

March 20, 2023

**On Behalf of the University of Southern California**

**File BLED20000404ABH**

This application for construction permit seeks to correct the coordinates and base elevation of KUSC (FM), a Los Angeles public radio station licensed to the University.

A review of the licensed station coordinates finds that the site is off by 80 meters. The actual coordinates are N. Lat. 34-12-45.53, W. Long. 118-03-45.68.

Page #2 is a Google Earth map showing the licensed site and the actual site.

The base elevation has been determined to be 1,646m AMSL (5400 ft) using a 7 ½' topographic map. The existing antenna height is 30.48m AG (100 ft), therefore the rounded and corrected height for the center of radiation is 1,676m AMSL (lower by 12.6m.) Page #3 is the topographic map for the Mount Wilson quadrant, marked with the corrected site.

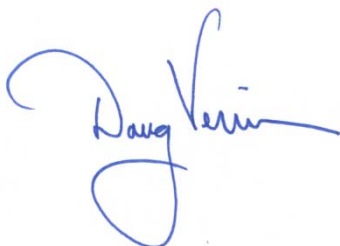
Page #4 is a contour-to-contour channel study at the corrected coordinates. Neither outgoing nor incoming contour overlap is observed (GLOBE 30 sec.)

Page #5 is a 60 dBu coverage map showing 100% service to the principal city is maintained. Due to the corrected lower COR antenna height, the 60 dBu will remain entirely inside the licensed 60 dBu, so there will be no expansion of coverage.

**Waiver:** It should be noted that KUSC's combination of ERP and antenna height is above the class B maximum distance, however, under its current license, the University applied for and received a waiver for same to fight severe Mexican interference. The University, therefore, asks that the waiver be continued in its present form.

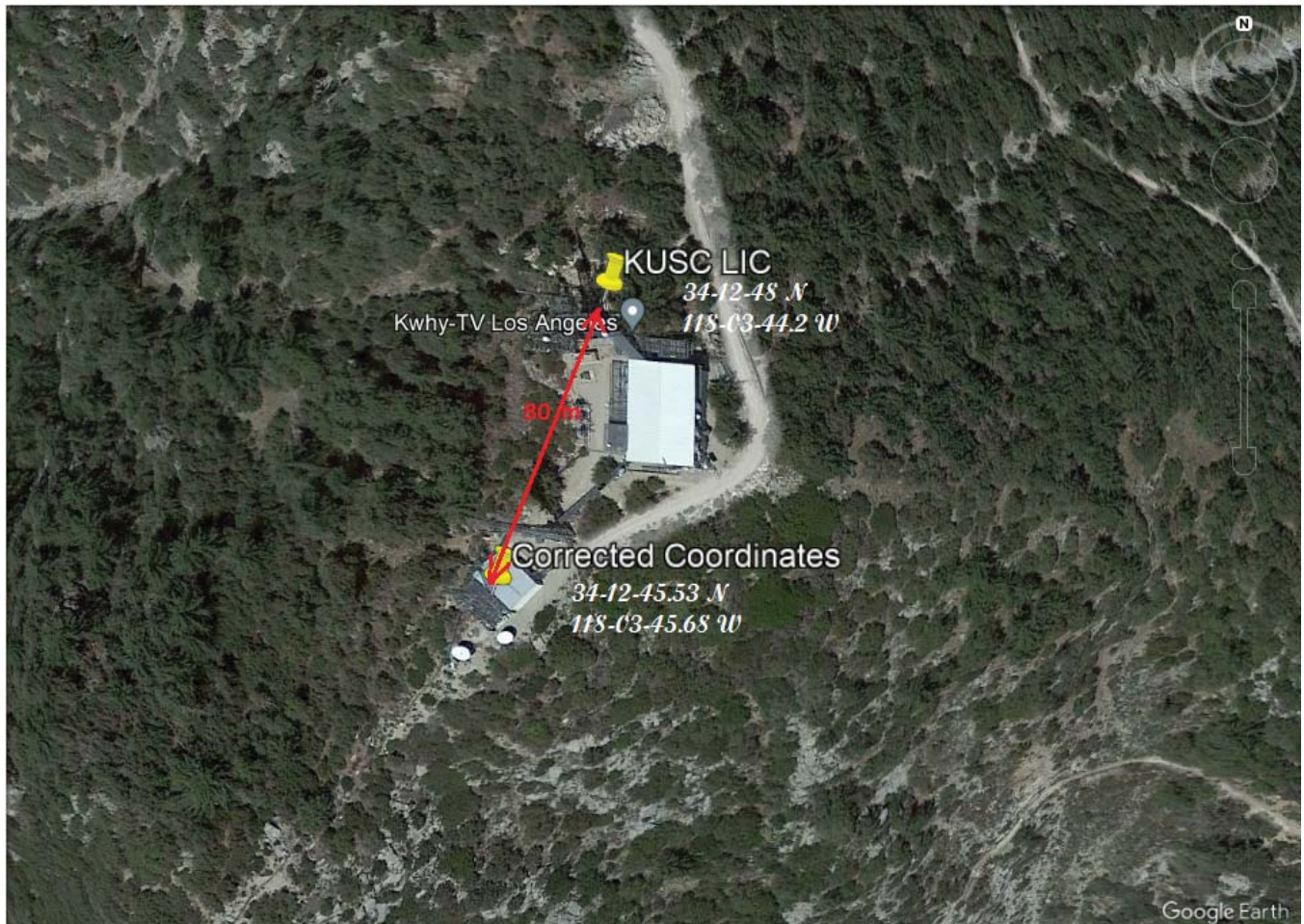
Page #6 of this statement is an EEM study contracted by KUSC with Richard A. Rudman, CPBE #952. The study was done in 2019. No changes have occurred since then that would affect the Rudman measurements. The study indicates the station meets all FCC requirements with regard to worker and public safety.

