



***Engineering Exhibit***

***Modification of Construction Permit for  
Minor Change of Transmitting Facilities***

***BP-20050124AKA***

***Roger L. Hoppe, II  
KLIM(AM), 1120 KHz  
Black Forest, Colorado***

***June 2008***

***Prepared by:***

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## **ENGINEERING STATEMENT**

### **AMENDMENT TO MODIFY CONSTRUCTION PERMIT BP-20050124AKA ROGER L. HOPPE, II KLIM(AM), BLACK FOREST, COLORADO**

**1120 KHz 17.5 KW-D/3 W-N DA-2**

This Engineering Statement and attached exhibits have been prepared on behalf of Roger L. Hoppe, II, licensee of KLIM(AM), 1120 KHz, in Limon, Colorado (250 watts ND-D), by B. Benjamin Evans, P.E. of Evans Associates Consulting Communications Engineers. KLIM has a construction permit to change the transmitter location, construct a directional antenna and increase power daytime. The purpose of this FCC Form 301 application is to change the community of license to Black Forest, Colorado, and to make changes in the engineering exhibit to reflect the proposed change in the community of license. This modification application proposes no other changes besides the change in community of license. However, in the interest of completeness, the entire engineering exhibit is included herein.

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### **PROPOSED FACILITIES**

The proposed antenna array consists of three uniform cross section guyed radiating towers arranged more or less on an east-west line (see attached Figure 2). All towers will be 79.9 degrees in radiating height, and 198 feet overall AGL.

The operating power will be 17.5 kilowatts daytime, and 3 watts nighttime. The nighttime operation will use the daytime directional antenna system parameters.

### **TRANSMITTER SITE**

Figure 6 is a 7.5-minute topographic map showing the proposed site.

### **SIGNAL COVERAGE**

The proposed predicted 5 mV/m daytime contour extends well beyond Black Forest, the proposed community of license (see Figure 8-B).



*Engineering Statement - Page 2*  
*KLIM(AM), Black Forest, CO*

## **DAYTIME ALLOCATIONS**

The proposed KLIM daytime operation will protect all pertinent daytime operations, both existing and proposed, within 30 KHz of 1120 KHz from interference in accordance with §73.37 of the FCC Rules. All daytime contours shown in the attachments have been determined using M-3 conductivities.

## **CRITICAL HOURS PROTECTION**

The proposed KLIM daytime operation will protect the 0.1 mV/m groundwave contour of the U.S. Class A station on 1120 KHz, KMOX, St. Louis, MO, during critical hours, as required under §73.187 of the FCC Rules (see Figure 5).

## **NIGHTTIME ALLOCATIONS**

The proposed KLIM nighttime operation, at 3 watts, will not cause prohibited skywave interference to the service area of KMOX or any other co- or adjacent-channel station, either existing or proposed (see Figure 10).

## **TOWER FENCES**

Fences will be erected around each tower to prevent persons from traveling or standing in areas where the RF radiation levels may exceed the FCC maximum exposure limits. The distances to these fences will comply with Supplement A of OET Bulletin 65, Edition 97-01, dated August 1997, or RFR measurements will be taken on the constructed facility to demonstrate that smaller-radius fences would be adequate.

## **ENVIRONMENTAL AND AERONAUTICAL MATTERS**

The proposed facility is not deemed to be a major environmental action as defined in §1.1306 of the FCC Rules. The proposed site is not in any area described in §1.1307(a)(1) through (7) of the FCC Rules. The tower fences as described above will assure that the levels of RF exposure in areas accessible to the public will be below FCC guidelines. Therefore, this proposal is excluded from environmental processing.



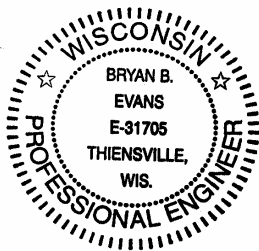
*Engineering Statement - Page 3*  
*KLIM(AM), Black Forest, CO*

The proposed towers, at 198 feet AGL, do not require notification to the FAA, nor do they need to be registered with the FCC.

This statement and attached figures are true and accurate to the best of my knowledge and belief.

A handwritten signature in black ink, appearing to read "B. Benjamin Evans".

B. Benjamin Evans, P.E.  
Consulting Engineer for Roger L. Hoppe, II



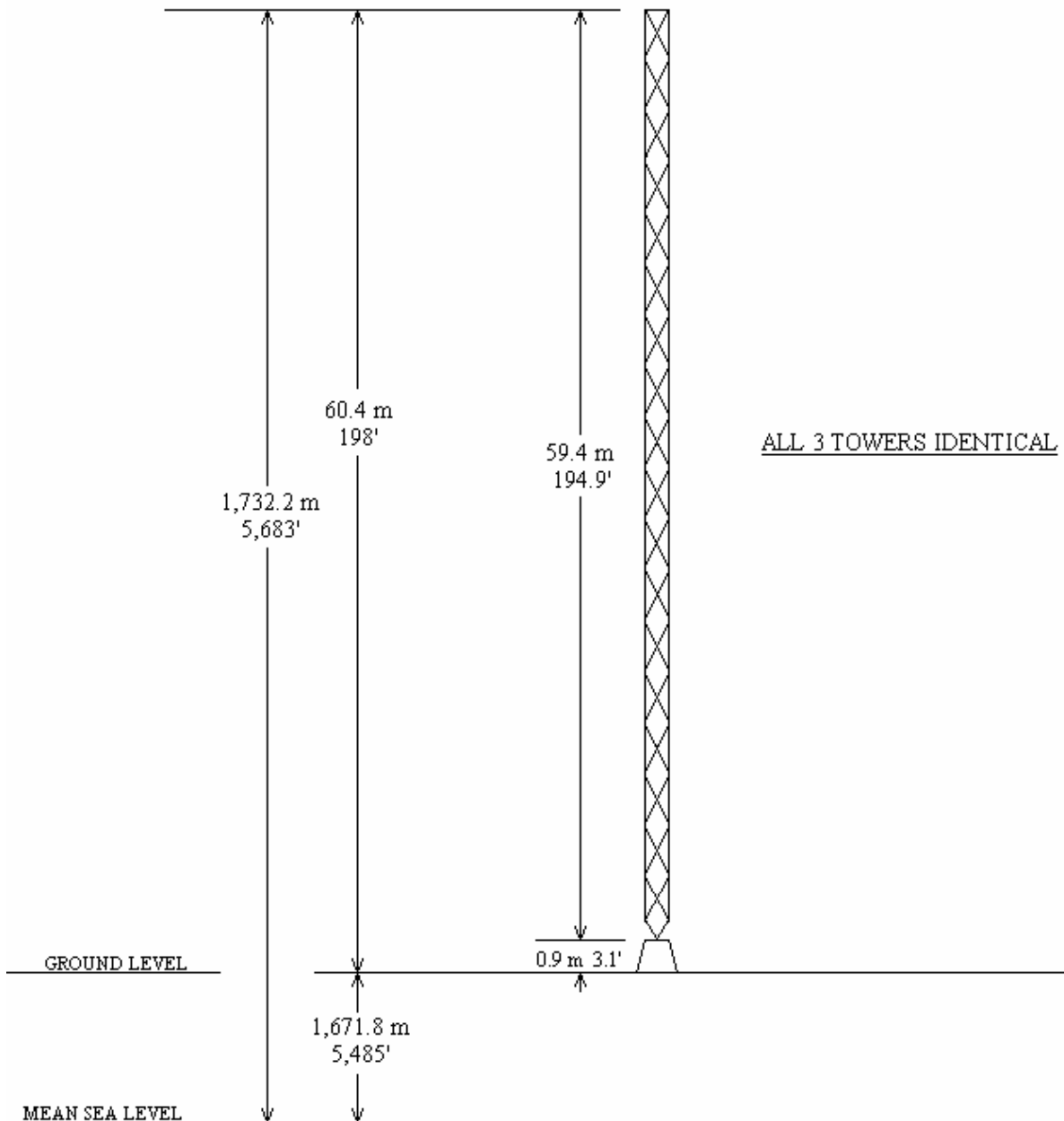
June 12, 2008

**ATTACHED FIGURES:**

- Figure 1 - - - Vertical Plan Tower Sketch
- Figure 2 - - - Tower Layout & Ground System Sketch
- Figure 3 - - - Daytime & Nighttime Directional Standard Pattern Polar Plots
- Figure 4 - - - Daytime Allocation Study
- Figure 5 - - - Critical Hours Study – KMOX, St. Louis, MO
- Figure 6 - - - Topographic Map Showing Proposed Site
- Figure 7 - - - Specifications of Proposed Daytime & Nighttime Patterns
- Figure 8 - - - Maps Showing Proposed Daytime Contours
- Figure 9 - - - Distances to Proposed Daytime Contours
- Figure 10 - - - Nighttime Radiation Limit Calculations
- Figure 11 - - - Aerial Photograph of Proposed Transmitter Site

FIGURE 1

Drawing Not to Scale - Not  
to be used for Construction.

