

TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT  
RADIO STATION KUVO(FM)  
DENVER, COLORADO  
CH 207C1 12.0 KW (MAX-DA) HAAT 342 METERS  
REVISED AUGUST 15, 2018

This Technical Exhibit was prepared on behalf of Rocky Mountain Public Media, Inc. (“RMPM”), licensee of noncommercial, educational FM station KUVO(FM). KUVO(FM) operates on Channel 207C1 at Denver, Colorado, file number BLED-19851022KD. The current ERP of the station is 18 kW non-directional with a Height Above Average Terrain (HAAT) of 278 meters. This power level is authorized under STA, file number BESTA20171205AAY, the purpose of which is to limit NIER exposure to the public around the current transmission site on Lookout Mountain. Operation at less than licensed power has been the situation for the station since September 2004 with a resolution remaining elusive due to various zoning, legal, and contractual issues.

It is proposed to move KUVO(FM) to an unregistered tower located at the coordinates 39° 40’ 24.4” N, 105° 13’ 02.5” W (NAD27). The proposed antenna is an existing master FM antenna, which is being used by KOSI(FM) (Channel 266C0, Denver CO), KIMN(FM) (Channel 262C0, Denver CO) and KXKL-FM (Channel 268C0, Denver CO). It is a directional antenna manufactured by ERI, model number 1182-6CP-DA-SP. Attachment 1 depicts the composite directional envelope pattern for KUVO(FM) and the tabulation for the antenna pattern is shown in Attachment 2.

#### **Table Mountain Quiet Zone, Other Coordination Considerations**

The proposed facility is located 49.37 km from the nearest Table Mountain coordinates, which is well outside the 16 km coordination distance specified in 47 CFR 1.924 of the commission’s rules for stations having less than 25 kW ERP. In addition Figure 1 shows that the 1mV/m (80 dBu) contour of the proposed station does not reach Table Mountain.

The proposed facility is located 1,036.4 km from Canada and 883.6 km from Mexico, beyond the 320 km coordination distance for those countries. The proposed facility is located 593.7 km from the nearest FCC monitoring station at Grand Island, MI, exceeding the threshold for consideration. There are no AM stations with 3.2 km of the proposed site.

#### **Environmental Considerations, Human Exposure to RF Radiation**

The proposed facility will use an existing master FM antenna in common with KOSI (FM), KIMN (FM) and KXKL (FM). No change in structure height is proposed. The site is located on a remote mountain top, with a locked gate to the access road located two miles from the site. The portions of the site that are expected to exceed public exposure limits for radiofrequency radiation have been enclosed by a fence. Recent measurements made for radio

station KOSI (FM) showed that areas outside the fence do not exceed the public exposure limit. Following the addition of KUVO (FM) to the facility, RMPN will commission a new set of measurements to confirm the RF exposure resulting from the proposed station, and if necessary, additional exposure abatement procedures will be established.

In the event that personnel are required to enter the fenced area or to climb the tower structure, the proposed KUVO (FM) transmissions will be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits. RF warning signs have been posted and will be maintained at the site.

### **Predicted Coverage Contours**

A portion of the predicted 60 dBu contour is shown in Figure 1, demonstrating coverage over the city of license.

### **Interference Analysis**

There are no IF related facilities in close proximity to the proposed facility. A list of co-channel and 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> adjacent channel stations to be considered from an interference point of view is shown in Table 1. The maximum HAAT and maximum ERP values were used in determining the maximum distance in any direction to the predicted coverage and interference contours. The maximum HAAT of the proposed KUVO (FM) facility is 342 meters. Figures 2 through 6 are depictions of the predicted coverage and interfering contours of those stations close enough to warrant further study. As shown in those figures the proposed facility meets the contour overlap requirements with respect to all pertinent stations.

### **Conclusion**

It is believe that the proposed facility satisfies all of the commission's rules and policies currently in effect.

### **Exhibit Prepared by:**

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303-725-9043

TABLE 1: DATABASE CULL RESULTS

Call	Lic	Ch.	Svc	Cls	City	St	ERP	DA	Dist
KMKZ	LIC	204	M	A	Red Feather Lakes	CO	0.005	No	137.5
KCME	LIC	204	M	C1	Manitou Springs	CO	12.0	No	107.6
KGNI	LIC	204	M	C3	Gunnison	CO	6.5	No	193.5
KDNR	LIC	204	M	A	South Greeley	WY	2.5	Yes	159.3
KAIW	LIC	205	M	C2	Saratoga	WY	0.58	No	244.1
KRFC.C	CP	205	M	C2	Fort Collins	CO	50.0	Yes	104.3
KCJX	LIC	205	M	C1	Carbondale	CO	4.0	Yes	187.1
KRFC	LIC	205	M	A	Fort Collins	CO	3.0	No	104.3
KHUI	LIC	206	M	A	Alamosa	CO	0.2	No	246.5
KTLC	LIC	206	M	C3	Canon City	CO	1.15	No	101.9
KECC	LIC	206	M	A	La Junta	CO	0.74	No	235.8
KBWA	LIC	206	M	A	Brush	CO	1.5	No	143.3
KDAI	LIC	206	M	C3	Scottsbluff	NE	1.4	No	267.4
KTDX	LIC	207	M	A	Laramie	WY	0.45	No	182.9
KUVO	LIC	207	M	C1	Denver	CO	22.5	No	6.9
KTAW	LIC	207	M	A	Walsenburg	CO	0.5	No	229.7
KLBV	LIC	207	M	C2	Steamboat Springs	CO	2.6	No	156.8
KWCC-FM	LIC	208	M	A	Woodland Park	CO	0.1	Yes	76.5
KTSC-FM	LIC	208	M	C3	Pueblo	CO	8.0	No	161.1
KQSI-LP	LIC	208	L	L1	Sidney	NE	0.065	No	250.9
KXGR	LIC	209	M	C0	Loveland	CO	80.0	No	105.3
KEPC	LIC	209	M	C3	Colorado Springs	CO	10.0	Yes	107.9
KTMH	LIC	210	M	C1	Montrose	CO	4.0	No	256.2
KPRE	LIC	210	M	A	Vail	CO	1.5	No	105.6
KTAD	LIC	210	M	C3	Sterling	CO	5.0	No	202.5