Page # is a certification of the qualifications of the preparer.



March 18, 2023

Satellite Map showing NAD 83 Coordinates from Google Earth. The licensed site and the corrected site are shown. The correction totals 80 meters.





## 7 1/2' Topographic Map, Showing the Official Base Elevation

**KUSC**

BLED20000404ABH

Latitude: 34-12-45.53 N

Longitude: 118-03-45.68 W

ERP: 39.00 kW

Channel: 218

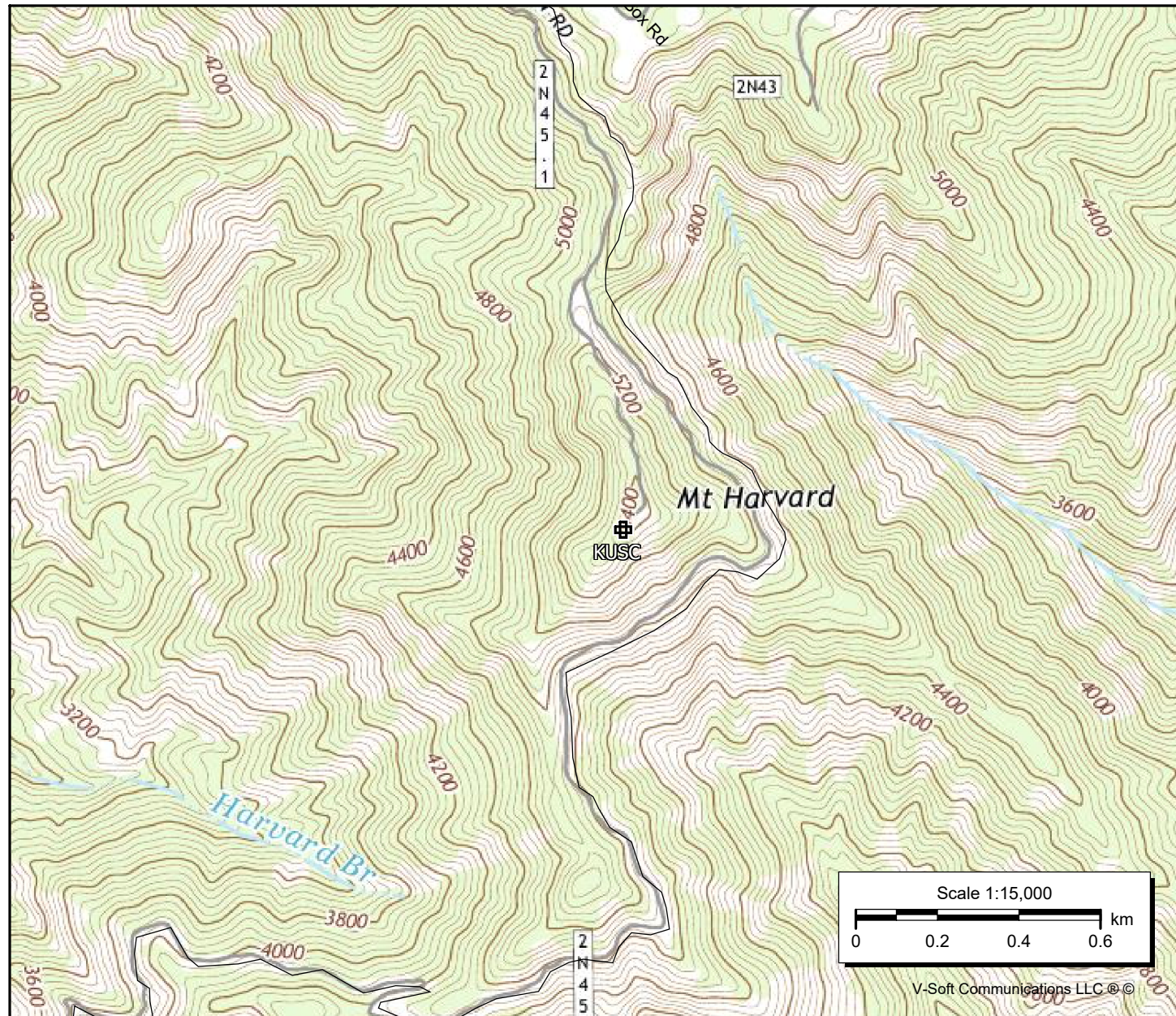
Frequency: 91.5 MHz

Base elevation: 1,646.0m

Ant. Ht. A.G. 30.0m

AMSL Height: 1676.0 m

Horiz. Pattern: Directional



**V** Doug Vernier  
1600 Picturesque Drive  
Cedar Falls, Iowa 50613  
Telecommunication Consultants

Doug Vernier, V-Soft Communications LLC  
Frequency Study

Contour-to-Contour Channel Study  
University Of Southern California

REFERENCE CH# 218B - 91.5 MHz, Pwr= 39 kW DA, HAAT= 844.7 M, COR= 1675.5 M DISPLAY DATES  
34 12 45.53 N. Average Protected F(50-50)= 90.59 km DATA 03-16-23  
118 03 45.68 W. Standard Directional SEARCH 03-16-23

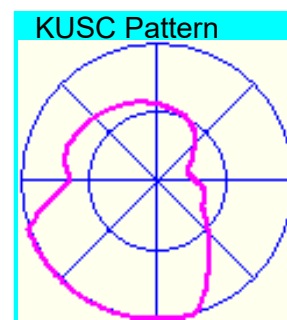
CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
218B Los Angeles	KUSC	LIC DCN CA		26.4 206.4	0.08 BLED20000404ABH	34 12 48.00 118 03 44.20	39.000 891		---Reference---		
