

June 24, 2016

## **COMPREHENSIVE ENGINEERING EXHIBIT**

This Engineering Exhibit supports a minor license modification for FM translator K209AW to operate on Channel 280, with proposed location in Redding, CA. K209AW has presently authorized facilities with file number BLFT-19930611TD. This proposal complies fully with the requirements of 47 C.F.R. §74.1204(a) & (c), with the exception of 2<sup>nd</sup> adjacent channel KSHA facilities protected under 47 C.F.R. §74.1204(d) by the Undesired to Desired (U/D) method described below. The proposed modified facilities create no other mutual exclusivities with any licensed facilities, construction permits, or applications.

This application proposes a move from its authorized location in Bridgeport, CA, to Redding, CA. In addition to the move, the proposed facility seeks to change its primary station and to change operating channel from 209 to 280. The new primary station is KQMS-AM and the applicant has a retransmission agreement executed with the licensee of KQMS-AM. The proposed antenna is a Jampro JLLP-1 single bay antenna mounted at 219 feet RCAGL. The elevation pattern is shown in Exhibit 1 and in tabular form in Exhibit 2.

Exhibit 3 shows confirmation that the Proposed Facility 60 dBu F(50,50) contour is contained within the KQMS-AM 2 mV contour. As the 2 mV contour is smaller than the 25 mile radius around KQMS, this is the primary constraint for the proposed translator coverage contour. In summary, the licensee proposes to change location, receive a new primary station, and utilize an omnidirectional antenna at an RCAGL of 67 meters with a power level of 250 W ERP.

## **TELEVISION CHANNEL 6 PROTECTION**

The proposed channel of operation is not subject to television channel 6 protection.

## **POTENTIAL INTERFERENCE**

Potential interfering stations 3 channels above and below the channel of operation were collected and displayed on the map in Exhibit 4. The only concern was contour overlap with KSHA. The KSHA F(50,50) field strength calculated at ground level at the proposed site is 97.0 dBu, as shown on the map of Exhibit 4. For the translator interference contours, free space calculations are used along with the elevation pattern of the proposed antenna. The corresponding interfering

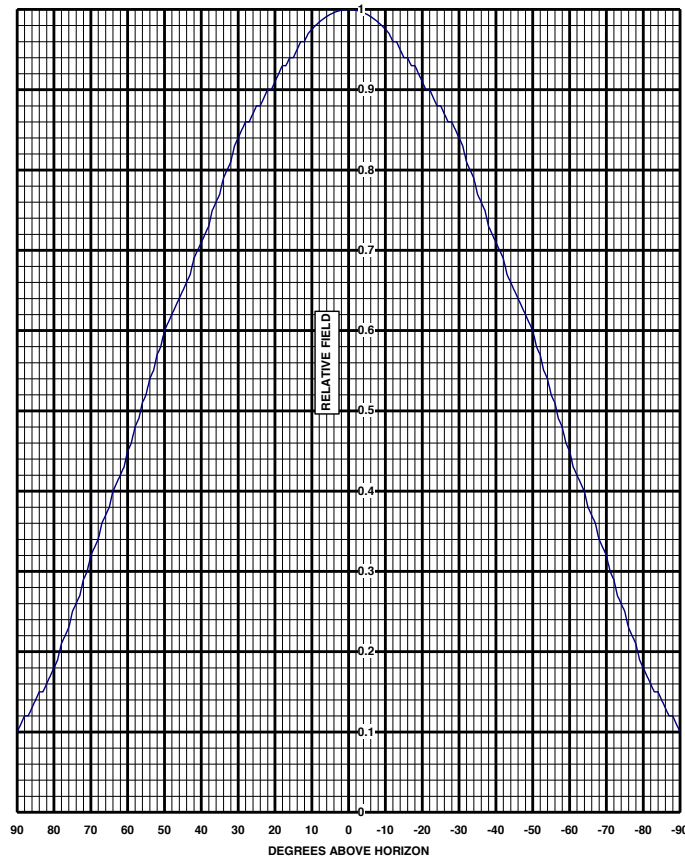
97 dBu + 40 dB = 137 dBu field strength contour was calculated and plotted in Exhibit 5. Protection to KSHA is provided through the use of Undesired to Desired Signal Strength Ratio (U/D) calculations. Specifically, station KSHA is evaluated and an exhibit is provided (a la "Living Way" analysis) to confirm that the interference does not reach the ground level. The proposed translator antenna is a Jampro JLLP-1 single bay antenna mounted at 219 feet RCAGL. The elevation pattern with tabular form shown in Exhibits 1 and 2 was used to execute calculations to determine the interfering contour field strength. The height of the proposed translator interference contour above ground is calculated.