FIGURE 1: CITY OF LICENSE COVERAGE AND TABLE MOUNTAIN 1mV/m CONTOUR

KUVO PROPOSED

Latitude: 39-40-24.40 N  
Longitude: 105-13-02.50 W  
ERP: 12.00 kW  
Channel: 207  
Frequency: 89.3 MHz  
AMSL Height: 2364.0 m  
Elevation: 2294.219 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 311.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

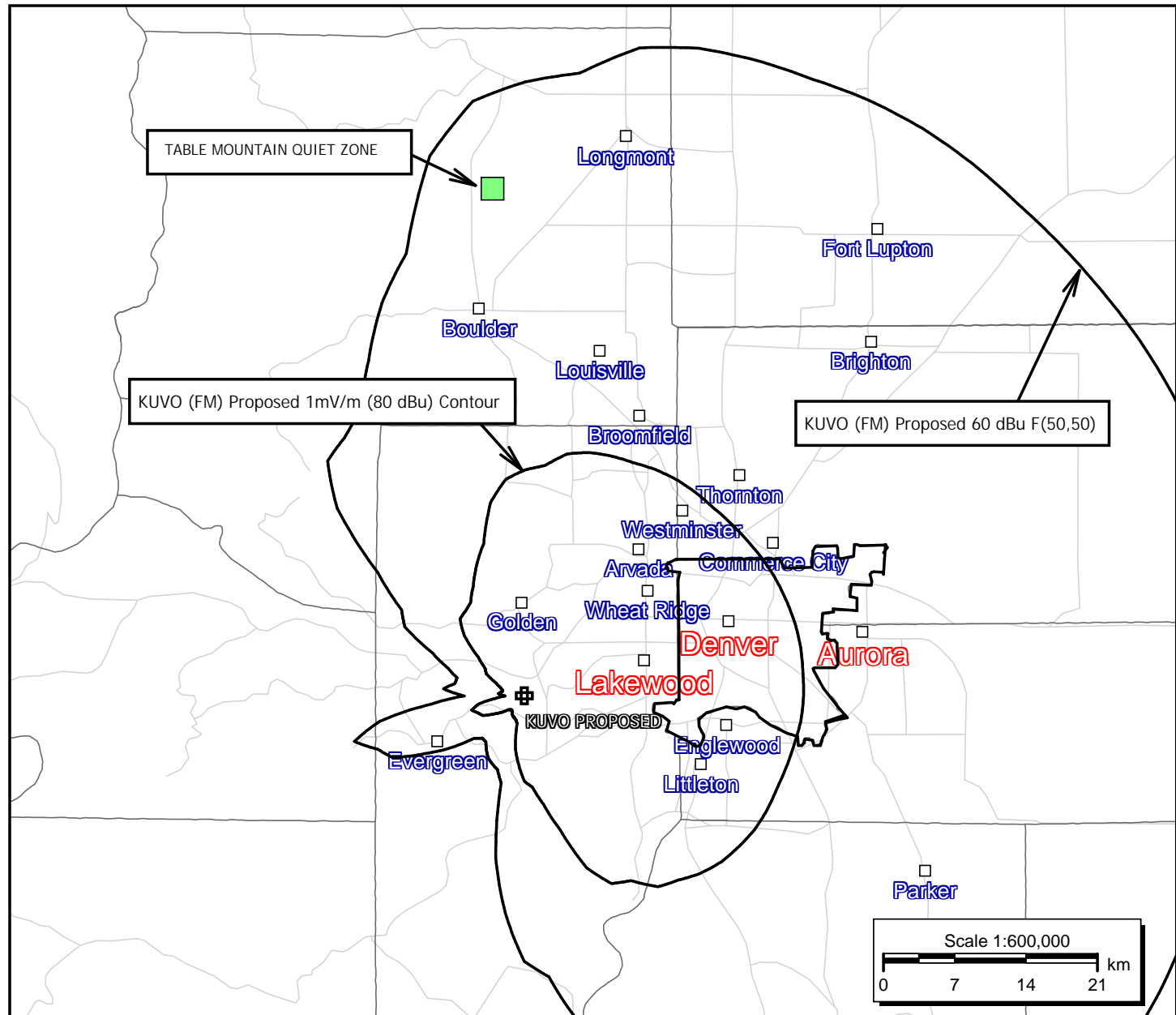


FIGURE 2: CO-CHANNEL INTERFERENCE CONTOUR OVERLAP DIAGRAM

KUVO PROPOSED

Latitude: 39-40-24.40 N  
 Longitude: 105-13-02.50 W  
 ERP: 12.00 kW  
 Channel: 207  
 Frequency: 89.3 MHz  
 AMSL Height: 2364.0 m  
 Elevation: 2294.219 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No  
 Prop Model: Longley-Rice  
 Climate: Cont temperate  
 Conductivity: 0.0050  
 Dielec Const: 15.0  
 Refractivity: 311.0  
 Receiver Ht AG: 9.1 m  
 Receiver Gain: 0 dB  
 Time Variability: 50.0%  
 Sit. Variability: 50.0%  
 ITM Mode: Broadcast