217B Barstow	KWTH	LIC _CN CA		69.6 250.4	140.03 BLED20060106ABX	34 38 38.90 116 37 41.00	1.550 700	78.0 1838	51.8 Advance Ministries, Inc.	3.2	1.2
217A Pala	KPRI	APP DCN CA		135.4 316.0	131.42 0000211198	33 22 00.70 117 04 08.40	0.165 -324	4.6 151	3.5 Pala Band Of Mission India	38.2	1.2
217A Pala	KPRI	LIC DCN CA		135.4 316.0	131.44 BLED20101203ABT	33 22 00.10 117 04 08.10	0.100 -325	4.0 151	3.1 Pala Band Of Mission India	38.7	1.6
220B San Bernardino	KVCR	LIC ZCY CA		110.8 291.2	76.60 0000089116	33 57 57.40 117 17 09.10	3.200 521	3.7 966	54.6 San Bernardino Community C	1.8	16.6
217B Bakersfield	KFRB	LIC DVN CA		335.8 155.4	149.61 BLED20050815AAD	35 26 16.80 118 44 25.30	2.800 417	84.6 1132	41.4 Family Stations, Inc.	13.4	9.6
217A Barstow	DKCWM	VAC __N CA		51.1 231.7	121.87	34 53 47.94 117 01 21.15	6.000 100	46.5 850	30.9 From CDBS	22.3	14.1
216B Thousand Oaks	KDSC	LIC _CN CA		282.5 101.9	105.62 BMLD20030717ABP	34 24 46.90 119 11 13.30	4.800 390	4.4 879	55.9 University Of Southern Cal	21.0	39.3
272A Compton	KJLH«	LIC _CN CA		228.9 48.8	36.32 0000157944	33 59 52.00 118 21 35.30	5.600 103	171.7 166	64.9 Taxi License Corporation	14.5R	21.8M

