the area surrounding the Proposed Project could not be developed with additional broadcast towers due to the steep terrain and limited access from Pisgah Peak Road is belied by the project proponent's current attempt to develop a broadcast facility in an area of steep terrain with limited access to Pisgah Peak Road.

Further, seven additional towers in the vicinity would have a significant visual impact. Moreover, the County fundamentally misunderstands cumulative impacts, claiming that "project-specific mitigation measures for any other future tower development … would ensure that any potentially significant aesthetic related impacts would be mitigated individually and therefore cumulatively." (DEIR, p. 5-7.) Even assuming that the project's impacts are mitigated (and not significant and unavoidable), a minor impact individually could have a significant impact when considering all of the projects. The term "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. (*Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1214.) Cumulative impact analysis "assesses cumulative damage as a whole greater than the sum of its parts." (*Irritated Residents*, 107 Cal.App.4th at p. 1403, *emphasis added*.)

Conclusion

Among other deficiencies, the DEIR fails to adequately analyze land impacts, including General Plan consistency; visual impacts; alternatives; erosion/safety impacts; and growth inducing impacts. A Revised Draft EIR must be prepared to correct the errors described above and examine other alternatives. Finally, this Project may not legally proceed in the present location unless the County amends its General Plan to eliminate the protections for the open space corridor and scenic vista attached to the Wildwood Canyon State Park, including Pisgah Peak (which we hope the County will not do). 5-9

Thank you for your consideration of these important issues.

Sincerely,

Josh Chatten-Brown
Attorney for Citizens for the Preservation of Rural Living

CALIFORNIA
NATIVE PLANT SOCIETY

Riverside-San Bernardino Chapter
40250 Reseda Springs Rd.,
Hemet, CA 92544

21 July 2016
Mr. Ken White
County Planner, Land Use Services
San Bernardino County, California

RE: SCH# 2008041082

Dear Mr. White:

The California Native Plant Society (CNPS) is a non-profit volunteer organization dedicated to the conservation and preservation of California's native flora. The Riverside/San Bernardino Counties Chapter of CNPS works to increase the public awareness of the significance of native plants and to preserve the native vegetation of Riverside and southwestern San Bernardino Counties.

This comment letter pertains to the Environmental Impact Report (EIR), State Clearinghouse No. 2008041082 for the Lazer Broadcasting Facility Project. Lazer Broadcasting Corporation is proposing the construction and operation of a radio broadcast facility to include a 43-foot tall monopole with attached antenna and a10-foot by 10-foot single-story (nine-foot tall) equipment building on a 38.12-acre site. The Project Site is located near Wildwood Canyon and Oak Gen Roads, west of Pisgah Peak Road in an unincorporated area of San Bernardino County, and within the Oak Glen Community Plan area. Please add our chapter to the notification list for all further documents on this project. 6-1

Our comments pertain to conserving and maintaining the natural vegetation on-site. This is part of the San Bernardino County General Plan: to maintain and enhance biological diversity and healthy ecosystems throughout the County (Goal "CO 2"), including the preservation of unique environmental features of the Mountain Region, including native wildlife, vegetation and scenic vistas (Goal M/CO 1).

To this end, we recommend **a restoration plan approved by the California Department of Fish and Wildlife be prepared and implemented for project approval**. This plan should include: 1) the use of *locally-sourced plant species native to the site*, 2) a design in "zones" to include appropriate vegetation for reduced fuels (i.e. planting native bunchgrasses such as *Festuca californica* documented onsite versus chaparral shrubs in the reduced fuel zone), 3) native vegetation and in addition, perhaps hardscapes such as natural rock to reduce erosion from the building site (building, monopole and access area - in the applicant's best interest, and along the proposed 6700 foot underground powerline going to the proposed broadcast facility, 4) success criteria for the restoration plan, 5) annual monitoring of the site to evaluate whether success criteria have been met, and 5) a performance bond to ensure implementation and adherence to county general plan goals. 6-2

Thank you for the opportunity to comment. Our local chapter of the California Native Plant Society would be happy to help you with the review of the restoration plan for this project. Please feel free to contact me at this email address for assistance: kakramer1@icloud.com.

Respectfully submitted,

/s/ Kathryn A. Kramer, PhD
Riverside-San Bernardino Chapter CNPS Conservation Co-Chair

LETTER 7

JOHN K. MIRAU*
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July 21, 2016

Mr. Kevin White, Project Planner
San Bernardino County Land Use Services Department
Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

RE: Project No. P201000215/CF - Radio Tower Application
Lazer Parcel - APN 0325-011-19-0000
Draft EIR (SCH No. 2008041082

Dear Mr. White:

This firm represents the Citizens for the Preservation of Rural Living ("CPRL"). CPRL is a public interest association that seeks to ensure that the open space and natural wilderness values of Wildwood Canyon State Park and the Pisgah Peak areas are preserved. We have previously submitted comments to the project application submitted by Lazer Broadcasting, Inc., which proposes the construction of a 43-foot tall radio tower on an undeveloped 40-acre parcel of land in the San Bernardino Mountains (the "Project"). 7-1

We have reviewed the Draft Environmental Impact Report ("EIR") for the Project prepared for the County of San Bernardino Land Use Services Department ("County") by the Lilburn Corporation. As detailed below, it there are several aspects of the EIR which are inadequate and do not comply with the requirements of California Environmental Quality Act ("CEQA"). 7-2

Please enter these comments in the official administrative record for this Project, and keep us notified of any proceedings related to the Project's and the EIR's consideration by the County. Please note that we reserve the right to supplement these comments, particularly should any additional information be submitted by the applicant related to the Project or additional analysis prepared by the County. 7-2 Cont.

1. **Proposed Project is Substantially Similar to Prior Denied Project.**

In 2007, Lazer proposed a substantially similar project which was denied by the County Board of Supervisors. The current Lazer application fails to reference that denial, and in fact is completely misleading as to the findings made by the County Board of Supervisors in denying the project.

In denying that project, the Board of Supervisors made adverse findings relating to the requirements for granting a conditional use permit or variance. Those findings include the following:

A. The site for the proposed use is inadequate in terms of open space because the project site is completely visible from portions of The Wildwood Canyon State Park.

B. The site for the proposed use does not have adequate access to the project site because Pisgah Peak Road is a very narrow, unpaved road and contains grades that are greater than 14%. Therefore, the project does not comply with the access requirements of the Fire Safety Overlay. 7-3

C. The proposed use will have a substantial adverse effect on the abutting properties and the allowed uses of the abutting properties since the proposed radio broadcast tower is located on property adjacent to Wildwood Canyon State Park. The radio broadcast facility would have a negative visual impact, because the tower can be seen from several locations within the park. The facility is also not compatible with existing and future residential development on other properties adjacent to the project site.

D. The proposed use and manner of development are not consistent with the goals, maps, policies and standards of the General Plan and Oak Glen Community Plan. More specifically, the findings found that the project is inconsistent with General Plan, Open Space Element, Goal LU2 to improve and preserve open space corridors throughout the mountain regions; Oak Glen Community Plan, Goal OG/C 1 to preserve the unique environmental features of Oak Glen including native wildlife, vegetation and scenic vistas; Policy OG/C 1.1 to recognize Pisgah Peak as an important open space area that provides for wildlife movement and other important linkage values.

E. There is currently a lack of adequate supporting infrastructure to accommodate the proposed development.

F. Proposed conditions of approval will not adequately protect the general welfare of the public because no feasible mitigation measures have been identified that would allow the project to be developed without disrupting the scenic views from Wildwood Canyon State Park and preservation of the open space corridor. [Underlining added]

7-3 Cont.

The current Project is substantially similar to the 2007-09 Lazer application for which the above findings were made. First, the Project is proposed for the exact same parcel. Second, the Project tower is 43 feet in height, instead of 80 feet in the 2007-09 application, but the base of the new tower now is 60 feet higher up in the mountains with greater visibility than the previously proposed tower. Additional changes include the elimination of the 500 gallon fuel tank, a decrease in the size of the equipment shelter from 250 ft.^{2} to 100 ft.^{2}, and a reduction in parking from two parking spaces to one.

None of these changes cure the inadequacies raised in the above findings. The Project suffers from the same access problem, would be visible from Wildwood Canyon State Park (as admitted in the application), and is inconsistent with the goals, maps, policies and standards of the General Plan and the Oak Glen Community Plan.

The California courts have recognized the legal principle of res judicata (the legal doctrine to bar or preclude continued litigation of such cases between the same parties) in administrative proceedings in which the decision-making body is acting in a judicial or quasi judicial capacity. In City of Lodi v. Randtron, 118 Cal App 4th 337 (2004), the court held as follows:

> "Collateral estoppel, which is an aspect of res judicata, has been applied to give preclusive effect to an administrative decision if the issue is actually litigated in an administrative proceeding by an agency acting in its judicial capacity." See also, Penn-Co. v. Board of Supervisors (1984) 158 Cal App 3rd 1072.

7-4

The decision to grant a conditional use permit or a variance is a quasi-judicial decision in which the administrative decision-making body plays a judicial like role in applying legal standards set forth in the development code to the specific facts of the case. The determination of whether or not the requirements for the granting of a variance or a conditional use permit were satisfied has been fully argued and "litigated" as part of the hearing held by the Board of Supervisors in connection with the appeal of the Planning Commission approval of the 2007-09 Lazer Application

Section 86.06.080 of the County Development Code provides that, after 12 months following the date of disapproval with prejudice, the applicant can refile the application for the same project. However, the Development Code does not state that the new application will be heard on a de novo basis. Rather, to the extent that the Project is substantially similar to the prior filing, the findings of fact previously made by the Board of Supervisors are res judicata (meaning they are binding on the applicant) because the key findings relating to the

requirements to granting of a variance or a conditional use permit are unchanged by the minor changes in the new application. Accordingly, there is a binding determination that neither a variance nor a conditional use permit can be granted for the 2010 project as well as the current Project which is substantially similar. 7-4 Cont.

2. Project Description.

A key component of any draft EIR is an accurate project description, so that governmental agencies as well as the public can understand the project well enough to comment on the adequacy of the environmental analysis. In this case, there are multiple errors, inconsistencies and uncertainties that make it difficult, if not impossible, to determine what the Project is, including the following:

- Section 3.5 of the EIR lists required agency review, permits and approvals. The only County permit or approval listed is the certification of the EIR and Notice of Determination. Elsewhere in the EIR it is stated that the project needs a conditional use permit. In other sections, the EIR states that a major variance is required. Which is correct? The project description must disclose the Project's necessary approvals in order to be thorough, adequate, and accurate under CEQA. Moreover, presumably the utility trenching would require its own permits and approvals from relevant agencies that are not listed in the EIR. 7-5
- Section 4.4.3 of the EIR, it states as follows: "The Proposed Project includes approval of a major variance to the Fire Safety overlay to reduce the required fuel modification zone from 100 feet to 30 feet around the equipment building." On page 4.4 – 10, the fire safety discussion states that at the discretion of the responsible Fire Authority, the fire safety development standards for projects that only propose to construct unoccupied structures may be altered at the discretion of the responsible Fire Authority on a case-by-case basis without an approved variance." Which is correct? Is a major variance necessary or not? In the project description, no major variance is listed as a necessary County approval.
- Section 3.4 of the EIR, page 3-9, describes the grading required for the Project. This section indicates that the Project would include "the movement of approximately 50 yd.^{3} of soil to be balanced on – site ." This grading description is woefully inaccurate. The Project includes approximately 6,700 feet of undergrounding of electrical wiring in Pisgah Peak Road to service the Project site. The EIR completely ignores the potential impacts of this utility trenching, the grading of which will disturb over one mile of surrounding land, and fails to analyze any corresponding impacts related to demolition, cut/fill, construction access/staging, best management practices, etc.. The order of magnitude of this component of the Project is not adequately disclosed, rendering the EIR's project description fatally flawed. 7-6
- The most significant and disruptive aspect of the Project, which has the greatest amount of land disturbance, is the undergrounding of electrical service for over 1 mile. Undergrounding of utilities constitutes a significant project in and of itself,

for which there is almost no description in the EIR. In section 3.4, page 3-7, there is a one sentence description: "Off-site, the proposed project includes the extension of electric lines and utility approximately 6,700 LF located within Pisgah Peak Road, near the existing KRQB tower. The electric utility line will be extended for exclusive use by Lazer." The EIR simply fails to recognize that extension of utilities for 6,700 linear feet which must be analyzed in full detail. If Southern California Edison were to propose a utility extension of over a mile, it would be unthinkable that such project could proceed forward without a detailed environmental analysis of that utility extension. Despite that, the EIR completely ignores this major aspect of the project and treats the utility extension as if it were not part of the overall Project being analyzed by the EIR.

7-6 Cont.

3. Land Use/ General Plan Inconsistency.

CPRL has consistently pointed out, during the hearing process for the Lazer Project, that the proposed tower is inconsistent with the County General Plan and the Oak Glen Community Plan. The inconsistent provisions of the General Plan, and the Oak Glen Community Plan that are inconsistent with the Project are set forth below:

A. Inconsistent with General Plan

- Project is in Pisgah Peak Open Space Policy Area No. 47 of the General Plan. This area is so designated in order to protect and maintain the natural open spaces for scenic resources and habitat values;

- The Project is inconsistent with General Plan, Open Space Element, Goal LU2 to improve and preserve open space corridors throughout the mountain regions ;

7-7

- Open Space Policy Area No. 47 designates the proposed project area and surrounding Bureau of Land Management (BLM) and State Park land as the Pisgah Peak Open Space overlay area. County Dev Code Section 82.19.010 specifically states that the "Open Space Overlay seeks to preserve resources and to provide additional opportunities for the public to enjoy these pleasing features."

- The Oak Glen area (included within Open Space Policy Area No. 47) has been specifically designated as including scenic vistas that will be preserved. State parks and BLM Wilderness Areas, which surround the proposed tower site on three sides, are designated as "significant scenic vistas". The proposed 43' tower has a significant adverse impact on these areas which have been designated by County's own policies and ordinances as sensitive, scenic vistas that should be preserved.

B. Inconsistent with Oak Glen Community Plan

7-7 Cont.

- Policy OG/CO1.1: The following areas are recognized as important open space areas that provide for wildlife movement and other important linkage values. Projects will be designed to minimize impacts to open space corridors such as WCSP, Little San Gorgonio and Pisgah Peak.

- Policy OG/OS 1.2: County is committed to supporting and actively pursuing the expansion of WCSP, including cooperation with open space community groups such as The Wildlands Conservancy and Yucaipa Valley Conservancy.

- Policy OG/C 1.1 to recognize Pisgah Peak as an important open space area that provides for wildlife movement and other important linkage values.

- Goal OG/C 1 to preserve the unique environmental features of Oak Glen including native wildlife, vegetation and scenic vistas.

C. Inconsistent with Development Code—Hillside Ordinance.

- Development Code section 83.0 8.030 sets forth the procedure for the Hillside grading review. Paragraph (b) requires submittal of a natural features map, a grading plan (which must include details as to drainage, elevations, a separate map with proposed fill colored green and cut areas colored red, and contours for existing and natural and conditions and proposed work), a drainage map, a slope analysis map, and slope profiles

- There are many standards set forth in the hillside grading ordinance designed to preserve the natural topography and to discourage development that will create or disproportionately increase fire, flood, slide or other safety hazards to public health, welfare and safety. Table 83-8 sets forth site standards for different slope categories, depending upon whether the slope is 15 to 30% slope, 30 to 40% slope, or greater than 40% slope. With respect to the 30 to 40% slope category, the following standard applies: 7-8

  "Development within this category shall be restricted to those sites where it can be demonstrated that safety will be maximized while environmental and aesthetic impacts will be minimized [Underline added]. Use of large parcels, variable setbacks, variable building structural techniques (e. g. stepped foundations) shall be expected. Extra erosion control measures may be included as conditions of approval.

> For grading on slopes of 40% or greater, the following standard applies: "This is an excessive slope condition. Pad grading shall not be allowed. Grading for driveways and roads shall be reviewed through the Minor Use Permit application process."

7-8 Cont.

In 2011 CPRL retained Goodman and Associates, civil engineers, to assess the plans for the broadcast tower and equipment building as well as for an 18,000 square-foot house that Lazer threatened to build to punish the community for opposing its radio tower. Attached hereto as **Exhibit A** is a letter from Goodman Associates, dated October 4, 2011 ("Goodman Engineering Letter"), as well as exhibits thereto showing plans for the equipment shelter the house and a plot of the contours of the Lazer Property developed by Goodman and Associates based on a field survey taken on the property. The conclusion of the October 2011 letter with respect to the slope of the project is as follows: "The area covered was dictated by limitations of physical access due to steepness of terrain and density of thick growth of plant life indigenous to the area. The primary purpose was to provide confirmation that the proposed construction site for either use mentioned above [a one-story equipment shelter or a single family residence] has a slope of about 40 ± % ..." On Exhibit C to the letter, which contains a plot of the contours of a portion of the Lazer Property indicates that the area near Pisgah Peak Road [on which the equipment building will be constructed] is "greater than 80% (by observation)."

This conclusion, that the location of the equipment tower is in a slope exceeding 40% grade, is confirmed in the General Biological Assessment ("Biological Assessment") prepared by Natural Resources Assessment, Inc., dated August 17, 2015. In section 4.1 of the Biological Assessment, the consultant hired by County and Lazer states: "The radio tower location is on the ridgeline of a mountain slope. Slope angle is about 40% along the ridge, and steeper along the sides." The equipment building is not located on a ridge, but rather on one of the adjacent slopes which pursuant to the biological consultant is greater than 40%. This confirms the conclusion in the Goodman Engineering Letter.

Statements by a civil engineer, who physically surveyed the property, constitute substantial evidence as to the slope of the Lazer Property where the equipment building is proposed to be located. Because grading of a pad on the Lazer Property be in anarea with a slope greater than 40 percent, the Development Code expressly prohibits construction of a pad or construction of the equipment building in the proposed location. That policy clearly applies to the Lazer Parcel. Accordingly, this is another "direct violation" of the County Development Code which has not been analyzed or discussed in the EIR. As a result, the EIR land-use discussion is inadequate and fails to comply with CEQA because there is no discussion whatsoever of a Development Code prohibition which clearly applies to the proposed equipment building.

D. Judgment in CEQA Case Requiring EIR.

In the case of Citizens for the Preservation of Rural Living v. County of San Bernardino, Lazer Broadcasting real party in interest, Case Number CIV DS213273 (herein CEQA Litigation"), the court specifically addressed the issue of Lazer's claim that the tower project would not conflict with applicable land-use plans and policy because Lazer had agreed to provide an open space easement to Wildwood Canyon Park and relinquish future development rights for the greater surrounding portion of the parcel. In analyzing this claim, the court said:

> "However, no analysis is provided to support this conclusion in light of prior findings that made reference to General Plan Goal LU2 and Oak Glen Community Plan goals relating to preserving and improving the open-space corridor and scenic vistas attached to the Wildwood Canyon State Park, including Pisgah Peak. The property at issue is undeveloped land "in a pristine wilderness area." Given the prior findings, a fair argument in support of an inconsistency still exists, even if the proposed Project would "disturb only a small portion of the 38.12 acre parcel" and Lazer agrees to provide a open space easement to the Park. Construction including a monopole, equipment shelter, and fencing are proposed in the area intended to provide a "pristine wilderness experience to park visitors." Substantial evidence supports a fair argument the Project is inconsistent with the applicable General Plan and Oak Glen Community Plan policies. (Ruling P. 31)." 7-9

The trial court made a direct finding that the MND was inadequate in its discussion and analysis of whether the tower project was consistent with County land use policies and goals. That conclusion by the court as to the MND raises the question as to whether or not the EIR cures this deficiency and adequately analyzes compliance with the County General Plan and Oak Glen Community Plan. As discussed below, CPRL believes the answer is "no". Rather, the EIR offers conclusory (and incorrect) statements that construction of an industrial-type facility, including a monopole, building, fencing and parking would enhance and expand the adjacent Wildwood Canyon State Park. This statement directly conflicts with the court's finding. As a result, the EIR is inadequate and fails to appropriately discuss, analyze and substantiate the conclusion that the project would have a less than significant impact on land use.

E. Land Use Discussion in EIR.

On page 4.5-10, section 4.5.4.3, the EIR states as follows: "The Proposed Project is in direct conflict with the goals and policies of the County of San Bernardino General Plan and Oak Glen Community Plan. This could be a potentially significant impact." CPRL agrees with this analysis, and has made that comment throughout the entire process of Lazer's multiple applications for a radio tower project. 7-10

After coming to that conclusion, the EIR then sets forth Mitigation Measure LU 1 as follows:

"The Project Site is located directly adjacent to Wildwood Canyon State Park and to ensure development of the site does not prevent the expansion of the park to include Pisgah Peak, the project Proponent shall be required to deed restrict the unused portion of the 38.12 acre Project Site for passive use by visitors to the Wildwood Canyon State Park." 7-10 Cont.

On pages 4.5-7 through 4.5-9, the EIR recognizes the importance of the Oak Glen Community Plan Goal OG/LU1 which seeks to retain the existing rural agricultural character of the community. This goal encapsulates the point that CPRL has been trying to make for years with respect to the Lazer radio tower at this location. Put simply, the construction of an industrial style complex of a radio tower, equipment building, fence and parking space immediately adjacent to a state park and to other open-space lands owned by open space conservancies does not retain the existing rural agricultural character of the community. The EIR then further discusses goal OG/LU1 which specifically provides that Wildwood Canyon State Park is an important open-space area that should be protected. The discussion also references goal OG/OS 1.2 which provides for support of the expansion of Wildwood Canyon State Park "including cooperation with open-space community groups such as The Wildlands Conservancy and the Yucaipa Valley Conservancy...."

In section 4.5.4.3 of the EIR, on page 4.5-10, the EIR fails to actually analyze the Project's impact on land use. For example, at the top of page 4.5 – 12, the EIR states: "The project would be restricted to a 425 square-foot portion of a larger 38.12-acre site, and utilities, including the installation of 6,700 linear feet of electric, would be placed within an existing unpaved road (Pisgah Peak Road)."

This statement, that the Project only impacts 425 ft.^{2} of land, repeats throughout the EIR. It is demonstrably false. Not only does the EIR disregard the impacts associated with the 1+ mile of electrical undergrounding, but the EIR also fails to take into account the potentially dangerous emissions from the tower's radio frequency ("RF") electronic fields that would cover a much larger portion of the 38.12 property, and possibly beyond. Attached as **Exhibit B** to this letter is a copy of a letter previously sent by CPRL to the County, which details FCC rules relating to fencing of properties which are accessible by the public. The purpose of these FCC rules is to assure that persons accessing the property adjacent to a RF tower are not injured due to high frequency radio waves. Pursuant to FCC rules and regulations, Lazer would be required to fence a significant portion of the property to protect the public from the dangers of high-frequency radio waves, and also to post signs indicating the danger of the high-frequency waves. 7-11

On the bottom of page 4.5 – 12, the EIR comes to the following conclusion, without any evidentiary support or analysis of any kind:

"Upon approval of a Conditional Use Permit, the proposed Project would be consistent with the County's General Plan and the Oak Glen Community Plan land use and zoning designations and the Policies and guidelines within the General Plan and the Oak Glen Community Plan, and therefore would not represent a conflict. However to ensure the 7-12

Project would not conflict with the future expansion of the Wildwood Canyon State Park, the following mitigation measures shall be implemented: 7-12 Cont.

Mitigation Measure LU–1:

Since the Project Site is located directly adjacent to Wildwood Canyon State Park and to ensure development of the site does not prevent the expansion of the park to include Pisgah Peak, the Project Proponent shall be required to deed restrict the unused portion of the 38.12 – acre Project Site for passive use by visitors to the Wildwood Canyon State Park (A.R. 5:188:3243). "

This analysis (or lack thereof) is completely inadequate under CEQA for the reasons discussed below.

First, under the Oak Glen Community Plan, Wildwood Canyon State Park is designated as an important open-space area. In addition, the Community Plan specifically indicates that expansion of the park should be pursued in cooperation with open-space community groups such as The Wildlands Conservancy and the Yucaipa Valley Conservancy. In this case, both of those conservancies have vigorously opposed the Lazer tower project since it was first proposed in 2007. All of the open space, equestrian, hiking and trail organizations in the Yucaipa and Oak Glen area have vigorously opposed the Project because they have concluded that the construction of an industrial complex with a radio tower and supporting buildings and infrastructure is not consistent with the nature of an open space park and constitutes a disruption and blight on the park, rather than a proper expansion of the park's passive, recreational uses.

Second, the EIR simply repeats the statement that, without any supporting analysis, deed restricting portions of the Lazer property for Park use does not prevent the expansion of Wildwood Canyon State Park and, therefore, the passive uses of the park are protected. However, the EIR offers no factual support whatsoever for the conclusion that this deed restriction accomplishes consistency with the goals and objectives of the Oak Glen Community Plan. The EIR ignores the following facts:

1. The total Project, including the tower and antennas, equipment building, security fencing, parking, and utility trenching will impact a significant portion of the Lazer parcel, as well as Pisgah Peak Road. The EIR must include analysis as to the impacts of the radiofrequency waves that could create an area dangerous for Park users to utilize; 7-13

2. An industrial facility, which emits RF waves potentially dangerous to public health, does not constitute a passive use consistent with the public's expectation as to safe enjoyment of the park. On a 24 hour basis, seven days a week, 365 days a year, the radio tower could create a dangerous condition immediately adjacent to a park with thousands of hikers, bikers and horse riders actively using that park, including a trail immediately adjacent to the Lazer property.

3. An industrial facility that disturbs a pristine, open-space view is not the type of expansion contemplated by the General Plan or the Oak Glen Community Plan;

4. The Project is vigorously opposed by The Wildlands Conservancy and the Yucaipa Valley Conservancy, because those conservancies do not believe that land surrounding an industrial radio tower facility fulfills the spirit or intent of the Community Plan goals and the EIR fails to disclose that these open space stakeholders, with whom the County is obligated to cooperate, actually oppose the Project because of their collective desire to promote only legitimate expansion of Wildwood Canyon State Park.

5. On page 4.5-12 and in Table 1 – 1, as well as in several other places, the EIR continues to state that "the monopole is proposed below the ridgeline." That statement is inaccurate. The monopole is not located at the uppermost ridge of the Pisgah Peak Mountains, but rather is located on one of the ridges below the top of the mountain and immediately adjacent to Wildwood Canyon State Park

6. Adjacent to Wildwood Canyon State Park, various governmental agencies (such as the Bureau of Land Management ("BLM"), as well as open-space conservancies, own tracts of land with the intent to significantly expand Wildwood Canyon State Park. The EIR fails to analyze or explain how construction of a radio tower facility, building, parking, and infrastructure would facilitate passive recreational expansion of the park, considering that the radio tower facility would be located in the middle of the area intended for annexation.

7-13 Cont.

Lastly, the EIR's land use discussion concludes that "upon approval of a Conditional Use Permit, the proposed Project would be consistent with the County's General Plan and Oak Glen Community Plan Land Use and zoning designations and the policies and guidelines within the General Plan and Oak Glen Community Plan, and therefore would not represent a conflict. (DEIR, p. 4.5-12.) This conclusion misunderstands CEQA. The County must find the Project to be consistent with applicable land use regulations **before** approving a CUP, as the County's approval is legally contingent on this consistency—not the other way around.

Similarly, the EIR's imposition of Mitigation Measure LU-1 (e.g. deed restriction) is similarly misplaced. The EIR states on page 4.5-13:

> "Implementation of the above mitigation measure would ensure that the Project is consistent with Conservation Goal (OG/CO 1) of the Oak Glen Community Plan, and should ensure the preservation of the environmental features of Oak Glen, including native wildlife, vegetation and scenic vistas. The measure would also ensure the preservation and continued growth of this important open-space area including the expansion of Wildwood Canyon State Park."

7-14

Again, this discussion in no way adequately discloses how Mitigation Measure LU-1 would cause the Project to be consistent with Conservation Goal OG/CO – 1. Consequently, the EIR's analysis is not supported by substantial evidence in the record and is inadequate under CEQA. 7-14 Cont.

4. **Aesthetic Impacts**.

A. Project will have significant negative impact on Open Space and Conservation Resources associated with Pisgah Peak and Wildwood Canyon State Park.

The Project is within the Pisgah Peak Open Space Policy Area of the County General Plan's Open Space Element. Among other things, this area is so designated in order to protect and maintain the natural open space for scenic resources and habitat values. *See* http://www.co.san-bernardino.ca.us/landuseservices/General%20Plan%20Update/Mapping/5b-Open%20Space%20Overlay%20Maps/Default.asp.

As discussed in more detail below, the Project would have a significant negative impact on the open space and conservation resources associated with Pisgah Peak and the Wildwood Canyon State Park. The Project is directly adjacent to the Park and permitting construction of this type would be inconsistent with the policies of both minimizing impacts to these corridors and supporting the responsible expansion of the Park. Allowing a proliferation of high profile towers such as proposed by the Project could create a substantial detrimental impact on the aesthetics and open space values of this area. Because the Project is inconsistent with these policies, the County cannot make the findings required to approve a CUP and Major Variance (if required) for the Project.

7-15

The proposed 43-foot tower just off Pisgah Peak Road will be highly visible from Pisgah Peak Road and from areas within Wildwood Canyon State Park. As noted in the Final Environmental Impact Report for the County of San Bernardino's General Plan Program (SCH #2005101038), dated February of 2007 ("FEIR"), vast undeveloped areas and undisturbed scenic vistas within the County provide a significant scenic resource as they contrast against the developed areas. FEIR at IV-5. In addition, as noted above, the County has identified as areas of primary scenic importance, ridge tops within mountain communities, and within Oak Glen, the important open space areas of Pisgah Peak and Wildwood Canyon State Park. FEIR at IV-4; Oak Glen Community Plan Policy OG/CO1.1; General Plan Open Space Element, Policy Area 47. The Project will pose a significant adverse impact to scenic vistas from the trails of eastern portion of the Wildwood Canyon State Park which the Park has actively tried to maintain.

This significant adverse impact is likely to become more severe, as The Wildlands Conservancy and the Yucaipa Valley Conservancy continue to work to purchase additional property to expand the Park from its current size of approximately 850 acres to 3,500 acres or more. The County is committed to supporting and actively pursuing the expansion of Wildwood Canyon State Park, including cooperation with open space community groups such as The Wildlands Conservancy and the Yucaipa Valley Conservancy. *See* Oak Glen Community Plan

Policy OG/OS 1.2. The approval of the Project in the middle of this wilderness open space area could harm these efforts and is clearly inconsistent with County policy. 7-15 Cont.

B. Project is inconsistent with the Oak Glen Community Plan to preserve scenic vistas in the San Bernardino mountains.

a. Inconsistency with Goal OG/CO 1—Preserve Scenic Vistas

Page 4.1 – 12, Oak Glen Community Plan goal OG/CO 1 provides as follows:

"Preserve the unique environmental features of Oak Glen including native wildlife, vegetation and scenic vistas."

This goal is particularly significant in light of the fact that the Oak Glen and Yucaipa communities are rural in nature. Many of the unique features of the Oak Glen Community Plan were included, following community input, to retain the rural nature and scenic beauties of those communities. The Lazer tower project places an industrial type facility, with a tower, antennas, equipment building and fencing in the middle of one of the most beloved open space preserve areas within those communities.

7-16

In analyzing the applicability of Oak Glen Community Plan Goal OG/CO 1 to the Project, the first question that arises is whether or not the foothills of the San Bernardino Mountains, within and adjacent to Wildwood Canyon State Park, constitute a "scenic vista." The EIR answers that question in the affirmative. On page 4.1-13, the EIR concludes that the area in which the Project is located is a "scenic vista." In section 4.1.4.2, page 4.1-13, the EIR concludes: "[t]he Project Site is one of several private parcels that occurs within the foothills of the San Bernardino Mountains. Although the Project Site itself may not be considered a scenic vista, the area that is it is a part of, namely the San Bernardino National Forest is a scenic vista. Both looking towards the Project Site at the rolling hills and distant mountains, looking west to the Project Site out towards the valley and distant mountains would be considered a scenic vista." Accordingly, it is clear that Goal OG/CO 1 is applicable to the area in which the Project is being proposed.

b. False narrative in EIR—that the Project is located below a ridgeline

A false narrative that has been included in the visual impact analysis of the Tower project, starting with the 2007 application through the current application, is that the Project site is located "on a west facing slope below the ridgeline...". This description is again included within the executive summary, project location on page 1-1 of the EIR and elsewhere throughout the document. This statement has been a continued purported fact underpinning the conclusion that the Project does not have a significant impact on scenic or aesthetic values. 7-17

Despite this conclusion, photos and commentary within the EIR itself shows that the statement that the project site is located "below the ridgeline" is false. Figures 4.1-2, 4.1- 3 and 4.1-4 contain long distance photos of the foothills of the San Bernardino Mountains, showing the ridge tops of those mountains and the location of the equipment shed and monopole antenna. The foothills of the San Bernardino Mountains contain ridgelines that run both north-south and east-west. The north-south ridge tops are the highest ridge tops, but the East-West ridge tops are significantly higher than the surrounding valleys and create scenic vistas which are highly visible from the park and surrounding neighborhoods. These two figures, as well as the Google map photos attached hereto as **Exhibit C**, show that the equipment shed and monopole are in fact on a ridgeline, even though it is repeated many times in the EIR that the monopole tower is below a ridgeline. It is more accurate to say that it is below the north-south ridgelines, but the monopole is located on an east-west ridgeline and accordingly much more visible from Wildwood Canyon State Park and adjacent neighborhoods. 7-17 Cont.

In addition, attached as **Exhibit D** is a photo taken by CPRL from the trail within the park immediately adjacent to the Lazer property. That view shows the mock pole clearly visible against a blue sky, due to the fact that the monopole is on an east-west ridgeline visible from the viewpoint of the adjacent trail.

In addition, there is significant evidence in the record, including photo simulations in the EIR, which show that the statement that the Project is not located on the ridgeline is factually incorrect.

c. <u>The Lazer tower, antennas, equipment shed are visible from adjacent neighborhoods and from Wildwood Canyon State Park.</u>

The EIR admits (contrary to prior visual analysis) that the monopole, antennas, and equipment shelter are visible from nearby neighborhoods and from viewpoints within Wildwood Canyon State Park:

a. On page 4.1-2, the EIR concludes that "...{f]rom eastern trails (i.e. North Valley and Stintson trails), within the Park, the monopole was visible due to the contrast created by the darkened weathered wood and linear lines of the pole which stand out in contrast to the lighter vegetation along the hills. See Figure 4.1-1 – Stimulation Viewpoint Locations, for the location of viewpoints analyzed within this EIR ." 7-18
b. On page 4.1-2 , the EIR also concludes that the demonstration pole is visible from Parkview Terrace, a nearby residential neighborhood.
c. On page 4.1-2, the EIR concludes that the equipment shed (but not the monopole) would be visible from a vacant residential lot located along Oak View Road.

d. On page 4.1-7, the EIR concludes: "There are also unmarked trails that begin near the Project Site and trend towards the Wildwood Canyon State Park. The nearest one to the Project Site begins adjacent to the Project Site and is accessed from Pisgah Peak Road (see Photograph 3). As determined in site visits conducted in November 2014 and May 2015, from certain portions of this trail, the Project Site is visible (see Figure 4.1 – 5). 7-18 Cont.

In addition to the evidence set forth in the EIR that the Project will be visible from various locations within Wildwood Canyon State Park, and adjacent neighborhoods, there is significant evidence in the record from residents of Oak Glen and Yucaipa and users of the park and surrounding open space areas. We request that all testimony of citizens, as well as all comment letters and protest letters to the tower projects considered by the Board of Supervisor's in 2009 in 2012 be included within the administrative record for the current Project.

In summary, the equipment shelter and monopole tower are located on an east-west ridgeline highly visible from Wildwood Canyon State Park. The tower and or equipment shed is visible from eastern trails within the park (North Valley and Stinson), visible from trails adjacent to the Project site and trending towards the park, and visible from a vacant residential lot on Oak View Road and visible from another residential street called Parkview Terrace. Consequently, there is significant evidence in the administrative record, including conclusions and pictures within the EIR itself, which proves that the Project will have a significant aesthetic impact on the scenic views within and surrounding the project.

d. <u>Analysis of Thresholds of Significance</u>.

On page 4.1 – 12, the EIR sets forth the thresholds of significant for visual resources. Two of those thresholds are as follows:

- Have a substantial adverse effect on a scenic vistas as identified in the County's General Plan.
- Substantially degrade the existing visual character or quality of the site and its surroundings. 7-19

On page 4.-13, the EIR analyzes whether or not the project has a substantial adverse effect on a scenic vista. After conducting visual studies that conclude that the tower will be visible from all of the sites described above, the EIR comes to the following conclusion: "The design of the Proposed Project has included each of these goals to minimize potential impacts of the surrounding scenic vista. Therefore a less than significant impact will result."

The visual impact analysis is set forth on pages 4.1-16 through 4.1-25 of the EIR. While most of the chapter describes the methodology used, the analysis itself is completely subjective

and minimizes the impact of the visual blight created by the Project. The EIR declares that there is more visual blight from the electrical and telephone poles and wires in the area than from the Project. This statement is unsupported because the only place that telephone poles and wires exist are on the road entering into the park. The view to the east, including the foothills of the San Bernardino Mountains and the ridge on which the Project will be located, is a pristine vista with no view of telephone poles, wires, etc. In addition, at one of the prior hearings relating to the tower, an official from State Parks testified that, when funds are available, the existing poles and wires will be removed, consistent with what has been done at other state parks. 7-19 Cont.

With respect to Viewpoints 3 and 4, the EIR subjectively concludes that the monopole and equipment shed "would not be a dominant feature" in the landscape and thus would only slightly alter the landscape. Many local residents have testified and presented letters in connection with the prior tower applications, setting forth their personal experience and observation that the monopole will in fact be a dominant visual experience when utilizing the park. The subjective opinion of the preparer of the visualization study, paid for ultimately by the applicant, should not have more weight than the view of the users of the park who have testified that the monopole will in fact be a dominant feature of the landscape.