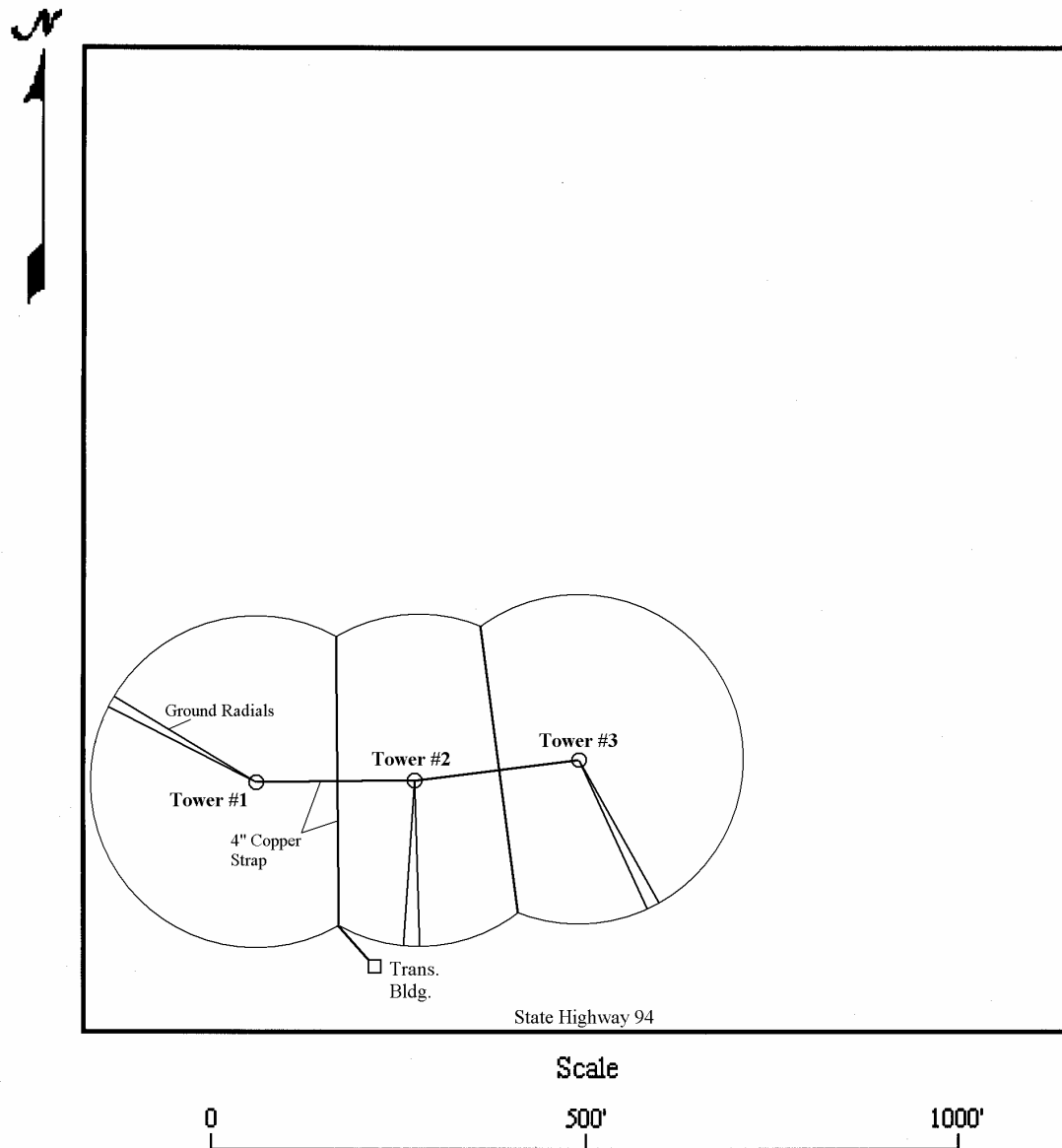


VERTICAL PLAN SKETCH OF ANTENNA STRUCTURE

KLIM(AM), 1120 KHz  
Black Forest, Colorado

Figure 2

***KLIM(AM), 1120 KHz, Black Forest CO  
Proposed Tower Layout  
& Ground System***



**Ground Radials:**

240 #10 bare copper wires, extending at least 220' or to intersecting strap, around each tower, buried 4-6. Outer ends of radials should be bonded to a ground strap along the perimeter.