Terrain database is GLOBE 30 Sec , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference zone= - Zone 1A, Co to 3rd adjacent.  
All separation margins (if shown) include rounding.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
"\*"affixed to 'IN' or 'OUT' values = site inside restricted contour.  
« = Station meets FCC minimum distance spacing for its class.  
Reference station has protected zone issue: Mexico

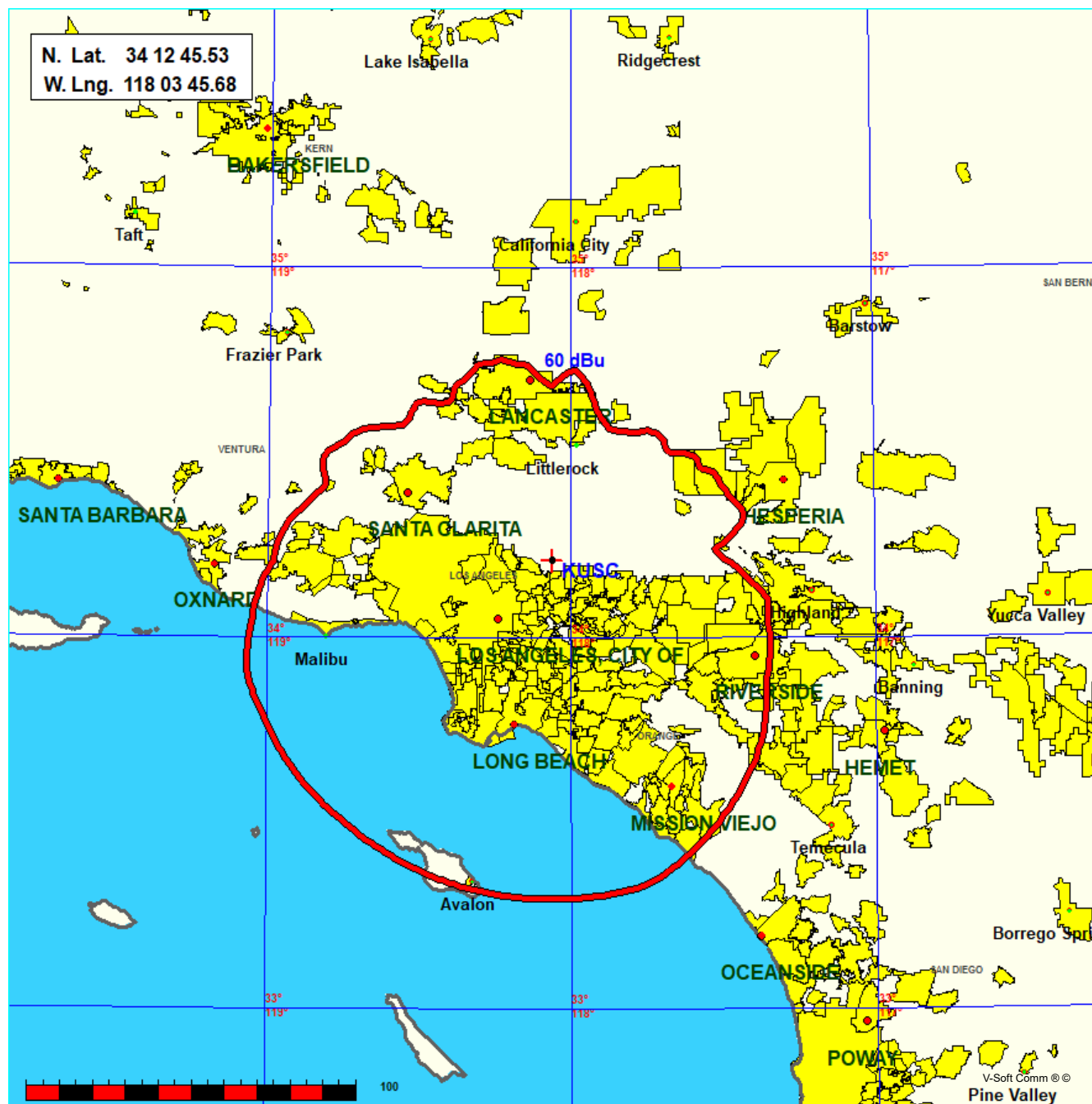
60 dBu Coverage - proposed  
Shows full service to Los Angeles - Principal City