The visual impact analysis in the EIR focuses significantly on Mitigation Measure AES-I, which requires that the monopole, antenna and shed be painted olive green to blend with the surrounding vegetation, along with random patterns of light sage and light brown. This mitigation fails to take into account that the landscape surrounding the tower changes dramatically during the year. The olive green color will blend in with the vegetation during the winter when the surrounding vegetation is green (assuming that drought does not minimize the change of seasons), but will cause a contrast during much of the year when the background color will be the tan and gray of the background vegetation at that time. Accordingly, the analysis fails to indicate that even with the mitigation measure implemented, during significant times of the year the Project will be significantly more visible. 7-20

The EIR's aesthetic discussion does not in any way analyze the visual impact of the 650-foot path constructed by Lazer from Pisgah Peak Road to the location where the monopole will be constructed. Attached to this letter is a copy of a Google picture of the site before and after Lazer owned the Property (**Exhibit E**). The Google picture, taken from a satellite, shows the significant visual impact of the 650-foot scar across the landscape, visible from Wildwood Canyon State Park. On page 4.1-10, the EIR states that the pre-pole conditions are established as the CEQA baseline – the time when the entire Project site remained undisturbed. Accordingly, the aesthetic analysis must include the visual impact of this 650-foot path as well as all other potential visual impacts to the undisturbed baseline condition. 7-21

The visual impact analysis also fails to meaningfully analyze the visual impact of the fuel clearance areas around the tower, the fencing around the equipment building, the monopole, and

the 1+ mile of utility trenching that will occur along Pisgah Peak Road—all of which will cause significant visual impact, particularly from the trails in Wildwood Canyon State Park immediately adjacent to the Project site. 7-21 Cont.

C. <u>The aesthetic impact analysis and final conclusion are inconsistent and confusing. The final conclusion undercuts all of the studies, analysis and conclusion set forth in the EIR.</u>

As set forth above, CPRL strongly disagrees with the analysis and conclusions reached in the EIR relating to aesthetic impact of the Project. Time and again, the analysis and studies minimize the visual impact, and concludes that the level of significance after mitigation is insignificant. Table 1-1 summarizes the impacts and mitigation measures for the Project. With respect to level of significance after mitigation, it states that, after mitigation, the level of significance is "less than significant". On page 4.1-22 of the EIR, the summary of viewpoints concludes that "the Proposed Project would not result in a decrease to the Moderate and Low scenic integrity views within the Wildwood Canyon State Park along Canyon Drive and other interior trails." On pages 4.1-23-24, the new viewpoints are analyzed with the conclusion that the Project impact is less than significant.

Following this lengthy discussion concluding that the aesthetic impacts are less than significant, the EIR concludes:

> "The Lead Agency determines that implementation of Mitigation Measures AES-1 and AES-2 would reduce potential impacts at the Wildwood Canyon State Park and nearby sensitive receptors including residents and trail users to a less than significant level. This is supported by the analysis that relied on the USFS model and other federal agency models for determining and ranking visual changes in the environment. However, this area of CEQA is highly subjective and public comments previously received by the County Board of Supervisors indicated a high level of viewer sensitivity to the monopole's visual impact. In consideration of this and the alternatives analysis showing that no other feasible Project Sites could avoid such impacts, although the project is considered highly beneficial, the county determines that the visual impact, at least to some portion of the population, is significant and unavoidable." 7-22

The EIR's significant and unavoidable conclusion, which conflicts with the Aesthetic chapter's entire analysis, renders the whole discussion so confusing that no decision-maker could possibly understand what the final conclusion is or should be and whether the evidence cited adequately supports that conclusion. Since the very purpose of an EIR is to inform decision-makers and the public as to the environmental impact of the Project, this confusion is a fatal defect in the EIR. Not only can the decision-makers not understand the final conclusion, neither

can CPRL or any other members of the public attempt to comment on and understand exactly what the conclusion of the draft EIR is with respect to impact on aesthetics and scenic vistas. 7-22 Cont.

In summary, there are significant omissions and fatal flaws in the aesthetic impact analysis set forth in the EIR, which render the EIR inadequate under CEQA.

5. Alternatives Analysis.

a. Gaming the FCC rules.

By attempting to locate its radio tower in San Bernardino County, the real purpose of Lazer is to "game" the FCC rules in a way that it barely serves the community of license (Hemet) but extends its signal into larger portions of San Bernardino County and Riverside County. The FCC rule relating to Community of Service (47 CFR §73.315 (b)) states as follows:

> "The transmitter location **should be chosen to maximize coverage to the city of license** while minimizing interference." [BOLD ADDED]

7-23

It is clear from the engineering statements presented by Lazer (as well as statements made throughout the hearing process for the prior tower applications) that the transmitter/tower location was not chosen to maximize coverage to the City of Hemet, but was chosen to maximize coverage to other areas within Riverside and San Bernardino counties. Serving the required community of service is an afterthought rather than the goal of Lazer in relocating its radio antenna. The purported lack of alternative sites is not driven by FCC rules and regulations, but rather by Lazer's attempt to utilize its Hemet radio station to serve other communities rather than the community of Hemet. Lazer does not have any right, under FCC rules or under local zoning rules, to utilize its Hemet radio station to service other communities besides its community of license.

b. The Purported Project Goal of Expanding Wildwood Canyon State Park is fraudulent and in bad faith.

Section 6.1.2, on pages 6-3 and 6-4 (and the Project Description), establishes the project objectives of Lazer's tower proposal. In addition to the project objectives related to the relocating of the antenna to comply with FCC criteria, operating a fully licensed FM radio broadcasting facility, and enhancing coverage of public service and commercial programming, the EIR sets forth the following additional objectives: 7-24

- Contribute to the expansion of Wildwood Canyon State Park (WCST) through the implementation of a passive, not active, land use. As a passive land-use broadcast towers have been implemented in many CA State Parks.

- Create long-term buffering of passive land uses within and adjacent to the eastern WCSP boundary through dedication of development rights and/or transfer of ownership in fee of close to 4% of the current WCSP land area.

7-24 Cont.

These purported goals of the Project are illusory and not in any way supported by the prior actions or motivations of Lazer. Rather, these objectives are a cynical attempt to justify the position that deed restricting a portion of the Lazer property for open space uses somehow "expands" Wildwood Canyon State Park. We now have an administrative record of the Lazer tower proposal going back to 2009. Never, in any prior correspondence, testimony or documents submitted has Lazer indicated one of the purposes of purchasing the Lazer property and pursuing the tower proposal was to expand the park. The County has an obligation under CEQA as Lead Agency to independently prepare and review the EIR. Thus, the mere fact that the County included these absurd goals in the EIR shows that the County is not exercising its independent judgment. The expansion of Wildwood Canyon State Park as a goal of the Project does not pass the proverbial "smell test" here, and shows a lack of good faith in articulating the goals of the Project for purposes of analyzing its alternatives.

c. <u>The "no project" alternative analysis is totally fictional "straw man".</u>

The analysis of a 7,000 sf house that is 60 feet high is a highly unlikely "straw man" for the purpose of showing that the "no project" alternative is environmentally more damaging than the Lazer tower. (EIR section 6.4.1, page 6 – 13)

Due to lack of utilities and very difficult, sometimes unusable, access to the Lazer property, construction of a single family home on the lot is infeasible. If a home could be built, it would likely be a modest structure with much less impact than the maximum possible size analyzed in the EIR as the "no project" alternative. The Lazer property, as well as surrounding properties, was subdivided in 1980. No homes have been built in the vicinity in the last 36 years, yet the "no project" alternative abstractly analyzes a monstrous 7000 ft.^{2} home that is 60 feet in height.

7-25

General Plan Policy OS 7.4 states that the County should "discourage residential development on land with slopes greater than 30 percent, ridge saddles, canyon mouths, and areas remote from existing access." This policy clearly applies to the Lazer property and would severely limit the development potential of the Project site for a single family home. In addition, the County Development Code also restricts construction of homes on sites in excess of a 30 percent slope. As CPRL has previously pointed out, the Project site exceeds a 40 percent slope. Moreover, in connection with its 2009 application for the tower project, Lazer submitted a proposal to build an 18,000 ft.^{2} home on the property. We believe this was done not because Lazer wanted to construct such a home, but rather as a threat to the community and conservancy groups. In responses, CPRL submitted the Goodman Letter which pointed out that such a

residence would not be permitted under Chapter 83.08 of the Development Code. In fact, the "no project" alternative located adjacent to Pisgah Peak Road would be on slopes greater than 40% grade and, therefore, would be prohibited by the Development Code, which provides the following rules with respect to slopes in excess of 40 percent: "This is an excessive slope condition. Pad grading shall not be allowed. Grading for driveways and roads shall be reviewed to the Minor Use Permit application process"[Underlining Added]. 7-25 Cont.

The "no project" alternative should be analyzed with the assumption that the property would be used for open space purposes—that is, an alternative that considers the undeveloped nature of the site. That analysis would lead to a completely different (and more appropriate) conclusion than that reached in the EIR. For example, the Yucaipa Valley Conservancy ("YVC") made an offer to purchase the Lazer property, but Lazer did not respond to that offer. Therefore, the open space alternative would be vastly more feasible than the EIR's "no project" alternative. Moreover, if the Lazer project is denied, YVC will again make an offer to purchase the property in order to dedicate the property for open space. If YVC does not purchase the site, other local open space conservancies would purchase the site, unless Lazer refuses to sell the site and leaves it vacant, Accordingly, the "no project" alternative should be analyzed as use of the property for open space.

d. Alternative sites.

CPRL has previously submitted the following analyses prepared by qualified FCC engineers: (1) Engineering Analysis & statement dated January 2009 prepared by Klein Broadcast Engineering ("Klein Report"), and (2) Engineering Statement dated March 2011 prepared by De La Hunt Communication Services (De La Hunt Report"). Both of these engineers are highly qualified. De La Hunt worked for the FCC for many years in the department which made determinations as to whether or not proposed tower locations were compliant with FCC rules and regulations, including spacing and line of sight requirements. Both of these engineers concluded that a site in Beaumont, California (ASR #1263499) (Site 1) and a site located in Cherry Valley, California (ASR #1202850) (Site 2) qualified under all FCC rules and requirements. 7-26

In prior applications and hearings, Lazer. its engineers, and attorneys have consistently taken the position that the proposed Oak Glen site, located adjacent to Wildwood Canyon State Park, was the only site in the world that would satisfy FCC requirements and their business objectives. Now, an engineering firm (Cavell Mertz and Associates, Inc.) has been hired to provide another engineering statement (CMA Report) that supports the Lazer Project. The CMA Report includes a review of the prior engineering statements submitted by Lazer as well as CPRL. Not surprisingly, the new engineering study criticizes the Klein Report and the De La Hunt Report, and supports the conclusions made by Lazer's engineer.

Anticipating that FCC engineers hired (directly or indirectly) by Lazer would continue to criticize the Klein Report and the De La Hunt report, CPRL retained Goldman Engineering Management, LLC, to review the Klein Report and the De La Hunt report, as well as to review other alternative sites. The Engineering Statement (Goldman Report) prepared by Goldman Engineering Management, LLC, dated July 20, 2016, is attached hereto as **Exhibit F**. 7-26 Cont.

The Goldman Report concludes that Site 1 and Site 2 identified in the Klein Report and the De La Hunt Report meet the community coverage requirements for Hemet with full, unblocked line of sight to Hemet. This is different than the CMA report, which concluded that Site 1 did not comply with community coverage or line of sight rules. However, the key to the distinction between the Goldman Report and the CMA Report is explained by the following language in the Goldman Report:

> "When community service is analyzed in the same manner as the currently permitted KXRS site, the sites chosen by Mr. De La Hunt are compliant with community coverage rules."

What Goldman points out is that two different standards are being utilized for analyzing whether or not the FCC coverage rules have been satisfied. If the same standards and testing utilized for the KXRS site are applied to Site 1, the FCC rules are satisfied. It is important to note that in the CMA Report, there seems to be a recognition of these dual standards. Rather than applying the same standards for the KXRS site and Site 1 and Site 2, the CMA avoids this issue by stating:

> "For comparison purposes, the proposed KXRS site was also studied using the same line of sight study as the alternative sites. Figure 5A shows the unshadowed area is 50.5% of the area and covers 41.9% of the population of Hemet. As mentioned above, the FCC rules address both the 70 DBU signal coverage and the prohibition of "major obstructions. **Since the FCC has granted a construction permit for this location, it must be concluded that this site satisfies the FCC Rules and policies at the time of the grant in 2009." [BOLD ADDED]**

This passage suggests that CMA has not analyzed community service or line of sight for Site 1 and Site 2 in the same way that the KXRS site was analyzed, but instead "punted" by assuming that the KXRS site satisfies the requirements because it is an FCC approved site. In essence, CMA is quick to assume that the KXRS site satisfies FCC rules being applied to Site 1 and Site 2. CMA should be required to create an addendum to its engineering statement setting forth an analysis of Site 1, analyzing community service and line of sight in the same way that the proposed KXRS site was analyzed. According to the Goldman Report, the FCC used a methodology for community service and line of site that is different than the methodology used by CMA in analyzing Site 1 and Site 2. That same method of analyzing community service and line of sight should be used in analyzing Site 1 and Site 2. Alternatively, the conclusion to be

reached from the CMA Report is that CMA believes that the approved KXRS site would not satisfy FCC rules and regulations if a consistent methodology was applied. 7-26 Cont.

In summary, the CMA Report raises as many questions about compliance with FCC rules as it purports to resolve. Because Site 1 satisfies FCC rules using the same community of service analysis that was used for the proposed KXRS site, Site 1 should be included in the alternatives analysis. This conclusion has been confirmed by a qualified FCC engineer in the Goldman Report. The alternatives analysis is inadequate without inclusion of Site 1, which would have significantly less environmental impact than Site 2 and would be a viable, feasible alternative location for the Project.

e. Additional FCC compliant site identified in the Goldman Report should be analyzed as an alternative location under CEQA.

The alternative study should also include analysis of the additional site identified in the Goldman Report, namely the "Calimesa Site" (33° 59' 22" N, 116° 59' 2" W). This site is along a jeep trail on a hill in Calimesa, California. There are residences and developments nearby. A very short tower (such as that proposed for the KXRS tower) could be used. This site is closer to Hemet than the current construction permit for KXRS and it has similar line of sight to Hemet.

Another alternative site that should be analyzed under the EIR is the Gilman Hot Springs site described in the Goldman Report. Lazer itself admits in prior engineering studies that this site satisfies FCC requirements. Hemet, California is the community of license that, pursuant to FCC rules, Lazer is obligated to serve. Lazer claims that it needs to relocate the tower to satisfy FCC rules, but in fact the site is grandfathered and there is no need whatsoever to relocate the tower.

CPRL is not opposed to Lazer expanding its business, but believes that there can and should be a compromise that allows it to expand without damaging San Bernardino's precious open spaces in the process. There clearly are alternatives potentially available; Site 1 as well as the Calimesa site and the Gilman Hot Springs site identified in the Goldman Report must be analyzed to provide decision makers as well as the public adequate information to determine the feasibility of alternative sites for the Lazer tower. Until a complete aanalysis with a reasonable range of alternatives is prepared as part of theEIR, the alternatives analysis is inadequate under CEQA

8. Biological Impacts.

A. **Avian Collision Impacts.**

There is general agreement and well documented evidence that communications towers result in dramatically increased avian mortality rates. *See, e.g.*, Travis Longcore, Ph.D. et al., *Scientific Basis to Establish Policy Regulating Communications Towers to Protect Migratory Birds*, Land Protection Partners (2005), attached hereto as **Exhibit G**. Studies show that for the 7-27

ten avian species killed most frequently at communication towers, total annual mortality is estimated to be from 490,000 to 4.9 million for each species. The avian mortality crisis is compounded by the growing impacts of communication towers, such as the proposed tower, whose construction is occurring at an exponential rate. 7-27 Cont.

In addition, the concerns of avian mortality at the proposed tower are heightened by a number of factors. There is already a 199-foot radio tower located about a mile away along Pisgah Peak Road, which coupled with the proposed radio tower, will put the migratory birds and raptors at a heightened risk of tower strikes. The project is located on East-West ridgeline, thus increasing the probability of avian mortality. Guidelines to reduce avian mortality suggest that towers should be designed to accommodate additional antennas, to reduce the number of future towers. *See, e.g.*, Albert M. Manville, II, Ph.D., *The ABCs of Avoiding Bird Collisions at Communication Towers: The Next Steps*, U.S. Fish and Wildlife Service, Division of Migratory Bird Management (2000), attached hereto as **Exhibit H**. Particularly with a radio tower in such close proximity, the County must require the applicant to fully evaluate this option prior to construction of the proposed tower.

The topography of the San Bernardino Mountains also poses an increased risk of avian mortality. A recent multi-modal research study in New Hampshire revealed the effect of topography of the Appalachian Mountains on migratory birds, finding exceptional numbers of birds flying at low heights over mountain ridges. As a result, placement of the proposed tower in this mountainous area is likely to result in increased risk of bird mortality and injury from tower strikes. *See* **Exhibit I**. The applicant contends it has strategically placed the tower in a "bowl" on the site. Although it is clear from pictures and site plans submitted by applicant that the proposed tower is on the top of an east-west ridge, not in a bowl, if applicants claim that the tower is located in a bowl, this bowl would most likely collect fog, which also enhances the risk of avian mortality.

In connection with the EIR, a General Biological Assessment was prepared by Natural Resources Assessment, Inc., dated August 17, 2015 ("2015 Biological Assessment"). The project findings relating to avian collision impacts in the 2015 Biological Assessment states:

> "The Lazer Radio Tower project will consist of a 43 – foot tall monopole with no support wires. While this pole rises above the height of the surrounding vegetation, it is well below the recommended 199 foot standard height requirements designed to minimize impacts to birds. The pole will not require the installation of guy wires nor will it be lighted. This will reduce impacts to birds, as well as bat species."

These findings failed to take into account several significant factors. First, the 43 foot tall monopole is located on a ridge, which significantly increases the probability of avian collision. Secondly, although the monopole will not have lighting, the equipment shelter will be lighted. In section 4.1.4.2, page 4.1-14, the EIR states that "the proposed 100 square- foot equipment shed would have exterior lighting directed and shielded on-site for safety purposes." This discussion then concludes that "no impacts are anticipated", but there is no indication whatsoever that the

lighting on the building was taken into account in analyzing avian collisions. The equipment shed is located on the slope above and behind the tower, and will provide a light that could attract birds to fly towards the monopole. 7-27 Cont.

Attached to the 2015 Biological Assessment are the "Service Interim Guidelines for Recommendations on Communications Tower Siting, Construction, Operation, and Decommissioning." The assessment fails to note that recommendation 1, encouraging new communication towers to be co-located on existing towers, was not followed. This can be done with respect to existing towers in the San Jacinto area, near Hemet. Recommendation number 4 is to cite new towers within existing "antenna farms" (cluster of towers)." This recommendation was also not followed, even though it be possible to do so in the San Jacinto area.

B. **Cursory Nature of Assessment**.

It appears that there was a single site visit to the Project site on May 3, 2015. A single visit is inadequate and significantly increases the probability of false absences and imperfect detection. It is rare that a species has a 100% chance of being detected on a single visit. Therefore non-detection does not necessarily mean the species is absence. An observed absence may be due to an observer failing to detect a species that lives at the site, e.g. a bird that was elsewhere in its home range at the time of the survey or failed to call during a point count. Increasing the number of visits to a site would increase the probability of detecting targeted fauna. False absences have serious consequences for monitoring studies, as well as impact assessments. In order to assure that the biology assessment is accurate, the biologist should be required to visit the site numerous times to assure its accuracy. 7-28

C. **Failure to Survey Pisgah Peak Road.**

One of the most significant and disruptive aspects of the Project is the undergrounding of electrical services along 6700 feet of Pisgah Peak Road. The 2015 Biological Assessment in no way assesses the impact of the undergrounding of utilities along an area more than a mile in length. The EIR states that because the road is a dirt road that is not vegetated, there will be no significant environmental impact. This fails to recognize that all of the fauna of the wilderness areas through which Pisgah Peak Road traverses will be impacted by the undergrounding of utilities. Failure to analyze the biological impact of a one-mile plus component of the Project is a fatal defect in the biological assessment. In order to be complete, the assessment must include this significant component of the Project. In essence, the biologists defined the "Lazer project" as only the on-site portion of the project relating to the tower, equipment shed and fencing, completely ignoring the largest portion of the Project. 7-29

9. **Construction Impacts; Growth Inducing**

CEQA requires that construction impacts be analyzed, even though they are temporary. *City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392, 1425 7-30

(EIR required to analyze temporary construction air quality and noise impacts). The EIR provides very little information or analysis related to the construction of the Project. It indicates that some grading will be required and states that the majority of the construction will be coordinated via a ground crew working closely with a helicopter service to install the tower and equipment shelter. However, the EIR provides no information related to the number of workers that will be involved in the construction, how these workers will get to the site, the length of the construction period, the number of truck trips associated with bringing workers and materials to the site, the number, frequency or time of day of helicopter trips associated with bringing workers and/or materials to the site, or the location of a staging area for materials, workers or the noted helicopter trips. For example, will the helicopters be bringing all the materials and equipment to the site, or just some? Where will these helicopter flights originate? Where on the site will they land? Where will workers park? Pisgah Peak Road is a single lane, unpaved dirt road. Can it handle the truck trips needed to transport workers and materials to the site to construct the Project? Will truck routes include going through the nearby residential areas to reach Pisgah Peak Road? The County needs answers to these questions in order to assess the potential construction impacts associated with the Project. 7-30 Cont.

Included with the radio tower application is a Geotechnical Report and Site Plan Review prepared by Southern California Geotechnical. That report recommends the following work be done in order to assure that the tower is placed on a proper foundation:

A. "Based on the subsurface conditions encountered at the site, the drilled piers should be founded at a depth of 20 to 30 feet". (Page 1)
B. "It appears that the most economical method of support for the new tower will be to extend the foundation elements down to the dense bedrock at depths of 20+ feet". (Page 11)
C. "All fill soil should be compacted to at least 90% of the ASTM D-1557 maximum dry density." (page 11)
D. "In general, all utility trench backfill should be compacted to at least 90% of the ASTM D-1557 maximum dry density. As an alternative, a clean sand (minimum Sand Equivalent of 30) may be placed within trenches and flooded in place." (Page 11)."

The work described above will require substantial drilling, digging and trenching, including drilling and/or digging within dense bedrock. The EIR in no way considered how that work will be accomplished. What equipment will be used? What noise and dust will result from the use of that equipment? What air emissions will be released as a result of the necessary equipment? These details as to how the work will be performed is critical in analyzing the construction impacts of the project.

As set forth above in the comments regarding the in adequacy of the Project description, the EIR also fails to analyze the environmental impact of the extending utilities for over a mile. This failure alone is a fatal flaw in the document, but the disregard for the associated construction impacts makes the omission even more glaring. The analysis of the utility extension 7-31

is almost nonexistent, in part because the Project analyzed in the EIR is limited to the portion of the project located on the Lazer property. This fails to analyze the environmental impact of the much larger project of extending utilities for 6700 linear feet. Not only does the EIR fail to analyze the impact of that utilities extension, it fails to include even a basic description of what that utility extension would entail, including the amount of land that would be disturbed, the equipment to be used, the workforce, the schedule or the plans. The EIR does not describe how the mile-long trench will be excavated, how much dirt will be displaced, the amount of dirt and other waste that will be generated, the amount of dust that will be created and how that dust will be mitigated, vibrations from use of equipment and digging that might impact threatened or endangered species in the open spaces immediately adjacent to Pisgah Peak Road and storm water pollution control relating to the one-mile trench. Lastly, the EIR does not analyze the erosion impacts of disturbing a mile of dirt roads that are already subject to severe erosion and barely drivable. The EIR seems to take the position that, because the utility extension is a private utility extension by a private party, it is not necessary to engage in the same environmental analysis that a public utility would engage in in connection with a mile-long underground utility extension. That position is unsupported by law.

7-31 Cont.

Because of the missing information noted above, the County is without the information necessary to analyze the potential for grading, truck trips, helicopter use, and related construction activity to cause significant air quality impacts. The San Bernardino Mountains are located within the South Coast Air Quality Management District ("SCAQMD"). FEIR at IV-27. The topography and climate of the region make the SCAQMD an area with a high potential for air pollution. *Id.* at IV-26. Air pollutants of greatest concern in San Bernardino County include PM_{10}, because the County is currently in non-attainment with the Ambient Air Quality Standards ("AAQS") for this pollutant. *Id.* at IV-29. Construction related dust pollution is a major contributor to PM_{10} emissions. *Id.* Because the construction of the Project will contribute to this already adversely impacted situation, the Project is likely to result in significant adverse construction-related air quality impacts with respect to at least PM_{10} emissions.

CEQA mandates that a project should not be approved if there are feasible mitigation measures available which would substantially lessen the project's significant environmental effects. Cal. Pub. Res. Code § 21002; *see also Sierra Club v. State Bd. of Forestry* (1994) 7 Cal.4th 1215, 1233. Because of the non-attainment status related to PM_{10} in the SCAQMD, the FEIR recommends that developers such as the applicant, to mitigate air quality impacts during construction, address site-specific analysis of (i) grading restrictions and/or controls on the basis of soil types, topography or season; (ii) landscaping methods, plant varieties, and scheduling to maximize successful revegetation; and (iii) dust-control measures during grading, heavy truck travel, and other dust generation activities. FEIR at IV-30. Among other things, the applicant must also develop a construction vehicle plan, which restricts the number of daily trips of helicopters and trucks to the construction site, and ensures that such trips are made during hours that are least likely to impact the neighboring residential communities along Oak Glen Road. *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 794. Because the Project has the potential to cause significant air quality impacts during construction,

7-32

the County must recirculate the EIR to analyze the potential air quality impacts and develop feasible measures to mitigate such impacts. 7-32 Cont.

The EIR's notion that, because the service extension is "private," the extension is not considered growth-inducing turns CEQA on its head. If the Project can be accommodated by a private service extension, then there is no support for the conclusion that service could not be made available to other tower facilities. In fact, if this EIR can so completely ignore the impacts of the Project's service extension, then what assurance does the public have that the County approval process will protect the open space from growth inducing impacts? Lastly, the EIR impermissibly concludes that, because a determination of growth-inducing would be highly speculative, a less than significant impact is expected. (EIR, p. 5-10.) CEQA does not allow for a lead agency to "throw up its hands" in the face of complex impact-inducing factors and make a less than significance finding that is unsupported by substantial evidence. 7-33

10. **Hazards - Safety Impacts.**

The Project site is located within County Fire Safety Area 1 ("FS1 Area"). The FS1 Area is "characterized by areas with moderate and steep terrain and moderate to heavy fuel loading contributing to ***high fire hazard conditions***." Development Code § 82.13.030 (emphasis added). There have been several major wildfires in the San Bernardino Mountains over the years including one in 2006 which was caused by lightening, and burned tens of thousands of acres, including 485 acres of the San Bernardino National Forest. *See* the Mountain Area Safety Taskforce website, available at www.calmast.org. Extreme heat, arid surroundings, erratic winds, thunderstorms, and difficult mountainous terrain make such wildfires in the San Bernardino Mountains extremely dangerous and difficult to contain. *Id.* 7-34

The Project will enhance the risk of wildfire already associated with the high fire hazard conditions in the area. The tower and tower antenna will contribute to this increased risk by adding a new source of electricity and new structures which could attract lightening during storms.

The analysis in the EIR, as well as in the letter from Don Oaks dated May 13, 2016, focuses solely on an unmanned structure and the impacts to the radio tower equipment. The General Plan policies and goals, including policy S3 .2 directs that the county "will endeavor to prevent wildfires and continue to provide public safety from while fired hazards." Neither the analysis in the EIR nor in the Oaks letter in any way analyze the disastrous impact that a brush fire caused by a lightning strike to the tower would have on adjacent neighborhoods and residential dwellings. Also, the Oaks letter has general information about lightning strikes, but fails to include a detailed, scientific analysis of the probability of a lightning strike of a 43-foot monopole located on a ridge line.

11. **Historic/Archeological/Paleontological Impacts.**

The Land Use Application Questionnaire (questions 11 and 23) asserts there are no known cultural or historic resources on site. However, the application also admits that the site 7-35

has not been surveyed for historical, paleontological or archaeological resources. Such surveys must be performed. Until they are, it is not possible for the County to assess these potential impacts. 7-35 Cont.

12. **Cumulative Impacts.**

CPRL is quite concerned that there is the potential for the Project area to become a magnet for the type of development proposed by the Project. As noted in the Project application, there is already one radio tower structure in the area. If this Project is approved, it could result in an even greater proliferation of tower structures for communications facilities in the Mountain Region. If this happened, it would permanently alter the character of the area and mar the mountain landscape for decades to come. As discussed above, the proposed Project has the potential to have several significant adverse impacts on the environment.

The EIR concludes that, based on the plans, policies, and building guidelines set forth by the County, the majority of the area surrounding the Project could not be developed with additional broadcast towers because of steep terrain and limited access from Pisgah Peak Road—these factors are described as "development limiting." (EIR, p. 5-3.) The EIR also eliminates the potential for broadcast tower development in both State Park Lands and National Forest Lands, notwithstanding the fact that the construction of the Project is identified as a Project Objective for purposes of contributing to the expansion of Wildwood Canyon State Park. 7-36

Specifically, the EIR relies on planning assumptions to assess the reasonably foreseeable cumulative projects. The first assumption states: "[r]easonable extension of electrical power lines (power line extension would be cost prohibitive to develop and **biological impacts of the power line extension would likely be significant**) and no future tie-ins to the Proposed Project's extended electrical line." (EIR, p. 5-4) (emphasis added). This assumption for the cumulative impact analysis contemplates a potentially significant biological impact for electrical power lines, while the EIR's analysis of the actual Project ignores such a possibility by concluding that the undergrounding of 6700 LF of electrical power lines would have no impact on biological resources (EIR, p. 4.2-9/10.) The cumulative assumption directly contradicts the biological conclusion, which calls into question the adequacy and accuracy of the biological resources analysis as it relates to the undergrounding of the power lines—for both Project and cumulative impacts..

The cumulative section then assumes that up to seven (7) additional broadcast towers could be developed within the identified area proximate to the Project, with potentially significant cumulative impacts in the following resources areas:

- Aesthetics 7-37
    - This section recognizes that the EIR analyzed aesthetic impacts on a project level basis; however, the cumulative aesthetics analysis incorrectly concludes that potentially significant impacts are mitigated to a less than significant level with Mitigation Measures AES-1 and AES-2. (EIR, p. 5-7.) This conclusion ignores the Project-level finding that visual impacts are determined to be significant and

unavoidable. Consequently, the cumulative visual conclusion does not correspond to the underlying Project conclusion and, therefore, the analysis is flawed. 7-37 Cont.

- This section also concludes that future tower impacts would not be greater than those of the Project, which are significant and unavoidable. Thus, the finding that cumulative visual impacts would not be considered significant is not supported by substantial evidence.

- Biological Resources
  - This section suffers from the same infirmity relative the EIR's disregard for the potential impacts arising from the undergrounding of 6700 LF of electrical power lines in Pisgah Peak Road (that could be significant as noted above). If there is the likelihood of a significant Project impact, then the EIR must take into account and disclose the correct order of magnitude of any impacts to biological resources on a cumulative level. 7-38
- Land Use
  - The EIR declares that the cumulative projects are "unlikely" to create cumulative land use impacts—a statement that is conclusory and not supported by substantial evidence. 7-39

13. **EIR is Inadequate Under CEQA and Must be Recirculated.**

CEQA requires the County to consider the environmental impacts of the Project before any approvals are granted for the Project. Among the purposes of CEQA are (1) informing the government decision makers and the public about the potential environmental impacts of proposed activities, (2) identifying ways to avoid or reduce environmental damage from such activities, (3) preventing environmental damage by requiring changes in projects, either by adoption of mitigation measures or alternatives, and (4) disclosure to the public of why a project is approved if the project would have significant effects on the environment. Cal. Pub. Res. Code §§ 21000, 21001.

The EIR contains numerous inaccuracies and omissions which would prevent responsible and trustee agencies from fully understanding the potential environmental impacts of the Lazer tower project. The proposed study of alternatives is completely inadequate and fails to comply with CEQA. The "no project" alternative analysis is based upon development of a 7000 ft.^{2} residence, which would not be permitted under the Development Code and is improbable based upon lack of utilities, access, etc. The discussion and analysis on land-use impacts is incomplete, and fails to adequately address direct conflicts with the County Development Code, General Plan and Oak Glen Community Plan. The discussion of aesthetic impacts is based on false assumptions (such as that the project is located below the ridgeline), and fails to adequately take into account the aesthetic impact on trails and open-space properties immediately adjacent to the Project. Additional defects can be found throughout EIR, in the Project Description, the cumulative analysis, the impact analysis, and the alternatives. The EIR is wholly lacking in 7-40

thorough and adequate analysis and its conclusions are not supported by substantial evidence in the record as required by CEQA

7-40 Cont.

Accordingly, in order to give public agencies as well as the general public an adequate opportunity to review the full environmental impacts of the Project, the EIR must be corrected and then recirculated so that those agencies and the general public have an opportunity to comment on the Project with full knowledge as to its adverse environmental impacts.

We at CPRL appreciate your consideration, and reserve all of our rights. Please feel free to call me with any questions or comments you may have.

Very truly yours,

MIRAU, EDWARDS, CANNON, LEWIN & TOOKE

By: John K. Mirau, Esq.

Cc w/out Encl: Supervisor James Ramos
Mayor Dick Riddell
Mr. David Myers, The Wildlands Conservancy
Mr. David Miller, Yucaipa Valley Conservancy

EXHIBIT A

Goodman &ASSOCIATES

October 4, 2011

John Mirau
MIRAU, EDWARDS, CANNON,
LEWIN & TOOKE
1806 Orange Tree Lane, Suite C
Redlands, CA 92375

Subject: Pisgah Peak
Lazer Broadcasting

Dear John,

The following are results of our assessment of plans provided to us and field work we have done as it relates to the Pisgah Peak/Lazer Broadcasting project:

1. **Exhibit A** is a copy of a portion the Enlarged Site Plan prepared by others for Lazer Broadcasting. The Site Plan depicts the existing physical topography, the existing property line and center of the 60-foot road easement, and the proposed new facilities. We have highlighted in red on this plan the delineation of the road easement centerline (already on the plan) and have added the 30-foot half-width easement to illustrate that their Site Plan proposes to build a one-story equipment shelter and parking space within the existing road easement.
2. **Exhibit B** is a copy of a portion of a Grading and Drainage Plan, prepared by M3Civil, Inc., for Lazer Broadcasting. It depicts the existing physical topography, the existing property line and the 60-foot road easement, and the design for proposed construction of a single family residence. We have highlighted in red on this plan the delineation of the road easement (already on the plan) to illustrate that this plan proposes to build the house within the existing road easement.
3. **Exhibit C** is a plot of the contours Goodman & Associates has developed based on a field survey taken on the property. The area covered was dictated by limitations of physical access due to steepness of terrain and density of thick growth of plant life indigenous to the area. The primary purpose was to provide confirmation that the proposed construction site for either use mentioned above is in an area that has a slope of about 40±% or greater and will violate the 60-foot road easement. The physical topography is illustrated by others on Exhibits A and B. Consequently, our field work only serves to verify what has already been depicted on plans prepared for Lazer Broadcasting.

Please advise if you have any questions.

Sincerely,

GOODMAN & ASSOCIATES

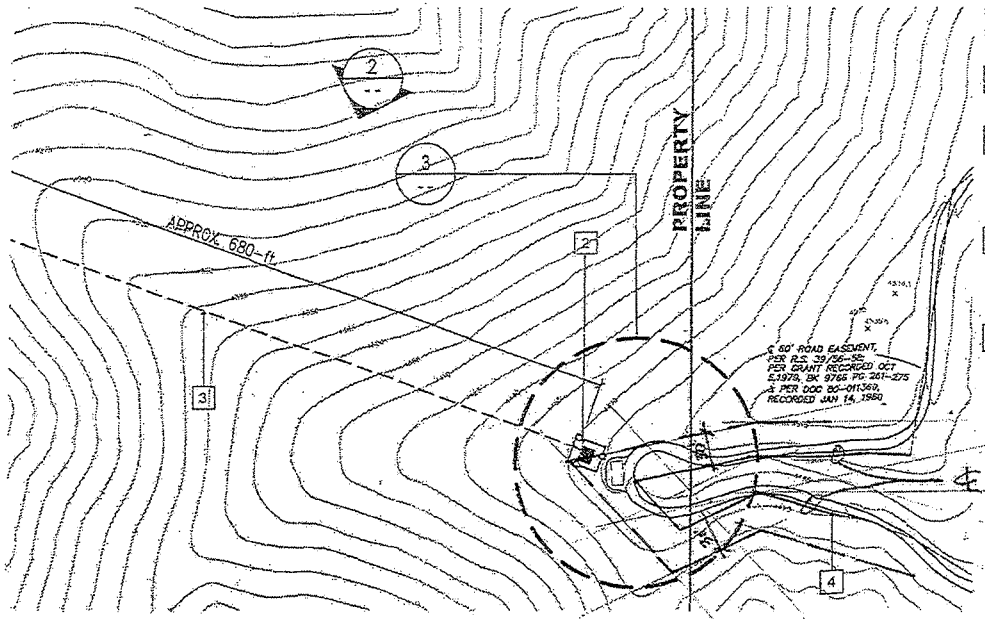
Douglas L. Goodman, PE

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS L. GOODMAN
No. 28500
Exp. 03-31-12
CIVIL
STATE OF CALIFORNIA

Attachments: Exhibit A, B, and C

2079 Sky View Drive • Colton, Ca 92324 • (909) 824-2775 • FAX (909) 824-2807
email • doug@goodman-assoc.com

EXHIBIT A



Keynotes:

1. PROPOSED 43-FT. SELF-SUPPORTING BROADCAST TOWER
2. PROPOSED ONE-STORY (10-FT. X 10-FT. X 9-FT. TALL) EQUIPMENT SHELTER: PLACED LESS THAN 680-FT FROM TOWER TO MINIMIZE GRADING AND SITE DISTURBANCE, AND TO PROVIDE EASY ACCESS FOR MAINTENANCE PERSONNEL
3. 680-FT LONG (APPROX.) UNDERGROUND CONDUIT FOR RADIO TRANSMISSION LINES (NOT VISIBLE FROM OFF-SITE) - TO BE COORDINATED WITH PROJECT BIOLOGIST
4. EXISTING UNPAVED ACCESS ALONG PISGAH PEAK ROAD: NO GRADING PROPOSED. PASSES THROUGH AND PROVIDES ACCESS TO ADJACENT PARCELS

4 ENLARGED SITE PLAN (To Scale)

1-IN. = 100-FT.