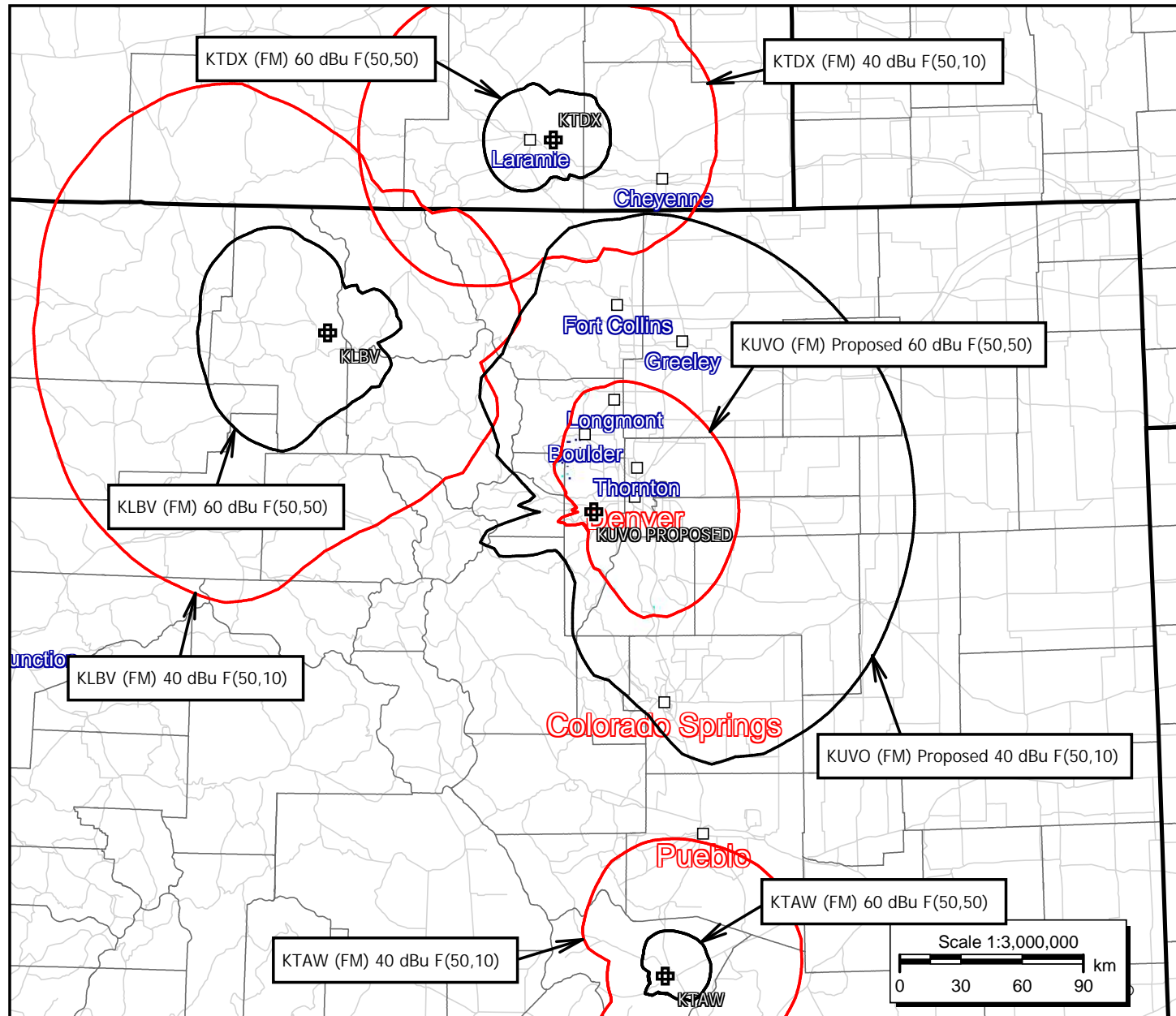


FIGURE 3: FIRST ADJACENT CHANNEL OUTGOING INTERFERENCE CONTOUR OVERLAP DIAGRAM

KUVO PROPOSED

Latitude: 39-40-24.40 N  
Longitude: 105-13-02.50 W  
ERP: 12.00 kW  
Channel: 207  
Frequency: 89.3 MHz  
AMSL Height: 2364.0 m  
Elevation: 2294.219 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 311.0  
Receiver Ht AG: 9.1 m  
Receiver Gain: 0 dB  
Time Variability: 50.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