Coverage Study - GLOBE 30 Sec  
03-18-2023

KUSC CH218 B , 39.0 kW, 844.7m HAAT, 1675.5m COR AMSL  
Service Contour = 60 dBu.



Page #5





# Electromagnetic Energy Measurement (EEM) Study

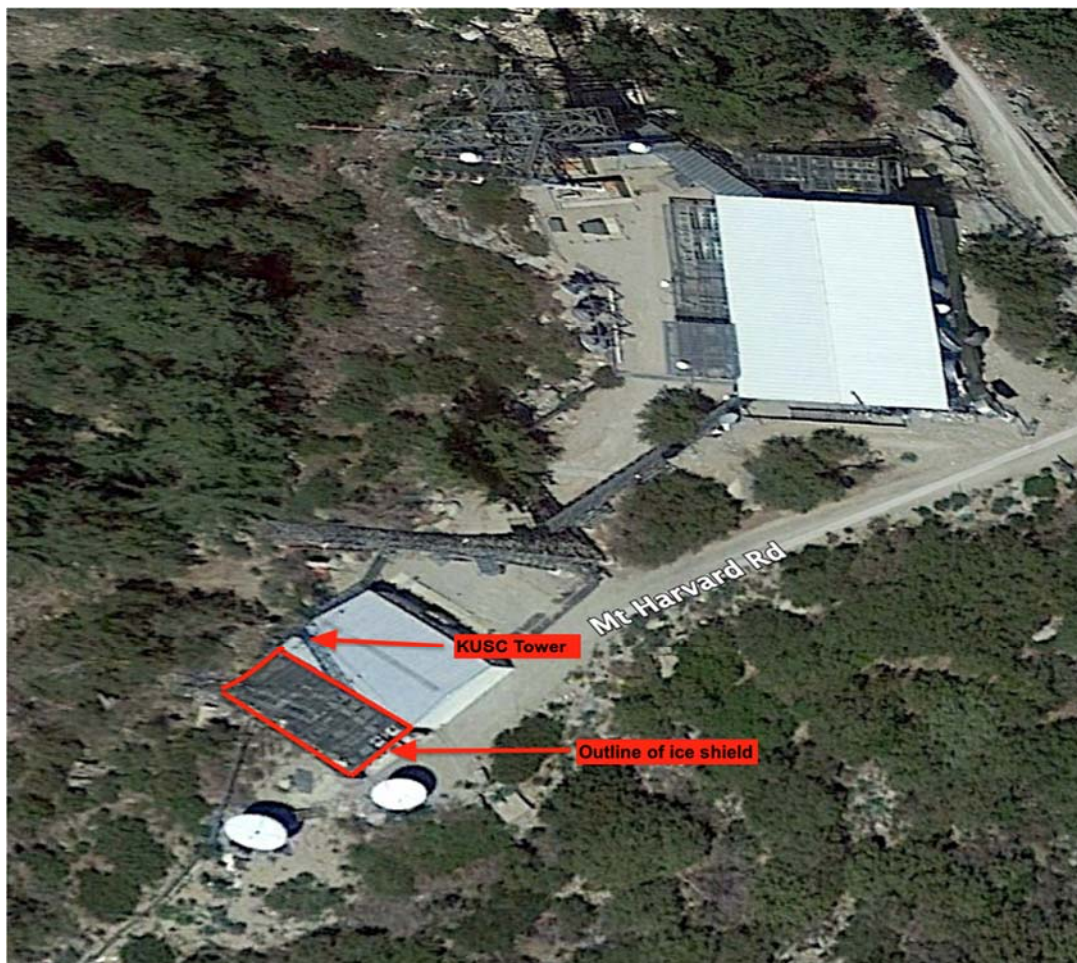
## Prepared For:

KUSC  
University of Southern California  
Mt. Harvard Transmitter Site  
Los Angeles, California  
Effective Radiated Power: 39 Kw.  
Transmitter Operating Power for 39 kW ERP: 13.2 kW

April 3, 2019

Measurements were performed under the direction of:

*Richard A. Rudman, CPBE (#952)*  
*Remote Possibilities*  
*1046 Corte La Brisa, Santa Paula, CA 93060*



## Qualifications of Richard A. Rudman

The Society of Broadcast Engineers (SBE) attests that Richard Rudman is a Certified Professional Broadcast Engineer (CPBE) holding certificate number 952. Richard retired from a 27-year career at KFWB Radio in Los Angeles (Infinity/CBS) as that station's Director of Engineering in June 2002.

At KFWB, he was responsible for all studio and transmitter technical matters as well as FCC compliance. He has owned and operated his own contract broadcast engineering company, [Remote Possibilities](#), since 2002 that performs turn-key radio broadcast studio and transmitter installation, construction, maintenance, operations, FCC-required measurements, technical due diligence, and technical services related to all phases of radio broadcasting.

## Purpose

Measurements to determine Electromagnetic Emissions (EE) conditions for the current KUSC main transmitter on the working surface of the rectangular ice shield on the Southwest side of the building at Mt. Harvard were conducted on April 3, 2019 between the hours of 13:24 to 14:24 hours. The purpose of this EME study is to ascertain the EE Occupational Exposure level for workers standing anywhere on the ice shield for the tower adjacent to the transmitter building in accordance with the rules and regulations of the Federal Communications Commission (FCC). This study is intended for safety management guidance for workers performing duties while standing on the ice shield.



View of ice shield located on the Southwest side the building

## Test Equipment Used

A NARDA Model NBM-550 Electromagnetic Monitor (serial Number E-1035) and a NARDA measurement probe, Model 2402/07B (Serial Number 01101, were employed to make the measurements. The serial number for this NARDA meter is 5037. The calibration date for the NBM-550 was 11/25/13. Per NARDA, the NBM-550 does not require bi-annual calibration. The last calibration date for the probe was 2/15/2017.

## Site Description

Mt. Harvard is a multi-user site located on the Southward-facing “front range” of the Angeles National Forest close to Mt. Wilson. The site is owned and managed by American Tower.

## Measurement Preparation and Conditions

After attaching the probe, the NARDA NBM-550 meter self-calibrates. The battery voltage was checked and the percentage of charge was noted (100%). Temperature at the time of the measurements was measured as 13.0 degrees Centigrade. The NBM-550 was set to measure peak emissions up to 30 GHz. The KUSC main transmitter was checked to assure it was operating at licensed power. Since there are several other FM and TV licensees operating at this site, the KUSC Engineering Manager who was on site checked to make sure all other FM and TV transmitters contributing to the overall EE level were operating at licensed power.

## Peak Average Reading Method

RF field peak measurements were made with the NARDA probe in various orientations and hand-held heights while standing on the ice shield to assure that maximum field readings were observed and documented. Peak average measurements were recorded at 13 points on the ice shield. Special attention was given to measurements on the ice shield immediately surrounding the tower where downward radiation could be expected to present elevated EE levels. The peak average reading noted at each measurement location was recorded in the internal memory of the NARDA NBM-550 and transcribed to a drawing representing the ice shield’s relationship to the tower and building.

## Results

The highest EE reading noted was on the ice shield adjacent to the Southwest tower leg (.3001 mw/cm<sup>2</sup>) that equates to 30.11% of the 100% Occupational exposure Level.<sup>1</sup> Other readings, all significantly lower, are shown in the table attached to this report.