EXHIBIT A

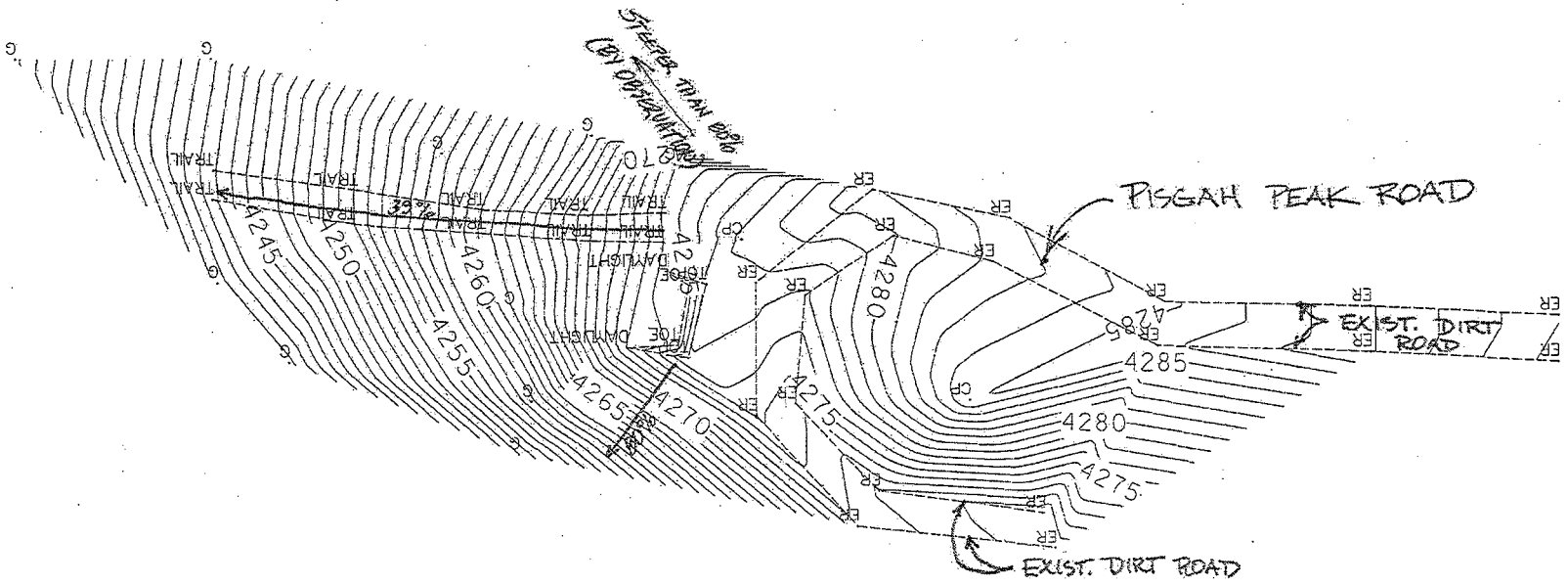
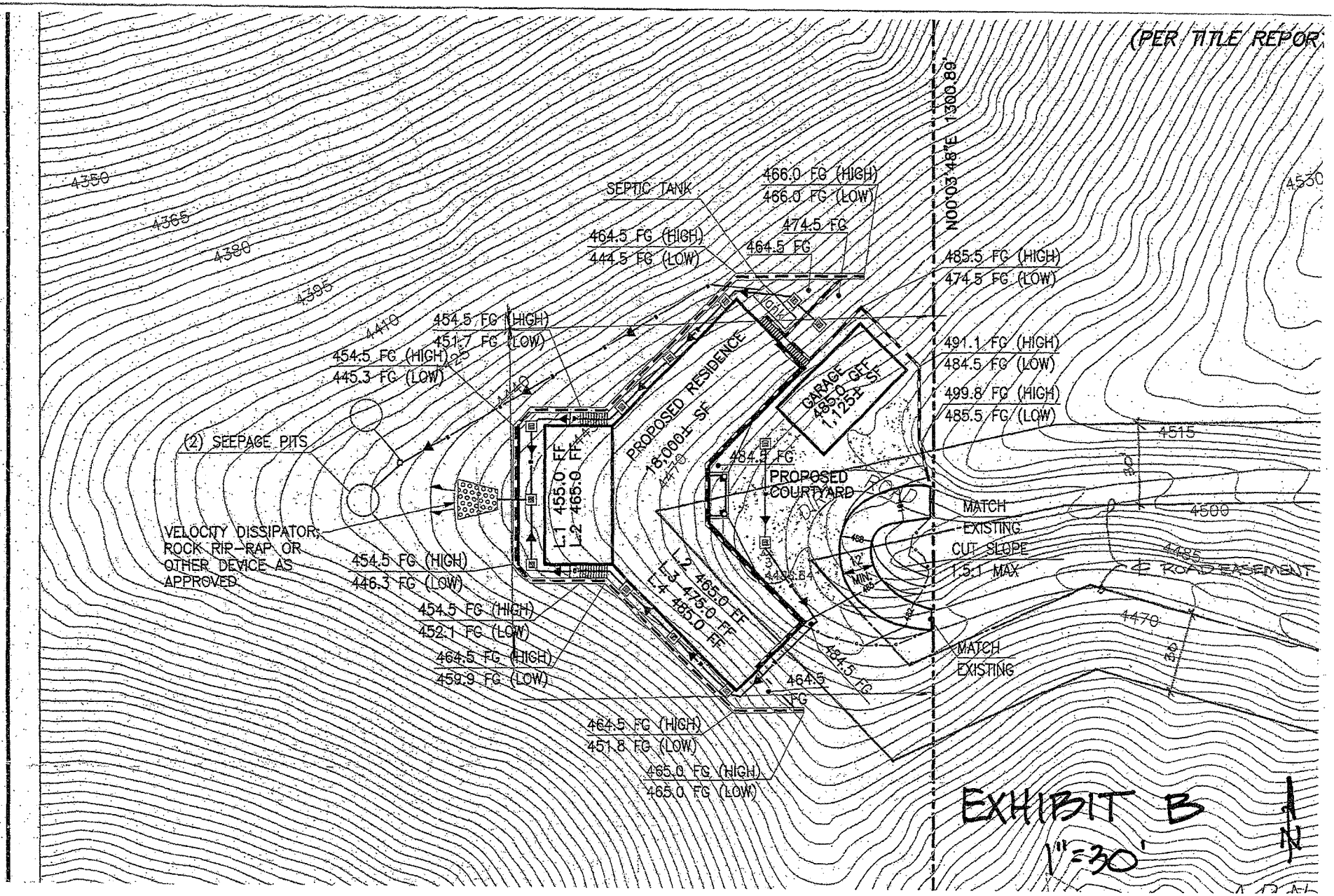


EXHIBIT C

1"=20'

N


(PER TITLE REPOR
N00°30'48"E 1,300.89'
SEPTIC TANK
466.0 FG (HIGH)
466.0 FG (LOW)
474.5 FG
464.5 FG
464.5 FG (HIGH)
444.5 FG (LOW)
485.5 FG (HIGH)
474.5 FG (LOW)
454.5 FG (HIGH)
451.7 FG (LOW)
454.5 FG (HIGH)
445.3 FG (LOW)
491.1 FG (HIGH)
484.5 FG (LOW)
499.8 FG (HIGH)
485.5 FG (LOW)
PROPOSED RESIDENCE
18,000± SF
GARAGE
485.0 GFF
1,125± SF
(2) SEEPAGE PITS
L-1 455.0 FF
L-2 465.0 FF
484.5 FG
PROPOSED COURTYARD
DRIVE
ROAD
MATCH EXISTING CUT SLOPE 1.5:1 MAX
VELOCITY DISSIPATOR; ROCK RIP-RAP OR OTHER DEVICE AS APPROVED
454.5 FG (HIGH)
446.3 FG (LOW)
454.5 FG (HIGH)
452.1 FG (LOW)
464.5 FG (HIGH)
459.9 FG (LOW)
L-2 465.0 FF
L-3 475.0 FF
L-4 485.0 FF
464.5 FG
464.5 FG
464.5 FG (HIGH)
451.8 FG (LOW)
465.0 FG (HIGH)
465.0 FG (LOW)
MATCH EXISTING
℄ ROAD EASEMENT
4350
4365
4380
4395
4410
4425
4440
4455
4470
4485
4500
4515
4530
EXHIBIT B
1"=30'
N

JOHN K. MIRAU*
MARK C. EDWARDS
ROBERT W. CANNON†
MICHAEL J. LEWIN
WILLIAM P. TOOKE

* Certified Specialist, Taxation Law, The State Bar of California Board of Legal Specialization
†Certified Specialist, Estate Planning, Trust and Probate Law, The State Bar of California Board of Legal Specialization

LAW OFFICES OF
MIRAU, EDWARDS, CANNON, LEWIN & TOOKE
A PROFESSIONAL CORPORATION

1806 Orange Tree Lane
Suite "C"
Post Office Box 9058
Redlands, CA 92375
909-793-0200
Fax 793-0790

August 12, 2011

S2197-002

Ms. Dena M. Smith, Director
Mr. Kevin White, Project Planner
San Bernardino County Land Use Services Department
Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

RE: Project No. P201000215/CF - Radio Tower Application
Lazer Parcel - APN 0325-011-19-0000
Visualization Study

Dear Ms. Smith and Mr. White:

This firm represents the Citizens for the Preservation of Rural Living ("CPRL"). CPRL is a public interest association that seeks to ensure that the open space and natural wilderness values of Wildwood Canyon State Park and the Pisgah Peak areas are preserved. We have previously submitted comments to the project application submitted by Lazer Broadcasting, Inc., which proposes the construction of a 43-foot tall radio tower ("Project") on an undeveloped 40-acre parcel of land in the San Bernardino Mountains.

1. Visualization Study: Safety of tower and antennas.

One major issue raised by the proposed construction of the Lazer radio tower is the significantly adverse visual impact and public safety concerns affecting the adjacent Wildwood Canyon State Park. At the Planning Commission meeting held on May 5, 2011, CPRL presented a visualization of a radio tower which included a fence around the tower and antenna facilities.

EXHIBIT B

Staff indicated that they were not certain as to whether or not a fence was required. The applicant gave no clear response as to whether or not it was required.

The purpose of this letter is to set forth authorities which make it clear that FCC rules and regulations require a fence around the tower and antenna facilities. This is important both for the purposes of determining the visual impact of the tower and antenna, as well as the safety of the facility. The safety concern in this case is magnified by the steep incline that rises behind the 43-foot tower so that a person standing on the up-slope immediately behind the tower can easily be on the same level and within relatively close range of the radiating antenna.

2. FCC rules and regulations require a fence around the tower and antennas.

FCC rules and regulations contain specific rules relating to protection of the public against radio frequency radiation. Those rules specifically acknowledge that exposure to radio frequency radiation (RFR) can be dangerous to the health of persons who have exposure above a certain maximum permissible exposure (MPE). The FCC limits are generally based on recommended exposure guidelines published by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," NCRP Report No. 86.

FCC Rule 1.1310 (47 C.F.R. Section 1.1310) establishes maximum exposure limits for radio frequency radiation applicable to facilities, operations or transmitters. Guidance on evaluating compliance with these limits may be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation." Failure to comply with the maximum exposure limits subjects the licensee to fines and forfeitures imposed by the FCC upon a finding of violation of the MPE limits.

The FCC rules regarding protection of the public from RF radiation were recently applied to a fact situation similar to the proposed Lazer tower in an FCC ruling entitled "In the Matter of Frandsen Media Company, LLC", File No. EB-09-DV-0090. The facts in that ruling were as follows. Frandsen operated a radio transmitter with no perimeter fence at the base of the hill on which it was located. Access to the site was available from a one mile dirt road and from the base of the hill by four-wheel drive all-terrain vehicles or by hiking. The antennae structure and building were inside a secure chain link fence, measuring approximately 22 feet by 12 feet. No signs were posted warning the public of radio frequency radiation. During an inspection, FCC agents identified and marked a 500 square foot rectangular area of potentially high RFR levels outside of the fenced area. Tests determined that RFR MPE levels were exceeded in areas tested.

The FCC described its rules regarding protection of the public from RFR radiation as follows:

> "Section 1.1310 of the Rules requires licensees to comply with RFR exposure limits. Table 1 in Section 1.1310 of the Rules provides that the general population RFR maximum permissible exposure limit for a station operating in the frequency range of 30 MHz to 300 MHz is 0.200 m/W/cm. The general population or public exposure limits apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. Licensees can demonstrate compliance by restricting public access to areas where RFR exceeds the public MPE limits."

After analyzing the facts, the FCC made a finding that Frandsen violated RFR limits as follows:

> "Frandsen bears the responsibility to restrict access to the noncompliant area that exceeds the RFR limits or to modify the facility and operations so as to bring the station's operation within the RFR exposure limits prior to public or worker access to the impacted area. The Denver agents observed no RFR caution or warning signs at or near the Station KGNT site, particularly in the easily accessible areas of concern, in which the RFR levels ranged between 130% and 350% of the public MPE limits. We therefore find that Frandsen's operation of Station KGNT exceeded the public RFR MPE limits in a large, publicly accessible area and violated section 1.1310 of the Rules."

In footnote 16, the FCC cited OET Bulletin 65, quoting language from Bulletin 65 as to the methods of compliance with RFR exposure limits as follows:

> "Restricting access is usually the simplest method of controlling exposure to areas where high RF levels may be present. Methods of doing this include fencing and posting such areas or locking out unauthorized persons in areas such as rooftop locations, where this is practical. There may be situations where RF levels may exceed the MPE limits for the general public in remote areas, such as mountain tops that could conceivably be accessible but are not likely to be visited by the public [Emphasis added]. In such cases, common sense should dictate how compliance is to be achieved. If the area of concern is properly marked by appropriate warning signs, fencing or the erection of other permanent barriers may not be necessary."

3. Application of FCC Ruling to Lazer Tower site.

In order to determine the need for a fence around a tower and antenna facility, the key issues to analyze under the Frandsen ruling is the accessibility of the site by the public and the level of radiation emitted from the antennas on the site.

In terms of accessibility of the tower site to the general public, the facts of this case are even more compelling than the facts in the Frandsen ruling. The tower is located immediately adjacent to the Wildwood Canyon State Park. The park is used by thousands of users every year. The park is regularly used by hikers, mountain bike cyclists and horseback riders. Use of the park is organized and encouraged by the Supporters of Wildwood Canyon State Park, the Yucaipa Equestrian Arena Committee and the Trails and Open Space Committee of the City of Yucaipa.

The trails map of the City of Yucaipa (Yucaipa General Plan) includes trails that are immediately adjacent to the location of the tower. One of the trails is located on the boundary line between the Lazer parcel and the State Park.

The location of the tower is easily accessible from the trails within the State Park. It is also accessible from Pisgah Peak Road. Under the Frandsen ruling, use of warning signs rather than fencing is permitted only if the site is "not likely to be visited by the public". It is not reasonable to take the position that the Lazer tower is located in a remote area in which it is not likely to be visited by the public. Lazer has proposed that the land surrounding the tower be utilized for open space, accessible by the general public. The tower location is on a small flat area at the bottom of a steep slope. Radiation from the antenna will radiate in all directions, including toward the sloping ground immediately behind the tower. High radiofrequency radiation levels are predicted to occur at ground level, producing a significant RFR risk on that slope. Accordingly, the fence would need to go up the slope behind the tower and antennas as shown in the visualization that CPRL presented to the Planning Commission, which is enclosed with this letter. Indeed, positioning a fence only around the base of the Lazer tower would invite a situation not unlike Frandsen where the area of high RFR danger was located *outside* of the fenced-in area, thus leading the public to believe that an area is safe when it is not.

4. Conclusion.

Prior to proceeding ahead with the visualization study, there needs to be a resolution of the issue of the requirement of a fence around the tower and antennas. If this issue is not resolved, and direction is not given to the consultant that the visualization study must include fencing around the tower and antennas as well as the maintenance building, the visualization study will be fatally flawed and will have little value in determining the visual impact of the tower and antennas on the adjacent Wildwood Canyon State Park.

We at CPRL appreciate your consideration, and reserve all of our rights. Please feel free to call me with any questions or comments you may have.

Very truly yours,

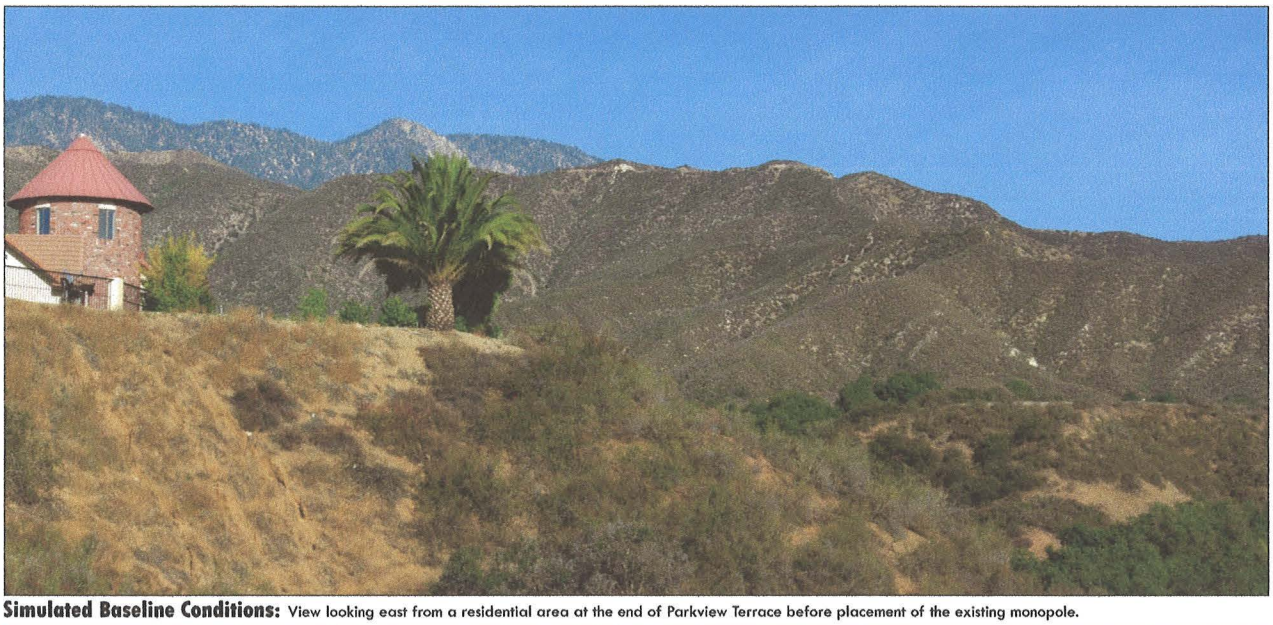
MIRAU, EDWARDS, CANNON, LEWIN & TOOKE

By: John K. Mirau, Esq.

Cc w/out Encl: Supervisor Neil Derry
Mayor Dick Riddell
Mr. Bill Collazo
Mr. Kevin White
Mr. David Myers, The Wildlands Conservancy
Mr. Frank Sissons, Yucaipa Valley Conservancy

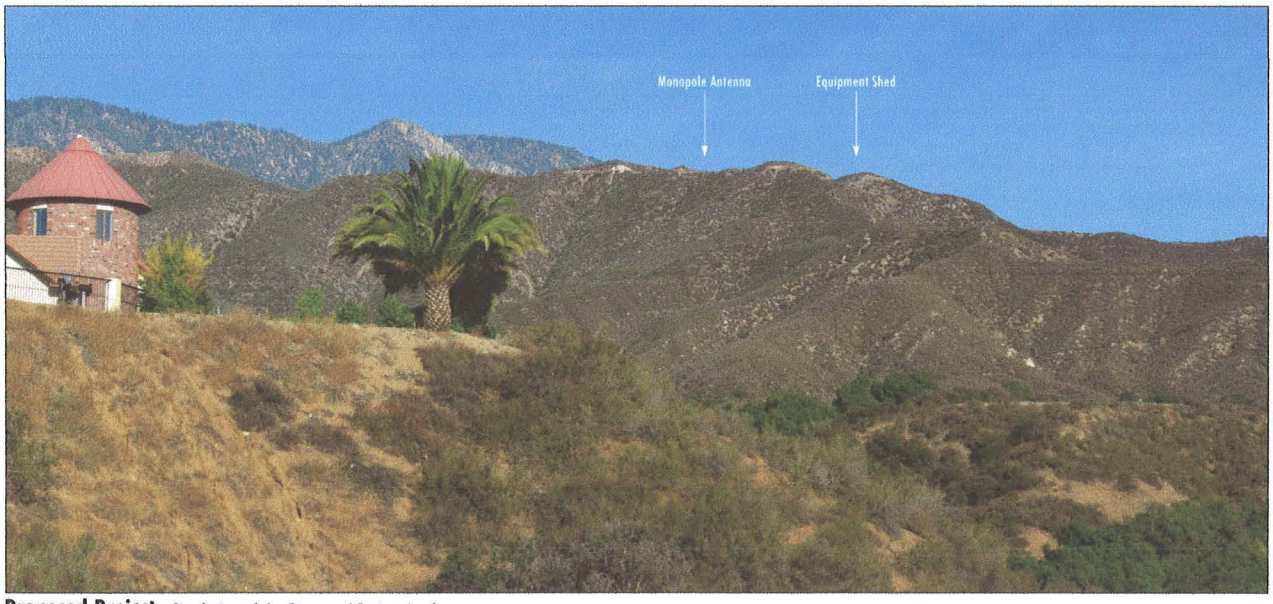
EXHIBIT C

EXHIBIT C



Simulated Baseline Conditions: View looking east from a residential area at the end of Parkview Terrace before placement of the existing monopole.

Existing Conditions: Current monopole in place.



Proposed Project: Simulation of the Proposed Project in place.

IMAGE INFORMATION
Image Date: 11/19/2014 PM
Camera: Pentax K-3
Sensor: 24 mp (6016x4000)
Lens: 50mm Prime
ISO: 200

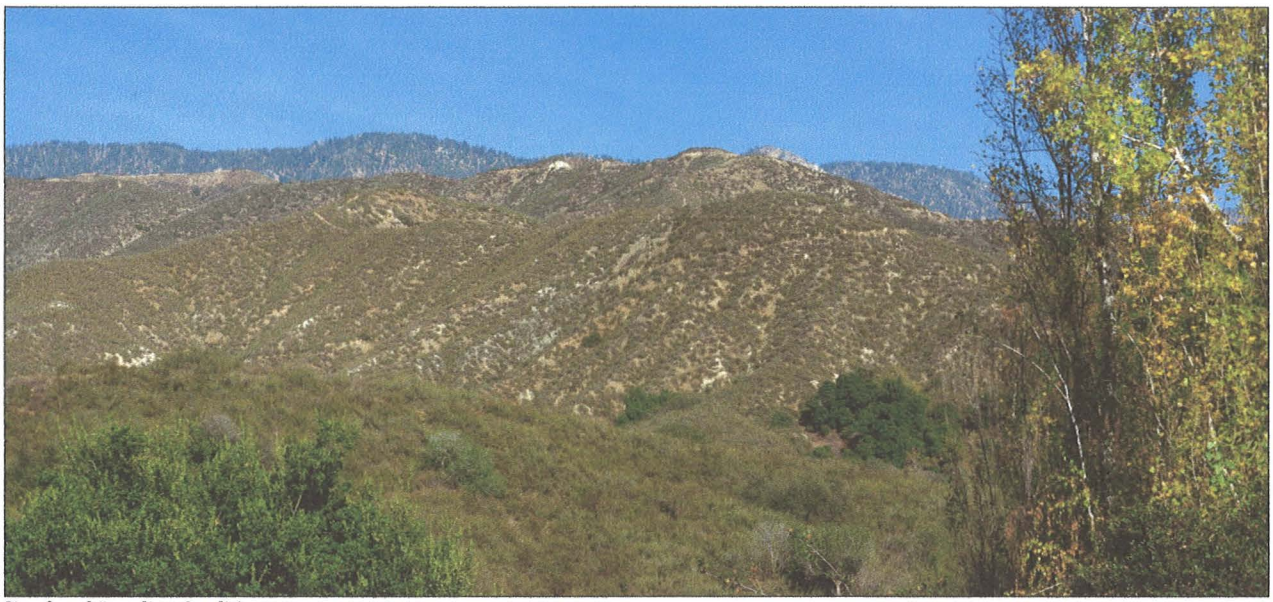
NOTE:
This 11"x17" visual simulation figure approximates on-site conditions when held 15 inches away from viewers eyes.

LILBURN CORPORATION

SIMULATION VIEWPOINT 1

Lazer Broadcasting - EIR
APN: 0325-011-19
Oak Glen Community, County of San Bernardino, California

FIGURE 4.1-2



Simulated Baseline Conditions: View looking northeast from a residential area along Oak View Road before placement of the existing monopole.

Existing Conditions: Current monopole in place is not visible.

Proposed Project: Simulation of the Proposed Project in place. Monopole antenna will not be visible.

IMAGE INFORMATION
Image Date: 11/19/2014 PM
Camera: Pentax K-3
Sensor: 24 mp (6016x4008)
Lens: 50mm Prime
ISO: 200

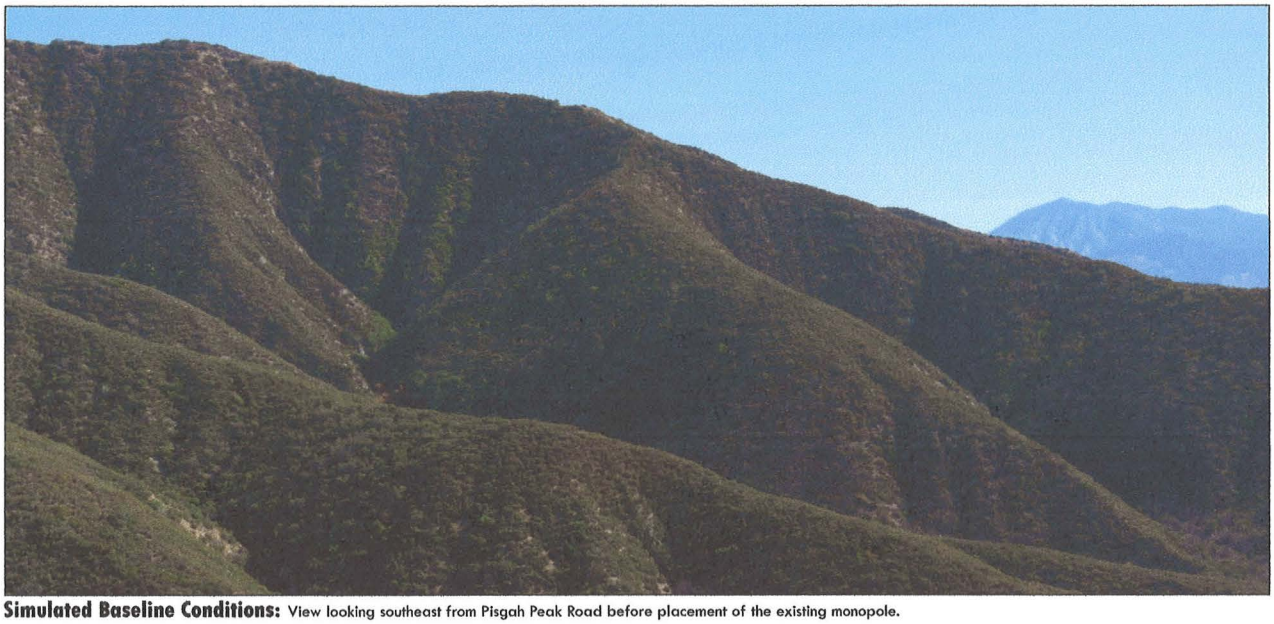
NOTE:
This 11"x17" visual simulation figure approximates on-site conditions when held 15 inches away from viewers eyes.

LILBURN CORPORATION

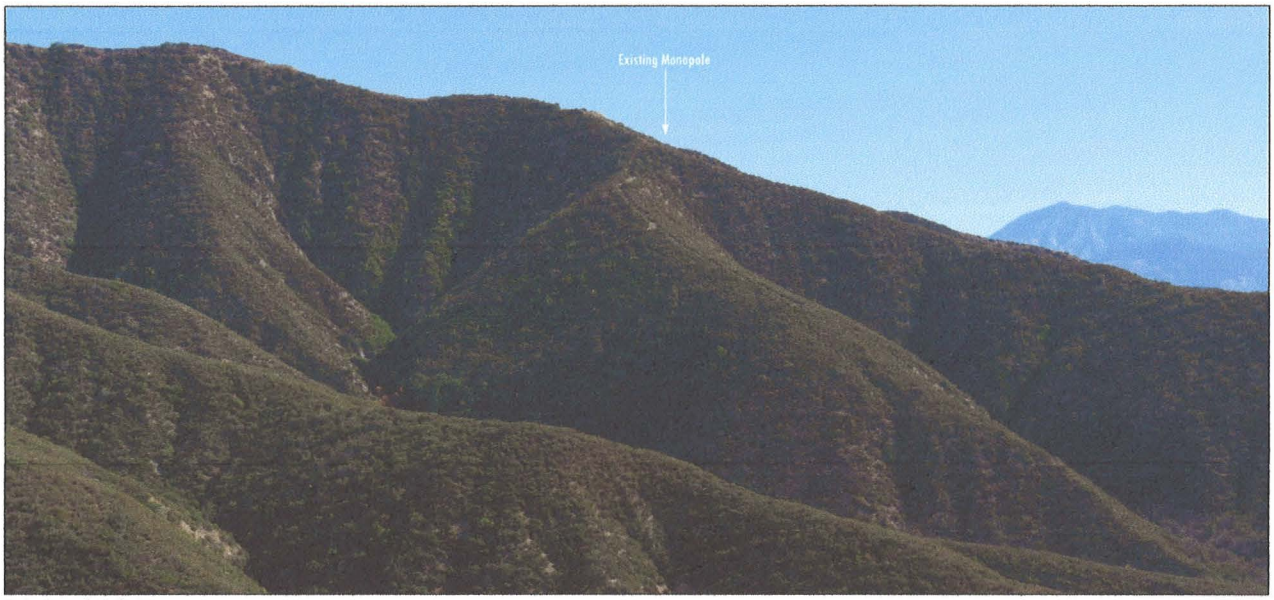
SIMULATION VIEWPOINT 2

Lazer Broadcasting - EIR
APN: 0325-011-19
Oak Glen Community, County of San Bernardino, California

FIGURE 4.1-3



Simulated Baseline Conditions: View looking southeast from Pisgah Peak Road before placement of the existing monopole.



Existing Conditions: Current monopole in place.

Proposed Project: Simulation of the Proposed Project in place.

IMAGE INFORMATION
Image Date: 11/19/2014 PM
Camera: Pentax K-3
Sensor: 24 mp (6016x4000)
Lens: 50mm Prime
ISO: 200

NOTE:
This 11"x17" visual simulation figure approximates on-site conditions when held 15 inches away from viewers eyes.

LILBURN CORPORATION

SIMULATION VIEWPOINT 3

Lazer Broadcasting - EIR
APN: 0325-011-19
Oak Glen Community, County of San Bernardino, California

FIGURE 4.1-4

EXHIBIT D

View 1

EXHIBIT D

EXHIBIT E

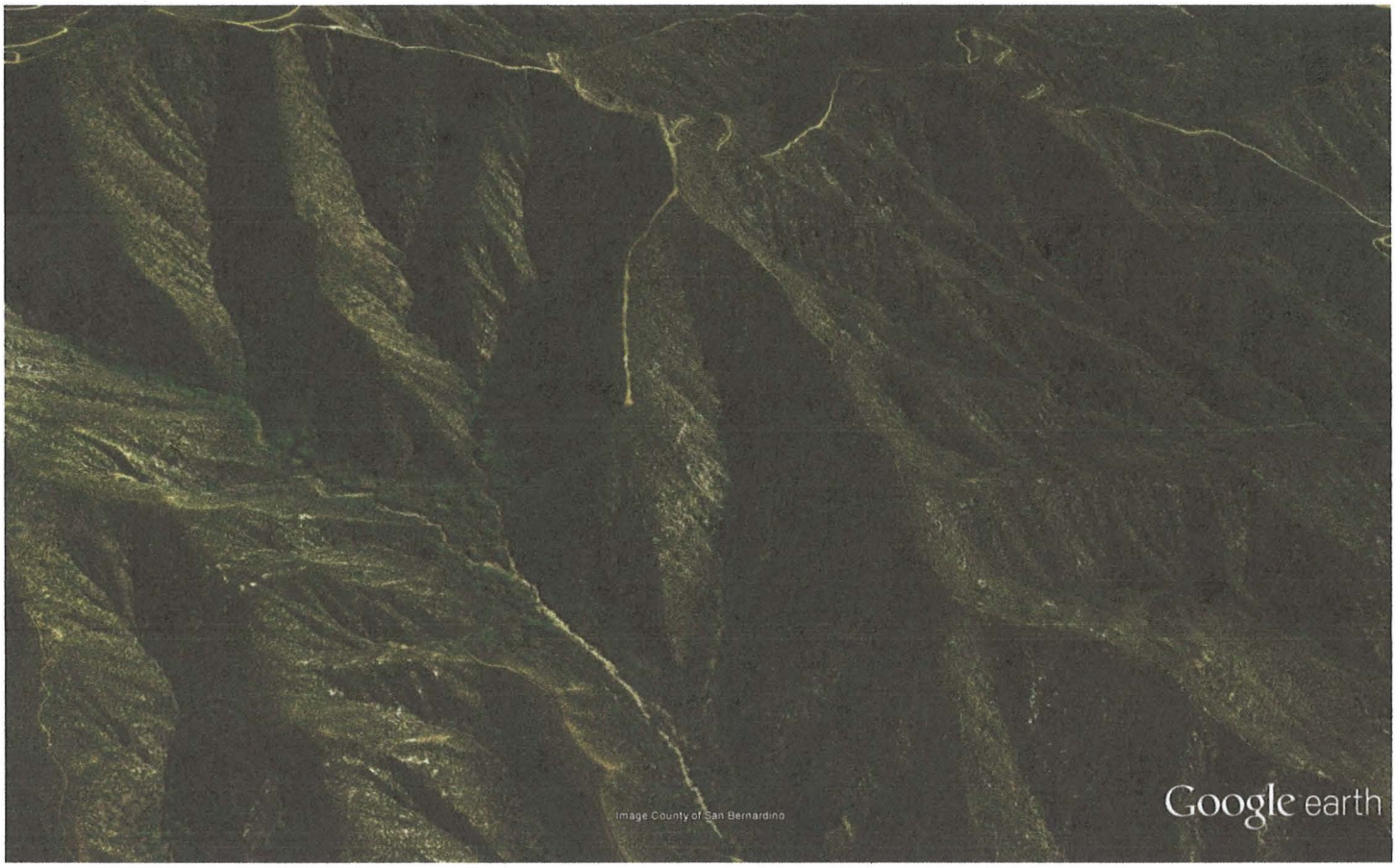
GOOGLE EARTH IMAGE DATED DECEMBER 19, 2006

Google earth

feet 1000
meters 500

EXHIBIT E

GOOGLE EARTH IMAGE DATED APRIL 12, 2007



Google earth

feet 1000
meters 500

EXHIBIT F

GOLDMAN
Engineering Management, LLC

July 20, 2016

ENGINEERING STATEMENT

EXECUTIVE SUMMARY

Goldman Engineering Management has been retained by the Citizens for the Preservation of rural Living ("CPRL"), San Bernardino County, California to prepare this Engineering Statement related to the proposed relocation of FM Radio Station, KXRS, Hemet, CA This statement will review the validity of the report prepared by Ed De La Hunt in March of 2011, and the report prepared by the late Elliott Klein from January of 2009.

Before the Planning Commission of the County of San Bernardino is a request to construct a tower for Radio Station KXRS(FM) owned and operated by Lazer Broadcasting Corporation ("Lazer"). Lazer seeks to construct a new tower to host KXRS(FM) as part of a relocation project to make improvements to the existing licensed operations of KXRS(FM). Radio Station KXRS(FM) is licensed by the FCC to serve Hemet, California. The licensed KXRS(FM) transmitting facilities originate from Polly Butte in full compliance with FCC's Rules and Regulations. We reaffirm statements by both Mr. Klein and De La Hunt that the current KXRS(FM) operation from the currently licensed site is "grandfathered" at that location and is under no obligation to relocate.

It is recognized that the desire to relocate KXRS is a business decision in order to serve more population in the more densely populated Riverside, San Bernardino Market. As will be shown in the following report, the reports by Mr. De La Hunt and Mr. Klein are still valid if Community Coverage is analyzed in the same fashion as the current KXRS Construction Permit was analyzed by the FCC. Additional information will be presented to further advance the fact

EXHIBIT F

that Lazer has other options to relocate KXRS(FM) than the location they have chosen which is in conflict with those who live in the vicinity of the currently proposed KXRS tower site.