As shown in Exhibit 5, the interfering 137 dBu field strength level does not reach ground level. Thus no interference is predicted to occur for this configuration.

The applicant recognizes that the U/D method shown is only a tool for predicting likely interference. Should any actual interference be experienced, the applicant will cooperate fully in correcting the interference. Corrective steps may require changes in the transmitting antenna or other steps which would require Commission authorization, may require that the translator cease operation except for brief equipment tests, or may require filtering at the receivers which report interference. Transmitter location, effective radiated power, antenna patterns, and elevation data are extracted from the Commission's CDBS. All contours for existing and proposed facilities are calculated using height above average terrain calculated at one degree horizontal increments.



COMPUTED ELEVATION PATTERN



Frequency: 103.9 MHz

Model: JLLP-1  
Description: FM Sidemount Antenna  
-0° Beam Tilt, 0% Null Fill

EXHIBIT #1—ELEVATION PATTERN FOR PROPOSED TRANSLATOR ANTENNA



### Elevation Pattern Tabulation

#### ELEVATION PATTERN TABULATION

##### RELATIVE FIELD VS ELEVATION ANGLE

<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>	<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>	<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>
10	0.975	-26	0.870	-61	0.430
9	0.980	-27	0.860	-62	0.420
8	0.984	-28	0.860	-63	0.410
7	0.988	-29	0.850	-64	0.400
6	0.991	-30	0.840	-65	0.380
5	0.994	-31	0.830	-66	0.370
4	0.996	-32	0.810	-67	0.360
3	0.998	-33	0.800	-68	0.340
2	0.999	-34	0.790	-69	0.330
1	1.000	-35	0.770	-70	0.320
0	1.000	-36	0.760	-71	0.300
-1	1.000	-37	0.750	-72	0.290
-2	0.999	-38	0.730	-73	0.270
-3	0.998	-39	0.720	-74	0.260
-4	0.996	-40	0.710	-75	0.250
-5	0.994	-41	0.700	-76	0.230
-6	0.991	-42	0.690	-77	0.220
-7	0.988	-43	0.670	-78	0.210
-8	0.984	-44	0.660	-79	0.190
-9	0.980	-45	0.650	-80	0.180
-10	0.975	-46	0.640	-81	0.170
-11	0.970	-47	0.630	-82	0.160
-12	0.960	-48	0.620	-83	0.150
-13	0.960	-49	0.610	-84	0.150
-14	0.950	-50	0.600	-85	0.140
-15	0.940	-51	0.580	-86	0.130
-16	0.940	-52	0.570	-87	0.120
-17	0.930	-53	0.550	-88	0.120
-18	0.930	-54	0.540	-89	0.110
-19	0.920	-55	0.520	-90	0.100
-20	0.910	-56	0.510		
-21	0.900	-57	0.490		
-22	0.900	-58	0.480		
-23	0.890	-59	0.460		
-24	0.880	-60	0.450		
-25	0.880				