## Recommendations

While all readings taken were well under the 100% Occupational exposure level, existing site, all personnel must be trained on site EE procedures. Existing procedures for power reduction must be followed for any work requiring climbing the tower above the ice shield. Applicable signage should

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<sup>1</sup> The Occupational exposure maximum allowed level at 100 MHz is 1000  $\mu\text{W}/\text{cm}^2 = 1\text{mW}/\text{cm}^2 = .001\text{W}/\text{cm}^2 = 10,000,000 \mu\text{W}/\text{m}^2 = 10,000 \text{mW}/\text{m}^2 = 10\text{W}/\text{m}^2 = 61.4 \text{V}/\text{m} = 64,100 \text{mV}/\text{m}$  (<https://mdsafetech.org/conversion-and-exposure-limits-emr-emf/>)



be posted. If RFR-trained climbers are wearing RF shielded suits in good repair and carry calibrated personal RF monitors and qualified RFR-trained engineers are on site. While climbing above the ice shield with RF suits and personal monitors can be conducted at higher transmitter power levels than for situations when RF suits and personal RF monitors are not available, RF training should include reminders that a power cutback to 10% of ERP (3900 watts) only reduces ERP by 10 dB. and definitely does not reduce E field emissions enough to allow tower work near to the active antenna.

*NOTE: KUSC Engineering personnel must verify before any tower work involving climbing that all personal RF monitors in use by climbers are capable of and set for E Field readings in the FM broadcast spectrum (88-108 MHz.), bear current calibration decals, have new batteries, and are in good working order.*

The FCC's online theoretical model calculator (<https://www.fcc.gov/general/fm-model#result-content>) run for KUSC (39 Kw. licensed ERP with a 3 bay ERI 1083-CP antenna) shows that the exposure risk rises significantly the closer one gets to the antenna. While it is true that climbers on the tower below the KUSC 3-bay ERI antenna are not in the direct field, working on the tower above the ice shield at licensed ERP power (75.9 dB) must be regarded as representing a significant exposure risk. RF suits and monitors may allow acceptable short periods of tower work coupled with reductions of transmitter power. Even at a power reduction level to 3900 watts ERP (65.9 dB) the risk is still there.

#### Workers on the Ice Shield

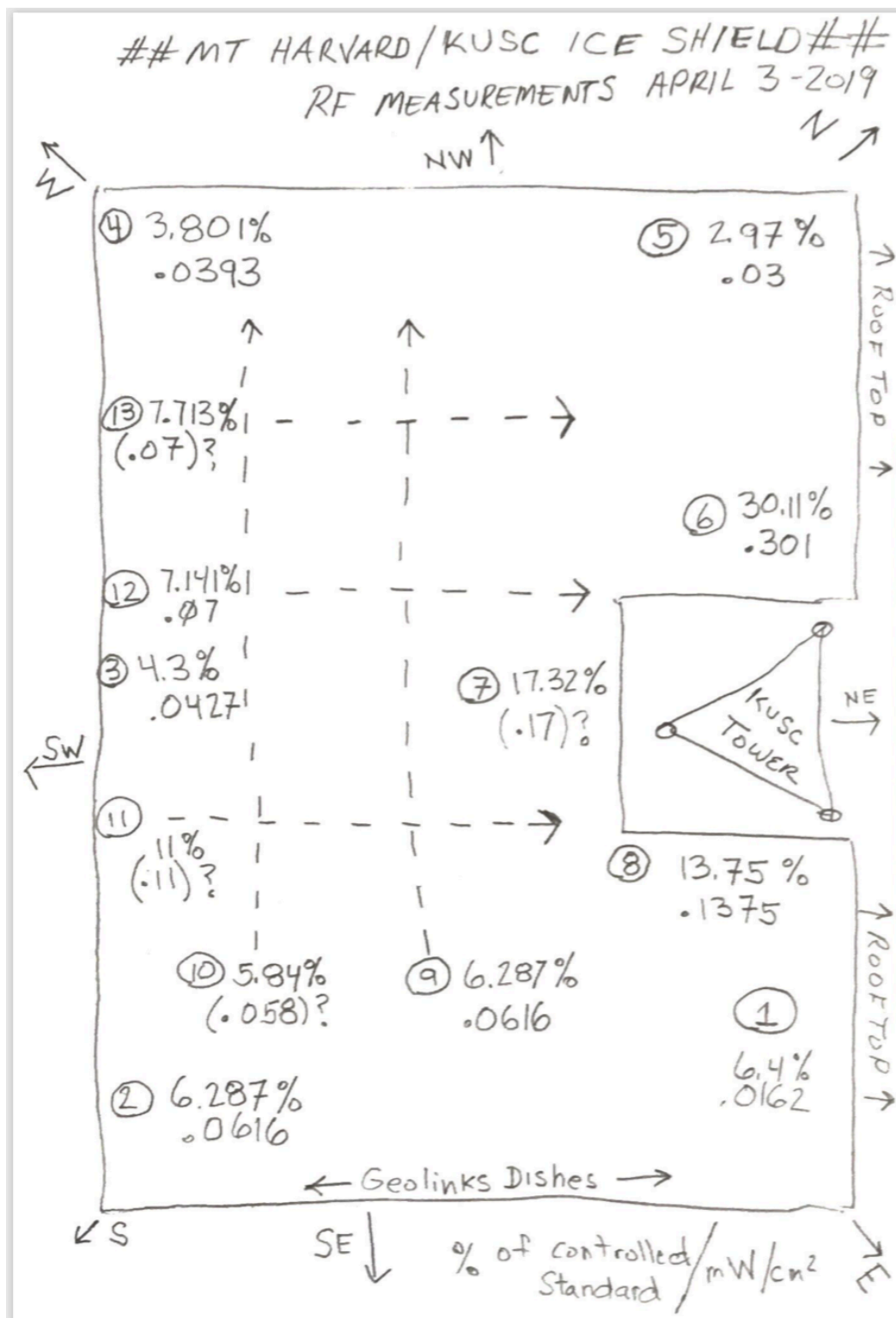
The highest measured peak average field on the ice shield was 30% of the Occupational limit or 0.3001 mW/cm<sup>2</sup>. The next highest measured peak average fields were 17% and 14% of the Occupational limit, respectively, 0.7113 and 0.1407 mW/cm<sup>2</sup>. Measurements indicate it is safe for on the ice shield for workers without RF suits for inspections, routine maintenance, and other tasks that can be accomplished within the usual work day.