REVIEW OF KLEIN REPORT

The sites chosen by Mr. Klein are still valid for use by KXRS. Although there may be some dispute about the ability to serve Hemet with the requisite 70dBu signal level if analyzed using line of sight, it should also be noted that from a line of sight basis, the current KXRS construction permit is also significantly lacking in the ability to prove adequate service Hemet.

Statements by Klein concerning the FCC rules and requirements of KXRS remain accurate and should be considered in a review of alternate sites as well as the potential for KXRS to relocate to a site which even better serves Lazer's target audience while serving a new community of license.

DE LA HUNT ANALYSIS

Mr. De La Hunt's statement from 2011 remains accurate and alternative sites suggested meet the FCC rules as noted by him. The FCC Part 73 rules governing tower siting have not changed since 2011. When community service is analyzed in the same manner as the FCC used when reviewing the currently permitted KXRS site, the sites chosen by Mr. DeLahunt are compliant with community coverage rules. It should further be noted that the FCC has not changed the way community coverage is analyzed since the original KXRS construction permit was authorized.

ADDITIONAL SITES EVALUATED

In addition to the sites noted by Mr. Klein and Mr. De La Hunt, we evaluated some additional potential sites. These are undeveloped in the same way the chosen site for the current KXRS site is undeveloped. Site 1 meets community coverage requirements to Hemet when

analyzed in the same way as the current KXRS construction permit was analyzed. Site 2 also meets community coverage requirements to Hemet but with full, unblocked line of sight to Hemet. Exhibit A denotes the now familiar 73.207 "area to locate" for KXRS along with the two sites specified below.

- Site 1, "Calimesa Site" (33° 59' 22" N, 116° 59' 2" W)

  This site is along a jeep trail on a hill in Calimesa, CA. There are residences and developments nearby. A very short tower (such as that proposed for the KXRS CP) could be used. This site is closer to Hemet than the current construction permit for KXRS and it has similar line of sight to Hemet. Exhibit B and C demonstrates community coverage.

- Site 2- "Gilman Hot Springs Site" (33° 50' 43" N, 116° 59' 05" W)

  The location is along a road which leads to another tower site. There appears to be a water tank nearby this location. A short tower would work from this location as well. This site has direct line-of-sight into Hemet, and while this location does not cover as much of Riverside as the other more northerly sites, it does a significantly better job providing service to Hemet than either the CP site or the other proposed sites while significantly improving coverage toward Riverside. Exhibit D demonstrates coverage from this site.

CONCLUSION

If analyzed using the same parameters used to obtain the current KXRS Construction Permit from the FCC, the sites noted by the Elliott Klein report as well as the De La Hunt report are compliant with FCC rules. If strictly analyzed including terrain blockage evaluation, even the current KXRS proposed site fails scrutiny.

Two additional sites have been proposed in this report. Either site could replace the KXRS proposed site. The purpose of specifying other undeveloped locations is to show that if there were sufficient intent by Lazer, another undeveloped site could likely be located and developed but would not be in conflict with the community desire to preserve the nature of the area.

Sincerely,

Bert Goldman
Goldman Engineering Management

Exhibit A- Proposed Sites

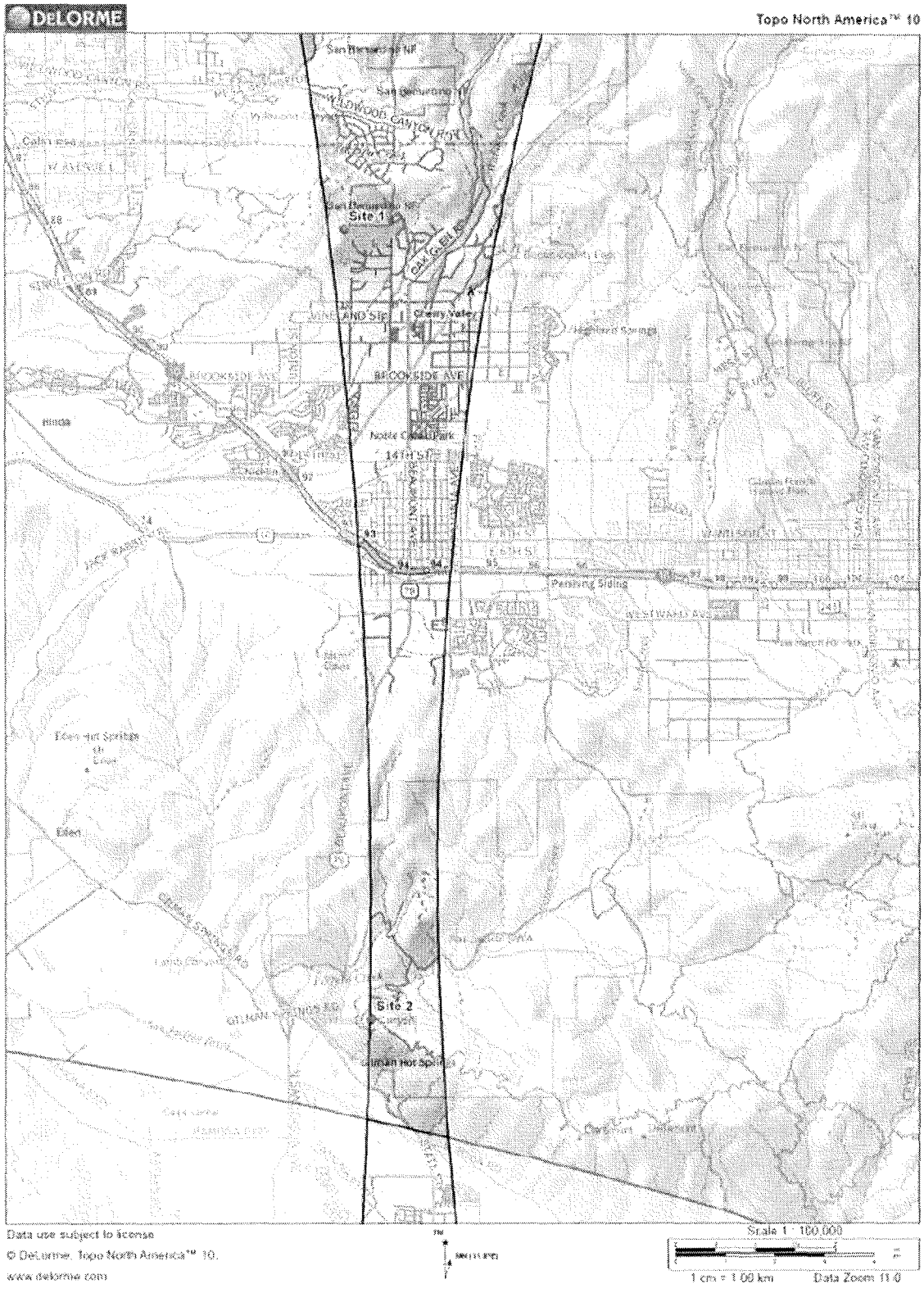


Exhibit B- Site 1 Coverage

KXRS Hypothetical Site #1 Coverage

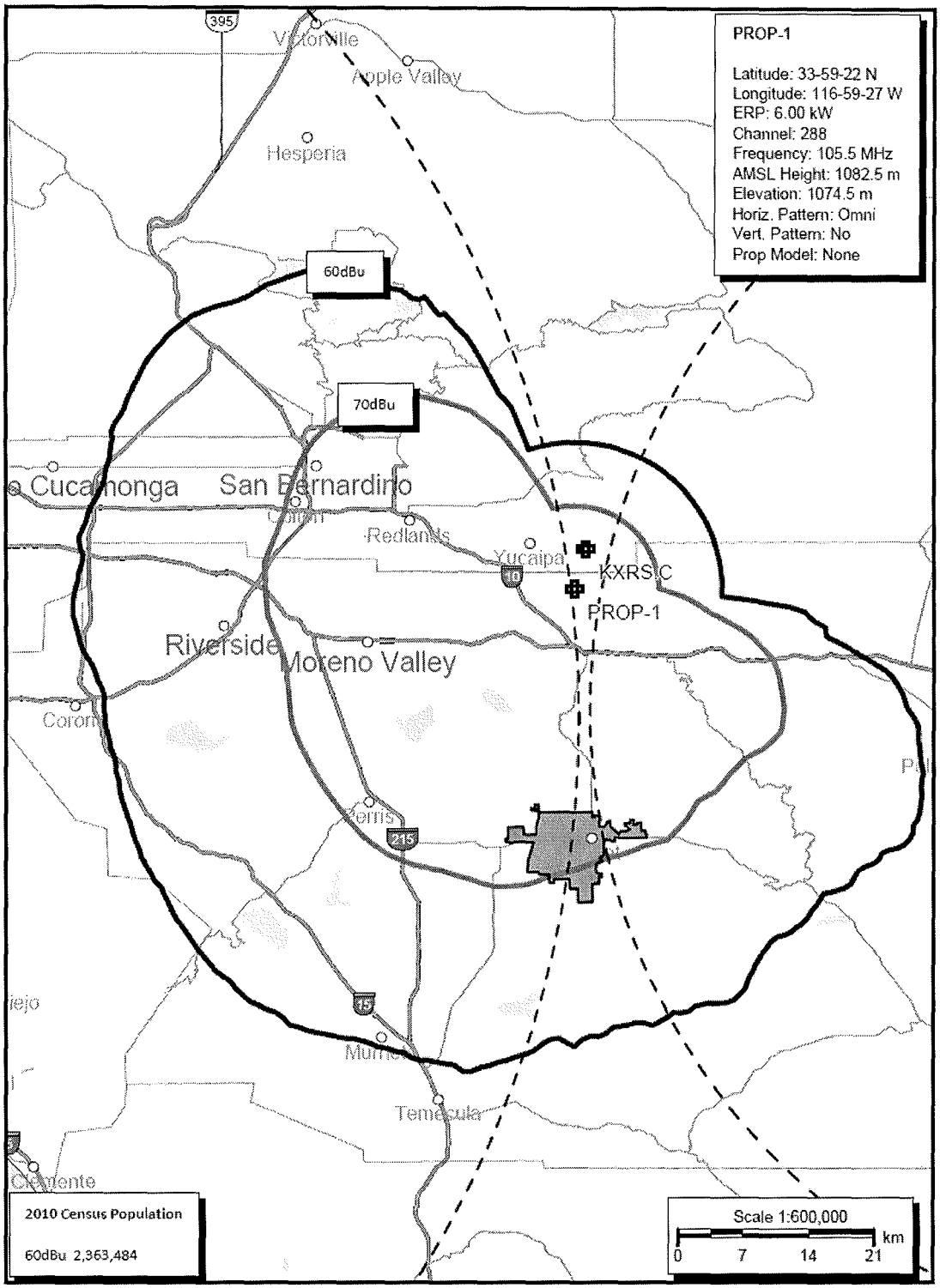


Exhibit C- Community Coverage Exhibit, Site 1 vs. Current KXRS Proposed site

KXRS Hypothetical Site #1 Hemet Community Coverage

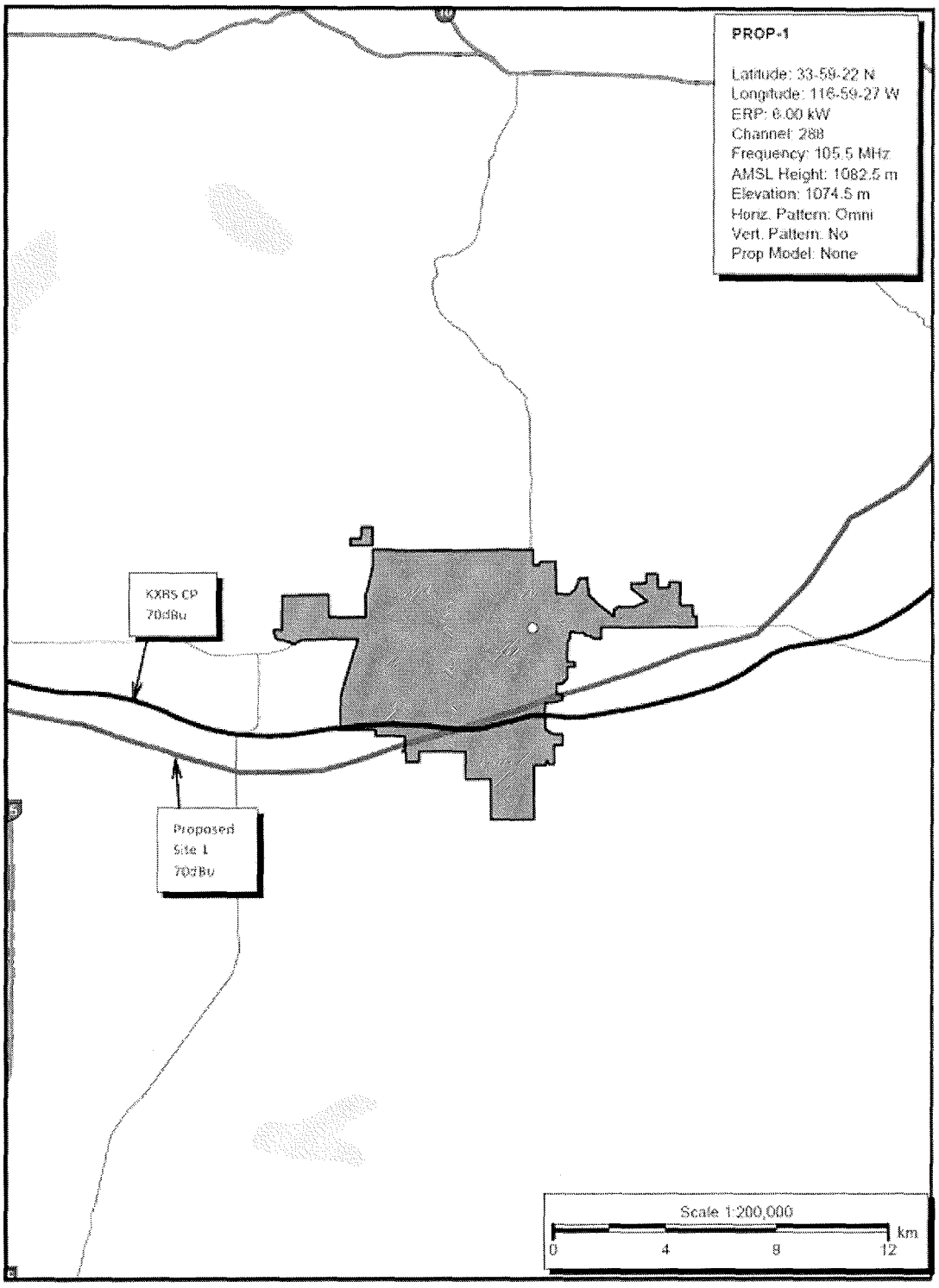
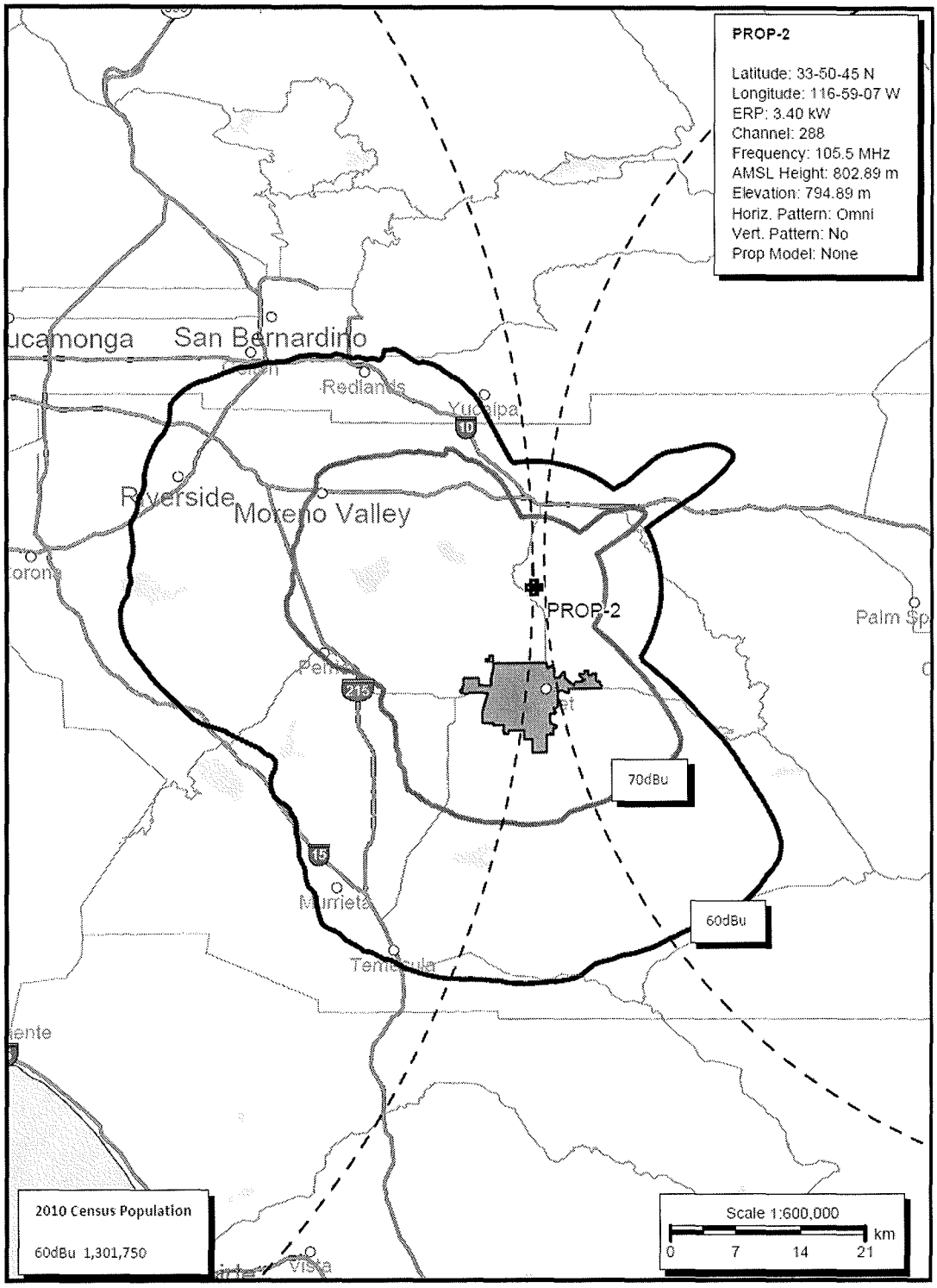


Exhibit D- Site 2 Coverage

KXRS Hypothetical Site #2



Bert Goldman, Background

Bert Goldman is currently the owner and president of Goldman Engineering Management, LLC. Bert brings more than 40 years of experience and specializes in analyzing AM and FM spectrum for the purpose of improving facility coverage and value as well as all facets of radio construction. He has coordinated the construction of numerous stations and transmitter sites throughout the United States.

Mr. Goldman regularly files applications for construction permits, licenses and other applications with the Federal Communications Commission and is familiar with both the rules and policies of the FCC.

Bert has directly managed engineering and construction efforts for several major radio broadcasting companies including Corporate Vice President of Engineering for all of the following broadcast groups:

- ABC/Disney Radio Division
- Nationwide Communications
- Patterson Broadcasting
- Shamrock Broadcasting
- First Broadcasting

At ABC/ Disney, Bert provided engineering oversight for over 100 ABC O&O, ESPN, and Radio Disney stations as well as the ABC Radio Network. He developed the Company's acquisition strategy and was responsible for all related budget requirements as well as a capital budget of over $20MM per year. During his career, Bert has engineered numerous station improvement projects, including stations in more than half of the top 25 radio markets, creating significant value to the station owners Bert has designed and managed construction of over 45 radio stations including studio, transmitter, tower, and office facilities.

Bert is a member of the Institute of Electrical and Electronics Engineers (IEEE), the Society of Broadcast Engineers (SBE), and is an associate member of the Association of Federal Communications Consulting Engineers (AFCCE). Bert has been active in broadcast industry organizations including the National Association of Broadcasters (NAB), the National Radio Systems Committee (NRSC), North American Broadcasters Association (NABA), and the Ad Hoc Forum on AM Directional Antenna Performance Verification and has written several articles for the industry trade press. Currently Bert is the chair of the NAB/CES joint working group examining use of single sideband FM transmission to reduce multipath.

EXHIBIT G

Land Protection Partners
P.O. Box 24020, Los Angeles, CA 90024-0020
Telephone: (310) 276-2306

Scientific Basis To Establish Policy Regulating Communications Towers To Protect Migratory Birds: Response to Avatar Environmental, LLC, Report Regarding Migratory Bird Collisions With Communications Towers, WT Docket No. 03-187, Federal Communications Commission Notice of Inquiry

Prepared for:

American Bird Conservancy
Defenders of Wildlife
Forest Conservation Council
The Humane Society of the United States

February 14, 2005

Prepared by:

Travis Longcore, Ph.D.[1]
Catherine Rich, J.D., M.A.[1]
Sidney A. Gauthreaux, Jr., Ph.D.[2]

[1]Land Protection Partners
[2]Clemson University

[redacted]

EXHIBIT G

Scientific Basis To Establish Policy Regulating Communications Towers To Protect Migratory Birds: Response to Avatar Environmental, LLC, Report Regarding Migratory Bird Collisions With Communications Towers, WT Docket No. 03-187, Federal Communications Commission Notice of Inquiry

1. Introduction

On December 14, 2004, the Federal Communications Commission ("FCC") made available a review of comments received for its Notice of Inquiry on Avian/Communication Tower Collisions. The Notice of Inquiry was issued on August 20, 2003 and closed on December 6, 2003. A team of consultants (Avatar Environmental, LLC, EDM International, Inc., and Pandion Systems, Inc.) was retained by the FCC in May 2004 and reviewed all of the comments received. Their report, "Notice of Inquiry Comment Review Avian/Communication Tower Collisions" ("Avatar Report"), dated September 30, 2004, includes recommendations of actions that might be taken by the FCC.

Land Protection Partners was engaged by the American Bird Conservancy, Forest Conservation Council, Defenders of Wildlife, and The Humane Society of the United States to provide an analysis of the conclusions and recommendations of the Avatar Report, and to provide the scientific basis, if any, for regulating communications towers to protect birds. We have found that the conclusions of the Avatar Report do not adequately represent the current state of scientific knowledge about bird kills at communications towers in many important respects, and that the recommendations derived from those conclusions are insufficient to address the adverse impacts of communications towers on birds.

This report is based on a review of the published scientific literature (both studies discussed in the Avatar Report and others), a peer-reviewed study now in press,[1] progress reports of a scientific study now in progress,[2] and personal communications with scientists working in this field. We first consider the question of whether bird kills at communications towers are biologically significant. We then address various factors that influence the number and rate of bird kills at towers: tower height, tower configuration, tower lighting, and local topography. Although weather influences bird kills at towers, it is not discussed in detail here because it cannot be regulated.

All parties involved in the debate over tower kill acknowledge that birds are killed in some number at towers. The Avatar Report documents this and finds that, "Overall, there is general agreement that there is sufficient documented evidence of avian mortality by communications towers and that the construction and operation of tall structures will

1. Gauthreaux, S.A., Jr., and C. Belser. 2005. Effects of artificial night lighting on migrating birds. *In* C. Rich and T. Longcore (eds.), *Ecological consequences of artificial night lighting*. Island Press, Covelo, California.
2. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Spring 2004 summary. Central Michigan University, Mount Pleasant. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Fall 2004 summary. Central Michigan University, Mount Pleasant.

likely result in the risk of bird collisions and possible mortalities,"[3] and, "That birds are colliding with towers has been well documented."[4] The Avatar Report further cites several sources estimating that mortality is between 2 million to 5 million birds per year, but ignores a letter to the FCC Chairman from the Director of the U.S. Fish and Wildlife Service dated November 2, 1999, where the Director references data indicating that the number of migratory birds killed by communications towers may be 4 million per year to an order of magnitude above this (40 million per year).

Assessment of the cumulative significance of tower-caused avian mortality is confounded by the absence of monitoring at a large number of towers. Because the FCC does not require monitoring at towers that it registers or otherwise approves, and because tower operators do not conduct such monitoring, bird kills reported in the literature represent only a minimum measurement of the total mortality. The majority of tower sites are never checked for mortality and even those that are checked are done so only on a sporadic basis. In addition, the reported numbers are based on actual carcasses found and there is no extrapolation for predator/scavenger removal or search efficiency. This means, as the Avatar Report notes, that the numbers of birds killed are higher than reported. Two of the longer-term studies with periodic searches confirm that numbers of birds killed can be significant at one tower: a 38-year study of a single 1,000-foot television tower in west central Wisconsin documented 121,560 birds killed representing 123 species,[5] and a 29-year study at a Florida television tower documented the killing of more than 44,000 birds of 186 species.[6] Neither of these studies adjusted carcass counts upward to account for search efficiency and predator/scavenger removal.

We do know that communications towers kill millions of birds annually, and that a very high percentage of these are neotropical migratory birds that migrate at night.[7]

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3. Avatar Report, p. 3-19.
4. Avatar Report, p. 3-20.
5. Kemper, C.A. 1996. A study of bird mortality at a central Wisconsin TV tower from 1957–1995. *Passenger Pigeon* 58:219–235.
6. Crawford, R.L., and R.T. Engstrom. 2001. Characteristics of avian mortality at a north Florida television tower: a 29-year study. *Journal of Field Ornithology* 72:380–388.
7. See Shire, G.G., K. Brown, and G. Winegrad. 2000. *Communication towers: a deadly hazard to birds.* American Bird Conservancy, Washington, D.C. Banks, R.C. 1979. Human related mortality of birds in the United States. *U.S. Fish and Wildlife Service, Special Scientific Report – Wildlife* 215:1–16. Clark, J.R. 14 September 2000. Service guidance on the siting, construction, operation and decommissioning of communications towers. U.S. Fish and Wildlife Service, Washington, D.C. Erickson, W.P., G.D. Johnson, M.D. Strickland, D.P. Young, Jr., K.J. Sernka, and R.E. Good. 2001. *Avian collisions with wind turbines: a summary of existing studies and comparisons to other sources of avian collision mortality in the United States.* National Wind Coordinating Committee (NWCC) Resource Document. Woodlot Alternatives. 2003. An assessment of factors associated with avian mortality at communications towers — a review of existing scientific literature and incidental observations. Topsham, Maine ("Woodlot Report").

2. Kills of Birds at Communications Towers Can Be Biologically Significant

Scientists do not have an accepted definition of "biological significance," and, in fact, do not use the term in any regular fashion. The terms "significant" and "significance" are generally reserved for the description of statistical results. To be useful to a scientist, "biological significance" must be defined in terms that can be measured. The Avatar Report states that, "biologically significant mortality is any mortality that is of sufficient magnitude and importance that it causes the viability of a particular population or species to be affected."[8] Elsewhere, the Avatar Report states that, "declines of local, regional, or range-wide populations [of species] would be biologically important,"[9] and presumably "significant." It is important to note that the Avatar Report provides no statutory basis for establishing this standard, nor does it attempt to apply this standard to any of the avian species or populations that are killed by towers.

It is apparent from the comments submitted in response to the Notice of Inquiry, especially those by the communications industry, that the standard for significance at issue is not a scientific standard, but rather a statutory standard under the National Environmental Policy Act ("NEPA").[10] For purposes of this report, we assume that "biologically significant" means a significant impact to biological resources under NEPA.

The Avatar Report does not outline the standards used by the FCC to determine significance of impacts to biological resources under NEPA.[11] The report does assert, however, that analysis of biological significance would be possible for well-studied bird populations such as Kirtland's Warbler and Red-cockaded Woodpecker, but then does not conduct any analysis or provide any insight into whether tower kill would be "biologically significant" for these species.

The communications industry likewise fails to present a coherent analysis of biological significance.[12] The industry relies on an argument that bird kills at communications towers are so small relative to other forms of human-caused bird mortality that they are insignificant by definition.[13] Because this argument is repeated (without critical analysis) in the Avatar Report, it deserves special consideration.

The communications industry bases its conclusions about the "significance" of bird kills at towers on the report prepared by Woodlot Alternatives ("Woodlot Report"). In this report, Woodlot Alternatives attempts to tabulate all of the sources of human-caused mortality for birds. From these rough estimates, Woodlot Alternatives concludes that

8. Avatar Report, p. 3-66.
9. Avatar Report, p. 3-62.
10. Cellular Telecommunications & Internet Association and National Association of Broadcasters. 2003. Comments of the Cellular Telecommunications & Internet Association and National Association of Broadcasters in the matter of effects of communications towers on migratory birds, WT Docket No. 03-187 ("CTIA/NAB Comments"), p. 11.
11. Avatar Report, p. 3-67.
12. See CTIA/NAB Comments and Woodlot Report.
13. CTIA/NAB Comments and Woodlot Report.

tower kill constitutes only 0.5% of the human-caused mortality of birds. This approach is inappropriate to any discussion of "biological significance" because it refers to mortality for **all** birds, not for any particular bird species or population of birds. The different human-induced causes of mortality do not affect all birds equally; any given type of mortality is more important for some species and less important for others. Generally speaking, as an example, birds that are subjected to oil spills are not also vulnerable to predation by house cats. Expressing tower kill mortality as a percentage of total human-induced mortality therefore does not make sense. Even if it were a rational approach, it is interesting to note that consultants for the wind industry undertook a similar analysis and concluded that communications towers result in 1–2% of human-caused mortality (not 0.5%).[14]

The estimates of total human-caused bird mortality are not relevant to determine whether kills at communications towers meet the NEPA standard for a significant impact. The FCC checklist for environmental impacts requires disclosure of placement of towers in wilderness or designated wildlife refuges, and disclosure of any potential impacts to species that are candidate species or listed under the Endangered Species Act. These FCC guidelines omit elements of NEPA analysis that are routine in other circumstances, including violation of the Migratory Bird Treaty Act, which prohibits the killing of any migratory bird, even unintentionally, without a permit. It is also customary to consider the impacts of a project to be significant if those impacts: 1) reduce populations of species of local conservation significance, such as those listed under state endangered species acts, 2) interrupt the movement of wildlife across the landscape, or 3) result in declines in species that will lead to their endangerment.

The available data are sufficient to allow an estimation of the number of individuals killed at towers on a species-by-species basis, which is a necessary approach to assess impacts to biological resources in any situation. Such an analysis is essential because whatever threshold of significance is applied, it will be applied to species, not to "birds" as a whole.

2.1. Estimate of Numbers of Birds Killed at Tower by Species

To estimate the number of individuals of each species killed at towers, we used species lists of birds killed at towers to determine the percentage representation of each species, which we multiplied by estimates of total birds killed per year at towers. The number of individuals of each species killed was collated by the American Bird Conservancy from 47 studies with complete lists of birds killed at communications towers.[15] The 47 studies were from 31 states and two Canadian provinces east of the Rocky Mountains, and report deaths of 184,797 birds at communications towers. We assume that the proportion of

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14. Erickson, W.P., G.D. Johnson, M.D. Strickland, D.P. Young, Jr., K.J. Sernka, and R.E. Good. 2001. *Avian collisions with wind turbines: a summary of existing studies and comparisons to other sources of avian collision mortality in the United States.* National Wind Coordinating Committee (NWCC) Resource Document, p. 16.
15. Shire, G.G., K. Brown, and G. Winegrad. 2000. *Communication towers: a deadly hazard to birds.* American Bird Conservancy, Washington, D.C.

each species in this dataset equals the proportion of individuals of the species killed each year at towers. We multiplied the percentage of each bird species in the dataset by a low (4 million) and high (40 million) estimate of total bird mortality at communications towers to obtain a range of the number of each species killed each year. Because the range of total number of birds killed per year is large, even at the lower end of estimates, it does not matter substantially if the actual percentage of each bird species killed per year is slightly different from our assumption. For example, whether Ovenbirds represent 10% or 12% of all kills is not particularly consequential; even the lower percentage represents a large number of individuals killed per year. This methodology provides a range of magnitude estimate for each species killed at towers.

The results show that for the ten avian species killed most frequently at towers, total annual mortality is estimated to be from 490,000 to 4.9 million **for each species**.

Table 1. Estimates of total number of birds killed per species by communications towers each year. Includes top ten bird species killed and all birds of conservation concern (BCC) identified by the U.S. Fish and Wildlife Service.[16]

Species	Total Killed	Percentage Killed	Number killed per year (low)	Number killed per year (high)
Top Ten Birds Killed				
Ovenbird	22,619	12.240%	489,597	4,895,967
Red-eyed Vireo	19,707	10.644%	426,565	4,265,654
Tennessee Warbler	17,689	9.572%	382,885	3,828,850
Common Yellowthroat[17]	10,397	5.626%	225,047	2,250,469
Bay-breasted Warbler (BCC)	10,396	5.626%	225,025	2,250,253
American Redstart	8,392	4.541%	181,648	1,816,480
Blackpoll Warbler (BCC)	6,304	3.411%	136,452	1,364,524
Black-and-white Warbler	6,099	3.300%	132,015	1,320,151
Philadelphia Vireo	4,317	2.336%	93,443	934,431
Swainson's Thrush	3,943	2.134%	85,348	853,477
Birds of Conservation Concern Below Top Ten				
Northern Waterthrush	3,148	1.703%	68,140	681,396
Northern Parula	2,662	1.440%	57,620	576,200
Connecticut Warbler	2,624	1.420%	56,797	567,975
Cape May Warbler	2,119	1.190%	47,598	475,982
Black-throated Blue Warbler	2,061	1.115%	44,611	446,111
Chestnut-sided Warbler	1,426	0.772%	30,866	308,663

16. U.S. Fish and Wildlife Service. 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia. The U.S. Fish and Wildlife Service's Birds of Management Concern List is a statutorily required listing of avian species that may become candidates for listing under the Endangered Species Act without additional conservation action and for which special attention is warranted to prevent declines. Congress dictated such a list be prepared at least every five years as an early warning system to try to prevent birds from becoming listed under the Endangered Species Act.

17. Subspecies *sinuosa* is of conservation concern.

Species	Total Killed	Percentage Killed	Number killed per year (low)	Number killed per year (high)
Black-throated Green Warbler	1,330	0.720%	28,788	287,883
Bobolink	1,201	0.650%	25,996	259,961
Prairie Warbler	1,018	0.551%	22,035	220,350
Marsh Wren	888	0.481%	19,221	192,211
Canada Warbler	689	0.373%	14,914	149,137
Wood Thrush	684	0.370%	14,805	148,054
Grasshopper Sparrow	582	0.315%	12,598	125,976
Yellow-billed Cuckoo	568	0.307%	12,295	122,946
Kentucky Warbler	568	0.307%	12,295	122,946
Golden-winged Warbler	542	0.293%	11,732	117,318
Prothonotary Warbler	476	0.258%	10,303	103,032
Yellow Warbler[18]	419	0.227%	9,069	90,694
Yellow-throated Warbler	339	0.183%	7,338	73,378
Swainson's Warbler	336	0.182%	7,273	72,728
Worm-eating Warbler	255	0.138%	5,520	55,196
Yellow-bellied Sapsucker	228	0.123%	4,935	49,351
Dickcissel	171	0.093%	3,701	37,014
Cerulean Warbler	164	0.089%	3,550	35,498
Field Sparrow	147	0.080%	3,182	31,819
Acadian Flycatcher	134	0.073%	2,900	29,005
Sedge Wren	107	0.058%	2,316	23,161
Louisiana Waterthrush	103	0.056%	2,229	22,295
Blue-winged Warbler	83	0.045%	1,797	17,966
Orchard Oriole	79	0.043%	1,710	17,100
Bachman's Sparrow	74	0.040%	1,602	16,018
Yellow Rail	67	0.036%	1,450	14,502
Sharp-tailed Sparrow spp.	51	0.028%	1,104	11,039
Henslow's Sparrow	49	0.027%	1,061	10,606
Le Conte's Sparrow	36	0.019%	779	7,792
Red-headed Woodpecker	33	0.018%	714	7,143
American Bittern	32	0.017%	693	6,927
Alder Flycatcher	25	0.014%	541	5,411
Rusty Blackbird	12	0.006%	260	2,597
Seaside Sparrow	12	0.006%	260	2,597
Black Rail	8	0.004%	173	1,732
Common Ground Dove	8	0.004%	173	1,732
Harris's Sparrow	8	0.004%	173	1,732
Whip-poor-will	7	0.004%	152	1,515
Chuck-will's Widow	6	0.003%	130	1,299

18. Only resident subspecies *gundlachi* is of conservation concern.

Species	Total Killed	Percentage Killed	Number killed per year (low)	Number killed per year (high)
Painted Bunting	6	0.003%	130	1,299
Bell's Vireo	4	0.002%	87	866
Little Blue Heron	4	0.002%	87	866
Olive-sided Flycatcher	4	0.002%	87	866
Solitary Sandpiper	4	0.002%	87	866
Bewick's Wren	3	0.002%	65	649
Loggerhead Shrike	2	0.001%	43	433
Red-cockaded Woodpecker[19]	2	0.001%	43	433
Upland Sandpiper	2	0.001%	43	433
Baird's Sparrow	1	0.001%	22	216
Black-capped Petrel	1	0.001%	22	216
Common Tern	1	0.001%	22	216
Franklin's Gull	1	0.001%	22	216
McCown's Longspur	1	0.001%	22	216
Northern Harrier	1	0.001%	22	216
Semipalmated Sandpiper	1	0.001%	22	216
Smith's Longspur	1	0.001%	22	216
White Ibis	1	0.001%	22	216
Willet	1	0.001%	22	216

The results of this analysis show the range of mortality per year experienced by bird populations from communications towers alone, assuming that overall mortality at towers is between 4 and 40 million individuals per year. But even if total mortality at towers is 2 million individuals per year, the most frequently killed bird species will lose 250,000 individuals per year, and a single record of a death at a tower in any of the 47 studies with complete lists can be extrapolated to approximately 10 birds per year for that species. With the worst-case scenarios (40 million birds per year killed), the top ten most commonly killed birds would suffer losses of ~1 million to ~4 million individuals per year, including two species of conservation concern (Bay-breasted Warbler and Blackpoll Warbler).[20] Even without going further, we note that the killing of 1 million to 2 million or even 100,000–200,000 individuals of a bird species of regulatory concern annually typically would be considered a significant impact in environmental impact analysis. To further illustrate the potential significance of these levels of mortality, we consider the population dynamics of neotropical migrants, which are most affected by collisions with communications towers.