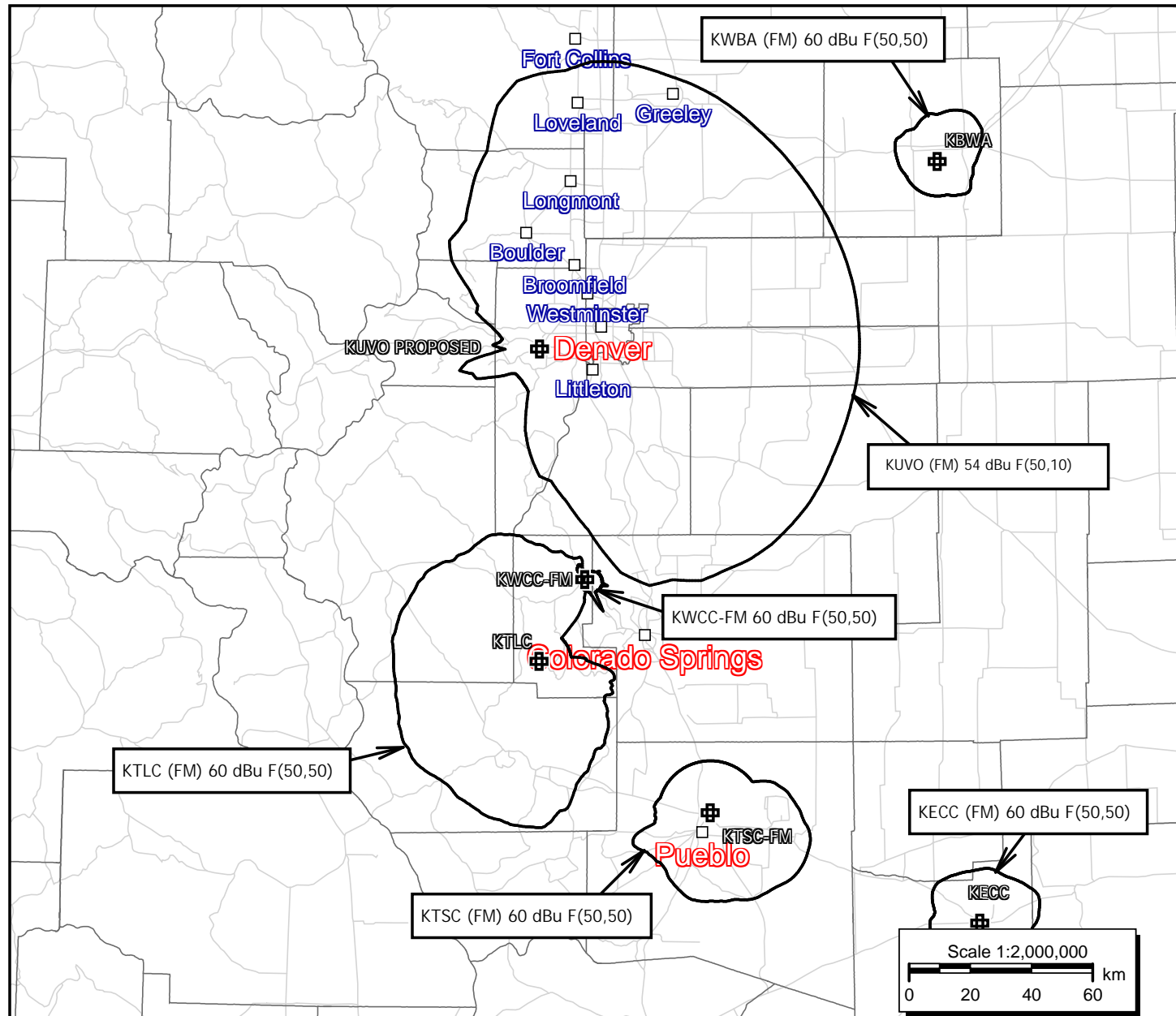


FIGURE 4: FIRST ADJACENT CHANNEL INCOMING INTERFERENCE COUTOUR OVERLAP DIAGRAM

# KUVO PROPOSED

Latitude: 39-40-24.40 N  
 Longitude: 105-13-02.50 W  
 ERP: 12.00 kW  
 Channel: 207  
 Frequency: 89.3 MHz  
 AMSL Height: 2364.0 m  
 Elevation: 2294.219 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No  
 Prop Model: Longley-Rice  
 Climate: Cont temperate  
 Conductivity: 0.0050  
 Dielec Const: 15.0  
 Refractivity: 311.0  
 Receiver Ht AG: 9.1 m  
 Receiver Gain: 0 dB  
 Time Variability: 50.0%  
 Sit. Variability: 50.0%  
 ITM Mode: Broadcast