**This is a plan drawing only, and not to be used for construction.**

Figure 3-A

*Proposed Daytime Standard Pattern  
KLIM(AM), Black Forest, CO*

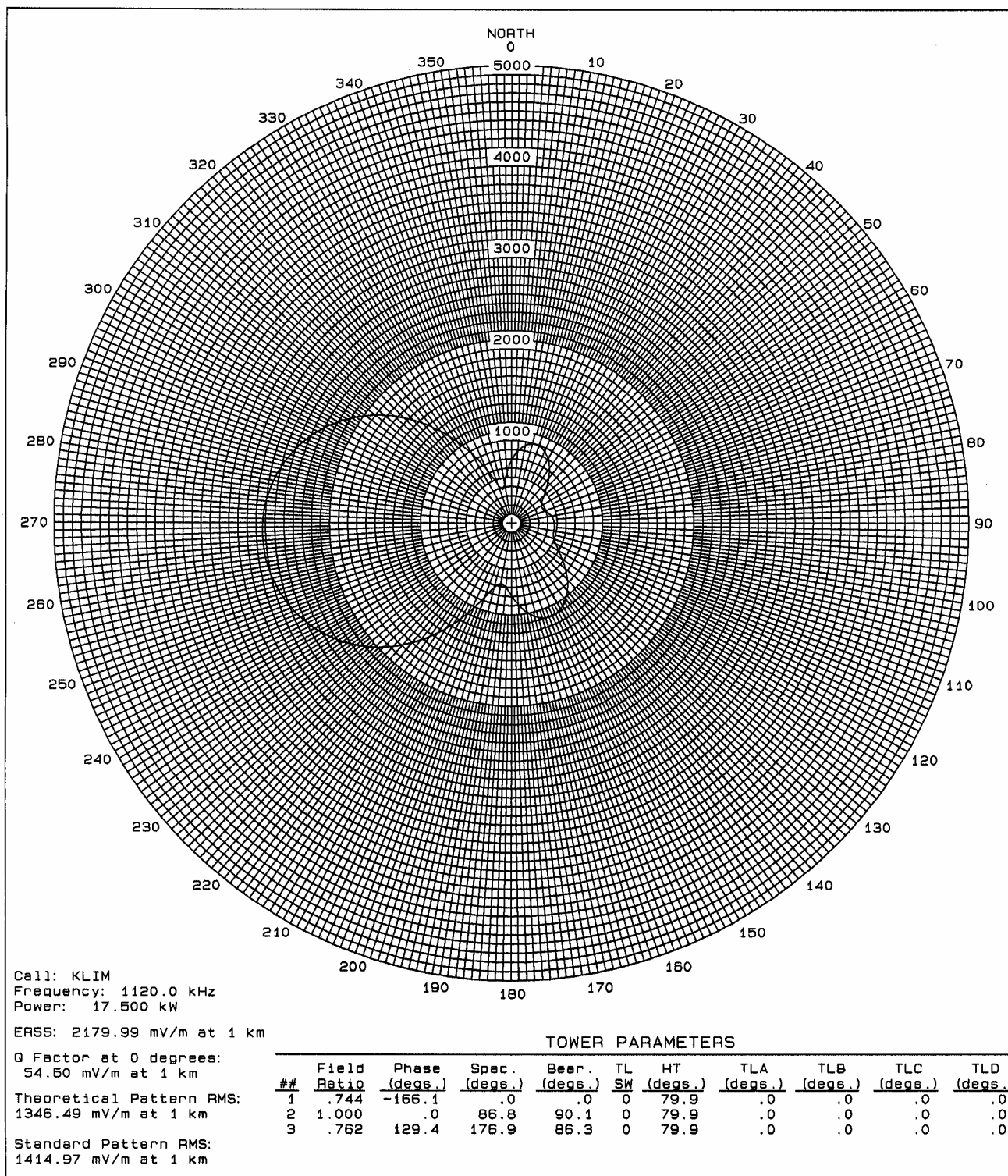
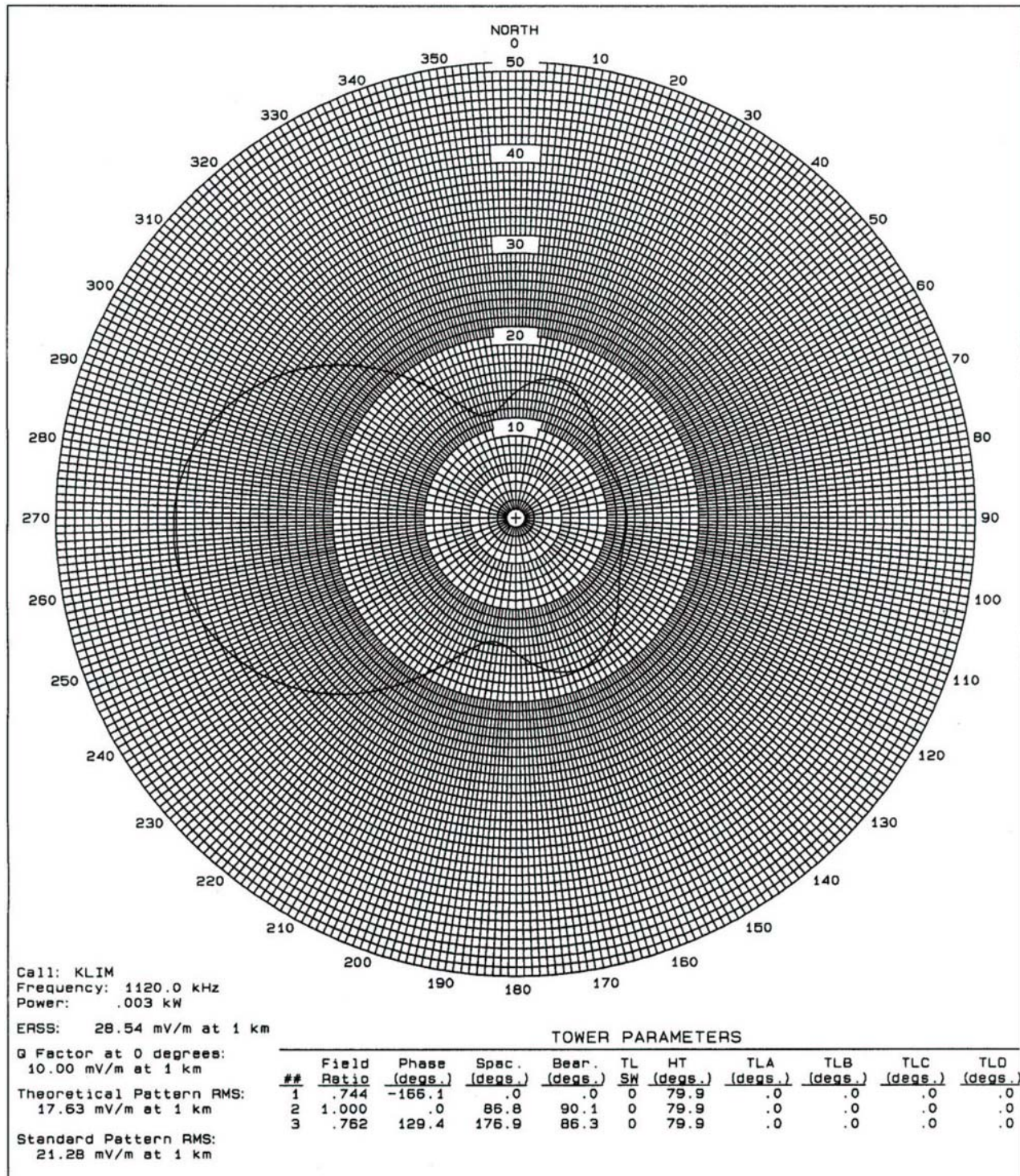