19. Listed under Endangered Species Act.
20. U.S. Fish and Wildlife Service. 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia.

2.2. Highest Mortality for Neotropical Migrants Currently Occurs During Migration

The migratory period has been suspected to be the "critical period contributing to long-term declines in some species."[21] To address this question, Sillett and Holmes presented a long-term study of Black-throated Blue Warbler, which is documented as being killed at communications towers (1.15% of all records) and is a federal species of conservation concern, based on observations at breeding grounds in New Hampshire and wintering grounds in Jamaica.[22] They found that survival of individuals was high during the summer (0.99 ± 0.01) and winter (0.93 ± 0.05), while survival during both spring and fall migration ranged only 0.67–0.73. This was the first quantification of migration mortality for a neotropical migrant, and the results reinforced concern about the migratory period as playing an important role in species declines. These survival estimates mean that apparent mortality rates during migration were 15 times greater than during breeding and wintering seasons, and that over 85% of total mortality occurred during migration. Sillett and Holmes conclude that both habitat conditions before migration and conditions during migration affect mortality.

> Consequently, migrant populations could be especially susceptible to processes that further reduce survival of individuals during migration, such as destruction of high-quality winter habitats and stopover sites, and increases in the number of communications towers along migration routes.[23]

While it is premature to conclude that the majority of mortality for all neotropical migrants occurs during migration, it is the case for at least one species. Extra mortality, such as the 45,000–450,000 individuals per year of Black-throated Blue Warbler killed at towers, during a period that is already stressful likely contributes to recorded regional population declines or even overall population declines for the federal species of conservation concern.

2.3. Tower Kills Could Contribute to Population Declines in Neotropical Migrants

Additional mortality during migration could affect population trends for songbirds. It is unlikely that tower kill is compensatory. If birds that would die anyway were the only ones killed at towers (i.e., compensatory mortality), then they should show common characteristics that distinguish them from others, such as being young, old, below average weight, or disproportionately of one sex. Studies of Ovenbirds killed at towers do not

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21. Hutto, R.K. 2000. On the importance of *en route* periods to the conservation of migratory landbirds *Studies in Avian Biology* 20:109–114.
22. Sillett, T.S., and R.T. Holmes. 2002. Variation in survivorship of a migratory songbird throughout its annual cycle. *Journal of Animal Ecology* 71:296–308.
23. Sillett, T.S., and R.T. Holmes. 2002. Variation in survivorship of a migratory songbird throughout its annual cycle. *Journal of Animal Ecology* 71:296–308, p. 305.

reveal a consistent pattern of a particular age, sex, or weight of bird being killed,[24] which we take to be evidence against tower kills being compensatory mortality. If this is true, then birds killed at towers represent a chronic, additive drain on populations and will affect population size. To assess whether this effect is "biologically significant," we compared the estimated mortality for selected species with the Partners In Flight conservation targets for various regions in the eastern United States (Table 2). Partners In Flight is a collaborative effort for bird conservation that includes many government and non-profit stakeholders, and its scientific assessment of threats to birds is used as part of the U.S. Fish and Wildlife Service's determination of "birds of conservation concern." These goals are expressed by Bird Conservation Region (BCR).

Table 2. Comparison of selected bird conservation goals by Bird Conservation Region (BCR) from Partners In Flight with estimated annual tower kill *per year*. Conservation goals converted from pairs to individuals by doubling number of pairs.

BCR	Species	Regional Conservation Goal	Estimated Tower Kill Per Year
Adirondacks	Canada Warbler	30,000–40,000	15,000–150,000
Adirondacks	Black-throated Blue Warbler	100,000–110,000	44,000–440,000
Adirondacks	Golden-winged Warbler	2,000	12,000–120,000
Mid-Atlantic Piedmont	Grasshopper Sparrow	70,000	13,000–130,000
Mid-Atlantic Ridge and Valley	Wood Thrush	700,000	15,000–150,000
Lower Great Lakes Plain	Upland Sandpiper	1,200	40–400
Ohio Hills	Cerulean Warbler	300,000	3,500–35,000
Northern Ridge and Valley	Worm-eating Warbler	36,000	5,500–55,000
Northern Ridge and Valley	Louisiana Waterthrush	18,000	2,000–20,000
Northern Ridge and Valley	Bobolink	24,000	26,000–260,000
Mid-Atlantic Coastal Plain	Prothonotary Warbler	32,000	10,000–100,000

Even with the most conservative estimates of bird mortality at communications towers, it is evident that the number of birds of certain species killed each year can be as great as

24. Taylor, W.K. 1972. Analysis of Ovenbirds killed in central Florida. *Bird-Banding* 43:15–19. Brewer, R., and J.A. Ellis. 1958. An analysis of migrating birds killed at a television tower in east-central Illinois, September 1955–May 1957. *Auk* 75:400–414. Eaton, S.W. 1967. Recent tower kills in upstate New York. *Kingbird* 17:142–146. Goodpasture, K.A. 1963. Age and sex determinations of tower casualties, Nashville, 1963. *Migrant* 34:67–70. Johnston, D.W., and T.P. Haines. 1957. Analysis of mass bird mortality in October, 1954. *Auk* 74:447–458. Tordoff, H.B., and R.M. Mengel. 1956. Studies of birds killed in nocturnal migration. *University of Kansas Publications, Museum of Natural History* 10:1–44.

the conservation goal for those species for whole regions. By any rational standard of environmental impact analysis, this constitutes a significant impact to biological resources. Even if bird mortality at communications towers is half of the lowest estimate (i.e., 2 million per year), the effects would still be significant.

Discovery of any one specimen of an endangered species at a communications tower would be an indicator of a significant impact on the population of the species. If just one Kirtland's Warbler had been part of the dataset that we analyzed in Table 1, then the interpretation would be that between approximately 20 and 200 individuals of this species are killed at communications towers each year. The total population size of Kirtland's Warbler is only ~2,000 breeding individuals each year. Each breeding pair produces on average 2.2 fledglings,[25] meaning that approximately 4,200 birds migrate each year. If our extrapolation is close, then communications towers would kill between 0.5% and 5% of the migrants of this species each year. That Kirtland's Warblers are not regularly found at communications towers is evidence only of the rarity of the species and the low total effort put into searching for birds around the thousands of towers in its migratory pathway, not that Kirtland's Warblers are avoiding communications towers.

Although not a neotropical migrant, population effects from tower mortality could affect viability of Red-cockaded Woodpecker. Based on two recovered carcasses, the extrapolated mortality rate of ~40–400 Red-cockaded Woodpeckers annually would represent 0.4–4% of the total population of ~11,000 birds.[26]

The Avatar Report acknowledges that tower kills may have significant impacts on threatened or endangered species, but the authors of the report did not conduct any analysis.[27] Our analysis illustrates that not only are impacts possible, they are foreseeable and likely and therefore require analysis under NEPA.

Our analysis does, however, carry a caveat. These examples illustrate only that it is likely and foreseeable that bird mortality at towers has a significant impact on populations of birds; they are not meant to be precise predications of mortality from communications towers. These results will change as estimates of the total bird mortality at towers are refined. They do show, based on current knowledge, the range of magnitude that tower mortality has on individual species, rather than lumping all bird mortality into one number, as is done in the Avatar Report.

We conclude that the magnitude of mortality of individual species of birds at communications towers constitutes a significant impact, alone and cumulatively, within the under-

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25. Mayfield, H.F. 1992. Kirtland's Warbler (*Dendroica kirtlandii*). Pp. 1–16 *in* A. Poole, P. Stettenheim, and F. Gill (eds.), *The Birds of North America*, Vol. 19. The Academy of Natural Sciences, Philadelphia; The American Ornithologist's Union, Washington, D.C.
26. Jackson, J.A. 1994. Red-cockaded Woodpecker (*Picoides borealis*). Pp. 1–20 *in* A. Poole and F. Gill (eds.), *The Birds of North America*, Vol. 85. The Academy of Natural Sciences, Philadelphia; The American Ornithologist's Union, Washington, D.C.
27. Avatar Report, p. 5-2.

standing of NEPA. Beside the biological impact, this is a profound loss for the roughly 46 million Americans who watch and enjoy birds in their local environments.[28] Declines of migratory birds, from backyard species, to less common migrants, to rare and endangered species, diminish the human environment, and this should be recognized within the NEPA process as well.

3. Tower Height Affects Bird Mortality Rate

The Avatar Report reaches the conclusion that, "All other things being equal, taller towers with lights tend to represent more of a hazard to birds than shorter, unlit towers."[29] While true, this statement is too general to be useful, and no recommendation is made to regulate the height of new towers. Rather, the Avatar Report simply reviews the comments submitted. Perhaps this was the intention of the FCC, but it would seem that this would be the opportunity to analyze statistically the relationship between tower height and bird kills. The comments submitted by industry representatives to the FCC contain only a general description of the relationship between the size of bird kills, annual rate of bird kills, and tower height. Woodlot Alternatives, representing the communications industry, concludes, "There is little evidence of a threshold of tower height that is more dangerous to birds."[30] This statement is not consistent with the available evidence as we document below.

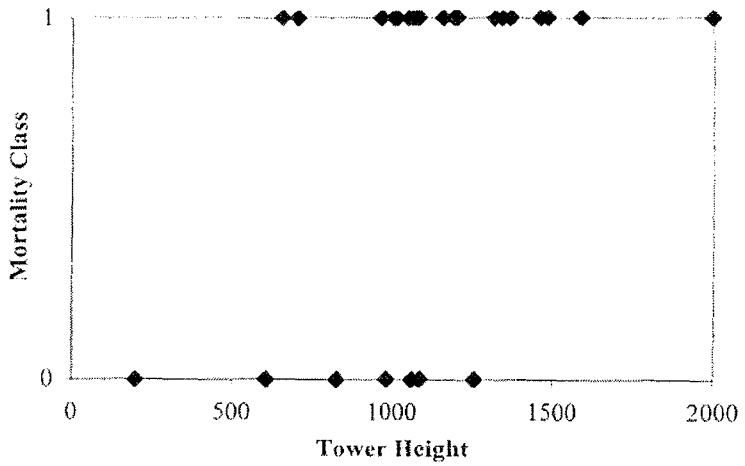

Figure 1. Annual mortality class by tower height for tower kill studies that provide or allow estimates of annual mortality. The mortality classes are below 250 birds per year (0) and above 250 birds per year (1). See Appendix for raw data.

28. U.S. Fish and Wildlife Service. 2002. 2001 national survey of fishing, hunting, and wildlife-associated recreation: national overview. U.S. Fish and Wildlife Service, Washington D.C. U.S. Fish and Wildlife Service. 2001. Birding in the United States: a demographic and economic analysis, report 2001-1. U.S. Fish and Wildlife Service, Washington D.C.
29. Avatar Report, p. 5-1.
30. Woodlot Report, p. 25.

3.1. Meta-analysis of Tower Kill Studies Shows Significant Effect of Tower Height on Bird Mortality

To investigate the relationship between tower height and bird mortality, we conducted a meta-analysis of studies of bird kills at towers that provide or allow estimates of annual mortality and include the height of the tower studied. Many of these studies are summarized in existing reports, such as the Woodlot Report. The mean annual mortality was reported for each study from the underlying article, or calculated by others. We classified each tower as causing mean annual mortality either less than 250 birds per year or more than 250 birds per year as an indicator of the magnitude of the annual kill (Figure 1). This threshold represents the bottom quartile of the number of annual kills. This conversion of a continuous variable (mean annual mortality) to a nominal variable reduces the effect of different study methodologies, search efficiencies, and scavenger removal. We then completed a logistic regression on mortality class with tower height as the independent variable (Figure 2). The data used in this analysis are included at the end of this report.

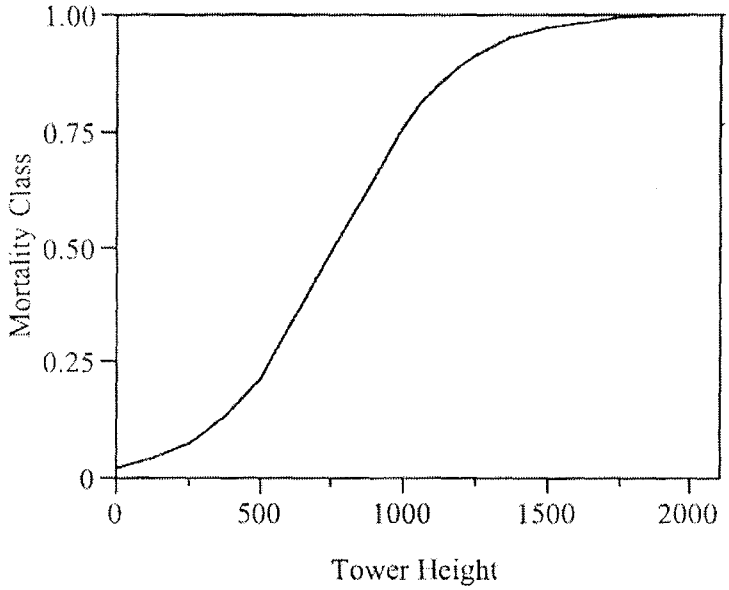

Figure 2. Logistic regression of birds killed per year by mortality class over or under 250 birds (lowest quartile or upper three quartiles) by tower height ($r^2 = 0.27$, $P < 0.01$). Line indicates probability of annual mortality falling over 250 birds per year. See Section 10 for source data.

The 26 towers that make up the data points for this regression are located in 14 states, with one to seven per state. When multiple studies were conducted on a given tower, only a single study was used to avoid double-counting. The regression is significant ($r^2 = 0.27$, $P < 0.01$).

The logistic regression provides a model that relates tower height with annual bird mortality. Because the data used to develop this model are all from towers that have recorded bird kills, the results cannot be extrapolated to all towers. For towers that cause bird kills, tower height is a strong predictor of whether the annual number of deaths is in the lowest quartile. In addition to providing a statistically significant description of the effect of tower height on bird mortality, the model can be used to predict the tower height necessary for bird kills to be below 250 per year a given percentage of the time. This model predicts that only 5% of the time would towers less than 160 feet tall cause more than 250 casualties per year, and only 25% of the time would towers less than 536 feet cause more than 250 casualties per year.

The effects of height are amplified by lighting at towers, so the lower mortality at shorter towers that do not require lighting, such as the one 197-foot tower in the analysis, is likely to be partly attributable to the lack of lighting. It is impossible, however, to investigate the effects of height completely independent of lighting, because all towers over 200 feet require some form of FAA-approved obstruction lighting. To ensure that our results were not biased by the inclusion of the one unlighted tower, we performed a logistic regression without this data point and still obtained a significant relationship between tower height and mortality class ($r^2 = 0.18$; $P < 0.05$) with all of the lighted towers.

More long-term studies of towers shorter than 500 feet would improve this model, but the model is certainly adequate to begin to make policy recommendations. Following this model, it would drastically reduce bird mortality to keep as many towers as possible below 199 feet, which both avoids FAA-required lighting (see below) and, according to our analysis, would avoid large yearly kills 90–95% of the time.

3.2. Statewide Study in Michigan With Random Sampling Design Shows Significant Effect of Tower Height on Bird Mortality

The results of our re-analysis of existing records of annual mortality rates at towers can only be extrapolated to towers that are known to kill birds (the towers analyzed were studied because they killed birds and not selected randomly) and share other characteristics (all towers were guyed and all but one was lighted). The results of our meta-analysis are consistent with an ongoing study with a random sampling design that compares mortality at different tower types. This research, led by Dr. J. Gehring of Central Michigan University, compares bird mortality rates at short unguyed towers, short guyed towers, and tall guyed towers (Figure 3). Differences between guyed and unguyed towers are discussed below. Bird mortality at 380–480 foot towers was significantly less than mortality at taller (1,000 foot) towers. On average, the taller towers killed over four times more birds during 20-day spring and fall survey seasons than did 380–480 foot towers. These towers were not known to be susceptible to bird collisions prior to the study. Adjustments were made for search efficiency and scavenger removal, but these did not change the character of the raw results. Because of the randomized study design, the re-

sults from the Gehring study are powerful new evidence of the role of height in bird mortality.[31]

The Gehring study has not yet detected any mass kill of birds, which is to be expected because the size of kills is inversely proportional to their frequency. The study provides evidence of the effects of height on chronic bird collisions with lighted, guyed towers. Lighting type may have influenced these results somewhat; the towers were lighted with solid red and flashing red lights but the flashing lights were of the strobe type on the 380–480 foot towers, and incandescent on the taller towers. Strobe-type lights extinguish completely between flashes while incandescent lights dim slowly. Darkness between flashes is thought to be important in reducing bird attraction. But both tower heights had solid red lights, which are more attractive to birds than either flashing light type.

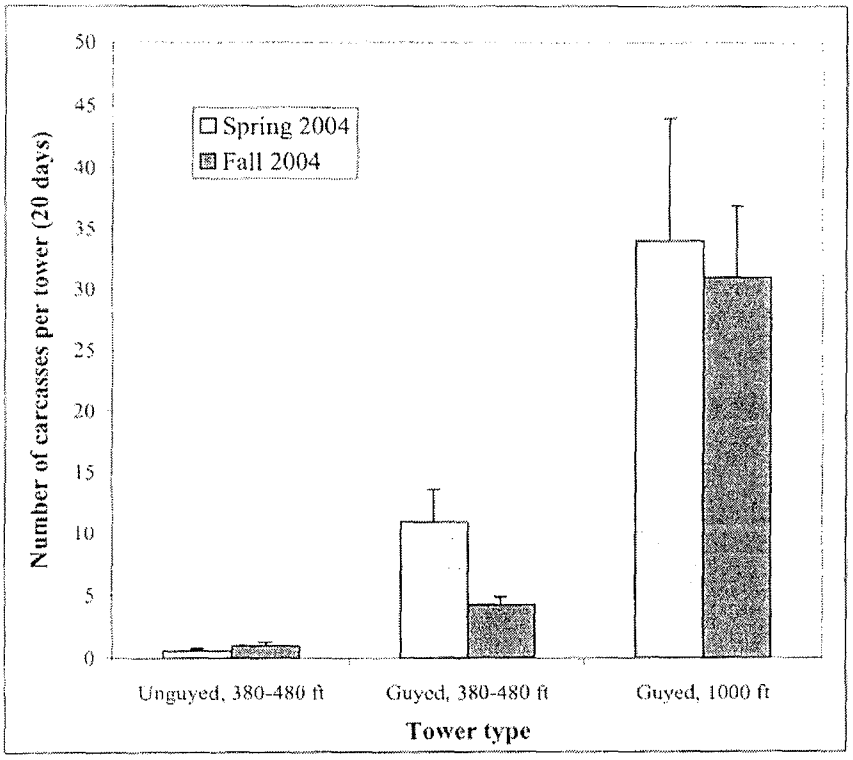

Figure 3. Bird carcasses found at towers in Michigan.[32] All towers were lit with combinations of solid red (L-810) and flashing red lights (L-864; strobe type on shorter towers, incandescent on taller towers). Error bars indicate standard error.

31. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Spring 2004 summary. Central Michigan University, Mount Pleasant. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Fall 2004 summary. Central Michigan University, Mount Pleasant.

With these results being consistent with the analysis of annual mortality presented above, it is possible to identify thresholds for the effects of tower height on bird mortality. From the logistic model above, that threshold for guyed towers is approximately 160 feet to keep mean annual mortality below 250 birds per year 95% of the time. There is no single tower height threshold that will eliminate bird collisions entirely, except zero feet. But the number of birds killed can be minimized by reducing tower heights and this reduction appears from the data to be quite drastic between 1,000 feet and 500 feet. There are certainly examples of towers of the same height killing different numbers of birds[33] and of shorter towers, even as short as 100 feet, killing birds under certain circumstances, but this variation in the data does not disprove the relationship.

The results of our analysis are consistent with the Gehring study with random sampling design and with surveys of bird kills after taller towers have been replaced with shorter towers. Crawford and Engstrom report decreased mortality following the reduction of a 1,008-foot tower to 284 feet.[34] Furthermore, in instances where a taller tower has been erected next to a shorter tower, more birds are killed at the shorter tower than before,[35] presumably because of the attracting effect of lights on the taller tower. Finally, the statistically significant relationship between tower height and bird mortality is consistent with studies of the vertical distribution of nocturnal migrants measured with radar. Most migrants fly at ~1,500 feet,[36] with a small proportion (2–15% in one study[37]) below 300 feet during clear weather. Greater proportions of total migrants (26–46%, depending on the season and location) are found in the strata up to ~1,300 feet, although the strength of radar used in that study[38] may underestimate the number of birds at higher altitude. All other things being equal, substantially more birds will encounter taller towers (greater than 300 feet) and their guy wires than shorter towers (less than 300 feet).

The logistic regression analysis of annual mortality and the Gehring study fully substantiate the U.S. Fish and Wildlife Service tower siting guidelines to better protect birds:

1. Any company/applicant/licensee proposing to construct a new communica-

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32. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Spring 2004 summary. Central Michigan University, Mount Pleasant. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Fall 2004 summary. Central Michigan University, Mount Pleasant.
33. Woodlot Report, p. 26.
34. Crawford, R.L., and R.T. Engstrom. 2001. Characteristics of avian mortality at a north Florida television tower: a 29-year study. *Journal of Field Ornithology* 72:380–388.
35. Stoddard, H.L., Sr., and R.A. Norris. 1967. Bird casualties at a Leon County, Florida TV tower: an eleven-year study. *Bulletin of Tall Timbers Research Station* 8:1–104. Wiseman, J. 1975. TV tower kills – Barrie (Ontario). *Blue Heron* 19:5. Hoskin, J. casualties at the CKVR-TV tower, Barrie. *Nature Canada* 4:39–40.
36. Able, K.P. 1970. A radar study of the attitude of nocturnal passerine migration. *Bird-Banding* 41(4):282–290. Bellrose, F.C. 1971. The distribution of nocturnal migrants in the air space. *Auk* 88:387–424.
37. Mabee, T.J., and B.A. Cooper. 2004. Nocturnal bird migration in northeastern Oregon and southeastern Washington. *Northwestern Naturalist* 85:39–47.
38. *Id.*

> tions tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (*e.g.*, billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.
>
> 2. If collocation is not feasible and a new tower or towers are to be constructed, communications service **providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL)**, using construction techniques which do not require guy wires (*e.g.*, use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.[39] [Emphasis added.]

The existing data would support the FCC adopting these recommendations as standards to better protect birds. Such standards for tower construction do not mean that towers exceeding 199 feet or any other height should not be constructed, only that the FCC would strongly encourage co-location and the construction of shorter towers to accomplish telecommunication goals while minimizing avian impacts.

4. Guyed Towers Kill More Birds Than Guyless Towers

Most towers from which large bird kills have been reported have had guy wires. Observational studies of birds in the vicinity of towers show that birds are much more likely to collide with the guy wires than with the tower itself.[40] Dr. Gehring's study in Michigan provides evidence of increased mortality caused by guyed towers compared to guyless towers of the same height and lighting regime. The Gehring study includes 12 guyed and 9 guyless communications towers 380–480 feet tall. During spring and fall 20-day survey periods in 2004, **guyed towers killed close to ten times more birds than guyless towers.**[41] This same ratio was found even after adjusting for scavenger removal and search efficiency.

It would be difficult to imagine more compelling results. Higher mortality from guyed towers would be expected because of the circling behavior exhibited by migrants under the influence of lights on towers. Furthermore, a study of bird mortality at transmission towers in Wisconsin found a high correlation between the locations of dead birds and guy wires, implicating collisions with guy wires as the cause of death.[42]

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39. Clark, J.R. 14 September 2000. Service guidance on the siting, construction, operation and decommissioning of communications towers. U.S. Fish and Wildlife Service, Washington, D.C.
40. Brewer, R., and J.A. Ellis. 1958. An analysis of migrating birds killed at a television tower in east-central Illinois, September 1955–May 1957. *Auk* 75:400–414. Avery, M., P.F. Springer, and J.F. Cassel. 1976. The effects of a tall tower on nocturnal bird migration — a portable ceilometer study. *Auk* 93:281–291. Fisher, H.I. 1966. Midway's deadly antennae. *Audubon Magazine* 68(4):220–223.
41. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Spring 2004 summary. Central Michigan University, Mount Pleasant. Gehring, J. 2004. Avian collision study plan for the Michigan Public Safety Communications System (MPSCS): Fall 2004 summary. Central Michigan University, Mount Pleasant.
42. Kruse, K. 1996. A study of the effects of transmission towers on migrating birds. M.S. thesis (Environmental Science and Policy), University of Wisconsin, Green Bay.

The hazard of guy wires to migrating birds has also been investigated by those working with wind power producers. Research on wind turbines, which are unguyed, and nearby guyed structures confirms the increased risk of guyed structures. For example, in one study, the average number of birds killed at a guyed meteorological tower was approximately three times higher than the nearby per turbine mortality. The turbines, of a similar height, are unguyed.[43]

This evidence, and the lack of records of mass bird kills at guyless towers in the reviewed literature, is sufficient for reasonable scientific minds to conclude that guy wires greatly increase mortality at towers. The evidence cited above documents the scientific merit of the U.S. Fish and Wildlife Service tower siting guidelines on the use of guy wires:

> 2. If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), **using construction techniques which do not require guy wires (*e.g.*, use a lattice structure, monopole, etc.).** Such towers should be unlighted if Federal Aviation Administration regulations permit.
>
> 7. Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint". **However, a larger tower footprint is preferable to the use of guy wires in construction.**[44] [Emphasis added.]

The FCC could significantly reduce avian mortality at communications towers by allowing construction only of guyless towers unless applicants document that such construction is not feasible.

5. Tower Lighting Influences Bird Mortality

The lighting scheme of communications towers is probably the most important factor contributing to bird kills at towers that can be controlled by humans.[45] The current Federal Aviation Administration Advisory Circular (AC) 70/7460-1, Obstruction Marking and Lighting, dictates the use of lighting for nighttime conspicuity for aviation safety for all obstructions over 199 feet and for structures within three nautical miles of an airport. This is the only purpose in placing lights (Table 3) on communications towers and other

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43. Young, D.P., Jr., W.P. Erickson, R.E. Good, M.D. Strickland, and G.D. Johnson. 2003. Foote Creek Rim final bird and bat mortality report: avian and bat mortality associated with the initial phase of the Foote Creek Rim Wind Power Project, Carbon County, Wyoming. November 1998–June 2002. Final Report. Western EcoSystems Technology, Inc., Cheyenne, Wyoming.
44. Clark, J.R. 14 September 2000. Service guidance on the siting, construction, operation and decommissioning of communications towers. U.S. Fish and Wildlife Service, Washington, D.C.
45. Cochran, W.W., and R.R. Graber. 1958. Attraction of nocturnal migrants by lights on a television tower. *Wilson Bulletin* 70:378–380. Avery, M., P.F. Springer, and J.F. Cassel. 1976. The effects of a tall tower on nocturnal bird migration — a portable ceilometer study. *Auk* 93:281–291.

structures — to provide for aviation safety by making sure pilots can see human-made obstructions.

Table 3. FAA-approved light types for obstruction lighting.

Type	Description
L-810	Steady-burning Red Obstruction Light
L-856	High Intensity Flashing White Obstruction Light (40 FPM)
L-857	High Intensity Flashing White Obstruction Light (60 FPM)
L-864	Flashing Red Obstruction Light (20–40 FPM)
L-865	Medium Intensity Flashing White Obstruction Light (40 FPM)
L-866	Medium Intensity Flashing White Obstruction Light (60 FPM)
L-864/L-865	Dual: Flashing Red Obstruction Light (20–40 FPM) and Medium Intensity Flashing White Obstruction Light (40 FPM)
L-885 Red Catenary	60 FPM

FPM = Flashes Per Minute

Nocturnal migrants can be attracted to lights and they are disoriented or "trapped" by the lights once within their zone of influence. This zone of influence is extended when fog is in the air reflecting the light and inclement weather or topographic factors have forced migrating birds to lower altitudes. These mechanisms have been observed not only with reference to communications towers, but also for attraction to lightships,[46] lighthouses,[47] fires,[48] oil flares,[49] ceilometers,[50] and city lights and buildings.[51]

46. Barrington, R.M. 1900. *The migration of birds as observed at Irish lighthouses and lightships*. R.H. Porter, London and Edward Ponsonby, Dublin. Bagg, A.M., and R.P. Emery. 1960. Fall migration: Northeastern maritime region. *Audubon Field Notes* 14:10–17. Dutcher, W. 1884. Bird notes from Long Island, N.Y. *Auk* 1:174–179.

47. Allen, J.A. 1880. Destruction of birds by light-houses. *Bulletin of the Nuttall Ornithological Club* 5:131–138. Brewster, W. 1886. Bird migration. Part 1. Observations on nocturnal bird flights at the light-house at Point Lepreaux, Bay of Fundy, New Brunswick. *Memoirs of the Nuttall Ornithological Club* 1:5–10. Hansen, L. 1954. Birds killed at lights in Denmark 1886–1939. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening* 116:269–368. Lewis, H.F. 1927. Destruction of birds by lighthouses in the provinces of Ontario and Quebec. *Canadian Field-Naturalist* 41:55–58, 75–77. Miller, G.S., Jr. 1897. Winge on birds at the Danish lighthouses. *Auk* 14:415–417. Munro, J.A. 1924. A preliminary report on the destruction of birds at lighthouses on the coast of British Columbia. *Canadian Field-Naturalist* 38:141–145, 171–175. Squires, W.A., and H.E. Hanson. 1918. The destruction of birds at the lighthouses on the coast of California. *Condor* 20:6–10. Tufts, R.W. 1928. A report concerning destruction of bird life at lighthouses on the Atlantic coast. *Canadian Field-Naturalist* 42:167–172.

48. Stone, W. 1906. Some light on night migration. *Auk* 23:249–252.

49. Tornielli, A. 1951. Comportamento di migratori nei riguardi di un pozzo metanifero in fiamme [Behavior of migrants under the influence of a burning natural gas well]. *Rivista Italiana di Ornitologia* II-21:151–162. Wiese, F.K., W.A. Montevecchi, G.K. Davoren, F. Huettmann, A.W. Diamond, and J. Linke. 2001. Seabirds at risk around offshore oil platforms in the North-west Atlantic. *Marine Pollution Bulletin* 42:1285–1290.

50. Ferren, R.L. 1959. Mortality at the Dow Air Base ceilometer. *Maine Field Naturalist* 15:113–114. Fobes, C.B. 1956. Bird destruction at ceilometer light beam. *Maine Field Naturalist* 12:93–95. Howell,

Historical accounts suggest that, at least for birds attracted to lighthouses, solid white lights are more attractive to birds than colored or flashing lights. Barrington analyzed birds that were killed at 58 lighthouses and concluded that solid lights were more attractive to migrants than blinking lights and that white lights were more attractive than red lights.[52] Others concluded that, "fixed white lights were more deadly than revolving or coloured lights"[53] and that, "coloured lights do not attract the birds as white ones so fatally do."[54] Although colored (red) lights at lighthouses may have attracted fewer birds, flashing red and solid red lights in combination on communications towers are well documented to attract birds, especially night-flying migrants.[55] Conclusive evidence is not available that the color of light affects bird attraction, and Verheijen concludes that lesser attraction at colored lights is a function of their generally lower intensity.[56] Nevertheless, birds are attracted to red obstruction lighting, even if the lighting may be classified as low intensity. The role of color is confounded with the duration of the light — evidence indicates that white and probably red strobe-type lights are less attractive to birds than solid light of either color, as discussed below.

It should be noted that attraction of birds to white light does not mean that white strobes will also be attractive for birds as suggested by comments from the communications industry.[57] The unpublished research cited by the communications industry is described by Kerlinger[58] as documenting attraction of birds to solid white light over colored light, constant light over flashing light, and light over darkness in a captive, experimental setting. The report of this study does not indicate that strobe lights were tested and other details of the study are not available, and therefore it should not be assumed that it provides evidence that white strobes would be attractive to migrating birds.

Observation of bird behavior at towers lighted with solid red (L-810) and flashing red (incandescent L-864) lights confirms that light is the stimulus that keeps birds circling the tower and thereby substantially increasing risk of mortality. Cochran and Graber ob-

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J.C., A.R. Laskey, and J.T. Tanner. 1954. Bird mortality at airport ceilometers. *Wilson Bulletin* 66:207–215.

51. Gastman, E.A. 1886. Birds killed by electric light towers at Decatur, Ill. *American Naturalist* 20:981. Overing, R. 1938. High mortality at the Washington Monument. *Auk* 55:679. Lord, W.G. 1951. Bird fatalities at Bluff's Lodge on the Blue Ridge Parkway, Wilkes County, N.C. *Chat* 15:15–16.
52. Barrington, R.M. 1900. *The migration of birds as observed at Irish lighthouses and lightships*. R.H. Porter, London and Edward Ponsonby, Dublin.
53. Dixon, C. 1897. *The migration of birds: an attempt to reduce avine season-flight to law*. Windsor House, London.
54. Thomson, A.L. 1926. *Problems of bird-migration*. H.F. & G. Witherby, London.
55. Weir, R.D. 1976. *Annotated bibliography of bird kills at man-made obstacles: a review of the state of the art and solutions*. Department of Fisheries and the Environment, Environmental Management Service, Canadian Wildlife Service, Ontario Region, Ottawa.
56. Verheijen, F.J. 1985. Photopollution: artificial light optic spatial control systems fail to cope with. Incidents, causations, remedies. *Experimental Biology* 44:1–18.
57. Avatar Report, p. 3-49.
58. Unpublished research described in Kerlinger, P. 2002. *Avian mortality at communication towers: a review of recent literature, research, and methodology*. Report to U.S. Fish and Wildlife Service, Office of Migratory Bird Management.

served birds flying around incandescent red lights on a tower. When the lights were switched off, the birds dispersed. Birds congregated anew when the lights were switched back on.[59] Avery et al. repeated this experiment, and birds dispersed when the lights were extinguished.[60] As others have noted, "Avery's data suggest that the tower's obstruction lights were the sole factor in the congregation of birds."[61] Larkin and Frase also documented the circular flight paths of birds around a broadcast tower lighted with solid red and flashing red lights.[62] The Avatar Report does not adequately convey the certainty of this information or the central importance of lights in causing birds to collide with towers. The combination of solid red and flashing red lights (L-810 with incandescent L-864) attracts and disorients birds, which accumulate around towers, collide with each other, the tower, guy wires, and the ground, die of exhaustion, or deplete their fat reserves.

5.1. Disorientation by Red Lights Has Physiological Basis

The accumulation of birds near red lights may result from the same mechanism that attracts birds to white lights, from disruption of magnetic orientation under red wavelengths, or from a combination of both mechanisms. Nocturnal migrants are attracted to both red and white lights, become "trapped" in the lighted area, and do not return to the darkness of their migratory path. This has been shown in experiments where birds, varying by species and individual, move into lighted areas but not back into dark ones.[63]

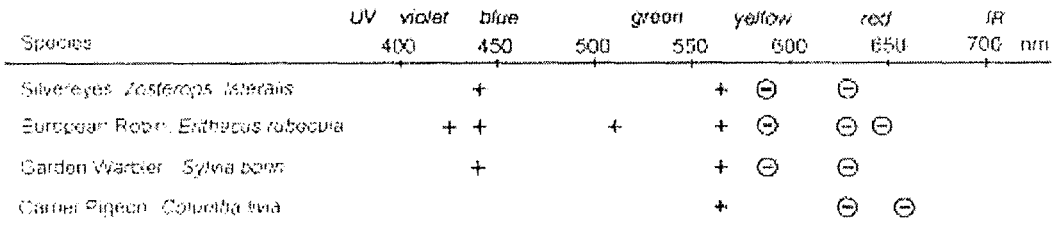

Figure 4. Orientation (+) and disorientation (–) responses of birds under different wavelengths.[64]

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59. Cochran, W.W., and R.R. Graber. 1958. Attraction of nocturnal migrants by lights on a television tower. *Wilson Bulletin* 70:378–380.
60. Avery, M., P.F. Springer, and J.F. Cassel. 1976. The effects of a tall tower on nocturnal bird migration — a portable ceilometer study. *Auk* 93:281–291.
61. Weir, R.D. 1976. *Annotated bibliography of bird kills at man-made obstacles: a review of the state of the art and solutions*. Department of Fisheries and the Environment, Environmental Management Service, Canadian Wildlife Service, Ontario Region, Ottawa, p. 18.
62. Larkin, R.P. and B.A. Frase. 1988. Circular paths of birds flying near a broadcasting tower in cloud. *Journal of Comparative Psychology* 102:90–93.
63. Verheijen, F.J. 1958. The mechanisms of the trapping effect of artificial light sources upon animals. *Archives Néerlandaises de Zoologie* 13:1–107.
64. Wiltschko, W., and R. Wiltschko. 2002. Magnetic compass orientation in birds and its physiological basis. *Naturwissenschaften* 89:445–452.