#### Public Access Considerations

The Mt. Harvard KUSC facility is at some distance from Box Springs Road. A Forestry gate is the first of three locked gates on the Mt. Harvard road. The Site is fenced except where steep terrain precludes access. Existing EE signage for KUSC and elsewhere on the site appears to be in compliance with FCC Rules. All persons on non-occupational visits or tours must be accompanied by RF-trained personnel.

KUSC Main / Mt. Harvard Electromagnetic Emission Measurements					
3-Apr-19					
Time	%	mw/cm <sup>2</sup> )	Notes	Lat.	Long.
13:34:21	3.445	0.03445	Ground level near the building	34.21292	-118.06249
13:37:56	2.898	0.2898	Ground level near the building	34.21289	-118.06248
13:47:31	9.484	0.0948	Under ice shield near Southwest leg	34.21261	-118.06263
14:08:10	14.240	0.1424	Under ice shield near Southeast leg	34.21265	-118.06269
14:10:16	5.765	0.0565	Under ice shield	34.21264	-118.06263
14:11:43	6.007	0.0601	Under ice shield	34.21263	-118.06264
14:14:41	3.369	0.0367	On Ice Shield	34.21260	-118.06273
14:15:58	2.927	0.0293	On Ice Shield	34.21265	-118.06272
14:16:52	30.010	0.3001	On Ice Shield next to tower	34.21264	-118.06260
14:17:32	17.130	0.1713	On Ice Shield next to tower	34.21263	-118.06266
14:18:08	14.070	0.1407	On Ice Shield next to tower	34.21264	-118.06267
14:20:26	11.020	0.1102	On Ice Shield	34.21264	-118.06271
14:21:32	7.171	0.7171	On Ice Shield	34.21263	-118.06274
14:23:13	10.870	0.1087	On Ice Shield	34.21258	-118.06267
14:24:09	7.141	0.0714	On Ice Shield	34.21261	-118.06263
14:24:51	7.700	0.770	On Ice Shield	34.21264	-118.06271

NARDA Recorded Measurements



Measurements from 13 points entered manually on drawing

Richard A. Rudman

*Richard A. Rudman*



**Declaration:**

I, Douglas L. Vernier, declare that I have received training as an engineer from the University of Michigan School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 40 years;

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464;

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Re-certified 1/2006);

That, my qualifications are a matter of record with the Federal Communications Commission;

That, I have been retained by University of Southern California, (KUSC) to prepare the engineering showings appended hereto;

That, I have prepared these broadcast engineering showings, the technical information contained in same and the facts stated within are true of my knowledge;

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

A handwritten signature in blue ink, appearing to read "Doug Vernier", with a large, stylized loop at the end.

Executed of March 20, 2023