Figure 3-B

**Proposed Nighttime Standard Pattern  
KLIM(AM), Black Forest, CO**





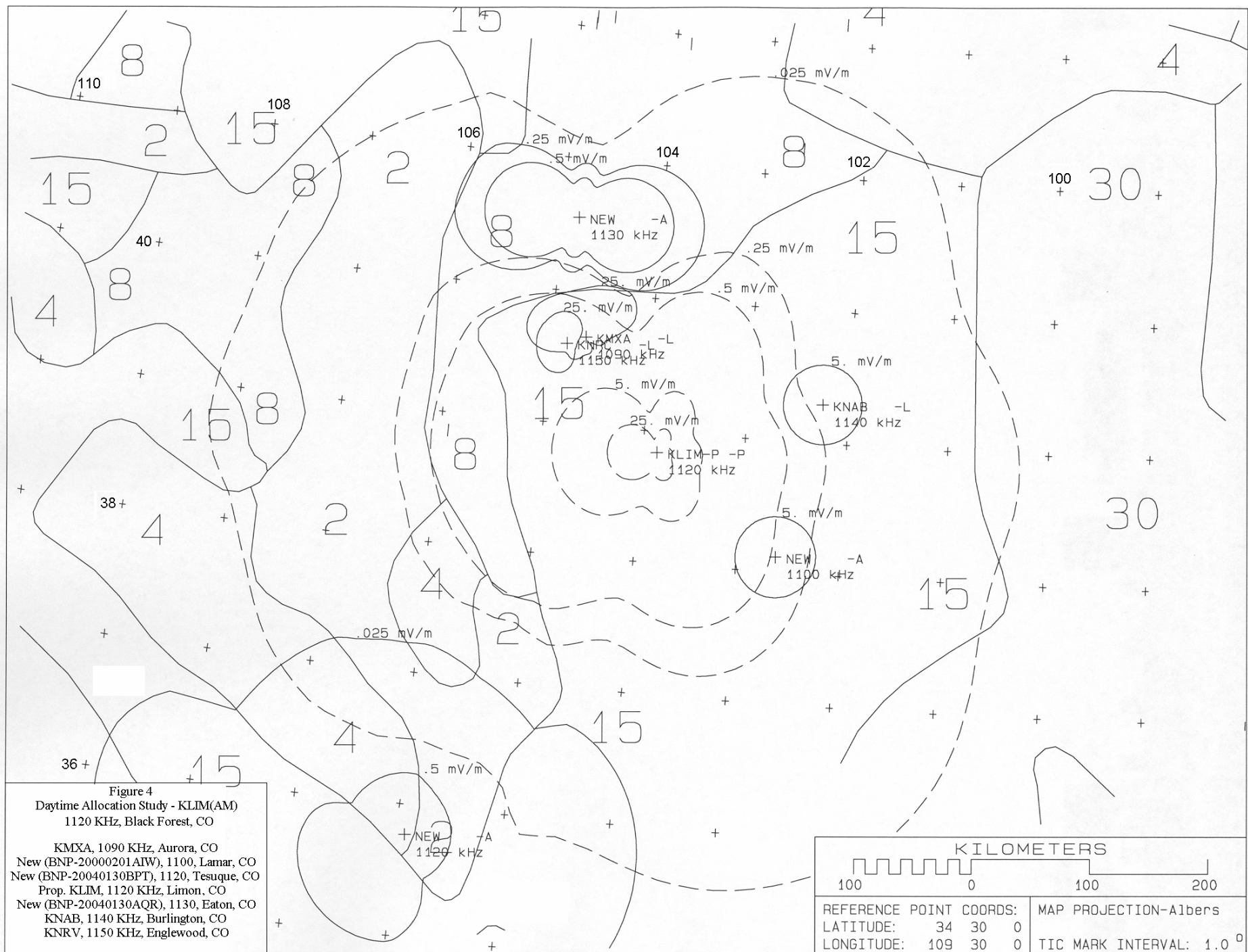


Figure 5

**CALCULATION OF  
CRITICAL HOURS RADIATION LIMITS  
TO 0.1 MV/M DAYTIME CONTOUR OF CLASS A STATION**

**PROPOSED KLIM, BLACK FOREST, CO  
TO  
KMOX, ST. LOUIS, MO**

KMOX Point #	Az.(°T) from KMOX to 0.1 mv/m	Dist.(km) to 0.1 mv/m from KMOX	Coords. of Point on KMOX 0.1 mv/m	Dist.(mi) from KLIM to KMOX Point	Az.(°T) from KLIM to KMOX Point
1	230.0	290.4	37-00-59; 92-33-39	627.5	98.1
2	240.0	290.4	37-22-54; 92-54-07	603.2	96.2
3	250.0	290.2	37-47-19; 93-09-33	583.7	93.8
4	260.0	289.6	38-13-29; 93-19-15	570.3	91.0
5	270.0	297.4	38-40-21; 93-28-55	558.4	87.9
6	280.0	302.1	39-08-38; 93-30-22	555.5	84.6
7	290.0	304.1	39-36-39; 93-23-31	561.9	81.3
8	300.0	304.6	40-03-06; 93-09-18	576.3	78.3
9	310.0	305.3	40-27-20; 92-49-10	596.9	75.7

KMOX Point #	Dist.(km) from KLIM to KMOX Point	Az.(°T) from KLIM to KMOX Point	Rad.(mv/m@ 1mi) from Fig. 10	Rad.(mv/m@ 1mi) from Fig. 11	Rad. Limit <sup>1</sup> (mv/m@ 1 km)	Vert. Angle (Curve 2 of Fig. 6a)	Prop. KLIM Rad. <sup>2</sup> (mv/m @ 1 km)
9	960.4	75.7	420	148	588.3	11.9	425.3
8	927.3	78.3	410	144	574.1	12.4	438.3
7	904.1	81.3	405	142	567.0	12.8	451.2
6	893.8	84.6	400	139	559.6	13.0	462.0
5	898.5	87.9	402	138	561.9	12.9	468.9
4	917.6	91.0	410	140	572.8	12.6	472.1
3	939.2	93.8	413	142	577.3	12.2	472.9
2	970.5	96.2	422	147	590.5	11.7	472.6
1	1009.6	98.1	438	152	612.7	11.1	472.3

<sup>1</sup> Calculated by the following:  $1.609 \times (0.8 \times \text{Rad.}_{\text{Fig. 10}} + 0.2 \times \text{Rad.}_{\text{Fig. 11}})$

<sup>2</sup> Maximum radiation occurs at 0° vertical angle for all above entries.





**Figure 7-A**

**SPECIFICATIONS OF PROPOSED DAYTIME PATTERN  
KLIM(AM), 1120 KHz  
BLACK FOREST, COLORADO**

Power: 17.500 kW

ERSS: 2179.99 mV/m at 1 km

Multiplying Constant (K factor): 1492.24 mV/m at 1 km

Q Factor (elevation angle = 0 degrees): 54.50

Theoretical Pattern RMS: 1346.49 mV/m at 1 km

Standard Pattern RMS: 1414.97 mV/m at 1 km

**ANTENNA ARRAY PARAMETERS:**

Field	Phase	Spac.	Bear.	TL	HT	TLA	TLB	TLC	TLD
Ratio	(deg.)	(deg.)	(deg.)	SW	(deg.)	(deg.)	(deg.)	(deg.)	(deg.)
1	0.744	-166.1	0.0	0.0	0	79.9	0.0	0.0	0.0
2	1.000	0.0	86.8	90.1	0	79.9	0.0	0.0	0.0
3	0.762	129.4	176.9	86.3	0	79.9	0.0	0.0	0.0

CALCULATED STANDARD PATTERN RADIATIONS (in mV/m at 1 km)							
Elevation Angle = 0°							
Az.(°T)	Rad.(mV/m)	Az.(°T)	Rad.(mV/m)	Az.(°T)	Rad.(mV/m)	Az.(°T)	Rad.(mV/m)
0.0	681.64	90.0	471.33	180.0	790.49	270.0	2729.98
5.0	784.78	95.0	472.79	185.0	703.79	275.0	2702.89
10.0	855.71	100.0	472.34	190.0	671.81	280.0	2651.91
15.0	891.17	105.0	477.61	195.0	725.69	285.0	2576.45
20.0	891.74	110.0	497.26	200.0	861.67	290.0	2475.88
25.0	860.69	115.0	537.82	205.0	1051.11	295.0	2349.73
30.0	803.31	120.0	600.67	210.0	1266.47	300.0	2197.96
35.0	726.49	125.0	681.81	215.0	1488.85	305.0	2021.18
40.0	638.48	130.0	773.86	220.0	1705.93	310.0	1821.02
45.0	548.77	135.0	868.16	225.0	1909.65	315.0	1600.34
50.0	468.21	140.0	956.05	230.0	2094.77	320.0	1363.65
55.0	408.19	145.0	1029.42	235.0	2258.06	325.0	1117.51
60.0	377.47	150.0	1081.12	240.0	2397.75	330.0	871.63
65.0	376.26	155.0	1105.36	245.0	2513.10	335.0	641.75
70.0	395.13	160.0	1098.26	250.0	2604.04	340.0	458.59
75.0	421.56	165.0	1058.47	255.0	2670.85	345.0	380.14
80.0	445.93	170.0	988.04	260.0	2713.93	350.0	435.27
85.0	463.00	175.0	893.90	265.0	2733.61	355.0	556.43



**Figure 7-B**

**SPECIFICATIONS OF PROPOSED NIGHTTIME PATTERN  
KLIM(AM), 1120 KHz  
BLACK FOREST, COLORADO**

Power: .003 kW

ERSS: 28.54 mV/m at 1 km

Multiplying Constant (K factor): 19.54 mV/m at 1 km

Q Factor (elevation angle = 0 degrees): 10.00

Theoretical Pattern RMS: 17.63 mV/m at 1 km

Standard Pattern RMS: 21.28 mV/m at 1 km

**ANTENNA ARRAY PARAMETERS:**

Twr #	Field Ratio	Phase (deg.)	Spac. (deg.)	Bear. (deg.)	TL SW	HT (deg.)	TLA (deg.)	TLB (deg.)	TLC (deg.)	TLD (deg.)
1	.744	-166.1	.0	.0	0	79.9	.0	.0	.0	.0
2	1.000	.0	86.8	90.1	0	79.9	.0	.0	.0	.0
3	.762	129.4	176.9	86.3	0	79.9	.0	.0	.0	.0