The evidence for disruption of magnetic orientation by red light is strong. Birds, when denied celestial cues, use magnetic orientation to guide migration direction.[65] It has been demonstrated in birds of several families that this magnetic orientation depends on the presence of light less than 590 nm (yellow; Figure 4). This magnetic orientation is disrupted under yellow and red light, as shown for European Robin (Figure 5). Birds within the visual sphere of influence of a red light would be denied use of celestial cues by the glare of the lights, and often by inclement weather that extends the influence of the lights. In this situation, the birds would also be denied use of magnetic orientation because of the absence of shorter wavelengths necessary for magnetic orientation to function, which may lead to disorientation and circular flight in the vicinity of the lights.[66]

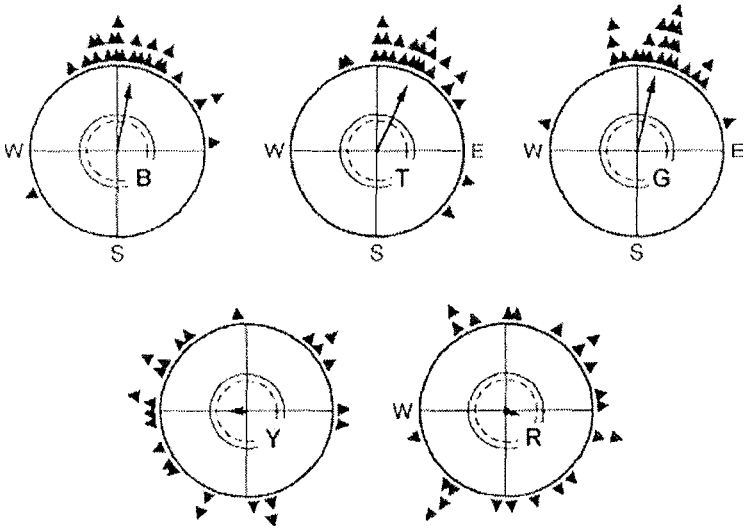

Figure 5. Orientation of European Robins under low-intensity light of different wavelengths in the spring. Birds under blue (B, 424 nm), turquoise (T, 510 nm), and green light (G, 565 nm) oriented properly, as indicated by the arrow in the circle. Individuals under yellow (Y, 590 nm) and red (R, 635 nm) light did not orient correctly.[67]

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65. Deutschlander, M.E., J.B. Phillips, and S.C. Borland. 1999. The case for light-dependent magnetic orientation in animals. *Journal of Experimental Biology* 202:891–908. The evidence for magnetic orientation in birds is derived from studies of birds before flight, choosing a migratory direction. Definitive evidence of use of the magnetic compass during flight has not been obtained.
66. Gauthreaux, S.A., Jr., and C. Belser. 2005. Effects of artificial night lighting on migrating birds. *In* C. Rich and T. Longcore (eds.), *Ecological consequences of artificial night lighting*. Island Press, Covelo, California.
67. Wiltschko, W., and R. Wiltschko. 2002. Magnetic compass orientation in birds and its physiological basis. *Naturwissenschaften* 89:445–452.

5.2. White Strobe Lighting Does Not Attract, or Negligibly Attracts, Migratory Birds

Duration of lighting is critical to whether birds are or are not attracted to lights. The Avatar Report states that, "Although some studies and several anecdotal reports suggest that white strobe lights may be less attractive to birds, this has not been proven to date."[68] This conclusion improperly downplays the strength of the evidence that white strobe lights do not attract migrating birds, perhaps because the Avatar Report does not include studies from other lighted structures such as lighthouses.

The Dungeness Lighthouse in Kent, England was well known for chronic bird kills. In 1961, its revolving beam was replaced with a bluish-white lamp that flashed one second in every ten seconds. The Warden of the Dungeness Bird Observatory noted:

> An intermittent, flashing light (i.e. as the new Dungeness light) proves of no attraction to birds and casualties have never been found.... So we see that a lighthouse long known to kill large numbers of night migrants in a manner familiar to any who have witnessed kills, has *ceased* to kill any simply by changing its old 10-beam revolving light for a flashing light sending the same signal.[69]

Observations during the transition week between lights, under similar weather conditions, showed bird attraction with the constant revolving light, but none with the intermittent light.[70]

The historical record of bird mortality at lighthouses with incandescent flashing (**not** strobe) lights is mixed. Some lighthouse keepers reported hundreds of mortalities annually, while others reported none.[71] This record is difficult to interpret because the literature does not describe the lights well. None of the lighthouses described in these early studies was equipped with strobe lights, which had not yet been invented.[72]

All reports indicate that replacement of solid lights with white strobe lights (and no other lights) reduces bird kills. When stacks and towers at a power plant in Canada were equipped with strobe lights, bird kills were "virtually eliminated."[73] Some U.S. television towers were equipped with white strobe lights (e.g., L-865) instead of solid red (L-810) and flashing red (L-864) for the first time in 1973.[74] Although 11 of the one-night kills

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68. Avatar Report, p. 3-43.
69. T.E. Scott, quoted in Baldwin, D.H. 1965. Enquiry into the mass mortality of nocturnal migrants in Ontario: final report. *Ontario Naturalist* 3:3–11.
70. Baldwin, D.H. 1965. Enquiry into the mass mortality of nocturnal migrants in Ontario: final report. *Ontario Naturalist* 3:3–11, p. 10.
71. Lewis, H.F. 1927. Destruction of birds by lighthouses in the provinces of Ontario and Quebec. *Canadian Field-Naturalist* 41:55–58, 75–77.
72. Strobe lights were invented in the 1930s.
73. Evans Ogden, L.J. 1996. *Collision course: the hazards of lighted structures and windows to migrating birds*. World Wildlife Fund Canada and the Fatal Light Awareness Program, Toronto, Canada, p. 29.
74. Avery, M., P.F. Springer, and J.F. Cassel. 1976. The effects of a tall tower on nocturnal bird migration — a portable ceilometer study. *Auk* 93:281–291, p. 289.

reported in the literature occurred since 1973, none was at a tower with only strobe lights.[75]

Gauthreaux and Belser investigated the influence of light type on bird behavior around towers. The complete details of the Gauthreaux and Belser study were not available to Avatar Environmental for its review. This study has been peer-reviewed as part of a chapter to be published in a forthcoming edited book.[76] It provides additional scientific evidence that white strobe lights do not attract birds to towers and that strobe lights affect bird behavior less than solid red and flashing incandescent red lights when birds are in the vicinity of a tower.

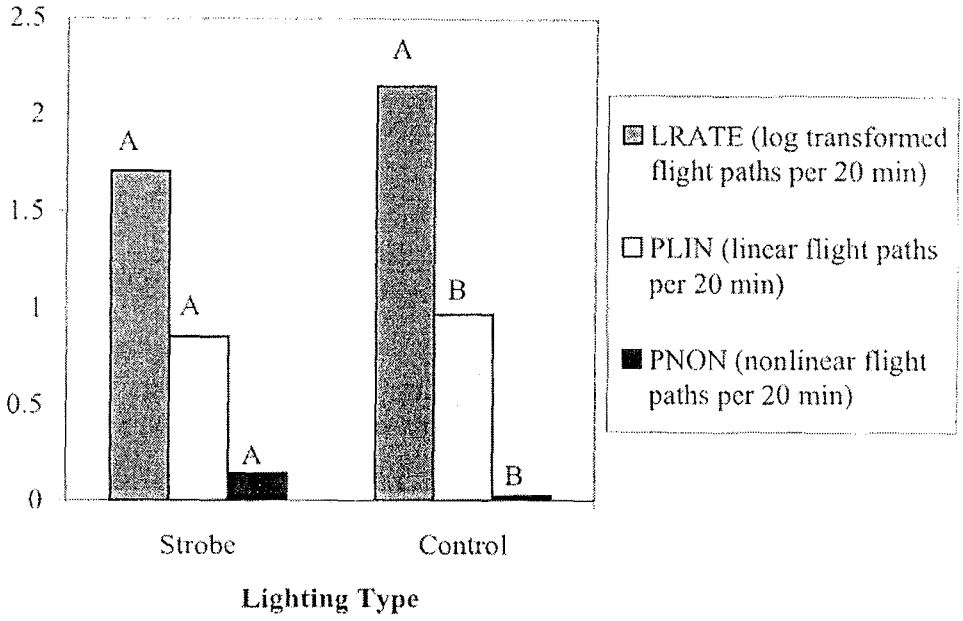

Figure 6. Rate, linear, and nonlinear migratory bird flights around control and strobe-lit tower sites at Neese, Georgia. Rate of linear and nonlinear paths are significantly different, with more nonlinear flights around the strobe-lit tower. The average rate of birds flying at each location was not significantly different.

Gauthreaux and Belser recorded bird behavior at towers at two study sites. At a site near Neese, Georgia, they compared bird flights at a 1,200-foot television tower with white

75. See reports reviewed in Woodlot Report. We consider the mass kill of Lapland Longspurs at a strobe-lighted tower to be a special event, likely explained by attraction to lighted facilities near the tower, an opinion that is shared by many experts. See Eaton, J. 2003. Tower kill. *Earth Island Journal* 17(4):32–35.

76. Gauthreaux, S.A., Jr., and C. Belser. 2005. Effects of artificial night lighting on migrating birds. *In* C. Rich and T. Longcore (eds.), *Ecological consequences of artificial night lighting*. Island Press, Covelo, California.

strobe lights (40–46 pulses per minute; L-856 or L-865) and a control site. Linear, nonlinear, and total paths were recorded and analyzed using general linear models with date and tower type (location) as explanatory variables. Results (Figure 6) show statistically significant higher rates of nonlinear flight around the strobe-lit tower compared to the control (no towers with red lights were studied in Georgia), but not significantly more total birds at the tower with white strobe lights compared with the control. The Avatar Report characterization that "white strobe lights attracted birds as compared to unlit control sites that attracted none"[77] is not accurate for the study as accepted for publication — there was **no significant difference between the number of bird flight paths at the control site and at the tower with white strobes**.

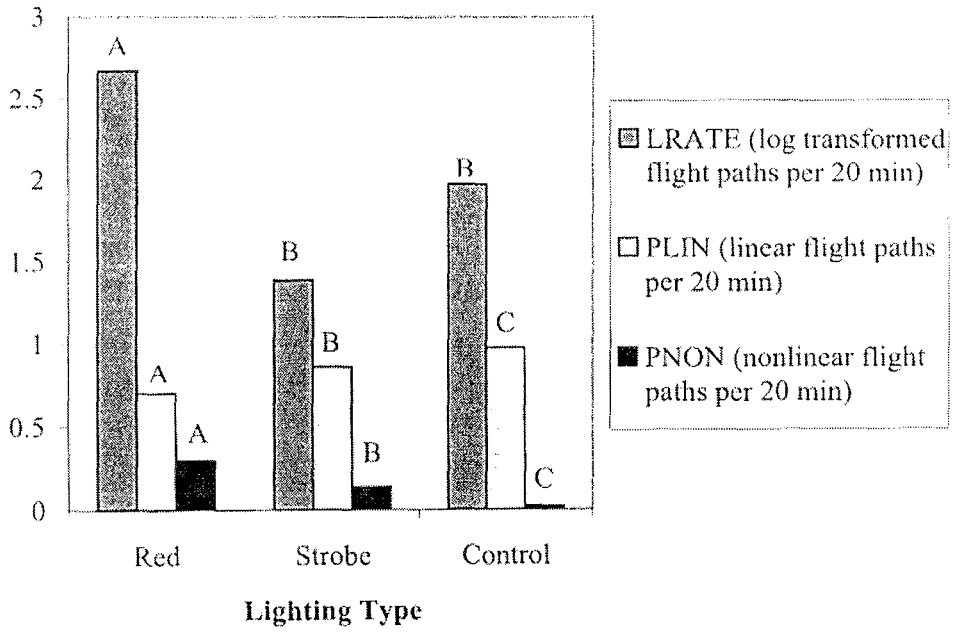

Figure 7. Rate, linear, and nonlinear migratory bird flights around towers with 1) a combination of solid red and flashing incandescent red lights, 2) white strobe lights, and 3) a control site without a tower near Moores Landing, South Carolina. Letters indicate statistically significant differences.

The second part of the study was conducted near Moores Landing, South Carolina during the fall migration. Gauthreaux and Belser monitor bird flights on 14 nights at two towers, one tower (1,667 feet) with incandescent flashing red and solid red lights (L-810) and one tower (2,016 feet) with white strobe lights, and a nearby control site. General linear models revealed that the number of flights was influenced by the day of observation and tower type. Significantly more birds were observed at the tower with the combination of

77. Avatar Report, p. 3-48.

red lights than at the tower with white strobe lights or the control site. Furthermore, lighting type was significantly associated with number of nonlinear flight paths, with twice as many nonlinear flight paths at the tower with red lights than at the tower with white strobe lights on average, and nearly **14 times more nonlinear flight paths at the red lighted tower than at the control site**.

The results suggest that although white strobe lights cause birds to take more nonlinear flight paths, they do not result in birds accumulating around the tower. Gauthreaux and Belser conclude that the significantly greater number of paths per 20 minutes around the tower with red lights resulted from the attraction of the lights, added to the influence of the lights on orientation, leading to accumulations of individuals near the towers with solid red and flashing red lights.[78]

Contrary to the characterization in the Avatar Report, the scientific evidence, including a study at two locations, indicates that white strobe lights on towers result in less bird attraction than red (solid and flashing incandescent) lights and, by extension, lower bird mortality. Indeed, the use of strobe lights has been recommended by a series of researchers investigating this topic. Verheijen, who wrote the classic review on the attraction of animals to light,[79] concludes that, "Success has been achieved in the protection of nocturnal migrant birds through interrupting the trapping stimulus situation by ... replacing the stationary warning lights on tall obstacles by lights of strobe or flashing type."[80] Jones et al. similarly conclude that strobe lights with a complete break between flashes would reduce bird mortality at tall structures.[81]

Dr. W. Taylor, Professor Emeritus of Biology at Central Florida University, reports drastic reduction of bird mortality when lighting of a tower in Orlando, Florida was changed from solid red and flashing red lights to white strobe lights (pers. comm.). The tower was the site of large bird kills, and Professor Taylor and colleagues had collected more than 10,000 birds over the years and reported these kills in the literature.[82] In 1974, the ~1,000-foot guyed tower blew down, and was replaced with a taller guyed tower with white strobe lights. Following the replacement, bird mortality was reduced drastically and no mass kills (i.e., >100 birds) were ever again reported at the site.

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78. See also Graber, R.R., and W.W. Cochran. 1960. Evaluation of an aural record of nocturnal migration. *Wilson Bulletin* 72:253–273. Avery, M., P.F. Springer, and J.F. Cassel. 1976. The effects of a tall tower on nocturnal bird migration — a portable ceilometer study. *Auk* 93:281–291.
79. Verheijen, F.J. 1958. The mechanisms of the trapping effect of artificial light sources upon animals. *Archives Néerlandaises de Zoologie* 13:1–107.
80. Verheijen, F.J. 1985. Photopollution: artificial light optic spatial control systems fail to cope with. Incidents, causations, remedies. *Experimental Biology* 44:1–18.
81. Jones, J., and C.M. Francis. 2003. The effects of light characteristics on avian mortality at lighthouses. *Journal of Avian Biology* 34:328–333.
82. Taylor, W.K., and B.H. Anderson. 1973. Nocturnal migrants killed at a south central Florida TV tower, autumn 1969-1971. *Wilson Bulletin* 85:42–51. Taylor, W.K., and B.H. Anderson. 1974. Nocturnal migrants killed at a south central Florida TV tower, autumn 1972. *Florida Field Naturalist* 2:40–43.

Two television towers near Awendaw, South Carolina had substantial bird kills during the 1980s when they had red incandescent lighting. The towers were changed to white strobe lights in about 1990 and few dead birds have been found around them since.[83]

An average of 2,300 birds per year were killed over a 10-year period at lighted smokestacks near Kingston, Ontario. After the lights were changed to white strobes, the bird kills ended.[84]

The observation that strobe-type lights (L-864 red strobes) do not attract night migrating birds has been made by those analyzing bird kills at wind turbines as well.[85] No comparison of attraction of birds to red strobes versus white strobes on communications towers is available because solid red lights (L-810) are always on towers along with red strobe lights. Many researchers believe that it is unlikely that red or white strobes attract birds at night.

Reports such as those from Florida, South Carolina, and Ontario are likely to be characterized as anecdotal and afforded less weight than peer-reviewed studies. But to ignore the many accounts of bird kills being virtually eliminated by changing to white strobe lights would be scientifically unsound. Anecdotal observations are data. Although they may not be accompanied by precise quantification, precision is not necessary when effects are large. For example, the dataset for the Orlando tower described by Dr. Taylor was well over 100 birds per year before the change to strobe lighting, then well under 100 birds per year following the change to strobe lighting. Even without knowing the exact number of years of observation before or after the change in light type, or the exact number of birds beyond those classes (i.e., over 100 birds/under 100 birds per year), one can conclude with a high degree of statistical certainty that the magnitude of mortality was significantly different. Absent another rational explanation for this difference (e.g., removal of guy wires, decrease in height, drastic change in weather), the only defensible scientific conclusion is that the changed lighting scheme was responsible for the difference. Furthermore, this same observation has been made on multiple occasions at different locations. It is possible, logical, and scientific to draw conclusions from multiple observations of the same phenomenon, even if those observations are not part of a prearranged scientific design. Multiple, consistent observations of the same response can be adequate to draw a statistically valid conclusion, so long as the effect size is sufficiently large.

To disprove the conclusion that bird kills are lower at strobe-lighted towers, large bird mortality events would have to have occurred at towers equipped with strobe lights without being noticed or reported by anyone. The one reported instance of mass mortality at

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83. Dr. W. Post, Curator of Birds, The Charleston Museum, pers. comm. to G. Winegrad.
84. Broderick, B. 1995. Light waves: why be concerned about light pollution? *Royal Astronomical Society of Canada Bulletin* 5(3):6.
85. See Kerlinger, P. 2004. Attraction of night migrating birds to FAA and other types of lights. Curry & Kerlinger, LLC, Cape May, New Jersey.

a strobe-lighted tower was an "abnormality"[86] confounded by the presence of other lighting at the site.

The Avatar Report concludes that the existing research is insufficient to make recommendations about lighting at communications towers. This conclusion is not accurate after considering the weight of the evidence, including the details of the Gauthreaux and Belser study that were not available to Avatar Environmental. Every known instance of changing to strobe lights at towers has reduced bird mortality and this solution has been known and recommended for 40 years. Reducing the attraction of birds to towers is a critical factor in minimizing bird deaths at towers. Without attraction, birds may still encounter and be killed in collisions with towers that are sited in migratory pathways, but the sum of the available scientific evidence indicates that mortality would be greatly reduced by using only strobe lights at towers.

The evidence above supports the U.S. Fish and Wildlife Service tower siting guidelines, which provide:

> 2. If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), using construction techniques which do not require guy wires (*e.g.*, use a lattice structure, monopole, etc.). **Such towers should be unlighted if Federal Aviation Administration regulations permit**....
>
> 5. If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. **Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.**[87] [Emphasis added.]

The research and studies cited and discussed above supports the U.S. Fish and Wildlife Service Guidelines for keeping towers unlit or lit exclusively with white or red strobes to minimize avian mortality. The FAA apparently concurs and has recommended the use of white strobes.

To reduce avian mortality, it is also important that accessory structures at towers, especially shorter unlit towers, not have constant exterior lighting. Studies from bird kills at

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86. Woodlot Report, p. 22.
87. Clark, J.R. 14 September 2000. Service guidance on the siting, construction, operation and decommissioning of communications towers. U.S. Fish and Wildlife Service, Washington, D.C.

wind turbines reveal greater kills at turbines near lighted structures.[88] Avoidance of lights on accessory structures for towers in natural areas would also reduce adverse effects on other taxa.[89]

6. Topography Influences Bird Mortality at Towers

Topography is known to concentrate migrants in certain locations such as coastlines, mountain ridges, rivers, and hills. Considerable evidence of this effect has been gathered in Europe,[90] with somewhat fewer studies in North America. A recent multi-modal research study in New Hampshire revealed the effect of the topography of the Appalachian Mountains on migratory birds, including neotropical migrants traversing southeast over the chain toward wintering grounds in Central and South America. At two ridgeline sites, the researchers observed "exceptional numbers of migrants at 2 to 30 m AGL [Above Ground Level]."[91] They conclude, consistent with the European studies, that it should not be assumed that birds migrate in a broad front across mountains. They continue:

> [This] is important for evaluation of structures such as wind-powered electrical generators or communication towers on ridge lines. Although our studies were not designed to observe concentrations of migrants at topographical features, reaction of migrants to topography that we did observe suggested such concentrations during both favorable and unfavorable conditions. Concentrations could result either as birds moved along a corridor, such as a pass or ridge line, or they could result from birds moving up and over a ridge meeting migrants already at that altitude and thus producing large numbers of birds a few tens of meters above the ridge summit. Our ceilometer observations of large numbers of birds near crests of ridges are particularly relevant in that regard.[92]

This study, which is plainly relevant but not cited in the Avatar Report, provides convincing peer-reviewed evidence that the placement of communications towers along ridgelines is likely to result in increased bird mortality than placement elsewhere. It pro-

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88. See Kerlinger, P. 2004. Attraction of night migrating birds to FAA and other types of lights. Curry & Kerlinger, LLC, Cape May, New Jersey.
89. Longcore, T., and C. Rich. 2004. Ecological light pollution. *Frontiers in Ecology and the Environment* 2:191–198.
90. Williams, T.C., J.M. Williams, P.G. Williams, and P. Stokstad. 2001. Bird migration through a mountain pass studied with high resolution radar, ceilometers, and census. *Auk* 118:389–403, citing Bruderer, B. 1978. Effects of alpine topography and winds on migrating birds. Pp. 252–265 *in* K. Schmidt-Koenig and W. Keeton (eds.), *Animal migration, navigation, and homing*. Springer-Verlag, Berlin. Bruderer, B. 1999. Three decades of tracking radar studies on bird migration in Europe and the Middle East. Pp. 107–141 *in* Y. Leshem, Y. Mandelik, and J. Shamoun-Baranes (eds.), *Proceedings international seminar on birds and flight safety in the Middle East*. Tel-Aviv, Israel. Bruderer, B., and L. Jenni. 1988. Strategies of bird migration in the area of the Alps. Pp. 2150–2161 *in* H. Ouellet (ed.), *Acta XIX Congressus Internationalis Ornitologici*. National Museum of Natural Science, Ottawa, Ontario. Eastwood, E. 1967. *Radar ornithology*. Methuen, London.
91. Williams, T.C., J.M. Williams, P.G. Williams, and P. Stokstad. 2001. Bird migration through a mountain pass studied with high resolution radar, ceilometers, and census. *Auk* 118:389–403, p. 394.
92. Williams, T.C., J.M. Williams, P.G. Williams, and P. Stokstad. 2001. Bird migration through a mountain pass studied with high resolution radar, ceilometers, and census. *Auk* 118:389–403, p. 401.

vides a rational explanation for why some short towers cause high bird mortality (e.g., a kill at a 100-foot unlighted tower on a ridgeline). Birds will be killed at a tower whenever large numbers are flying near it at the same elevation as the tower. This can occur because the tower is tall or because it is placed topographically where birds are concentrated close to the ground. At ridgeline locations, inclement weather is not required for concentrations of birds to be found at low elevation. Radar studies can be conducted prior to siting a tower in an area that might concentrate night migrants so that the tower can be located to avoid such sites.

7. Data Quality Act

The communications industry appears eager to use the Data Quality Act and its implementation by the FCC as a way to discount the available information about bird mortality at communications towers. The National Association of Broadcasters et al. asserts, "As described in more detail in the attached Technical Comments, most reports, observations and studies on the supposed effects of communications towers on migratory birds have not been peer-reviewed and would not qualify as 'quality information' under the Commission's own DQA Information Quality Guidelines."[93] In their commissioned report, Woodlot Alternatives writes:

> Most of the literature cited, particularly those involving observations and incidental reports, was found to be of limited scientific value. Referring to some aspects of the FCC's Data Quality guidelines (transparency and reproducibility), we used these criteria to assess the 27 peer-reviewed studies used in this review. In accordance with these guidelines, published papers were required to 1) have a research protocol with a clearly described methods section; 2) maintain sufficient metrics for statistical analyses; 3) have clearly stated results; and 4) have reproducible results. The studies that appeared to meet these criteria were published in peer-reviewed scientific journals. We found that 19 studies met the above criteria as discussed in the guidelines and 8 studies were doubtful in this regard (Table 4). None of the 173 incidental reports of avian mortality met the FCC Data Quality guidelines for transparency and reproducibility.

The eagerness to characterize incidental reports of bird mortality at particular towers as "of limited scientific value" misses the point. Incidental observations are neither useless nor ideal for scientific inquiry. Their appropriateness for use depends upon the purpose to which they are put. As long as assumptions are made explicit, incidental observations can be used to develop a description of reality using the scientific method.

While the communications industry concentrates on the elements of "reproducibility" and "transparency," it does not discuss the need for analysis to be objective. In the FCC's implementing guidelines, this means that if alternative explanations for patterns in data exist, they should be included in any discussion of results.[94] Both the Woodlot Report

93. CITIA/NAB Comments, p. 28 (footnote omitted).
94. The Information Quality Guidelines (FCC 02-277) read, in part: "Objectivity will be demonstrated by including in the information dissemination product's methodology section or appendix a discussion of

and the Avatar Report fail to do this. Many of the conclusions presented above are alternative, and we believe more accurate, interpretations of the material presented in the Avatar Report. The Avatar Report avoids drawing obvious inferences from the available data to such a degree that it could be interpreted as lacking objectivity. For example, it claims that little research on bird mortalities at towers has been completed in the past twenty years,[95] despite many recent studies available to Avatar.[96]

8. Conclusion

Our review of the scientific literature, combined with our analysis conducted in the preparation of this report, and the unpublished and in-press research described above, leads us to the conclusion that sufficient reliable information is available to implement communications tower guidelines that would reduce existing and future significant adverse impacts on bird populations. Many research needs are apparent — evaluating the attractiveness of strobe-type flashing red lights without the confounding effect of solid red lights and testing the hypothesis that red light disorients birds while in flight by disrupting their magnetic compass are only two. We conclude, however, that the U.S. Fish and Wildlife Service tower siting guidelines have a strong scientific basis, and their applicability has been demonstrated by research available at the time they were issued in 2000, or completed since then.

In view of the significant adverse effects on bird populations if nothing is done, an adaptive management approach would be advisable.[97] Adaptive management allows for a management action to be taken, such as requiring only strobe-type lights on new towers, while continuing to increase scientific knowledge by studying the effects of such actions (e.g., monitoring and comparing bird mortality at towers with all white strobe lights, all red strobe lights, and mixed solid red and red strobe lights on towers). Future recommendations can be modified to incorporate the findings of such studies. Many alternative

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other scientifically, financially, or statistically responsible and reliable alternative views and perspectives, if these alternative views or perspectives are not already noted in other sections of the information dissemination product."

95. Avatar Report, p. 3-1.

96. Morris, S.R., A.R. Clark, L.H. Bhatti, and J.L. Glasgow. 2003. Television tower mortality of migrant birds in western New York and Youngstown, Ohio. *Northeastern Naturalist* 10:67–76. Nehring, J., and S. Bivens. 1999. A study of bird mortality at Nashville's WSMV television tower. *Migrant* 70:1–8. Kemper, C.A. 1996. A study of bird mortality at a central Wisconsin TV tower from 1957–1995. *Passenger Pigeon* 58:219–235. Crawford, R.L., and R.T. Engstrom. 2001. Characteristics of avian mortality at a north Florida television tower: a 29-year study. *Journal of Field Ornithology* 72:380–388. Kruse, K. 1996. A study of the effects of transmission towers on migrating birds. M.S. thesis (Environmental Science and Policy), University of Wisconsin, Green Bay. Ball, L.G., K. Zyskowski, and G. Escalona-Segura. 1995. Recent bird mortality at a Topeka television tower. *Kansas Ornithological Bulletin* 46(4):33–36. Larkin, R.P., and B.A. Frase. 1988. Circular paths of birds flying near a broadcasting tower in cloud. *Journal of Comparative Psychology* 102:90–93.

97. Holling, C.S. 1978. *Adaptive environmental assessment and management*. John Wiley & Sons, New York. Walters, C.J. 1986. *Adaptive management of renewable resources*. MacMillan Press, New York. Haney, A., and R.L. Power. 1996. Adaptive management for sound ecosystem management. *Environmental Management* 20:879–886.

mitigation strategies could be investigated and eventually adopted under an adaptive management approach (e.g, different lighting colors, different flash rates), but progress in reducing current adverse impacts and minimizing future impacts from communications towers requires immediate action based on the substantial existing research.

9. About the Authors

Dr. Travis Longcore and Catherine Rich are co-editors of the forthcoming book *Ecological Consequences of Artificial Night Lighting* (Island Press). They provide expert comments on environmental impact analysis documents, concentrating on presenting a thorough review of the scientific literature. Dr. Longcore is Research Assistant Professor of Geography at the University of Southern California Center for Sustainable Cities and Lecturer for the UCLA Department of Ecology and Evolutionary Biology and the UCLA Institute of the Environment. He was graduated *summa cum laude* from the University of Delaware with an Honors B.A. in Geography, and holds an M.A. and a Ph.D. in Geography from UCLA. Ms. Rich holds an A.B. with honors from the University of California at Berkeley, a J.D. from the UCLA School of Law, and an M.A. in Geography from UCLA. She is a licensed attorney in California (currently on inactive status), and is Executive Officer of The Urban Wildlands Group, a conservation non-profit that she co-founded with Dr. Longcore. Dr. Sidney A. Gauthreaux, Jr. has studied behavioral and physiological aspects of bird migration since the late 1950s. He is currently Professor of Biological Sciences at Clemson University and Director of the Clemson University Radar Ornithology Laboratory.

Dr. C. Zonneveld (Free University, Amsterdam) provided useful criticism of the statistical analysis. All errors and omissions remain the responsibility of the authors.

10. Appendix: Data Used in Analysis of Tower Height

To allow transparency and reproducibility of the analysis of tower height presented in Section 3, the dataset is provided here. These data were obtained from, and full citations are found in, the Woodlot Report and a report from the National Wind Coordinating Committee.[98]

Table 4. Studies of birds killed at towers providing estimates of mean annual mortality.

Source	State	Tower Height (feet)	Duration of Study (years)	Mean/Estimated Annual Mortality
C. Nicholson, pers. comm.[99]	TN	197	3	8
Seets and Bohlen 1977	IL	605	1	~206
Young et al. 1994	KS	653	0.5	~1,272
Young et al. 1994	KS	700	0.5	~1,080
Bierly 1968, 1969, 1972, Remy 1974, 1975, Cooley 1977	AL	825	4	82
Morris et al. 2003	NY	961	30	267
Seets and Bohlen 1977	IL	981	0.5	~130
Kemper 1996	WI	1,000	38	3,200
Crawford and Engstrom 2001	FL	1,010	24	~1,370
Seets and Bohlen 1977	IL	1,047	0.5	~1,176
Morris et al. 2003	NY	1,059	30	35
Seets and Bohlen 1977	IL	1,063	0.5	~969
Morris et al. 2003	NY	1,076	30	370
Young et al. 1994	KS	1,079	0.5	~912
Morris et al. 2003	OH	1,084	19	227
Young et al. 1994	KS	1,154	0.5	~672
Carter and Parnell 1976	NC	1,188	2	767
Avery et al 1976	ND	1,197	3	1,075
Young et al. 1994	KS	1,253	0.5	~408
Stmad 1975	MN	1,314	5	701
Seets and Bohlen 1977	IL	1,338	0.5	~942
Nehring and Bivens 1999	TN	1,364	38	523
Seets and Bohlen 1977	IL	1,458	0.5	~1,680
Taylor and Anderson 1973	FL	1,481	3	2,594
Seets and Bohlen 1977	IL	1,587	0.5	~326
Carter and Parnell 1976	NC	1,994	2	767

98. Erickson, W.P., G.D. Johnson, M.D. Strickland, D.P. Young, Jr., K.J. Sernka, and R.E. Good. 2001. *Avian collisions with wind turbines: a summary of existing studies and comparisons to other sources of avian collision mortality in the United States.* National Wind Coordinating Committee (NWCC) Resource Document.

99. C.P. Nicholson, Ph.D., Tennessee Valley Authority, pers. comm. to G. Winegrad, March 26, 2004.

Table 5. Results of logistic regression of annual mortality class by tower height.

Whole Model Test

Model	-LogLikelihood	DF	ChiSquare	Prob>ChiSq
Difference	3.723222	1	7.446445	0.0064
Full	10.322085			
Reduced	14.045308			

RSquare (U)	0.2651
Observations (or Sum Wgts)	26

Converged by Gradient

Parameter Estimates

Term	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	-3.7233453	2.3306353	2.55	0.1101
Tower Height	0.00489571	0.0023436	4.36	0.0367

For log odds of over 250/under 250

Table 6. Results of logistic regression of annual mortality class by tower height omitting the only short, unlit tower.

Whole Model Test

Model	-LogLikelihood	DF	ChiSquare	Prob>ChiSq
Difference	2.257167	1	4.514335	0.0336
Full	10.252893			
Reduced	12.510061			

RSquare (U)	0.1804
Observations (or Sum Wgts)	25

Converged by Gradient

Parameter Estimates

Term	Estimate	Std Error	ChiSquare	Prob>ChiSq
Intercept	-3.4047111	2.5411879	1.80	0.1803
Tower Height	0.00458966	0.0025254	3.30	0.0692

For log odds of over 250/under 250

EXHIBIT H

FINAL MANUSCRIPT

8/31/00

Note: This is a manuscript, currently in press, of a speech presented by Al Manville at the Avian Interactions Workshop held December 2, 1999, in Charleston, SC, and sponsored by the Electric Power Research Institute. The paper provides a detailed overview of the communication tower/bird strike problem. The manuscript is being published in the Proceedings of the Avian Interactions Workshop. For purposes of copyright protection, should the document be cited, please use the following reference:

Manville, A. M. II. 2000. The ABCs of avoiding bird collisions at communication towers: the next steps. Proceedings of the Avian Interactions Workshop, December 2, 1999, Charleston, SC. Electric Power Research Institute (in press).

THE ABCs OF AVOIDING BIRD COLLISIONS AT COMMUNICATION TOWERS: THE NEXT STEPS.

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Abstract: Published accounts of avian collisions with tall, lit structures date back in North America to at least 1880. Long-term studies of the impacts of communication towers on birds are more recent, the first having begun in 1955. This paper will review the known and suspected causes of bird collisions with communication towers (e.g., lighting color, light duration, and electromagnetic radiation), assess gaps in our information base, discuss what is being done to fill those gaps, and review the role of the U.S. Fish and Wildlife Service (FWS or Service) in dealing with this important problem. This paper will also review avian vulnerability to collisions with tall structures, currently affecting nearly 350 species of neotropical migratory songbirds that breed in North America in the spring and summer and migrate to the southern United States, the Caribbean, or Latin America during the fall and winter. These species generally migrate at night and appear to be most susceptible to collisions with lit towers when foggy, misty, low-cloud-ceiling conditions occur during their spring and fall migrations. Thrushes, Vireos, and Warblers are the species that seem the most vulnerable. Lit towers, those exceeding 199 feet (61 m) above the ground, currently number about 46,000 in the United States (not including lit "poles"), with the total number of towers registered in the Federal Communications Commission database listed at some 75,000. Also included in this paper are preliminary voluntary recommendations designed to help minimize bird collisions with towers, as well as a review of activities that prompted recent FWS action in dealing with this issue. This paper will further review two partnerships with the electric utility and electric wind generation industries -- the Avian Power Line Interaction Committee and the National Wind Coordinating Committee's Avian Subcommittee, respectively -- as possible models for a future partnership with the communication industry (*i.e.*, radio, television, cellular, and microwave).

Key words: Avian mortality, bird watching, bird strikes, collisions, communication towers, guy wires, habitat management, lights, mitigation, neotropical migratory songbirds, night migrations, radio frequency waves, partnerships, tower siting.

INTRODUCTION

Published accounts of birds striking tall, lit structures such as lighthouses -- although often anecdotal --

have appeared in the scientific literature since at least 1880 (Crawford and Engstrom 1999). The earliest known published report of a bird-tower kill in the United States took place in September 1948 at a 450-foot (137-m) radio tower in Baltimore, Maryland, although no details about the incident were made available (Aronoff 1949). The first long-term study of the impact of a television tower on birds was begun in 1955 by the Tall Timbers Research Station in northern Florida. With the ground conditions and the number of scavengers controlled as much as possible, daily searches for dead birds were made under this tower. Kills were plotted on maps, weather records were maintained, and dead birds were speciated. After the first 25 years, 42,384 birds representing 189 species were tallied (Crawford and Engstrom 1999). The longest study yet conducted was by physician Charles Kemper over a 38-year period, beginning in 1957 (Kemper 1964, 1996). He collected 121,560 birds representing 123 species. On one night in 1963, he collected and speciated over 12,000 birds, the largest single-night kill yet documented, not accounting for the almost certain scavenging by wild and domestic predators such as crows (*Corvus brachyrhynchos*), owls (Strigidae), foxes (*Vulpes vulpes*), dogs (*Canis familiaris*), cats (*Felis domesticus*), and others then present. Other studies also have been conducted on the effects of tall towers on nocturnal bird migrations, most notably by Avery *et al.* (1976) at a U.S. Coast Guard Omega Navigation Station in North Dakota using a portable ceilometer.

In fact, since the 1970s there has been much information published about bird strikes with communication towers. A good deal of this information has been maintained by Division of Migratory Bird Management (DMBM) web sites at http://www.fws.gov/ r9mbmo/homepg.html and http://migratorybirds.fws.gov/issues/towers/agenda.html.