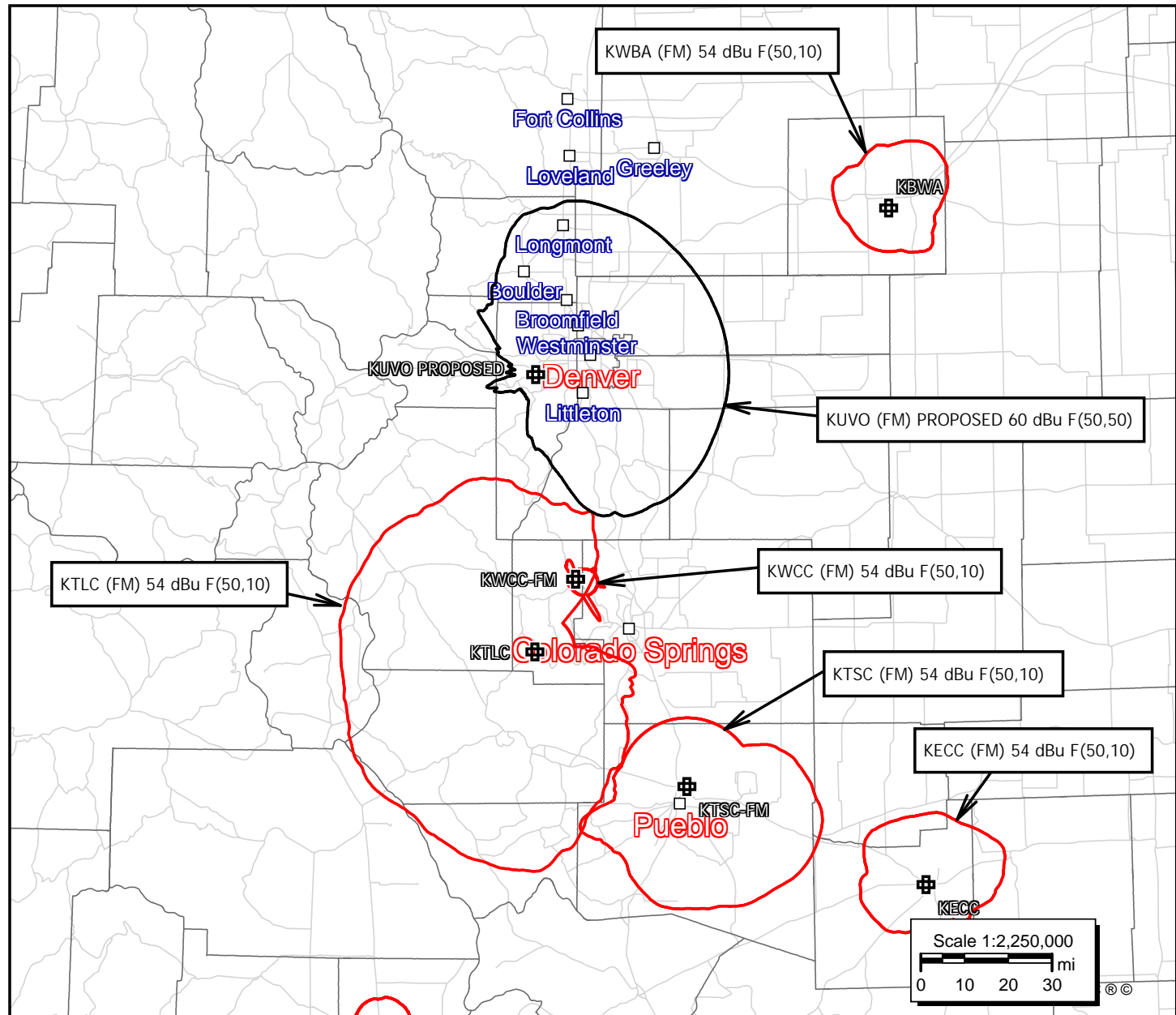


FIGURE 5: 2ND-3RD ADJACENT CHANNEL OUTGOING INTERFERENCE CONTOUR OVERLAP DIAGRAM

KUVO PROPOSED

Latitude: 39-40-24.40 N  
 Longitude: 105-13-02.50 W  
 ERP: 12.00 kW  
 Channel: 207  
 Frequency: 89.3 MHz  
 AMSL Height: 2364.0 m  
 Elevation: 2294.219 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No  
 Prop Model: Longley-Rice  
 Climate: Cont temperate  
 Conductivity: 0.0050  
 Dielec Const: 15.0  
 Refractivity: 311.0  
 Receiver Ht AG: 9.1 m  
 Receiver Gain: 0 dB  
 Time Variability: 50.0%  
 Sit. Variability: 50.0%  
 ITM Mode: Broadcast