**CALCULATED STANDARD PATTERN DATA (in mV/m at 1 km):**

Azimuth (deg.)	Elevation Angle (degrees):								
	.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00
.0	13.76	13.69	13.48	13.14	12.67	12.09	11.41	10.65	9.82
5.0	14.67	14.59	14.36	13.99	13.47	12.83	12.09	11.25	10.34
10.0	15.34	15.26	15.01	14.62	14.08	13.41	12.62	11.74	10.78
15.0	15.68	15.60	15.36	14.97	14.43	13.76	12.97	12.08	11.10
20.0	15.68	15.61	15.39	15.02	14.52	13.88	13.12	12.25	11.29
25.0	15.38	15.32	15.12	14.80	14.34	13.77	13.07	12.26	11.34
30.0	14.84	14.79	14.63	14.35	13.97	13.47	12.85	12.12	11.28
35.0	14.15	14.11	13.97	13.75	13.44	13.03	12.51	11.87	11.12
40.0	13.40	13.37	13.26	13.09	12.84	12.51	12.08	11.55	10.90
45.0	12.70	12.67	12.59	12.45	12.24	11.97	11.62	11.18	10.63
50.0	12.14	12.11	12.02	11.89	11.71	11.48	11.18	10.81	10.34
55.0	11.76	11.72	11.63	11.48	11.28	11.06	10.80	10.47	10.07
60.0	11.58	11.54	11.41	11.22	11.00	10.75	10.48	10.19	9.83
65.0	11.57	11.52	11.36	11.12	10.84	10.55	10.26	9.96	9.63
70.0	11.68	11.61	11.41	11.12	10.78	10.44	10.12	9.81	9.48
75.0	11.84	11.76	11.53	11.19	10.80	10.41	10.04	9.72	9.39
80.0	11.99	11.90	11.65	11.29	10.86	10.43	10.03	9.68	9.35
85.0	12.10	12.01	11.75	11.37	10.92	10.47	10.06	9.70	9.37
90.0	12.16	12.07	11.81	11.44	10.99	10.55	10.14	9.78	9.43
95.0	12.17	12.08	11.84	11.49	11.07	10.65	10.26	9.90	9.55
100.0	12.16	12.09	11.87	11.56	11.18	10.80	10.43	10.08	9.72
105.0	12.20	12.13	11.95	11.68	11.35	11.01	10.67	10.32	9.94
110.0	12.33	12.28	12.13	11.90	11.62	11.31	10.99	10.63	10.21
115.0	12.62	12.58	12.45	12.26	12.01	11.72	11.39	11.00	10.53
120.0	13.10	13.06	12.95	12.77	12.53	12.23	11.87	11.43	10.88
125.0	13.76	13.72	13.61	13.42	13.16	12.83	12.40	11.89	11.25



CALCULATED STANDARD PATTERN DATA (in mV/m at 1 km):

Azimuth (degs.)	Elevation .00	Angle (degrees): 5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00
130.0	14.57	14.53	14.40	14.18	13.87	13.47	12.97	12.35	11.62
135.0	15.46	15.40	15.25	14.98	14.61	14.12	13.52	12.79	11.95
140.0	16.32	16.26	16.06	15.74	15.29	14.71	14.00	13.17	12.22
145.0	17.07	16.99	16.76	16.38	15.85	15.18	14.37	13.44	12.40
150.0	17.61	17.52	17.26	16.83	16.23	15.48	14.59	13.58	12.46
155.0	17.86	17.77	17.48	17.01	16.37	15.57	14.62	13.56	12.40
160.0	17.79	17.69	17.39	16.90	16.24	15.41	14.45	13.37	12.20
165.0	17.37	17.27	16.97	16.49	15.83	15.01	14.06	13.00	11.86
170.0	16.64	16.55	16.27	15.80	15.17	14.40	13.50	12.49	11.41
175.0	15.71	15.62	15.36	14.93	14.36	13.64	12.81	11.89	10.88
180.0	14.72	14.65	14.41	14.03	13.51	12.86	12.11	11.27	10.35
185.0	13.95	13.88	13.66	13.30	12.82	12.22	11.52	10.73	9.88
190.0	13.68	13.60	13.38	13.01	12.51	11.91	11.20	10.42	9.58
195.0	14.14	14.05	13.79	13.36	12.79	12.09	11.30	10.44	9.53
200.0	15.39	15.28	14.95	14.41	13.70	12.84	11.88	10.85	9.79
205.0	17.29	17.15	16.73	16.06	15.17	14.10	12.91	11.64	10.36
210.0	19.61	19.44	18.93	18.11	17.02	15.72	14.27	12.73	11.18
215.0	22.13	21.93	21.33	20.36	19.08	17.55	15.83	14.02	12.18
220.0	24.67	24.44	23.76	22.66	21.20	19.44	17.48	15.40	13.28
225.0	27.11	26.85	26.10	24.88	23.26	21.31	19.11	16.78	14.41
230.0	29.36	29.08	28.27	26.95	25.18	23.06	20.66	18.11	15.50
235.0	31.37	31.07	30.20	28.80	26.92	24.65	22.08	19.33	16.52
240.0	33.10	32.79	31.88	30.40	28.43	26.03	23.33	20.42	17.43
245.0	34.53	34.21	33.27	31.74	29.69	27.20	24.38	21.34	18.21
250.0	35.67	35.34	34.37	32.80	30.70	28.13	25.22	22.08	18.84
255.0	36.50	36.17	35.19	33.59	31.44	28.83	25.85	22.63	19.31
260.0	37.05	36.71	35.71	34.10	31.92	29.27	26.26	22.99	19.61
265.0	37.29	36.96	35.95	34.33	32.14	29.48	26.44	23.15	19.75
270.0	37.25	36.91	35.91	34.28	32.10	29.43	26.40	23.11	19.71
275.0	36.91	36.57	35.58	33.96	31.79	29.14	26.13	22.87	19.50
280.0	36.27	35.94	34.95	33.36	31.21	28.60	25.64	22.43	19.12
285.0	35.32	35.00	34.03	32.47	30.37	27.81	24.92	21.79	18.58
290.0	34.07	33.75	32.81	31.29	29.25	26.78	23.98	20.96	17.87
295.0	32.50	32.19	31.29	29.83	27.87	25.50	22.82	19.95	17.00
300.0	30.63	30.33	29.48	28.09	26.23	23.99	21.47	18.77	16.01
305.0	28.46	28.19	27.39	26.09	24.36	22.28	19.94	17.44	14.90
310.0	26.04	25.79	25.06	23.87	22.29	20.39	18.26	16.01	13.72
315.0	23.43	23.20	22.54	21.48	20.08	18.39	16.50	14.51	12.50
320.0	20.70	20.51	19.94	19.02	17.80	16.35	14.73	13.02	11.30
325.0	17.99	17.83	17.36	16.59	15.58	14.38	13.04	11.63	10.21
330.0	15.49	15.36	14.98	14.38	13.58	12.62	11.56	10.44	9.31
335.0	13.43	13.33	13.05	12.59	11.98	11.26	10.45	9.58	8.69
340.0	12.07	12.00	11.79	11.45	11.00	10.45	9.82	9.13	8.41
345.0	11.60	11.54	11.37	11.10	10.72	10.26	9.72	9.12	8.47
350.0	11.92	11.87	11.71	11.44	11.07	10.61	10.07	9.46	8.79
355.0	12.76	12.70	12.51	12.21	11.81	11.30	10.70	10.02	9.27

Figure 7-B – Proposed KLIM Specifications of Nighttime Pattern – Page 2 of 4

CALCULATED STANDARD PATTERN DATA (in mV/m at 1 km):