Unfortunately, most of the research that has been done regarding bird strikes with these structures only reviews carcass counts and species variability, not the presumed or suspected causes of bird collisions. Research into this arena is sorely lacking. Published accounts do, however, answer one question. Birds vulnerable to communication towers comprise some 350 species of so-called neotropical migratory songbirds. Of these, Thrushes (Muscicapidae), Vireos (Vireonidae), and Warblers (Parulidae) are the species that seem the most vulnerable. These migratory songbirds are species that breed in North America in the spring and summer and migrate to the southern United States, the Caribbean, or Latin America during the fall and winter. These species also generally migrate at night and appear to be most susceptible to collisions with lit towers on foggy, misty, low-cloud-ceiling nights during their migrations. Lights seem to be key.

Federal Trust Responsibility

Migratory birds are a trust resource for the U.S. Fish and Wildlife Service. The Service is currently responsible for the conservation and management of 836 species of migratory birds protected by the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. Sections 703 and 712; Sections 704-712 authorizing the Secretary of Interior to issue implementing regulations). Of these, 778 are categorized as so-called nongame species (*e.g.*, the Eastern Bluebird [*Sialia sialis*]), while 58 species are legally hunted as game (*e.g.*, the Wood Duck [*Aix sponsa*]). The Service is currently faced with a dichotomous challenge: while the populations of some species are doing very well -- some too well (*e.g.*, the mid-continent lesser Snow Goose [*Anser caerulescens caerulescens*], the urban Canada Goose [*Branta canadensis*], the Brown-headed Cowbird [*Molothrus ater*], and the Double-crested Cormorant [*Phalacrocorax auritus*]) -- many other species are not (Schmidt and Petit 1998). We currently are seeing the continuing declines of over 200 species. Of these, 90 are listed under the Federal Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.): 75 species are listed as Endangered, such as the Whooping Crane (*Grus americana*); while 15 species are listed as Threatened, such as the San Clemente Sage Sparrow (*Amphispiza belli clementeae*). Another 124 are on the Service's list of Nongame Species of Management Concern (*e.g.*, Cerulean Warbler [*Dendroica cerulea*]; Trapp 1995). These include birds whose populations are declining, some precipitously. If trends are not reversed, the

next likely step is listing under ESA -- a train wreck we would prefer to avoid. Add to the known declines our lack of population data on many of the bird species. Fully one-third of the 836 species (some 279) have essentially no population data.

Before attempting to assess the impacts of communication towers (including -- but not necessarily limited to -- radio, television, cellular, microwave, paging, messaging, open video, public safety, wireless data, government dispatch, and emergency broadcast) on birds, first look at the other non-tower factors that kill birds. Mortality occurs from collisions with wind generators, electric transmission and distribution lines, glass windows, aircraft, and automobiles; electrocutions; oil and contaminant spills; pesticide poisonings; predation by cats; introductions of exotic species; habitat loss and/or degradation; and other causes. Although their estimates are conservative to very conservative, some of these impacts illustrate the relative magnitude of these threats to avian survivorship. For example, building window collisions are estimated to take from 97 to 970 million birds per year, or from 1 to 10 birds per building annually in North America (Klem 1989, 1990; O'Connell 1998). In one study, pesticide ingestion was estimated to kill 65 million birds per year (Pimentel *et al.* 1992). Kill figures alone from birds retrieved from Alaska's *Exxon Valdez* oil spill were huge. As of September 1989, over 36,470 dead birds were retrieved for evidence by the FWS, representing 90 different species (Manville 1991). Estimates for oil-caused avian mortality from the *Exxon* spill ranged from 350,000-500,000. Another source of bird mortality is free-ranging domestic cats. Nationwide, these felids are estimated to kill hundreds of millions of birds - an astounding impact. In one four-year study in Wisconsin alone, domestic cats were estimated to kill roughly 39 million birds each year (range 8-217 million) in just the rural areas of that State (Coleman *et al.* 1997).

Add to this the growing impacts of communication towers whose construction is occurring at an exponential rate -- conservatively estimated at 4-5 million birds killed per year due to collisions with communication towers (Manville 1999) -- and the cumulative impacts of all these mortality factors is of grave concern. While, for example, it may be difficult to seriously reduce window strike and automobile mortalities, many feel we can take substantive steps to reverse trends in bird-tower collisions. It is incumbent upon us to do whatever possible to reverse these trends.

Birds are big business in North America. In 1996, for example, some 63 million Americans 16 years old and older enjoyed activities such as feeding, photographing, and watching birds. These wildlife watchers spent an estimated $28.9 billion pursing these activities (USFWS 1997; Fenwick 1997). With perhaps the exception of gardening, birdwatching has become America's fastest growing hobby, increasing 150% over the past decade. More Americans reportedly go on vacations to watch birds today than to play golf. In the 1994-95 National Recreation Survey, for example, birdwatching had increased 155% over the previous decade compared to a 29% increase for golf (Stangel and Fenwick 1997).

From a utilitarian standpoint, birds pollinate flowers and remove insect pests from many important commercial food crop and forest species, making possible a multi-billion-dollar industry extremely dependent upon birds for its success. One pair of Warblers, for example, will remove the defoliating caterpillars from more than 1 million leaves within the 2-3 week period that they are feeding their nestlings. In the Pacific Northwest, 24 species of neotropical songbirds feed on the western spruce budworm (*Choristoneura occidentalis*) and the Douglas fir tussock moth (*Orgyia pseudotsugata*), two of the most destructive defoliating insects found in the region. Birds remove countless weed seeds -- including exotic species -- that compete for food crop and forest production. Birds also distribute seeds of important forest tree and shrub species whose survival would not exist without bird seed dispersal. The global reduction of pollinators -- including birds -- raises alarm. Fully two-thirds of our flowering plants are pollinated by birds, insects, and bats, producing a global economic benefit estimated at $117 billion per year (Smithsonian Migratory Bird Center 1994; Ornithological Council 1997). In short, birds are extremely important to us all.

DISCUSSION

Fish and Wildlife Service Involvement

The Service has played other and more historic roles than those dealing with bird strikes in the siting and placement of communication towers. Through the Service's Division of Habitat Conservation, Fisheries and Habitat Conservation, and our Ecological Service field offices, we review siting requests and potential problems created by towers as mandated by the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), and Section 7 of the ESA. It was only more recently that DMBM became actively involved in the tower-collision issue. On January 22, 1998, a large kill of an estimated 5,000-10,000 Lapland Longspurs (*Calcarius lapponicus*) -- a migratory songbird -- occurred at and in the vicinity of three communication towers and a natural gas pumping facility in western Kansas on a snowy, foggy night. Almost immediately, the issue was brought to DMBM's attention by various representatives of the environmental community, most notably the National Audubon Society, the American Bird Conservancy (ABC), and the Ornithological Council (OC). In April 1998, I was asked on behalf of DMBM to brief the Policy Council of ABC on, among other things, bird mortality from communication tower strikes. At the time, a partial but certainly not complete list of reviewed and abstracted literature was provided to the Council. Following this briefing, informal discussions continued between representatives of the Federal Communications Commission (FCC), the Service's Division of Habitat Conservation, and DMBM.

On November 17, 1998, representatives of the Service's regional, field, and Washington, DC, offices met in Panama City, Florida, to discuss, "Migratory Bird Conservation and Communication Towers: Avoiding and Minimizing Conflicts." That document was subsequently made available to the public (Lang 1999). In December 1998, I and another FWS staff member met with representatives of the environmental dispute resolution group, RESOLVE, to discuss the need for a facilitated meeting with stakeholders to review and discuss research needs and gaps, put concerns over bird kills on the table, and begin a dialogue with the various players. That facilitated meeting, attended by 42 stakeholders, took place on June 29, 1999, at RESOLVE in Washington, DC. Those agencies represented included the FCC, the Federal Aviation Administration (FAA), the Federal Highway Administration, the U.S. Department of Agriculture's National Wildlife Research Center, the Service, and the Wisconsin Department of Natural Resources. Those from the research community included the Illinois Natural History Survey, the Buffalo Museum of Science, Geo-Marine, the State University of New York at Geneseo, Cornell University, Clemson University, and Curry & Kerlinger. Industry representatives included the Cellular Telecommunications Industry Association, Environmental Resources Management, Motorola, the Personal Communications Industry Association, SBC Wireless, and Southwestern Bell Wireless. Environmentalists were represented by ABC, the National Audubon Society, the OC, and the Piedmont Environmental Council. The most substantive result of the meeting was the creation of the Communication Tower Working Group with 15 individuals agreeing to participate. The Working Group's purpose is to develop and implement a research protocol that will determine what about towers kills birds. DMBM was asked to chair the Working Group.

On August 11, 1999, the very first public workshop on "Avian Mortality at Communication Towers" was held at Cornell University in conjunction with the 117th meeting of the American Ornithologists' Union. The workshop was co-sponsored by the Service, ABC, and the OC. Bill Evans, an independent ornithological researcher from Ithaca, New York, and I - representing the Service - co-chaired the meeting which included presentations by 17 speakers, and a discussion on research and funding needs, information gaps, and next steps by a panel of 23 experts. Complete transcripts of the meeting are available on <http://migratorybirds.fws.gov/issues/towers/agenda.html> and on <www.towerkill.com>. Much information, some of which has previously been summarized in this paper, was presented in the

workshop. The representative from the FAA, for example, pointed out that all towers more than 199 feet (61 m) above ground level (AGL) must contain a pilot warning light(s). Based on the July 2000 FCC *Antenna Structure Registry* database, there were some 46,000 lit towers more than 199 feet AGL (not including towers classified as "poles") in the United States. Approximately 75,000 towers (including some 23,000 which are not lighted) are now listed in the FCC's database. Some groups have argued that the database understates the true number of lit towers, suggesting that upwards of 80,000 towers are currently lighted. Whatever the correct figure, we do know that tower siting and construction have increased exponentially within at least the last 3 years and that growth continues at 6-8% per year.

Known and Suspected Problems

What is it specifically about towers that seems to attract birds? Lighting, again, is critical. As bird attractants, lights on tall structures have been cited in the literature well back into the early 1900s and before (Crawford and Engstrom 1999). Cochran and Graber (1958) were among the first to document lighting impacts on birds. They noted that when tower lights were turned off, the number of migrant flight calls decreased significantly, but within minutes after the tower was relighted, flight calls "increased dramatically." Inclement weather conditions are usually necessary, as reported by Laskey (1954), and mass bird kills seem to be related to either white or red lighting as reported by Avery *et al.* (1976). Large bird kills, however, do not always occur during inclement weather, as evidenced by a kill of some 450 songbirds (30 species involved, most notably 145 Yellow-rumped Warblers [*Dendroica coronata*], 114 Orange-crowned Warblers [*Vermivora celata*], and 37 Nashville Warblers [*V. ruficapilla*] at a red blinking television tower near Topeka, Kansas, in early October 1999. The skies were clear until approximately 3:00 am the night of the tower kill (Stephanie Jones, FWS, 1999 pers. comm.). How many birds died during the clear weather conditions before 3:00 am is unknown.

The retina of the bird's eye is far more sensitive to the red and infrared spectra than is the human eye. Color perception in birds is far more complex than in humans, as birds eyes contain 4-6 types of cones (color receptors) while human eyes contain only 3 types. Light can affect birds' behavior both visually and magnetically. All bird species thus far examined have been shown to have a narrowly tuned receptor in the red region of the electromagnetic spectrum (Beason 1999). Although research in this area is lacking, birds may be attracted to red lights or become disoriented by having red lights disrupt their magnetic compasses. Color (*i.e.*, white, white with ultraviolet, and specific colors such as red) and flash duration (*i.e.*, strobed, slow flash, or steady) are two aspects of lighting that can change its attraction for birds (Beason 1999). A few reports indicate that white strobe lights, whose ultraviolet content is unknown, are less attractive to birds than steady or flashing red lights (Gauthreaux and Belser 1999).

Is the bird's navigation system disrupted by the red lighting or is the bird's ability to monitor the geomagnetic field disrupted by the radio frequency signal itself? Long wavelength illumination, such as that in the red-orange spectrum, has been shown to interfere with the avian magnetic compass (Beason 1999). However, current thinking seems to indicate that light flash duration, rather than color, is far more critical. The longer the "off" phase between the blink or flash phases of the light pulses, the less likely birds are to be attracted to the lighting (Michael Avery, USDA, 1999 pers. comm.). For example, solid or blinking red lights seem to attract birds on foggy, misty nights far more often than do white strobes, which may flash once every 2-3 seconds (3 seconds currently the maximum allowable "off" duration). Again, the "off" phase of the light seems critical, the longer that phase the less likely the attraction during foggy, misty, rainy, overcast, low-cloud-ceiling nights. While some preliminary research by Michael Avery, Robert Beason, and Sidney Gauthreaux supports this hypothesis, it will need further testing in a more systematic and statistically significant way.

While Avery *et al.* (1976) reported no noticeable effect of a Coast Guard navigation tower's signal on birds, they concluded that the tower's possible signal effect on birds could not be completely dismissed.

Beason (1999) indicated that most radio frequency (RF) signals have no effect on avian orientation, with the exception of tracking radars. Pulsed microwave signals resulted in changes in the rate of spontaneous activity of neurons in the avian brain. Whether these changes resulted in behavioral effects (*e.g.*, disorientation) is unknown (Semm and Beason, unpublished data *in* Beason 1999). While some have suggested the need for further RF research on birds, the literature does not support this suggestion (Bruderer and Boldt 1994; Bruderer *et al.* 1999).

The taller the tower, the more likely it will kill birds. As tower height increases, so often does the number of guyed, supporting wires. Guy wires are critical in their effects on birds. The greater the number of guys (which often are tiered in bands of 3-4 wires per level), the more risk of bird strikes. Here's how the problem seems to arise. On nights of inclement and overcast weather when songbirds are active in broad-front migrations, lights seem to draw birds into the towers. This has been reported by many observers (*e.g.*, Avery *et al.* 1976) when celestial cues are not available to birds flying below the cloud ceiling. Perhaps the birds mistake the light(s) for stars or the sun. Graber (1968) reported that birds entering an illuminated area on cloudy nights were reluctant to leave the lit area, just as birds in a lighted room will not fly out an open window into the darkness. Approaching the edge of the illuminated area, migrants are hesitant to fly into the darkness beyond the tower, and instead fly back toward the tower (Avery *et al.* 1976). Once attracted to the lights, they fly around the tower in a "tornado" of birds, striking the guy wires directly in the path of flight, the tower, themselves, or the ground, and often die.

A worst-case tower scenario might look like the following. The structure in question would be a 1,000-plus-foot (304-plus-m), multiple-guyed, multiple solid-lighted tower situated next to a wetland, within a known songbird migration corridor, with the presence of several Federally listed endangered songbirds documented in and around the area, in a location with a history of fog, especially during the spring and fall. This scenario, unfortunately, is by no means impossible. The Telecommunications Act of 1996 (Public Law 104-104), in fact, mandates that all television stations be digitized by no later than 2003. By some estimates, this mandate could result in the addition of 1,000 new, 1,000-plus-foot "mega-towers" across the landscape in the United States. However, the MBTA of 1918, as amended -- our "marching orders" for DMBM -- is a strict liability law. The Act does not allow the killing or taking of migratory birds, except by permit, and the Service does not issue incidental take permits. Thus, the incidental killing of even one bird is legally considered a taking under MBTA and is technically a violation of the law. Concerning their mandates, the Telecommunications Act and MBTA may, thus, be directly at odds. Taking these issues into consideration, the Service recommends that communication companies do whatever they can to prevent needless bird deaths.

Interim Guidelines

While the Service recognizes that research into the actual causes of bird collisions with communication towers is scant, some preliminary but promising findings -- previously mentioned -- provide insight into ways of minimizing or even avoiding bird collisions with towers. In an effort to provide significant protection for migratory birds, and until research efforts uncover significant new mitigation measures, the Service has been suggesting to industry voluntary interim guidance in the siting and placement of towers. While these recommendations are discretionary and non-binding to both Service personnel and to the public, they have been approved by the Director. Here is what the Service suggests. For companies planning to site, construct, and operate new towers, we encourage the following:

1. Any license applicant proposing to site a new communication tower is strongly encouraged to collocate the proposed communication equipment on an existing communication tower or related existing structure (*e.g.*, a church steeple, billboard mount, water tower, electric transmission tower, monopole, or building). With Crown Castle International, for example, 9 tenants on average collocate on towers they own around Pittsburgh, Pennsylvania; and as many as 120 tenants can collocate on a tower

(Powers 2000).

2. If collocation is not practical, license applicants are strongly encouraged to construct towers less than 200 feet (61 m) AGL, using construction techniques that do not require guy wires (*e.g.*, lattice or monopole structures). Such towers do not require lighting under FAA regulations unless located within 3.8 miles (6.1 km) of airports and near major travel corridors, and so should not be lighted unless required. If at all possible, new towers should be located within existing "antenna farms," preferably in areas not used by migratory birds or species Federally or state-listed as endangered or threatened, or listed as Nongame Species of Management Concern (Trapp 1995). Avoid siting towers in or near wetlands, near other known bird concentration areas (*e.g.*, National Wildlife Refuges), or in habitat of threatened or endangered species known to be impacted by towers. Local meteorological conditions should be reviewed, and areas with an especially high incidence of fog, mist, and low cloud ceilings should be avoided, especially during spring and fall migrations.

3. If taller towers (more than 199 feet [61 m] AGL) requiring lighting to warn pilots must be constructed, the minimum amount of warning and obstruction lighting required by the FAA should be used. Where permissible by FAA and local zoning regulations, only white strobe lights should be used at night. These should be up-shielded to minimize disruption to local residents, and should be the minimum number, with minimum intensity and number of flashes per minute (*i.e.*, the longest duration between flashes, currently three seconds) allowed by the FAA. The use of solid red or pulsating red warning lights should be avoided at night. Construction techniques which do not require the use of guy wires should be employed whenever possible.

4. Guyed towers constructed in known raptor or waterbird concentration areas should use daytime visual markers (*e.g.*, bird diverter devices) on the guy wires to prevent collisions by these diurnally active species. Suggested bird avoidance guidelines are available from the electric utility industry (APLIC 1994, 1996), and research and experimental design recommendations are available from the wind generation industry (NREL 1995, Anderson *et al.* 1999).

5. Towers should be constructed in a way that limits or minimizes habitat loss within the tower "footprint." Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above-ground obstacles that might impact birds in flight. A larger tower footprint, however, is preferable to construction of a guy-supported tower.

6. If significant populations of breeding birds are known to occur within the proposed tower footprint, construction should be limited to those months when birds are not nesting (*i.e.*, times other than spring and summer).

7. New towers should be designed structurally and electrically to accommodate the applicant's antenna (s), and comparable antennas for at least two additional users, to reduce the number of future towers -- unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.

8. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site and minimize its potential attraction for birds.

9. If a tower is constructed or proposed for construction, FWS personnel and/or researchers from the Communication Tower Working Group or their designees should be allowed access to the site after construction is complete to conduct both large (*e.g.*, crane [Gruidae], swan, and goose [Anatidae]) and small dead-bird searches; to place net catchments below the tower but above the ground; to position

radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird migrations and habitat use; and to gain information on the impacts of various tower sizes, configurations, and lighting regimes.

10. If constructing multiple towers, providers should consider the cumulative impacts of all of those towers on migratory birds, including impacts on birds listed as threatened and endangered and nongame species of management concern. The impacts of each individual tower should also be considered.

11. If significant numbers of breeding, feeding, or roosting birds are known to habitually use a proposed tower construction site, relocation to an alternate site is recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

12. Towers no longer in use or determined to be obsolete should be removed within 12 months of the cessation of use.

Next Steps

The Communication Tower Working Group (CTWG) was created at the June 29, 1999, meeting of RESOLVE, then consisting of 15 members. The task of the Working Group is to develop and implement a nationwide research protocol intended to determine what causes birds to collide with towers, and what can be done to avoid these collisions. The Working Group held its first meeting on November 2, 1999, with representatives from 7 Federal and 2 state agencies, 9 research organizations and universities, 8 industry representatives, and 6 non-governmental organizations (NGOs). The meeting was chaired by DMBM (A. Manville). Subcommittees were created to deal with research, funding and partnerships, and legal issues. All three subcommittees have met and subcommittee chairs reported back to the full Working Group on June 16, 2000.

The Research Subcommittee has been tasked specifically to address the following issues through the development and implementation of a research protocol. Thirty stakeholders attended an all-day meeting of the Subcommittee on April 17, 2000, approving a draft nationwide research protocol. The protocol calls for the following research:

1. The protocol should quantify, with statistical certainty, the cause(s) and effects of lighting color, lighting duration, and the correlation between bird kills and weather.

2. Research should attempt to determine critical tower height and if there is a height threshold above which bird kills increase significantly.

3. Research should attempt to assess and quantify the most dangerous situations for birds.

4. The protocol should assess radar, acoustic, and ground survey techniques that could be used to determine major migratory corridors or routes (not necessarily flyway-oriented) to avoid siting towers in these areas.

5. The initiative must develop an effective dead-bird monitoring protocol, which will borrow heavily from the wind generation (Anderson *et al.* 1999) and power line industries (APLIC 1994, 1996).

6. The protocol should attempt to assess the cumulative impacts of all towers on bird populations in North America. For example, in 1979, Dick Banks published a special scientific report for the Service

(Banks 1979) estimating annual bird mortality from tower strikes. Based on 50% of the 1,010 television transmitting towers then existing in the United States, Banks estimated annual mortality at nearly 1.3 million birds. He made no accounting for radio transmitting towers and airport ceilometers, or for the other half of the existing television towers. Today -- based on Banks' estimate, models from the Tall Timbers Research Station, extrapolations from Bill Evans and others, and the current known number of lit towers -- the Service estimates annual mortality at 4-5 million birds. This is a conservative estimate and could conceivably be off by an order of magnitude. Only systematic monitoring will provide us a better estimate.

A systematic research study may take 3-5 years to complete, with further testing, ground-truthing, and verification of mitigation measures that are anticipated to be discovered. Following approval of the detailed draft nationwide research protocol in April 2000, 36 attending members of the Communication Tower Working Group on June 16, 2000, approved the framework for the nationwide research initiative. Specifically, Southwestern Bell Wireless, Inc., solicited mini-research proposals from the Research Subcommittee for possible funding, of which some of the pilot studies could begin as early as Fall 2000. The pilot studies will likely compare lighting, assess radars, refine dead bird searches, develop a Geographic Information System study plot, assess the most dangerous towers, examine birds' retinal photoreceptors, and test bird behavioral responses to light. Applicable findings discovered during pilot study investigations will be applied to the nationwide monitoring effort.

To initiate a nationwide bird-strike monitoring study that could begin as early as Fall 2001, and to assess the cumulative impacts of towers on migratory birds, the Cellular Telecommunications Industry Association (CTIA) also solicited a detailed, fully budgeted research proposal from the Working Group at the June 16th meeting. The 3-5 year monitoring effort could cost in excess of $15 million. At this writing, the Research Subcommittee is beginning work on this proposal for CTIA.

Once the research is completed and the results analyzed, recommendations will be presented both to the FCC and to industry. During the research effort, where pertinent, statistically significant findings are discovered, that information and possible recommendations will be provided to the industry as quickly as possible.

To develop and implement the research, the Service will work in partnership with the communication industry, other government agencies, the research community, NGOs, and the public to solve this problem. We will work in partnership with the communication industry to voluntarily solve bird-kill problems at communication towers, rather than solving the problem through regulatory or enforcement means. To date, two partnerships have worked well and we will use these as models for future work with the communication industry. In 1972, for example, representatives from the electric utility industry, Federal agencies (including the FWS), and NGOs first met to address the problem of bird collisions and electrocutions at electric power lines. In 1988, the Avian Power Line Interaction Committee (APLIC) was officially created, the Service a founding member with several electric utilities. In 1975, the first edition of *Suggested Practices for Raptor Protection* was published, with an update of *Mitigating Bird Collisions with Power Lines* (APLIC 1994) more recently published. The electrocution avoidance document, *Suggested Practices for Raptor Protection on Power Lines* (APLIC 1996) was just reprinted in the Spring 2000. These publications speak to voluntary suggested practices to avoid bird collisions and electrocutions; the guidance in these publications is voluntary.

In like fashion, the Avian Subcommittee of the National Wind Coordinating Committee was created in 1994, with the Service again a founding member. This partnership is in an embryonic stage compared to APLIC, with the wind generation industry recently publishing a guidance document for conducting research on avian/wind interactions (Anderson *et al.* 1999). Following necessary research, the intent also

is to develop voluntary suggested practices for wind generators, similar to what has been done for power lines.

To review and assess the current literature, research, and methodologies for studying communication towers, independent consultant Paul Kerlinger was contracted by DMBM to conduct a review dating back to 1995. The review analyzed work in the United States, Canada, Europe, Australia, and New Zealand. The document is publicly available on the Service's new web site, http://migratorybirds.fws.gov/issues/towers/review.pdf.

The issue before us today is unprecedented. The research about to be jointly conducted provides an opportunity to determine what about a man-made structure attracts and not infrequently kills migratory songbirds, and hopefully what we can do to reduce or ideally eliminate the problem. Research discoveries may also be applicable to other construction, including tall buildings, smokestacks, tall monuments, wind turbine generators, utility towers, and other tall structures. Research learned about bird behavior and movements will likely fill many gaps in our current information database. We'll better be able to determine the status of some bird populations and determine the cumulative impacts of communication towers on migratory songbirds. The benefits of the collaborative approach between industry, academia, agencies, and the conservation community are many. Most importantly, this can be a win:win situation for all parties and the resources concerned.

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EXHIBIT 1

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BIRD MIGRATION THROUGH A MOUNTAIN PASS STUDIED WITH HIGH RESOLUTION RADAR, CEILOMETERS, AND CENSUS

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ABSTRACT.—Autumnal migration was studied with high-resolution radar, ceilometer, and daily census in the area of Franconia Notch, a major pass in the northern Appalachian Mountains. Under synoptic conditions favorable for migration, broadfront movements of migrants toward the south passed over the mountains, often above a temperature inversion. Birds at lower elevations appeared to be influenced by local topography. Birds moving southwest were concentrated along the face of the mountain range. Birds appeared to deviate their flights to follow local topography through the pass. Specific migratory behavior was not associated with species or species groups. Under synoptic conditions unfavorable for southward migration, multimodal movements probably associated with local flights were as dense as the southward migrations described above. Avian migrants reacting to local terrain may result in concentrations of migrants over ridge summits or other topographic features. *Received 29 November 1999, accepted 2 November 2000.*

NORTH AMERICAN nocturnal migrants as observed with radar, a light beam (ceilometer), or by moon-watching appear to use broadfront migration, moving in waves hundreds of kilometers wide and rarely responding to features of the terrain until they descend for landing (Lowery and Newman 1966, Able 1972, Richardson 1972, Williams et al. 1977). Evidence for deviation of nocturnal flights along features of the terrain such as rivers, coastlines, or hills is rare in North America (Richardson 1978a, Bingman et al. 1982, McCrary et al. 1983). In contrast to North America, moon-watching, infrared, and radar observations in Europe have revealed birds deviating to follow coastlines, river systems, and most obviously the Alps (Eastwood 1967, Bruderer 1978, 1999; Bruderer and Jenni 1988, 1990; Jellmann 1988, Liechte et al. 1996, Bruderer and Liechte 1999). It is not clear whether those differences are due to North American birds relying more heavily on fixed-heading orientation (Wiltschko and Wiltschko 1978, Berthold 1990, Williams 1991, Williams and Webb 1996) or to other factors. Mountains, especially those presenting a barrier transverse to the direction of migration, would present the most critical test of theories that posit fixed-heading migrations for North American migrants. The behavior of nocturnal migrants in mountainous areas is also important for conservation issues because alpine areas are increasingly developed in North America for projects such as communication towers and wind-powered generators.

Bruderer and his coworkers have observed bird migration in the Swiss Alps (Bruderer 1978, 1996; Bruderer and Jenni 1988, 1990), but the orientation and flight behavior of nocturnal avian migrants in mountainous terrain has been rarely studied in North America (Seilman et al. 1981, McCrary et al. 1983). Radar is poorly suited for use in mountainous areas due to echoes from surfaces rising above the horizontal. To study nocturnal migration in mountains, it is necessary to use high-resolution short-range radars and move the instruments either between nights, as was done by Bruderer and Jenni (1990), or use a mobile radar and move it rapidly between sites within a single night as did Seilman et al. (1981). Alternatively, one can use ceilometers or a number of moon-watching stations as did Liechti et al. (1996). In side-by-side tests, ceilometers and short range, high-resolution radars produce highly correlated

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EXHIBIT 2

measures of direction and density of bird migration and survey a similar range of altitudes above ground level (Williams et al. 1981, Bruderer 1999).

If birds use a variety of orientation systems in North America, it would be important to identify which species of birds use which system. Birds observed with radar or ceilometers, however, can rarely be identified to species (Williams and Williams 1980). Changes in the numbers of birds on the ground (diurnal census) have been only weakly associated with nocturnal radar or ceilometer observations (Drury and Keith 1962, Nisbet and Drury 1967, Williams et al. 1977, Bruderer and Jenni 1990). Williams et al. (1981) paired radar, ceilometer, and intensive mist-netting in southeastern Massachusetts. Numbers of birds detected with radar and ceilometers were highly correlated with each other, but were not significantly correlated with numbers of birds netted the next morning.

The present study reports radar and ceilometer observations of nocturnal migration in the Franconia Range of the White Mountains of New Hampshire and simultaneous daily censuses of birds at several sites in a variety of habitats. Those mountains are part of the Appalachian Mountain chain, which stretches from the breeding grounds of numerous migrant species in New England and Canada to wintering grounds of many North American migrants in the southeastern United States (see Fig. 1, inset). The Franconia Range runs northeast to southwest and rises about 1,000 m from the lowlands that stretch northwest to the Connecticut River. Franconia Notch is a pass that runs roughly north to south through this barrier (Fig. 1). The mountain range is large enough to interrupt flight of birds, but low enough that they can easily fly over it (Eastwood 1967, Williams et al. 1977).

Previous radar studies have shown two principal directions of autumnal migration in New England. Neotropical migrants move through that area toward the south and southeast on a route to Central and South America whereas North American migrants move southwest parallel to the coastline (Drury and Keith 1962, Williams et al. 1977). For the Neotropical migrants, those mountains constitute the largest mountain barrier on the route from Canada to the North American coast and the Neotropics.

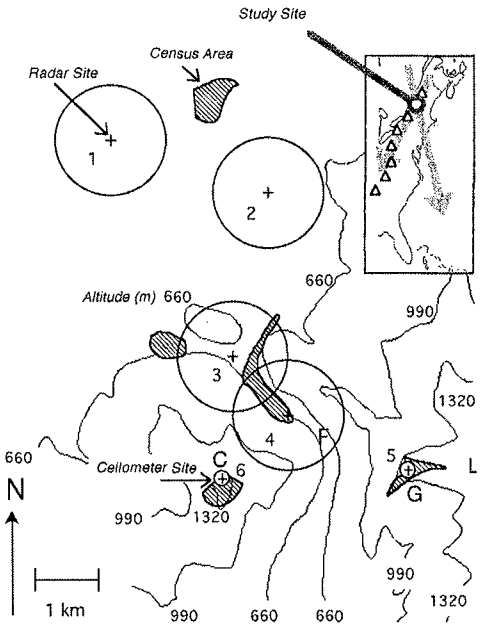

FIG. 1. Franconia Notch in the White Mountains of New Hampshire, 44°10'N, 71°41'W. The Franconia Range of mountains stretches northeast to southwest across the figure. Contour intervals are 330 m. The floor of the notch (F) is flanked by Cannon Mountain (C) and Mt. Lafayette (L). Greenleaf Hut (G) is located on a shoulder of Mt. Lafayette. Nocturnal observation sites identified by number. Large circles show maximum range for detection of birds by radar at observation sites 1–4. At sites 3 and 4, significant areas within this maximum were obscured by local topography. Small circles indicate ceilometer observation at sites 5 and 6. Hatched areas indicate census areas. Inset indicates location of Franconia Notch in the Appalachian Mountain chain and movements of Neotropical (southsoutheast) and North American (southwest) migrants.

For the North American migrants, the mountains form a major topographical feature parallel to their migration. If migrants were guided by fixed-heading orientation, we would expect broadfront migration to move as a wave up and over the mountains. If we found significant differences in the orientation of birds in the lowlands and over the mountains, that might indicate the existence of a second orientation system based on topography.

METHODS

We performed daily point-count and area-count censuses from near local sunrise to noon EST in the

3 to 10 ha areas shown in Figure 1. We made observations in all but the most northern area daily from 26 August to 11 October 1992. From 22 August to 17 October 1993, we observed daily at the most northern site. That was a mixed forest site in the lowlands (400 m), which included coniferous and hardwood forest, fields, and wetlands, 3 km northwest of the Franconia Range. The ecology of the multiple sites used in 1992 were as follows: the alpine sites around Greenleaf Hut on the shoulder of Mount (Mt.) Lafayette (1,300 to 1,400 m, see Fig. 1) and on the summit of Cannon Mountain (1,300 m) included areas of alpine meadow, krumholtz, and alpine coniferous forest. All vegetation at those sites was <4 m high and in most areas <2 m. Two lower elevation areas on the floor of the northern end of Franconia Notch (650 m, Fig. 1) included open fields, lake shore, and mixed forest.

We restricted our analysis to species for which we observed at least five individuals in one day. The 42 species of passerines and 2 species of woodpeckers that met that criterion are listed in Appendix. A group of Neotropical warbler species, which often moved in mixed flocks in association with each other, were treated as a single species for analysis. All the species in Appendix, both migrants and nonmigrants, except for the Bay-breasted Warbler, the Wilson's Warbler, and the White-crowned Sparrow, breed within the study area and were observed at lower densities during the breeding season.

The raw numbers of birds seen per day could not be used as a measure of migratory activity, especially in alpine areas. Local weather conditions ranged from clear, windless days at 25°C to 15 m s^{-1} winds, snow and −10°C. To correct for fluctuations in number of birds counted due to changes in local weather, we created an index of migratory activity. Each day's count of migrant species was expressed relative to the abundance of nonmigrant species and then compared with the previous day to produce a three-point index of major change in numbers of migrants (>50% change), minor change (50 to 21% change), and stable numbers (<20% change).

Wind direction and speed, temperature, cloud cover, and visibility conditions were recorded at ground level for each site during both morning and nocturnal observations. We also obtained hourly surface weather observations from the Fairbanks Museum in St. Johnsbury, Vermont (37 km northwest of the study site, elevation 175 m) and from the Mt. Washington Observatory (32 km northeast, elevation 2,068 m). We used surface and 850 mb weather charts and our local weather measurements to code synoptic weather on a five-point scale. The synoptic weather code, based on Gauthreaux (1980), reflects the synoptic weather system that most strongly affects local weather and does not always correspond to the synoptic feature geographically closest to the study area on a given night. Wind velocity was too variable within the mountainous areas to permit reliable calculation of headings from track and wind velocities; we frequently recorded differences of 120° and 5 m s^{-1} within distances of 100 m. Measurements by local meteorologists (Pat Gannon pers. comm.) indicate that such large deviations are common up to 100 m above ground level (AGL) in the study area. Thermal inversions were identified directly by comparison of temperature readings at different altitudes.

We observed nocturnal migration at two alpine sites (site 5 at 1,396 m and site 6 at 1,315 m; see Fig. 1) by watching birds pass through a vertically directed conical light beam, or ceilometer, as described by Gauthreaux (1969) and Able and Gauthreaux (1975). We observed with either 10 × 50 or 8.5 × 44 binoculars. On Cannon Mountain, we used a GE Ceilometer bulb 100PAR64. At Greenleaf Hut, where battery power was at a premium, we used a Custom Accessories model 58886, 300,000 candle power spotlight. Although beam width was not specified, tests showed that the beam on this unit was narrower and the range of detection similar to that of the ceilometer bulb.

We made simultaneous observations with ceilometer and radar for one hour on all 30 nights with suitable weather from 28 August to 10 October 1992, starting one hour after civil sunset. Observations were not made in rain, snow, or fog, or when the cloud ceiling was less than 100 m AGL. On eight additional nights without heavy rain in the same period, we were able to observe with radar alone. Gauthreaux (1969) and Able and Gauthreaux (1975) report that the maximum altitude of detection of the ceilometer we used is 500 m AGL for thrush-sized passerines. We estimated that most birds we detected were between 10 and 300 m AGL based on image size and rate of passage through the light beam.

We used a mobile, high resolution, modified marine radar to record nocturnal migration at sites 1, 2, 3, and 4 shown in Figure 1. The Furuno FR-8100 X-band marine radar (peak power 10 kW, beam width 1.8 × 25°, antenna rotation 24 RPM) was operated at 0.91 km range and 0.08 μs pulse length. The radar was modified by tilting the antenna upwards 12.5° above horizontal and was mounted on a van. Data from the display of the radar were recorded on video tape. We used a 30 s echo trail function allowing immediate recognition of bird echoes on the radar screen. Direction of movement was read with the electronic bearing line to ±2°. To ensure that all azimuths of the radar display had an equal probability of being detected, we began observations at 0° azimuth of the radar and moved constantly clockwise to select the next track, always completing the full 360° before repeating an azimuth. The great majority of tracks were separated by 100 m to 1 km. Those tracks were not used to determine the density of migration (see below).

Radar observations started about one hour after civil sunset and continued for 1–2 h to overlap the ceilometer observations. At all radar sites, low trees or hills near the radar were used as a radar fence to reduce ground clutter and facilitate detection of birds at short range (see Seilman et al. 1981). Site 1 (367 m) and site 2 (481 m) were free of major obscuration. Site 3 (569 m) and site 4 (601 m) had strong echoes from the east and west walls of the pass (see Fig. 1), which restricted detection of birds to about 50% of the radar screen in those areas. Observations were made for 5 min at sites 1, 2, and 4 and for 10 min at site 3, which was subdivided into four areas. (The northwest and northeast quadrants of site 3 were north of the entrance to the pass and the southwest and southeast quadrants were within the pass.) The radar was moved between sites in less than 10 min and aligned to within 3° using reflective markers at each site. Observations at each site were made at least twice each night at intervals of ~45 min. That technique provided samples ranging from 0 to 146 tracks (average = 29) at each site for each night. The altitude of birds detected was estimated by the technique of Cohen and Williams (1980) using track curvature as recorded on video tapes. That analysis indicated that 90% of all birds were detected at an elevation angle of <30°. Because the great majority of birds were detected at <600 m range, we conclude that 90% of all tracks were at <300 m AGL.