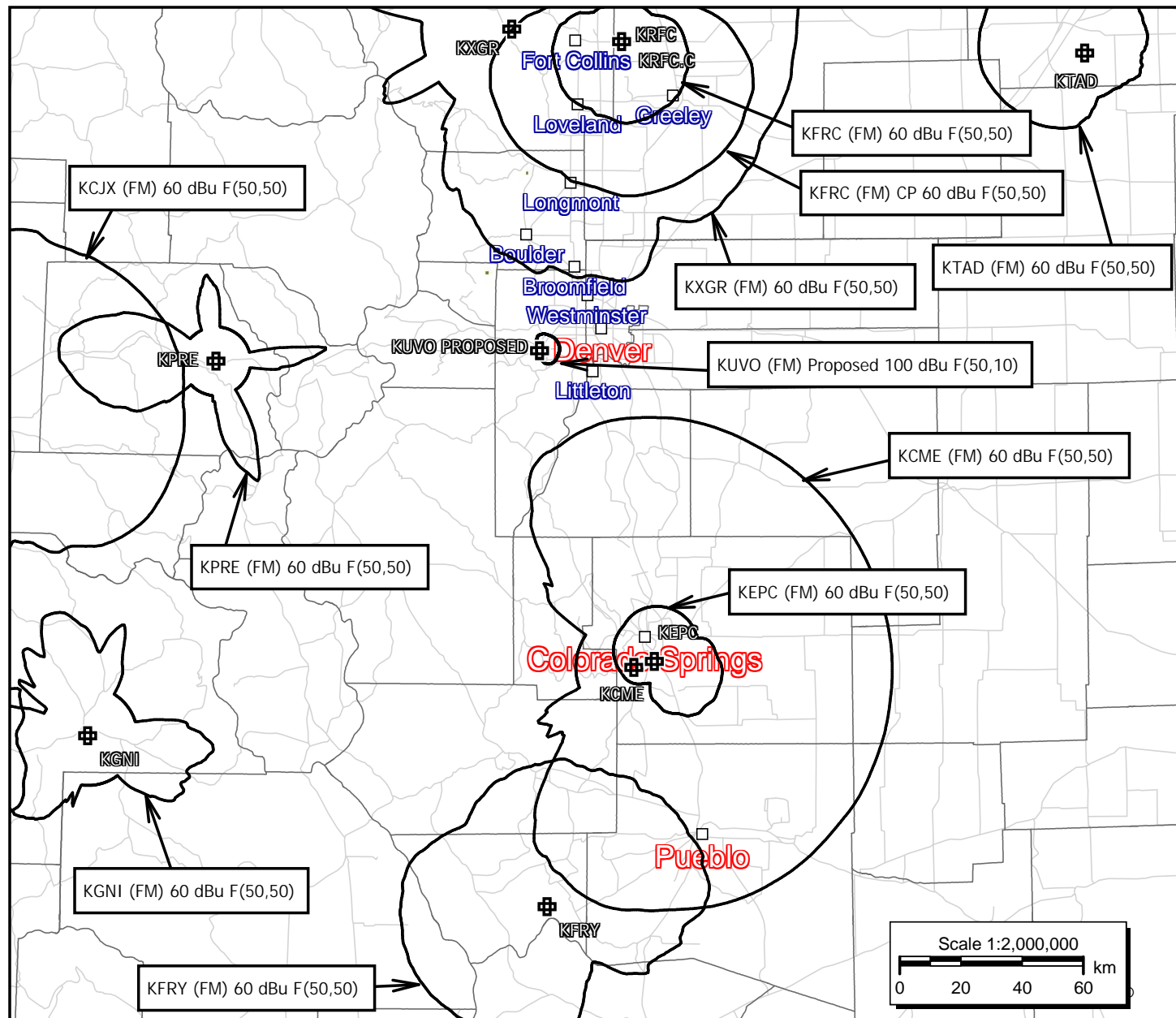
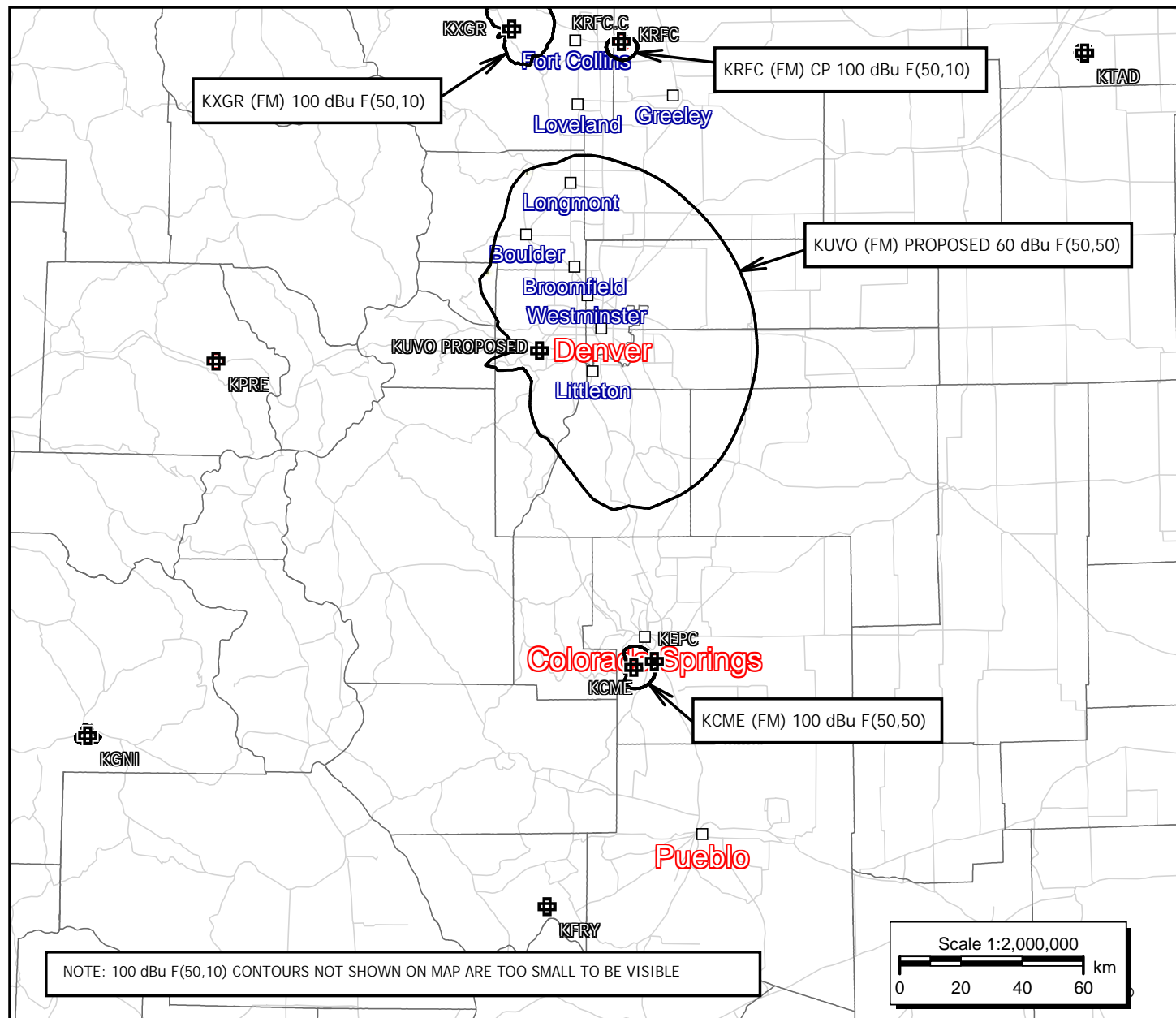