Azimuth (degs.)	Elevation Angle (degrees):			
	45.00	50.00	55.00	60.00
.0	8.93	8.00	7.04	6.06
5.0	9.37	8.36	7.33	6.27
10.0	9.75	8.68	7.59	6.48
15.0	10.05	8.95	7.81	6.65
20.0	10.24	9.14	7.98	6.80
25.0	10.34	9.25	8.11	6.92
30.0	10.34	9.30	8.18	7.01
35.0	10.26	9.29	8.22	7.06
40.0	10.12	9.22	8.21	7.10
45.0	9.94	9.13	8.18	7.11
50.0	9.75	9.01	8.12	7.10
55.0	9.55	8.88	8.06	7.09
60.0	9.36	8.76	8.00	7.06
65.0	9.21	8.66	7.94	7.04
70.0	9.09	8.57	7.89	7.03
75.0	9.01	8.52	7.86	7.02
80.0	8.98	8.50	7.85	7.02
85.0	8.99	8.51	7.86	7.03
90.0	9.04	8.55	7.90	7.06
95.0	9.14	8.63	7.96	7.09
100.0	9.29	8.74	8.03	7.14
105.0	9.47	8.88	8.13	7.20
110.0	9.70	9.05	8.23	7.26
115.0	9.95	9.23	8.35	7.32
120.0	10.22	9.41	8.46	7.37
125.0	10.49	9.60	8.57	7.42
130.0	10.75	9.77	8.66	7.45
135.0	10.98	9.90	8.72	7.46
140.0	11.15	9.99	8.75	7.45
145.0	11.25	10.02	8.73	7.41
150.0	11.26	9.98	8.67	7.33
155.0	11.16	9.87	8.55	7.22
160.0	10.96	9.68	8.38	7.08
165.0	10.66	9.41	8.16	6.90
170.0	10.27	9.09	7.90	6.70
175.0	9.83	8.73	7.61	6.49
180.0	9.38	8.36	7.32	6.27
185.0	8.98	8.03	7.06	6.07
190.0	8.69	7.78	6.84	5.90
195.0	8.60	7.65	6.71	5.77
200.0	8.73	7.69	6.68	5.70
205.0	9.10	7.89	6.75	5.70
210.0	9.67	8.25	6.94	5.77
215.0	10.40	8.74	7.23	5.90
220.0	11.23	9.31	7.59	6.09
225.0	12.09	9.93	7.98	6.31
230.0	12.95	10.55	8.40	6.55
235.0	13.76	11.15	8.81	6.79
240.0	14.48	11.70	9.19	7.02
245.0	15.11	12.18	9.53	7.23
250.0	15.63	12.58	9.80	7.41

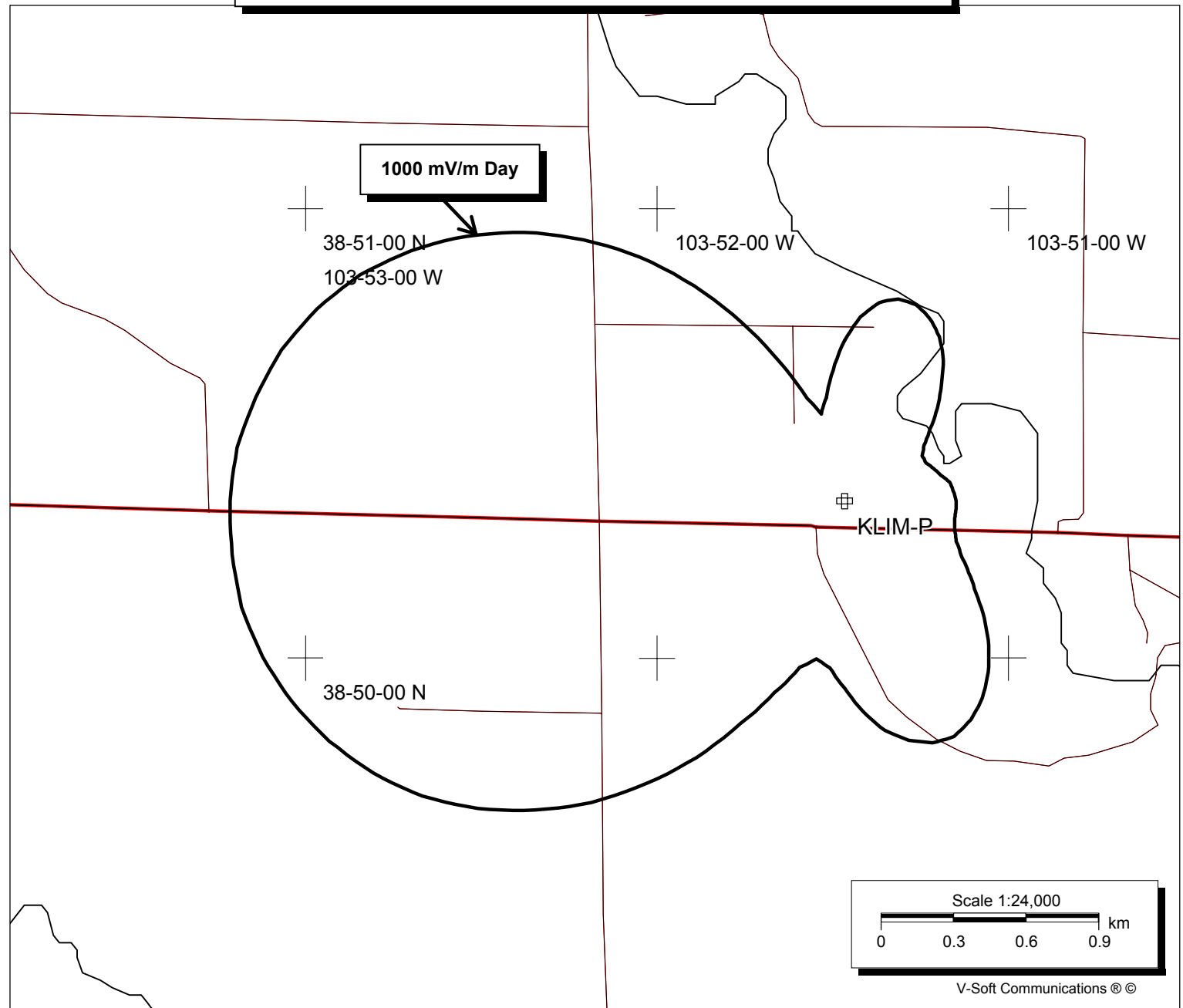
CALCULATED STANDARD PATTERN DATA (in mV/m at 1 km):

Azimuth (deg.)	Angle (degrees):			
	45.00	50.00	55.00	60.00
255.0	16.01	12.87	10.01	7.54
260.0	16.26	13.06	10.15	7.63
265.0	16.37	13.15	10.21	7.66
270.0	16.34	13.12	10.18	7.64
275.0	16.16	12.98	10.08	7.57
280.0	15.85	12.73	9.90	7.44
285.0	15.39	12.37	9.64	7.27
290.0	14.81	11.92	9.31	7.06
295.0	14.11	11.38	8.92	6.81
300.0	13.31	10.77	8.49	6.55
305.0	12.42	10.11	8.04	6.27
310.0	11.49	9.42	7.57	5.99
315.0	10.55	8.74	7.13	5.74
320.0	9.65	8.11	6.73	5.52
325.0	8.85	7.57	6.41	5.37
330.0	8.21	7.17	6.19	5.28
335.0	7.81	6.94	6.10	5.27
340.0	7.66	6.90	6.12	5.33
345.0	7.77	7.03	6.26	5.46
350.0	8.06	7.29	6.48	5.64
355.0	8.47	7.63	6.75	5.84

**Figure 8-A: Proposed KLIM(AM) 1000 mV/m Day Contour**

**KLIM-P**

Latitude: 38-50-21 N  
Longitude: 103-51-28 W  
ERP: 17.50 kW  
Frequency: 1.12 MHz  
Horiz. Pattern: DA  
Prop Model: FCC  
Soil Cond.: M-3