Frequency: 103.9 MHz

Model: JLLP-1  
Description: FM Sidemount Antenna  
-0° Beam Tilt, 0% Null Fill

EXHIBIT #2—ELEVATION PATTERN TABULAR FORM

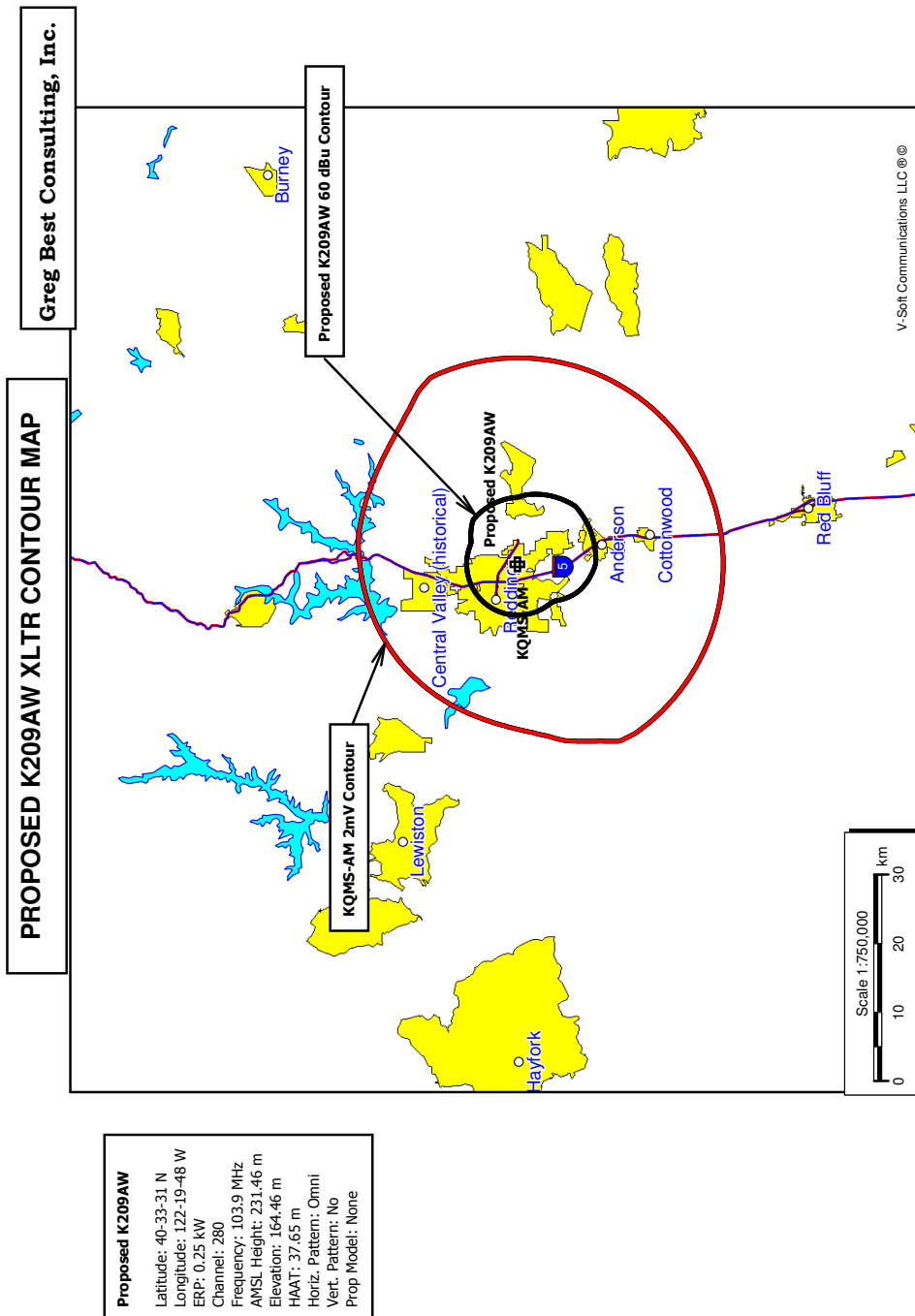


EXHIBIT #3-- PROPOSED TRANSLATOR SERVICE CONTOUR  
 & KQMS-AM 2 MV SERVICE CONTOUR

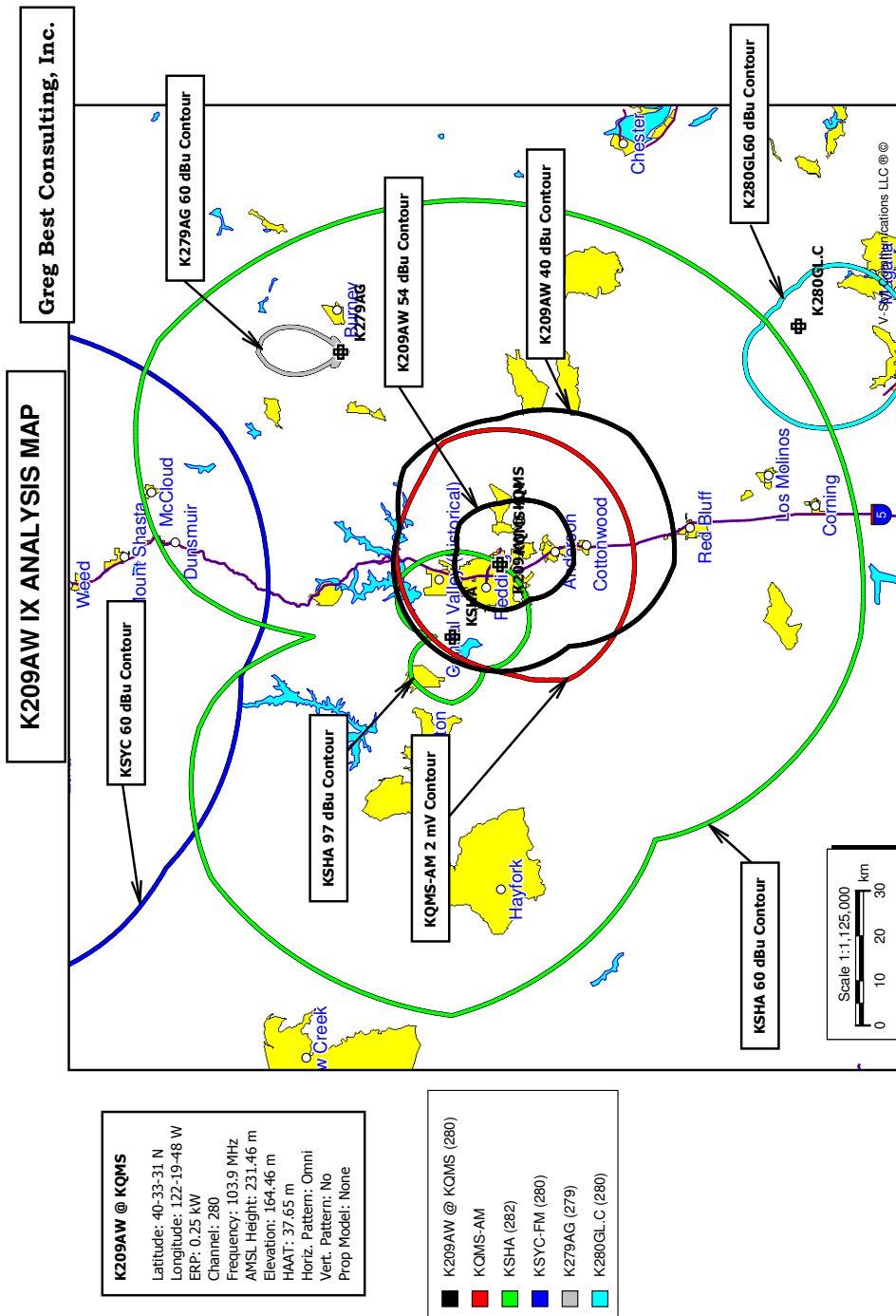


EXHIBIT #4—PROPOSED TRANSLATOR INTERFERENCE CONTOURS AND RELEVANT OTHER STATION SERVICE CONTOURS