FIGURE 6: 2ND-3RD ADJACENT CHANNEL INCOMING INTERFERENCE CONTOUR OVERLAP MAP

KUVO PROPOSED

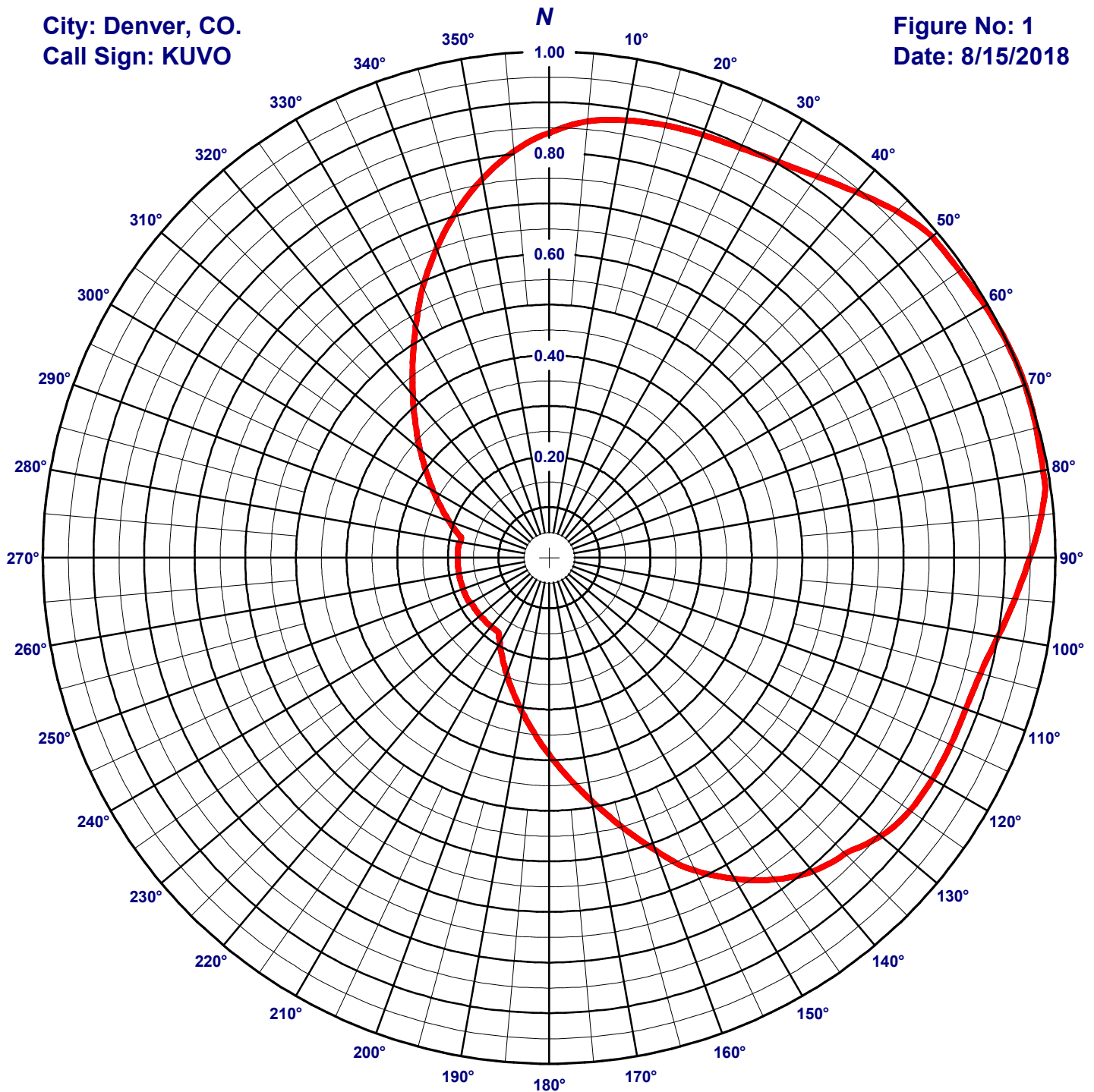
Latitude: 39-40-24.40 N  
 Longitude: 105-13-02.50 W  
 ERP: 12.00 kW  
 Channel: 207  
 Frequency: 89.3 MHz  
 AMSL Height: 2364.0 m  
 Elevation: 2294.219 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No  
 Prop Model: Longley-Rice  
 Climate: Cont temperate  
 Conductivity: 0.0050  
 Dielec Const: 15.0  
 Refractivity: 311.0  
 Receiver Ht AG: 9.1 m  
 Receiver Gain: 0 dB  
 Time Variability: 50.0%  
 Sit. Variability: 50.0%  
 ITM Mode: Broadcast



# ERI<sup>®</sup> Horizontal Plane Relative Field Pattern

City: Denver, CO.  
Call Sign: KUVU

Figure No: 1  
Date: 8/15/2018



Frequency: 89.3 MHz  
Antenna Type: 1182-6CP-DA-SP  
Antenna Orientation: 70° True  
Antenna Mounting: Custom  
Tower Type 42" Lambda

## VERTICAL

RMS: .666  
Maximum: 1 @ 68°  
Minimum: .178 @ 214°

## HORIZONTAL

RMS: .666  
Maximum: 1 @ 68°  
Minimum: .178 @ 214°

Composite pattern

# ERI<sup>®</sup> Horizontal Plane Relative Field Pattern

Electronics Research, Inc. 7777 Gardner Rd. Chandler, IN 47610 Phone(812) 925-6000 Fax(812) 925-4030 Web: www.eriinc.com

Figure# 1

Station: KUVO

Location: Denver, CO.