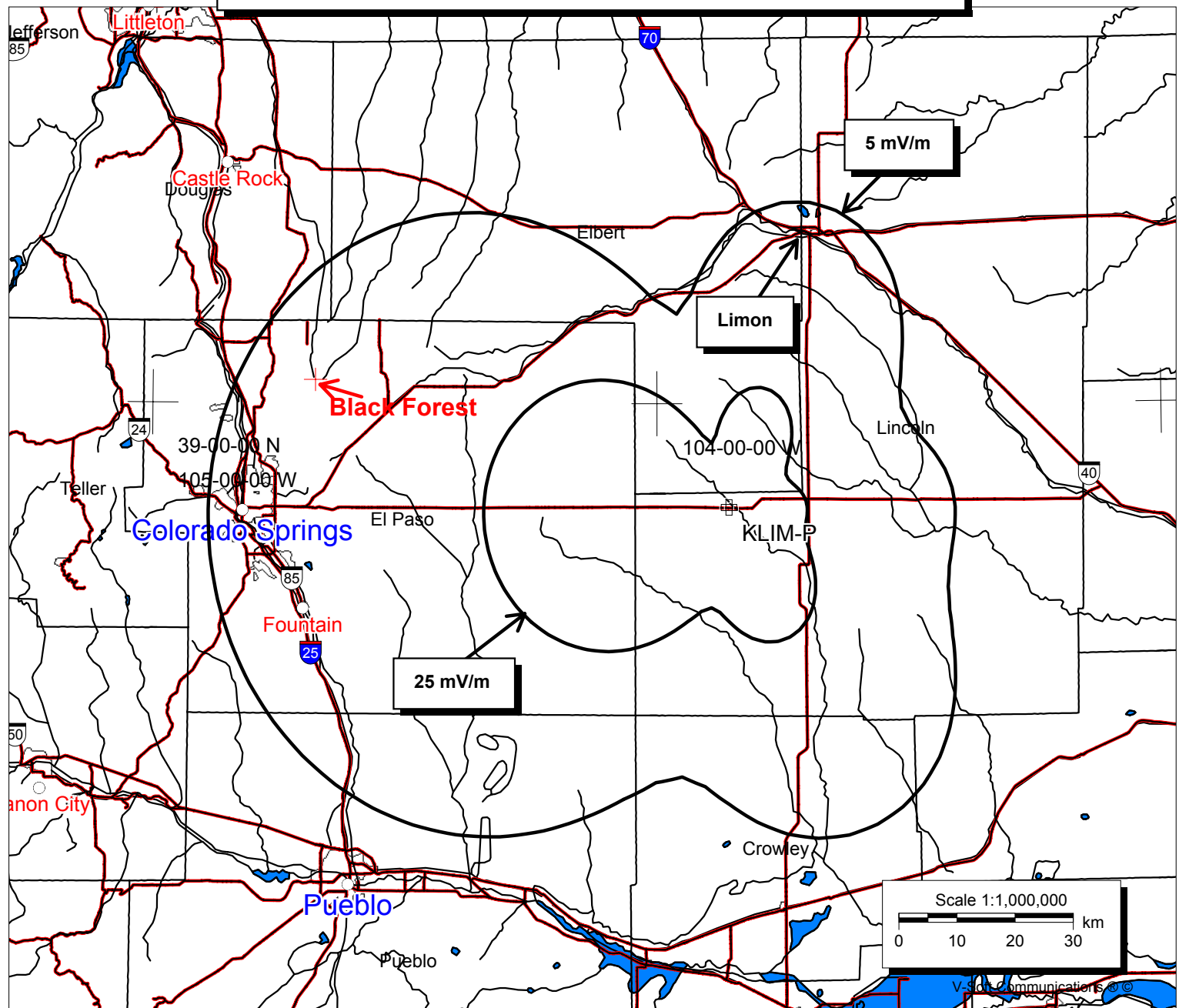


**Evans Associates**

**Figure 8-B: Proposed KLIM(AM) 25 & 5 mV/m Day Contours**

**KLIM-P**

Latitude: 38-50-21 N  
Longitude: 103-51-28 W  
ERP: 17.50 kW  
Frequency: 1.12 MHz  
Horiz. Pattern: DA  
Prop Model: FCC  
Soil Cond.: M-3



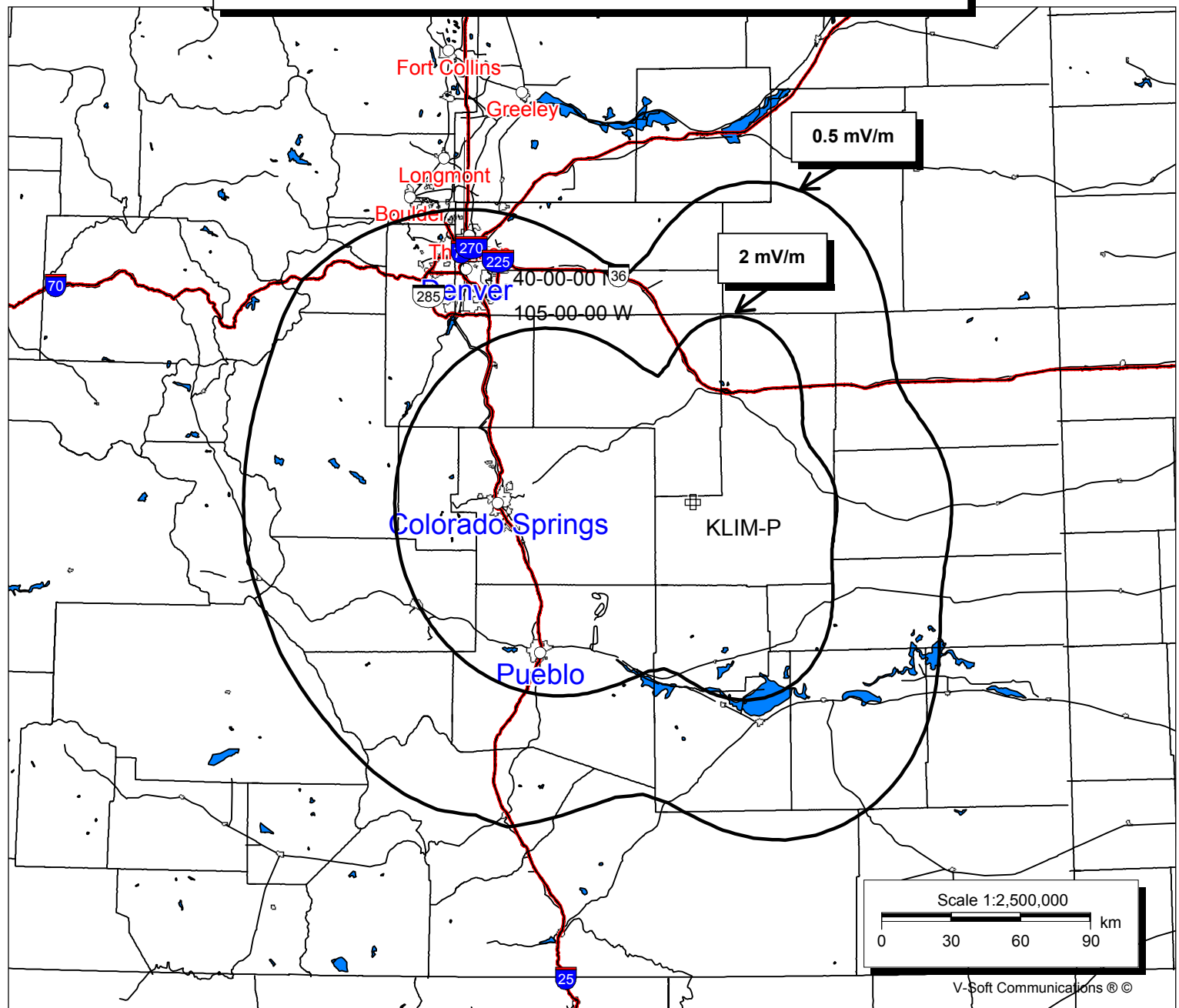
**Evans Associates**



**Figure 8-C: Proposed KLIM(AM) 2 & 0.5 mV/m Day Contours**

**KLIM-P**

Latitude: 38-50-21 N  
Longitude: 103-51-28 W  
ERP: 17.50 kW  
Frequency: 1.12 MHz  
Horiz. Pattern: DA  
Prop Model: FCC  
Soil Cond.: M-3



**Figure 9**

**DISTANCES TO PROPOSED DAYTIME CONTOURS  
KLIM(AM), 1120 KHz, BLACK FOREST, CO**

Coordinates: N 38°-50'-21" Lat.; W 103°-51'-28" Long.