To determine relative migration density for the radar observations, we used an arbitrary index, "the track density index." Video-tape records were reviewed and the number of tracks detected in a standard area of the radar screen was determined for four, 30 s periods at each site. (The location of those standard areas differed at each radar site.) In analyses, we summed the total of those counts for all sites for a night and termed that the "track density index."

It is unlikely that the ceilometer or radar data used for analysis were contaminated by significant numbers of insect tracks. Gauthreaux's (1969) ceilometer technique minimizes insect observations. Insects were detected by the radar, but they differed from bird tracks in echo intensity, range of detection, and straightness of track. All suspected insect tracks identified by those criteria were excluded from our analysis. Very few tracks reported in this study were detected at <180 m range, thus further reducing the risk of contamination by insects. We measured flight speeds for tracks detected by our radar on seven nights when wind velocity at all radar sites was <3 m s^{-1}. The average flight speed was 10.0 m s^{-1} and the range was from 4 to 22 m s^{-1}. Larkin (1991) reports that insect-like echoes detected with a tracking radar had a mean flight speed of ~4 m s^{-1} with a range of 1 to 10 m s^{-1}, whereas bird-like echoes had a mean flight speed of ~11 m s^{-1} with a range of 2 to 22 m s^{-1}. Comparison of our flight-speed data with those of Larkin (1991) and with the flight speeds of birds reported by Bloch and Bruderer (1982) and by Raynor (1985) indicate that the great majority of radar tracks reported in this study were of passerine birds. Larkin (1991), however, found that insects dominated the radar echoes on nights with winds unfavorable for bird migration; thus, it is possible that we detected insects when winds were from the south and we were not able to compute airspeeds due to turbulent wind conditions.

Parametric statistics were not used in the analysis of directions because of marked deviations from circular normal distributions. Analysis of directional data followed Batschelet's (1981) nonparametric χ^2 test, which is a contingency table with rows consisting of the bins of track directions shown in our circular histograms and columns for the criteria to be tested. In all χ^2 tests, rows or columns were summed if expected values were <5. Wide separation of tracks used for directional data satisfies the requirement for independence of data points. No one observation dominated the analyses as the maximum number of tracks at any site for any night was 146 (1.7%) of the total of 8,668 tracks. The χ^2 test will detect significant differences due to any association between directional distribution and criteria. Especially in tests with large n, significant differences may not be due to a shift in the modal direction(s) of tracks but to differences in dispersion around the modes or to numbers of tracks in nonmodal directions. To control for that effect we used a second method. Before any other analyses were performed, we scored each night of migratory behavior as one of four patterns of track directions. Southward (S) movements often had a second modal direction to the southeast. Southwestward (SW) movements often had a second mode to the south. Eastward and westward (E–W) patterns were usually scattered but with modes to the east or west, or frequently to both directions. Northward (N) patterns had modal directions ranging from northwest to northeast. We then used χ^2 tests to compare the distribution of nightly patterns with criteria to be tested. That method suffered from the necessity of qualitatively scoring each night as one of four types of migratory behavior.

RESULTS

Direction and density of nocturnal migrants detected with radar and ceilometers were compared with changes in species counts from daily censuses. We first describe diurnal census data and then nocturnal observations before proceeding with comparisons.

Daily census.—Daily censuses of birds were made at locations shown in Figure 1. We distin-

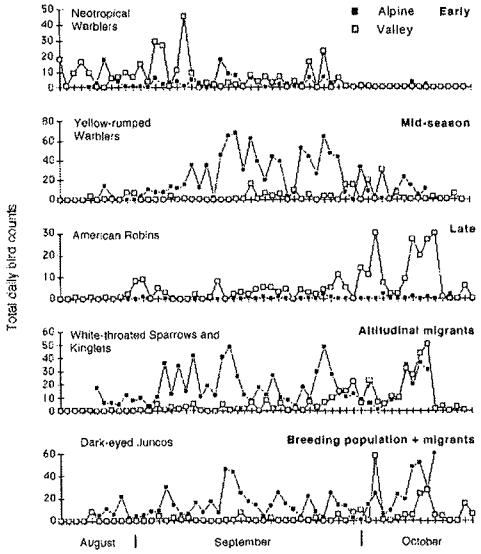

FIG. 2. Daily census of most numerous species for all major migrant status groups we observed in the area of Franconia Notch, New Hampshire in 1992 and 1993 (see Appendix A for other species). Solid squares (alpine) are data from observations at 1,300–1,400 m elevation (see text for habitat descriptions). Open squares (valley) are data from observations at 500–600 m elevation. Neotropical Warblers do not include Yellow-rumped Warblers. High counts in late September included in early migrants are Blackpoll Warblers which are mid-season migrants but are included in Neotropical warbler group.

guished five status groups of birds (described below) based on these. Appendix gives the status of each of the 42 species used in analysis and daily average and maximum counts of birds for each species at alpine and low-elevation areas. Daily counts for the most numerous species in each status group are given in Figure 2. Early migrants consisted of warblers and small numbers of other passerines that showed peak numbers at valley locations in August and early September and then decreased in mid September (Fig. 2, Early). Yellow-rumped Warblers at alpine locations were the most numerous midseason migrants. They increased in numbers in early to mid September and decreased in mid to late September (Fig. 2, Midseason). Blackpoll Warblers, mid-season migrants, were included with other Neotropical warblers in Figure 2 (Early) and show up as peaks in mid and late September. Late-season migrants, primarily American Robins and Dark-eyed Juncos at valley locations, increased in September and early October and did not decrease during the period of our observations (Fig. 2, Late). Altitudinal migrants, mainly White-throated Sparrows and Golden-crowned Kinglets (*Regulus satrapa*), shifted from alpine to low-elevation areas (Fig. 2, Altitudinal). Dark-eyed Juncos (Fig. 2, Breeding + migration) illustrate the interaction of several factors: an alpine breeding population in August was joined at alpine sites by migrants, formed large flocks and moved between alpine and valley sites depending on weather conditions. At each site, we also defined a group of "nonmigrant" species that did not show any significant change in numbers during the period of our observations, although those species may migrate in other areas or later in the season. Blue Jays, Black-capped Chickadees, nuthatches, Song Sparrows, and Evening Grosbeaks constituted the majority of the nonmigrant birds.

Simultaneous censuses in alpine and low-elevation communities revealed major differences in the numbers of migrants. Most migrant species arrived and departed at different times in those areas (Fig. 2). Alpine migrants consisted primarily of Yellow-rumped Warblers with smaller numbers of Bicknell's Thrushes and Blackpoll Warblers. Most other early and midseason migrants, including warbler species migrating to the Neotropics, were seen in greater numbers at lower elevations although small numbers were often seen at alpine sites the morning after a migration. Late-season migrants such as American Robins appeared primarily at lower elevations during October (Fig. 2, Late).

Migratory activity, scored on a three-point migration index (see above), was associated with changes in synoptic weather conditions over the study area. Synoptic weather was coded on a five-point scale illustrated in Figure 3B and described in Table 1. Heavy migration as indicated by large changes in numbers of migrants was associated with weather code 1. Minor changes in numbers of migrants were associated both with synoptic weather code 2 and with codes 4 and 5. Stable numbers of migrants were associated with weather code 3 (χ^2 = 12.70, df = 4, P = 0.0129).

Site-to-site fluctuations during periods of overall stable populations and shifts from al-

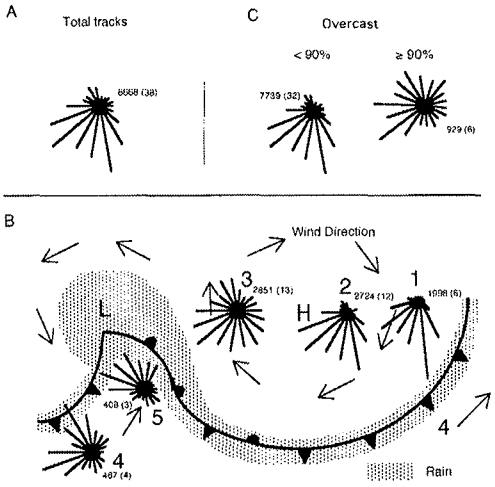

FIG. 3. A. Distribution of all tracks scored for directional data in 1992. B. Synoptic weather codes, geostrophic wind direction, areas likely to have rain, and distribution of track directions presented on a schematic synoptic weather map. See Table 1 for weather conditions associated with synoptic codes. C. Distribution of tracks under two conditions of overcast. Circular histograms give frequency of track directions in 20° bins. *N* of tracks followed by (*n* of nights) are given near histograms. Note *n* of tracks does not accurately represent density of migration, see text for independent density measurement.

pine to low-elevation areas (Fig. 2) indicate local movements within the study area. On several occasions, we could watch large flocks of Dark-eyed Juncos arrive at a census area, move through it, and then fly to another area at least 0.5 km away. We also observed that a sudden local abundance of food, such as outbreaks of lepidopteran larvae in birch stands (*Betula* spp.), attracted warblers in sufficient numbers to suggest movements over several kilometers to the feeding area.

Radar and Ceilometer observations.—Radar and ceilometers revealed large numbers of migrants passing through our study area. A total of 8,668 tracks of birds were scored for analysis of flight direction and 4,471 tracks were scored to determine density of migration (see above). There were no significant differences in the average density of migration at the four radar sites when numbers were adjusted for site specific obscuration of the radar (see above). The maximum density of birds detected with the ceilometers was 215 birds per hour at site 5. The maximum density detected with the radar was 151 tracks in four, 30 s periods at site 2 or 4,530 tracks per hour detected in an area of ~160,000 m^2. The same radar and ceilometer equipment operated in September and October for four years (1994, 1995, 1997, and 1999) in relatively flat terrain in Swarthmore, Pennsylvania, did not record migrations as dense as those.

Although we lacked the ability to determine altitude accurately, it was our impression that on nights of heavy southward migration over the two ridge sites (5 and 6) there were exceptional numbers of migrants at 2 to 30 m AGL. The density was such that observers without binoculars could often see birds at close range in the relatively dim light scattered from the ceilometer. We have not seen as many low-flying birds in other observations with ceilometers over level terrain.

The distribution of all track directions observed with radar and ceilometers for all sites was bimodal with similar numbers of birds moving southsoutheast (n = 1,078 at 170°) and southwest (n = 1,023 at 230°; Fig. 3). Those two modal directions correspond to southwest movement parallel to the face of the Franconia Range and by extension along the Appalachian Mountains in general, and a southsoutheast movement across the mountains toward the Atlantic Ocean (see Fig. 1). Multimodal distributions of direction were common at all levels of analysis from single 5 min observation periods to summed data for all nights. Tracks were not usually distributed around a preferred direction but instead suggested two or more preferences as above.

Synoptic weather pattern was a major factor in orientation and density of nocturnal migration. Synoptic weather codes 1 and 2 (Fig. 3B, Table 1) are favorable for southward migrations. We found migration generally heavy and toward the south or southwest on these nights (Fig. 3B, Table 1). Density measurements in Table 1 are based on a 2 min density sample, not the number of tracks scored for direction. The greatest number of birds detected by radar and ceilometers was moving south with smaller numbers moving southwest (Fig. 3B). On nights with synoptic code 2, the radar recorded somewhat lower densities of tracks and the directions of bird movements were about evenly distributed between south and southwest (Fig. 3B, Table 1). Synoptic codes 3, 4, and 5 repre-

TABLE 1. Change in the numbers of migrants detected overnight and nocturnal migratory behavior associated with five synoptic weather codes.

Weather Code	1	2	3	4	5
Synoptic feature that most affected local weather	North or west of a cold front	Near center of a high[a]	West of a high[a]	South or east of a cold front	South of a warm front
Typical wind (large local variation)	North moderate to strong	Calm or light north to west	South light to moderate	South light to moderate	South light to moderate
Census (1992 + 1993) *n* of nights with:					
Large changes in *n* of migrants	9	8	2	2	1
Minor changes in *n* of migrants	7	8	8	2	2
Stable *n* of migrants	0	4	8	2	0
Radar and ceilometer (1992)					
n of nights	6	12	13	4	3
Density (track density index)					
Maximum	199	259	185	148[c]	
Minimum	127	24	31	24[c]	
Average	169.7	114.5	124.0	66.7[c]	
Standard deviation	26.6	76.9	48.4	46.3[c]	
n of nights with track pattern[b]					
South	2	2	0	0	0
Southwest	4	9	1	0	0
East–west	0	1	11	2	2
North	0	0	1	2	1

[a] Center of high pressure.
[b] Most nights had multimodal track distributions. See methods for definitions of track patterns.
[c] Summed data for weather codes 4 and 5.

sent conditions unfavorable for southerly migrations. Under those weather conditions, tracks were widely scattered or moving generally north, but the density of birds aloft was often as high as for southward migration, especially for weather code 3. On nights with weather code 3, radar and ceilometers showed a broad spread of track directions with the greatest numbers moving southwest (Fig. 3B). Synoptic code 4 was accompanied by bird movements to both the southwest and the northwest (Fig. 3B). In synoptic code 5 (Fig. 3B), tracks were directed primarily northwest. Analysis of variance showed a significant difference in track-density index for the weather codes ($F = 3.62$, $P = 0.023$). Pairwise comparisons of density indicated significant differences at $P < 0.05$ only for weather codes 1 versus combined 4 and 5, and 3 versus combined 4 and 5. There were no significant differences in density between codes 1, 2, and 3. The distribution of track direction (Fig. 3) was significantly different for the five synoptic weather codes ($\chi^2 = 1{,}790$, df = 68, $P < 0.0001$).

In addition to analyzing summed tracks for all nights, we also investigated whether the nightly pattern of movement was associated with synoptic weather by scoring each night in one of four patterns (Table 1). Synoptic codes 1 and 2 were associated with nightly modal directions to the south or the southwest whereas synoptic codes 3, 4, and 5 were associated with nights having modal track directions toward the north, east, or west ($\chi^2 = 30.4$, df = 1, $P = 0.0001$).

On the six nights with more than 90% overcast, we recorded more scattered tracks than on clear or partially overcast nights ($\chi^2 = 440$, df = 17, $P < 0.0001$; Fig. 3C). There was no significant difference in track density index: the average for overcast nights was 92.8 ± 67.7, and for partial or clear nights 122.3 ± 61.5 ($F = 1.127$, $P = 0.295$). View of the stars or sky was not necessary for orientation. On both overcast

nights with synoptic code 1 or 2, tracks were directed southwest. On the two nights with synoptic codes 4 or 5, tracks were directed northwest to northeast. On two nights with code 3, tracks were generally southwest. The multimodal nature of the distributions and the small number of overcast nights prevented our testing whether downwind flight was more common under overcast.

The effect of topography on direction of bird movements was investigated by comparing simultaneous observations made in lowlands north of the mountains, within the mountain pass, and on ridges above the pass. Patterns of tracks recorded at six nocturnal observation sites shown in Figure 1 were significantly different ($\chi^2 = 1{,}686$, df = 85, $P < 0.0001$). At sites 1 and 2 in the lowlands, modal direction of movement was southwest, whereas within the mountains (sites 3, 4, 5, and 6) the most common direction was southsoutheast. The differences in orientation within our study area were most clearly shown when we considered the behavior of birds under each type of synoptic weather. In the following discussion, we will refer to birds detected at sites 1 and 2 (Fig. 1) as above lowlands northwest of the Franconia Range, or "above the lowlands." Birds detected at sites 3 and 4 are within the pass (Franconia Notch) and its northern approaches and will be termed "in the pass," and birds seen at sites 5 and 6, on ridge tops about 660 m above the pass, will be referred to as "above the ridges." Sites 3, 4, 5, and 6 together will be called "in the mountains."

Under synoptic code 1, birds above ridges and in the pass were moving primarily southsoutheast, whereas birds above the lowlands to the northwest of the mountains were moving primarily southwest with smaller numbers of birds moving south (Fig. 4). These differences are unlikely to be due to altitude alone because sites 2 (in the lowlands) and 3 (in the pass) differed by only 88 m, considerably less than the 300 m altitude range of the radar.

For synoptic code 2, we also observed predominantly southsoutheast movements above ridges and in the pass and southwest movements above lowlands (Fig. 4). Unlike code 1 weather conditions, we also found large numbers of birds moving southwest within the pass and over the western ridge area. Winds were near calm at almost all sites; on only two nights

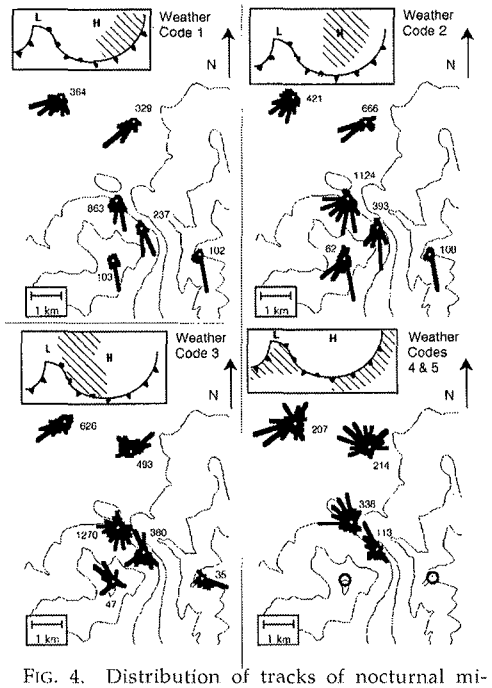

FIG. 4. Distribution of tracks of nocturnal migrants at six observation sites in Franconia Notch, New Hampshire, on nights scored for synoptic weather codes as indicated (see text). Inset shows area of general synoptic pattern. Circular histograms give frequency of directions in 20° bins of all scored tracks on these nights. The two most southerly histograms show ceilometer data taken at 1,300 and 1,400 m; all others are from radar at 500–600 m. *N* of tracks given for all histograms; circle indicates insufficient data for analysis, *n* of nights given in Table 1 and Figure 3. Note *n* of tracks does not accurately represent density of migration, see text for independent density measurement.

did we record winds >4 m s^{-1} and then only on ridges. On four of the 12 nights scored synoptic code 2, winds were calm at all our observation sites and at all other meteorological stations in the area and, thus, orientation was not due to downwind orientation. All of those nights showed patterns of track directions similar to those shown in Figure 4 for weather code 2.

The difference between birds moving within the mountains and those moving along the north slope of the range was most pronounced in the subareas of site 3 (see above) at the entrance to the pass (Fig. 1). For summed data from weather codes 1 and 2, tracks north of the entrance to the pass showed a bimodal distri-

bution with about half the birds moving into the pass (mode = 170°) and half moving across the entrance (mode = 230°). Within the pass, tracks showed a unimodal distribution centered around 180°.

Differences in modal track directions between the lowlands and the mountain sites were associated with presence of thermal inversions. We recorded thermal inversions on 11 nights with synoptic weather codes 1 or 2. Winds on those nights were calm to light over the lowlands and on the floor of the pass, and typically 5 to 12 m s^{-1} from the north at ridge summits. On 9 of these 11 nights, the pattern of migration at lowland and mountain sites had different modal directions; on 2 nights they had the same pattern. Of the seven nights without inversions, five showed the same modal patterns for lowland and mountain sites and only two showed differences ($\chi^2 = 5.1$, df = 1, $P = 0.02$). The differences in track direction above and below the inversion in most cases could be ascribed to differences in wind velocity, but on three nights with inversions winds were recorded as calm at all locations in the area, as described above. On all these nights, we recorded differences in track directions between lowlands and mountain sites which were not due to differences in wind velocity.

Synoptic code 3 resulted in widely scattered tracks at all sites (Fig. 4). In many cases, often on the same night, birds appeared to move in almost opposite directions at neighboring sites. Movements above lowlands were primarily northeast and southwest parallel to the mountain range. In the pass and above ridges, movements often did not follow contour lines and it was difficult to discern any influence of local topography on direction of movement. Local winds for those observations were calm or <8 m s^{-1} southerly.

Under synoptic codes 4 and 5, ridge sites were usually obscured by clouds, but on two of eight nights there were sufficient breaks in the clouds to use the ceilometers; a total of only three birds was seen on both nights indicating a paucity of migrants at those altitudes. In the pass, birds were moving northwest. Movements above lowlands were widely scattered. We conclude that those conditions, generally favorable for northward (spring) migration, were associated with north or northwest movements at low elevation and few birds flew at >1,000 m altitude. Winds were southerly at 5 to 8 m s^{-1}. (No statistical test was done combining sites and weather codes because both summed sites for all weather codes and summed weather codes for all sites gave significant differences [see above] and we wished to avoid repeated tests.)

On a few occasions, we observed birds in process of encountering a change in wind conditions without appearing to change orientation. Within the pass itself, we repeatedly observed tracks of birds that moved south into the pass and then appeared to slowly retrace their path northward. These "retro" birds (Larkin and Thompson 1980) were seen on nights when strong south winds were recorded in the mountains, but not north of the Notch. We interpreted those tracks as birds encountering strong south winds and then being blown backwards without reorienting their flights. On 17 September 1992, we were able to directly observe the phenomenon with a ceilometer. A passerine entered the light beam at Cannon Mountain as it encountered the southerly wind above the summit. The bird maintained its southward heading, beating its wings steadily without making forward progress. It then began to move slowly backwards still heading south and beating its wings until it disappeared.

Comparison of diurnal and nocturnal observations.—Changes in diurnal census data were associated with specific patterns of nocturnal migratory behavior observed by radar and ceilometer. Density of bird tracks detected with radar, however, was not reduced on nights when the census data indicated stable numbers of migrants in the area. Major changes in number of migrants on the ground, as indicated by the migration index for diurnal census data, were associated with southwest and southward movements the previous night as shown in Figure 5. Average track-density index was 123.4 ± 57.4 on these nights. Minor changes in diurnal migration index were associated with nocturnal southwest or southward movements at all sites and an average density index of 107.5 ± 68.5 tracks. At the lower elevation sites, there were also significant numbers of tracks moving north (Fig. 5). When the diurnal migration index indicated stable numbers of migrants, nocturnal movements were generally scattered (Fig. 5.) with an average density index of 141.2 ± 59.3. Analysis of variance showed no signif-

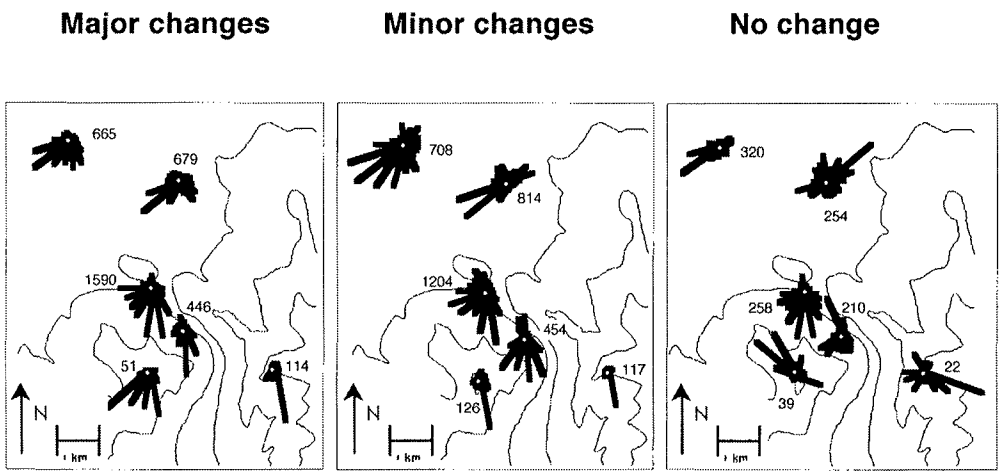

FIG. 5. Distribution of tracks of nocturnal migrants in Franconia Notch, New Hampshire, for three levels of migratory index derived from census counts the next morning: major changes in relative numbers of migrants from previous day (16 nights), minor changes (15 nights), and no discernible change (7 nights). Circular histograms as in Figure 4.

icant difference between the density of tracks under the three migratory index conditions ($F = 0.661$, $P = 0.523$). The Batschelet χ^2 test showed a significant association between those migration-index categories and direction of migrants recorded at all nocturnal observation sites ($\chi^2 = 277$, df = 34, $P < 0.0001$). Nights with modal track patterns of south, southwest, or north were associated with large or moderate changes in diurnal census, whereas nights with modal track patterns east–west were associated with minor changes or stable numbers of migrants ($\chi^2 = 9.2$, df = 2, $P = 0.01$).

Comparison of census results and nocturnal observations did not indicate an association of orientation behavior with either specific species or species groups. Daily census of birds indicated three migratory periods during our observations (Fig. 2): early migrants (largely Neotropical warblers), mid-season (primarily Yellow-rumped Warblers), and late (mostly robins and juncos, Fig. 2). There were significant differences between the density of migrants recorded by radar during the three periods. The early period was relatively light with an average track-density index of 86.9 ± 63.2. In midseason, radar recorded a higher density, average 154.0 ± 42; late season decreased to an average of 82.3 ± 60.4 (ANOVA: $F = 8.05$, $P = 0.0013$). Those periods did not correspond to marked differences in distribution of nocturnal migrant track directions as seen on radar and ceilometer. We selected nights with synoptic code 1 or 2 to obtain greatest probability of detecting southbound migrant birds rather than birds moving locally. All three migratory periods showed patterns of tracks at each site similar to those shown for codes 1 and 2 (Fig. 4), and therefore we summed all sites for analysis (Fig. 6). All three seasonal categories showed the same southwest and south–southeast modal track directions. The Batschelet χ^2 test showed a significant association between the distribution of track direction and migratory period ($\chi^2 = 157$, df = 30, $P < 0.0001$), but those differences were due to relatively minor differences in numbers of tracks in each of the south and southwest direction bins rather than a pronounced shift in any major directional tendency. Analysis of nightly patterns of migration supported this conclusion. There was no sig-

FIG. 6. Track distributions on nights with weather code 1 or 2. Total of all radar and ceilometer sites for early, mid-season and late migratory periods as defined by daily census data. Circular histograms as in Figure 3.

nificant association between nights with modal directions to the south versus soutwest and season, or with any group of species in diurnal census counts.

Discussion

The combination of high-resolution radar, ceilometers, and daily ground counts at multiple sites provided a view of autumnal migration through complex topography at a resolution not previously attained in North America. The lowest 300 m of bird migration (which we observed) probably represent the most dense stratum of nocturnal migrants (Eastwood 1967, Able 1970, Bruderer and Jenni 1988). Direction of movements we observed at low altitude agree well with those observed at greater altitudes by Drury and Keith (1962) and Williams et al. (1977) using surveillance and weather radars on Cape Cod. Primary directions of movement in both those studies were to the southwest and south–southeast. Drury and Keith (1962) interpreted those as movements along the New England coastline (southwest) and away from the coast, over the Atlantic Ocean. We found those same primary directions of movement 120 km inland. As in previous radar studies in North America, we found synoptic weather to be the most important factor in stimulating and maintaining autumnal migration. Southward migration is heaviest west of a cold front and east of a high-pressure center. Southward movements are less dense west of high pressure and after passage of a warm front (Drury and Keith 1962, Lowery and Newman 1966, Richardson 1972, 1978b; Williams et al. 1977, Able 1980). Our results differ from those studies primarily in the high density movements we recorded at low altitudes during periods of unfavorable weather, such as weather code 3 (compare Richardson 1978b). That difference is not entirely due to low altitude of migrants we observed. Able (1973) also observed low-altitude migrants in the southeastern United States, but did not record dense movements under unfavorable conditions. Our observations were made within breeding areas of most species we used for analysis. We also ended the study before killing frosts removed most insects from the area. Our diurnal observations suggested movement to abundant food sources and avoidance of hazardous local weather conditions, as well as southward migration, as a reason for movement. Richardson (1982) reviews other possible interpretations of reverse migration and Williams and Webb (1996) have shown the importance of search behavior in evolution of bird migration in North America. Our observations suggest that such movements are performed at night perhaps to avoid predation or to maximize feeding opportunities during the day. Alerstam (1978), Lindström and Alerstam (1986), and Lindström (1990) reached similar conclusions for migrants in northern Europe.

The principal difference between our results and those of previous studies in North America is departure from broadfront migration. We found clear differences in distribution of track directions above lowlands northwest of the mountains and within the mountains. It is our interpretation that those differences in direction of migration may be due to both topography and altitude, but not to local winds. Differences between orientation in lowlands and within Franconia Notch are probably due at least in part to topography. Sites are too close in altitude for differences to be due to elevation alone. Birds appear to move southwest along the face of the Franconia Range and deviate southward as they move through the pass. That is especially evident at site 3 where birds outside the entrance moved southwest and birds within the pass moved primarily southsoutheast. Altitude may play a more important role in simultaneous southwest movement of birds above lowlands and southward movements over the mountain ridges often observed during synoptic weather codes 1 and 2. We interpret those data as two strata of migrating birds often separated by a thermal inversion. The lower layer in lowlands and valleys moves primarily southwest and the upper layer moves south or southeast. Depending upon altitude of the inversion, the upper layer may move up and over the mountain ridges in broadfront migration or may flow along the contours of the pass. Persistence of those patterns under calm wind conditions argues against downwind orientation to local wind conditions as the source of differences.

Our results are similar to extensive radar, infrared, and moon-watching studies within the area of the Alps in western Switzerland. Bruderer and Jenni (1990) found that although au-

tumnal migration is broadfront in the sense that birds are moving over the entire area in the same general direction, land forms have a significant guiding effect. Birds within mountain valleys flying at 30 to 1,000 m AGL were more influenced by topography and showed more variability in direction over the study area than were those above 1,000 m AGL. When approaching the Alps, birds flying at <1,000 m tend to deviate to fly parallel to mountain ridges unless those ridges are more or less perpendicular to their flight. Birds moving above 1,500 m and those meeting ridges perpendicular to their flight direction tend to fly over ridges in broadfront migration (Bruderer 1978, 1996; Bruderer and Jenni 1990). Southward migrating birds encountering the Alps deviate their flight southwest and move parallel to the face of the mountain range with smaller numbers penetrating through passes in the mountains (Liechti et al. 1996, Bruderer and Liechti 1999). Other similarities between our work and Bruderer's include an increased effect of topographical cues in unfavorable winds, dense movements in seasonally inappropriate directions, and retro flights of birds encountering strong winds as they crest a ridgeline (Bruderer 1999). Liechti and Bruderer (1995) also found birds responding to topography over highlands of southern Israel although the effect was not as pronounced as in the Alps. McKernan and his coworkers used ceilometers in mountain passes of southern California and found that ". . . topographic relief (mountain passes) have greater magnitude [of migration] than other sites without relief (e.g. Mojave and Colorado Deserts). Mean angles for those nocturnal migrants within the topographic relief were aligned with the orientation of the relief." (R. McKernan pers. comm.).

Arrivals and departures of birds inferred from our diurnal visual census were clearly related to nocturnal flight behavior as observed with ceilometers and radar. Southward or northward nocturnal movements were more clearly associated with changes in ground counts than in previous studies (Nisbet and Drury 1967, Williams et al. 1981). That was probably due to our summing data from several sites for nocturnal observations and several widely separated, ecologically diverse areas for diurnal census counts.

Our observations suggest a range of orientation techniques for nocturnal migrants depending upon weather conditions. Broadfront migration and observations of retro birds under synoptic codes 1 and 2 suggest fixed-heading orientation. Local flights and altitudinal movements under weather codes 3, 4, and 5, and reaction to topography of the Franconia Range and the mountain pass under all weather conditions suggest importance of land forms in other phases of orientation. Able (1982) also found differences in orientation depending on weather conditions, but he found birds exhibiting downwind orientation under conditions of overcast. A definitive test of importance of local wind direction was not possible for our data because wind direction and speed often differed greatly over the range of a single radar site or within the altitude range of the radar or ceilometer. However, synoptic weather codes predicted patterns of migration even in calm winds and we often observed a multimodal distribution of simultaneous tracks at a single site, presumably under similar wind conditions. Birds migrating through the turbulent and unpredictable wind conditions in mountains might find it dangerous to rely on downwind flight for orientation. Although local winds are relatively constant over flat terrain, birds migrating through the Franconia Range might benefit from using a more reliable feature such as synoptic weather or topography.

We were not able to relate nocturnal migratory behavior to specific species or groups of species with similar migratory goals, such as Neotropical warblers. Ground counts revealed that was probably because both Neotropical and North American migrants responded similarly to synoptic weather stimuli for migration. Both early and midseason migrations contained birds heading for both the Neotropics (southsoutheast) and southern North America (southwest), for example movements in late September contained not only Yellow-rumped Warblers and Northern Flickers, but also Blackpoll Warblers and Bicknell's Thrushes. Alerstam (1996) presents evidence for a range of orientation techniques across a much broader taxonomic spectrum than our birds, which were primarily passerines.

Our observations and those of Bruderer and his coworkers indicate that broadfront migration should not be assumed for the passage of

avian migrants over mountainous areas (Bruderer 1996, Liechte et al. 1999). That is important for evaluation of structures such as wind-powered electrical generators or communication towers on ridge lines. Although our studies were not designed to observe concentration of migrants at topographical features, reaction of migrants to topography that we did observe suggested such concentrations during both favorable and unfavorable conditions. Concentrations could result either as birds moved along a corridor, such as a pass or ridge line, or they could result from birds moving up and over a ridge meeting migrants already at that altitude and thus producing large numbers of birds a few tens of meters above the ridge summit. Our ceilometer observations of large numbers of birds near crests of ridges are particularly relevant in that regard.

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APPENDIX. Bird species with five or more birds observed in one day during 1992 and 1993 census. Status, and average and maximum numbers of birds per day at alpine and valley sites. Status codes: e = early, l = late, m = midseason, n = nonmigrant during study period, a = altitudinal migrant.

			Alpine		Valley	
Common name	Scientific name	Status	Av	Max	Av	Max
Yellow-bellied Sapsucker	*Sphyrapicus varius*	n	0	0	0.26	6
Northern Flicker	*Colaptes auratus*	m	0.04	2	0.96	49
Blue-headed Vireo	*Vireo solitarius*	n	0	0	0.53	7
Red-eyed Vireo	*Vireo olivaceus*	e	0	0	0.29	7
Blue Jay	*Cyanocitta cristata*	n	3.93	13	10.69	33
American Crow	*Corvus brachyrhynchos*	n	0	0	2.98	13
Common Raven	*Corvus corax*	n	1.32	11	1.20	6
Black-capped Chickadee	*Poecile atricapillus*	n	2.65	17	10.09	38
Boreal Chickadee	*Poecile hudsonicus*	n	13.8	26	0	0
Red-breasted Nuthatch	*Sitta canadensis*	n	1.69	5	2.09	10
White-breasted Nuthatch	*Sitta carolinensis*	n	0	0	1.09	5
Golden-crowned Kinglet	*Regulus satrapa*	a	7.07	27	0.62	11
Ruby-crowned Kinglet	*Regulus calendula*	a	3.13	22	0.60	8
Bicknell's Thrush	*Catharus bicknelli*	e	0.84	11	0	0
Hermit Thrush	*Catharus guttatus*	n	0.02	1	0.62	5
American Robin	*Turdus migratorius*	l	0.27	2	4.07	28
Cedar Waxwing	*Bombycilla cedrorum*	e	0	0	0.57	11
Neotropical warbler group	see below		3.27	18	3.44	33
Yellow-rumped Warbler	*Dendroica coronata*	m	21.6	68	2.50	30
Common Yellowthroat	*Geothlypis trichas*	e	0	0	1.60	13
Chipping Sparrow	*Spizella passerina*	e	0.16	3	2.36	18
Song Sparrow	*Melospiza melodia*	n	0	0	7.38	27
White-throated Sparrow	*Zonotrichia albicollis*	a	6.98	21	4.04	34
White-crowned Sparrow	*Zonotrichia leucophrys*	l	0.16	2	0.029	5
Dark-eyed Junco	*Junco hyemalis*	l	16.80	60	2.42	50
Purple Finch	*Carpodacus purpureus*	n	0	0	0.50	8
American Goldfinch	*Carduelis tristis*	n	0.13	3	0.093	8
Evening Grosbeak	*Coccothraustes vespertinus*	n	0	0	3.16	30
The following Neotropical warblers were treated as a single group.						
Tennessee Warbler	*Vermivora peregrina*	e	0.09	2	0.52	2
Nashville Warbler	*Vermivora ruficapilla*	e	0	0	0.20	3
Yellow Warbler	*Dendroica petechia*	e	0.09	2	0	0
Chestnut-sided Warbler	*Dendroica pensylvanica*	e	0	0	0.13	6
Magnolia Warbler	*Dendroica magnolia*	e	0.60	9	0.38	5
Black-throated Blue Warbler	*Dendroica caerulescens*	e	0.12	2	0.38	5
Black-throated Green Warbler	*Dendroica virens*	e	0.09	2	0.84	9
Blackburnian Warbler	*Dendroica fusca*	e	0.13	2	0.22	4
Bay-breasted Warbler	*Dendroica castanea*	e	0	0	0.02	1
Blackpoll Warbler	*Dendroica striata*	m	1.27	10	0.22	5
Black-and-white Warbler	*Mniotilta varia*	e	0.04	1	0.11	4
American Redstart	*Setophaga ruticilla*	e	0	0	0.27	4
Ovenbird	*Seiurus aurocapillus*	e	0.02	1	0.09	2
Wilson's Warbler	*Wilsonia pusilla*	e	0.04	2	0.04	1
Canada Warbler	*Wilsonia canadensis*	e	0	0	0.23	3