Frequency: 89.3 MHz

Date: 8/15/2018

Antenna: 1182-6CP-DA-SP

Antenna Orientation: 70° True

Number of Bays: 6

Azimuth	Envelope			Polarization Maximum	Azimuth	Envelope			Polarization Maximum
	Field	kW	dBk			Field	kW	dBk	
0°	0.840	8.459	9.273	Max H (and or ) V	180°	0.389	1.814	2.586	Max H (and or ) V
5°	0.866	8.989	9.537	Max H (and or ) V	185°	0.347	1.441	1.586	Max H (and or ) V
10°	0.877	9.237	9.655	Max H (and or ) V	190°	0.309	1.145	0.587	Max H (and or ) V
15°	0.885	9.400	9.731	Max H (and or ) V	195°	0.275	0.909	-0.413	Max H (and or ) V
20°	0.889	9.480	9.768	Max H (and or ) V	200°	0.245	0.722	-1.413	Max H (and or ) V
25°	0.894	9.581	9.814	Max H (and or ) V	205°	0.219	0.574	-2.413	Max H (and or ) V
30°	0.904	9.803	9.913	Max H (and or ) V	210°	0.195	0.456	-3.413	Max H (and or ) V
35°	0.920	10.165	10.071	Max H (and or ) V	215°	0.178	0.379	-4.208	Max H (and or ) V
40°	0.943	10.677	10.285	Max H (and or ) V	220°	0.178	0.379	-4.208	Max H (and or ) V
45°	0.969	11.266	10.518	Max H (and or ) V	225°	0.178	0.379	-4.208	Max H (and or ) V
50°	0.987	11.699	10.681	Max H (and or ) V	230°	0.178	0.379	-4.208	Max H (and or ) V
55°	0.989	11.744	10.698	Max H (and or ) V	235°	0.178	0.379	-4.208	Max H (and or ) V
60°	0.994	11.864	10.742	Max H (and or ) V	240°	0.178	0.379	-4.208	Max H (and or ) V
65°	0.999	11.984	10.786	Max H (and or ) V	245°	0.181	0.392	-4.062	Max H (and or ) V
70°	1.000	11.995	10.790	Max H (and or ) V	250°	0.181	0.392	-4.062	Max H (and or ) V
75°	0.996	11.898	10.755	Max H (and or ) V	255°	0.181	0.392	-4.062	Max H (and or ) V
80°	0.991	11.778	10.711	Max H (and or ) V	260°	0.181	0.392	-4.062	Max H (and or ) V
85°	0.976	11.435	10.582	Max H (and or ) V	265°	0.181	0.392	-4.062	Max H (and or ) V
90°	0.950	10.819	10.342	Max H (and or ) V	270°	0.181	0.392	-4.062	Max H (and or ) V
95°	0.924	10.242	10.104	Max H (and or ) V	275°	0.181	0.392	-4.062	Max H (and or ) V
100°	0.900	9.723	9.878	Max H (and or ) V	280°	0.178	0.379	-4.208	Max H (and or ) V
105°	0.882	9.339	9.703	Max H (and or ) V	285°	0.187	0.420	-3.764	Max H (and or ) V
110°	0.876	9.202	9.639	Max H (and or ) V	290°	0.210	0.529	-2.765	Max H (and or ) V
115°	0.875	9.188	9.632	Max H (and or ) V	295°	0.236	0.666	-1.765	Max H (and or ) V
120°	0.874	9.168	9.623	Max H (and or ) V	300°	0.264	0.839	-0.765	Max H (and or ) V
125°	0.870	9.090	9.585	Max H (and or ) V	305°	0.297	1.056	0.235	Max H (and or ) V
130°	0.855	8.776	9.433	Max H (and or ) V	310°	0.333	1.329	1.235	Max H (and or ) V
135°	0.827	8.211	9.144	Max H (and or ) V	315°	0.373	1.673	2.235	Max H (and or ) V
140°	0.809	7.857	8.952	Max H (and or ) V	320°	0.419	2.106	3.235	Max H (and or ) V
145°	0.776	7.230	8.591	Max H (and or ) V	325°	0.470	2.651	4.234	Max H (and or ) V
150°	0.733	6.446	8.093	Max H (and or ) V	330°	0.527	3.338	5.234	Max H (and or ) V
155°	0.682	5.582	7.468	Max H (and or ) V	335°	0.590	4.184	6.216	Max H (and or ) V
160°	0.616	4.556	6.586	Max H (and or ) V	340°	0.650	5.072	7.052	Max H (and or ) V
165°	0.549	3.619	5.586	Max H (and or ) V	345°	0.708	6.010	7.789	Max H (and or ) V
170°	0.489	2.875	4.586	Max H (and or ) V	350°	0.760	6.940	8.414	Max H (and or ) V
175°	0.436	2.284	3.586	Max H (and or ) V	355°	0.805	7.784	8.912	Max H (and or ) V

Reference: KUVO4E.FIG

Composie pattern