

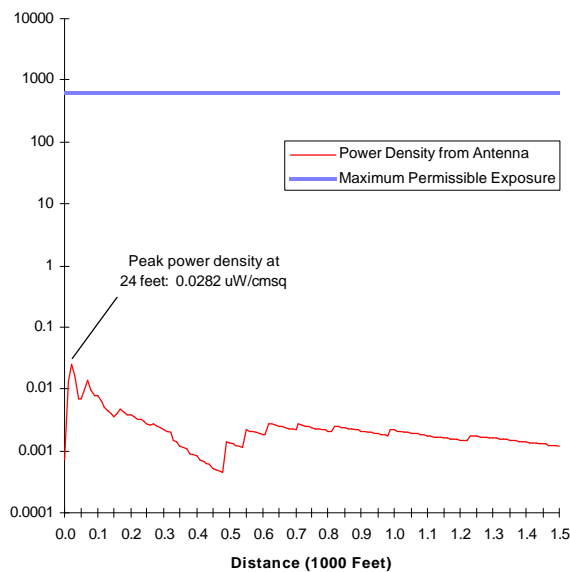
Project Experience

Radio Communications Study and Site Inventory Bureau of Land Management, Las Cruces, NM

Timberline Engineering was subcontracted to Albuquerque Surveying Company to perform communications analyses and site surveys at BLM's Caballo Mountain radio site in southern New Mexico. The project started with an inventory of 20 facilities representing 38 tenants or licensees. Data collected included radio transmitter and receiver brand, model number, frequency, output power, emission designator and channel loading; antenna brand, type, model number, centerline, azimuth, gain and polarization; and interconnecting coax and waveguide transmission lines.



Timberline performed a propagation study resulting in a line-of-sight area coverage map indicating the areas within a 50-mile radius which have visual line-of-sight from a single, centralized point five feet above grade at Caballo. In addition, the study produced coverage maps indicating the areas within a 50-mile radius that can effectively communicate from a single, centralized point on the Caballo site at 850 MHz (representative of the cellular telephone frequency band), 930 MHz (representative of the pager frequency band), and 2.4 GHz (representative of the PCS frequency band) assuming a unity gain omni-directional antenna on a 50-foot tower, 25 and 100-watt transmitter power levels, and -100 dBm receiver threshold. Coverage maps were developed through computer-based RF coverage analyses using 3-arcsecond digitized USGS terrain data.



**RADIATION EXPOSURE ANALYSIS
PEAK DENSITY VS. DISTANCE
AT GROUND LEVEL**

Timberline also studied electro-magnetic radiation exposure in the immediate vicinity of the Caballo site by determining the highest power radio transmitter with the least directional antenna (typically worst case) and then calculating the power density at 10-foot intervals to a maximum of 1000 feet from the base of the antenna tower for 16 radial paths around the antenna. The most powerful transmitter was found to be an FM radio station broadcasting at 49 KW and 98.7 MHz. Power density graphs were developed. Calculations were referenced to a horizontal plane intersecting the base of the tower and were compared to the maximum permissible exposure in an un-controlled environment as defined in ANSI/IEEE C95.1-1991.

Timberline provided recommendations for mitigating existing electromagnetic interference concerns at the site and provided BLM with guidelines that may be utilized by new facility owners in the design and construction of new towers to reduce the likelihood that future sites will create exposure hazards. Timberline also provided general observations regarding the capability of the existing site and adjacent spaces to accommodate additional communications facilities based on space requirements and communications suitability considerations.

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