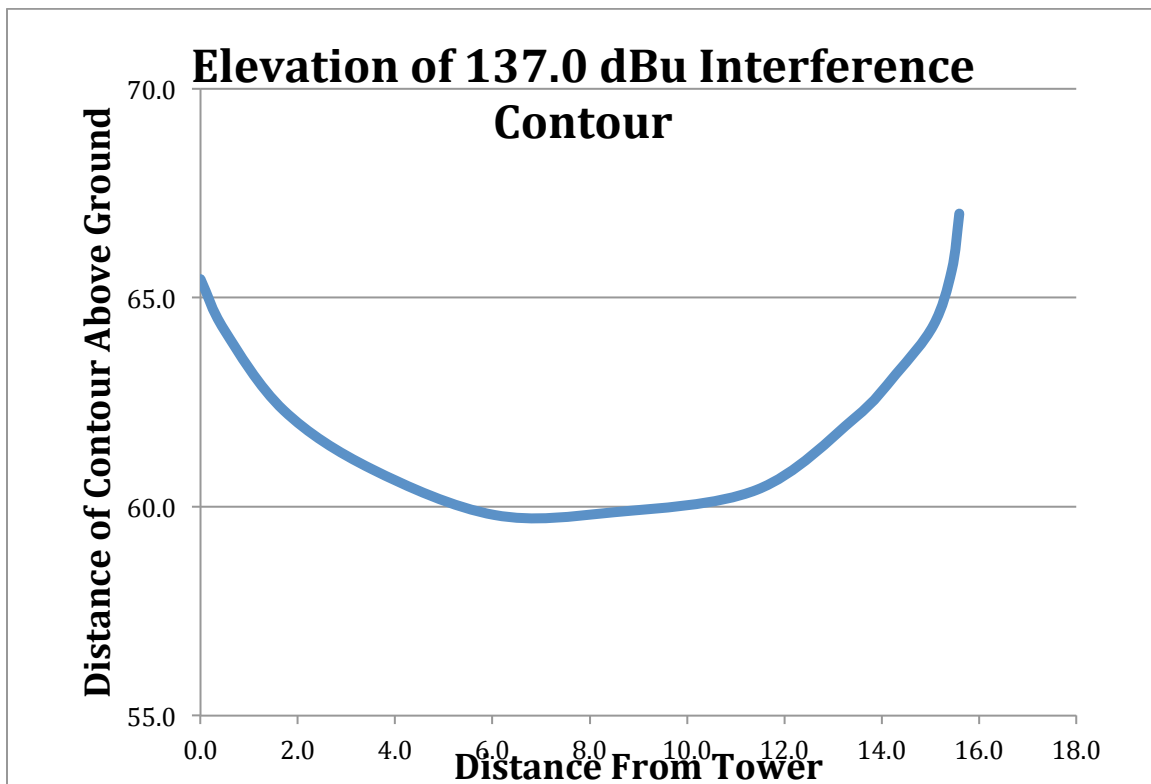


EXHIBIT #5—INTERFERING CONTOUR OF 137 dBu SIGNAL FROM PROPOSED TRANSLATOR TO KSHA

#### Certification

I hereby certify that the foregoing report or statement was prepared by me but may include work performed by others under my supervision or direction. The statements of fact contained herein are believed to be true and correct based on my personal knowledge, information and belief unless otherwise stated; with respect to facts not known of my own personal knowledge, I believe them to be true and correct based on their origin from sources known to me to be generally reliable and accurate. I have prepared this document with due care and in accordance with applicable standards of professional practice.

*Gregory L. Best, PE*