Azimuth	Radiation (mV/m at one km)	Distances to Contours in Kilometers :					
		Contour levels in mV/m.					
		1000.000	25.000	5.000	2.000	.500	.250
.0	681.64	.66	17.70	47.39	73.26	128.13	158.34
5.0	784.78	.76	19.55	50.93	77.89	135.04	165.76
10.0	855.71	.83	20.76	53.18	80.86	139.42	172.09
15.0	891.17	.86	21.34	54.25	82.26	141.52	178.87
20.0	891.74	.86	21.35	54.26	82.29	141.55	181.26
25.0	860.69	.83	20.84	53.33	81.07	139.72	179.06
30.0	803.31	.78	19.87	51.53	78.68	136.21	174.81
35.0	726.49	.71	18.52	48.98	75.34	131.22	168.75
40.0	638.48	.62	16.88	45.82	71.18	125.03	161.19
45.0	548.77	.54	15.10	42.27	66.50	118.04	152.67
50.0	468.21	.46	13.40	38.74	61.81	111.03	144.13
55.0	408.19	.40	12.05	35.85	57.92	105.24	137.02
60.0	377.47	.37	11.32	34.27	55.79	102.04	133.12
65.0	376.26	.37	11.30	34.20	55.70	101.91	132.96
70.0	395.13	.39	11.74	35.18	57.03	103.90	135.39
75.0	421.56	.41	12.35	36.52	58.82	106.58	138.66
80.0	445.93	.44	12.90	37.70	60.42	108.96	141.56
85.0	463.00	.45	13.28	38.50	61.49	110.55	143.54
90.0	471.33	.46	13.46	38.89	62.00	111.32	144.48
95.0	472.79	.46	13.50	38.95	62.09	111.45	144.64
100.0	472.34	.46	13.49	38.93	62.06	111.41	144.59
105.0	477.61	.47	13.60	39.18	62.38	111.89	145.18
110.0	497.26	.49	14.02	40.06	63.56	113.65	147.31
115.0	537.82	.53	14.88	41.81	65.90	117.14	151.56
120.0	600.67	.59	16.14	44.36	69.27	122.16	157.72
125.0	681.81	.66	17.70	47.40	73.27	128.14	165.01
130.0	773.86	.75	19.36	50.57	77.42	134.35	172.53
135.0	868.16	.84	20.96	53.56	81.37	140.16	179.60
140.0	956.05	.92	22.38	56.15	84.72	145.22	185.66
145.0	1029.42	.99	23.51	58.16	87.39	149.17	190.44
150.0	1081.12	1.04	24.27	59.54	89.17	151.84	193.65
155.0	1105.36	1.07	24.63	60.17	89.98	153.06	195.10
160.0	1098.26	1.06	24.52	59.99	89.75	152.71	194.68
165.0	1058.47	1.02	23.94	58.94	88.40	150.68	192.27
170.0	988.04	.96	22.87	57.04	85.90	146.96	187.77
175.0	893.90	.87	21.38	54.33	82.37	141.68	181.41
180.0	790.49	.77	19.65	51.11	78.14	135.40	173.82
185.0	703.79	.69	18.10	48.18	74.30	129.67	166.88

Azimuth	Radiation (mV/m at one km)	Distances to Contours in Kilometers :					
		Contour levels in mV/m.					
		1000.000	25.000	5.000	2.000	.500	.250
190.0	671.81	.66	17.51	47.04	72.79	127.43	164.14
195.0	725.69	.71	18.50	48.95	75.30	131.17	168.69
200.0	861.67	.84	20.86	53.36	81.11	139.78	179.14
205.0	1051.11	1.01	23.83	58.75	88.14	150.30	187.05
210.0	1266.47	1.22	26.88	64.11	95.11	160.72	187.37
215.0	1488.85	1.42	29.74	69.00	101.48	163.82	187.25
220.0	1705.93	1.62	32.28	73.29	107.07	171.75	196.45
225.0	1909.65	1.80	34.50	76.99	111.87	176.44	202.78
230.0	2094.77	1.97	36.39	80.13	115.94	179.49	212.55
235.0	2258.06	2.12	37.97	82.73	119.31	181.67	215.49
240.0	2397.75	2.24	39.26	84.84	122.07	183.88	218.33
245.0	2513.10	2.34	40.29	86.53	124.26	186.33	221.30
250.0	2604.04	2.42	41.08	87.82	125.94	188.58	219.56
255.0	2670.85	2.48	41.66	88.73	127.14	189.57	218.53
260.0	2713.93	2.52	42.02	89.32	127.87	191.50	220.62
265.0	2733.61	2.53	42.19	89.58	127.97	192.96	222.41
270.0	2729.98	2.53	42.16	89.53	128.00	192.96	223.82
275.0	2702.89	2.51	41.93	89.17	127.71	192.88	224.08
280.0	2651.91	2.46	41.50	88.48	126.80	192.54	224.00
285.0	2576.45	2.40	40.85	87.43	125.44	191.90	224.19
290.0	2475.88	2.31	39.97	85.99	123.56	191.88	225.93
295.0	2349.73	2.20	38.82	84.12	121.13	193.16	229.14
300.0	2197.96	2.06	37.40	81.80	118.09	192.87	232.01
305.0	2021.18	1.90	35.65	78.90	114.35	187.72	228.22
310.0	1821.02	1.72	33.55	75.42	109.83	181.15	220.50
315.0	1600.34	1.52	31.07	71.26	104.41	173.24	211.21
320.0	1363.65	1.31	28.16	66.32	97.98	164.37	200.60
325.0	1117.51	1.08	24.80	60.49	90.39	153.67	188.22
330.0	871.63	.85	21.02	53.66	81.50	140.37	173.94
335.0	641.75	.63	16.94	45.94	71.34	125.27	158.27
340.0	458.59	.45	13.18	38.29	61.22	110.14	142.65
345.0	380.14	.37	11.39	34.41	55.98	102.33	133.47
350.0	435.27	.43	12.66	37.19	59.72	107.94	139.20
355.0	556.43	.54	15.26	42.59	66.92	118.66	149.18



**Figure 10**

**NIGHTTIME SKYWAVE RADIATION LIMITS  
KLIM(AM), 1120 KHz, BLACK FOREST, CO  
3.0 WATTS USING DAYTIME PATTERN**

Coordinates: 38°-50'-21" N., 103°-51'-28" W.

Point	Distance (km)	Bearing (degs)	Theta Min. (degs)	Theta Max. (degs)	RSS Limit (mV/m)	Reqd. Prot. (mV/m)	Skywv. Mult. (uV/m)	Allowed Radiation (mV/m @ 1 km)	Prop. Radiation (mV/m @ 1 km)
NEW	731.2	230.7	9.5	16.4	10.33	2.58	71.51	180.6	28.6
NEW	509.2	210.9	14.6	24.0	11.79	2.90	117.27	123.5	18.6
NEW	387.0	208.8	19.5	30.8	13.15	3.29	163.22	100.7	16.7
KMOX235	769.7	143.3	8.9	15.5	24.76	.50	66.22	37.8	
KMOX240	682.2	143.0	10.4	17.8	23.86	.50	78.68	31.8	
KMOX245	596.4	141.8	12.2	20.5	24.06	.50	94.71	26.4	
KMOX250	513.6	139.4	14.5	23.8	24.26	.50	115.32	21.7	15.7
KMOX255	435.9	135.2	17.3	27.7	24.47	.50	141.37	17.7	14.8
KMOX260	366.9	128.3	20.6	32.2	25.63	.50	172.42	14.5	13.6
KMOX265	312.1	117.6	24.0	36.7	26.10	.50	204.34	12.2	12.0
KMOX270	279.4	102.9	26.6	39.9	26.62	.50	227.14	11.0	10.8
KMOX275	275.9	86.1	26.9	40.3	27.13	.50	229.33	10.9	10.3
KMOX280	301.6	71.0	24.8	37.7	27.59	.50	209.93	11.9	10.4
KMOX285	349.3	59.8	21.6	33.6	28.00	.50	179.34	13.9	10.9
KMOX290	410.4	52.4	18.4	29.3	28.33	.50	148.10	16.9	11.5
KMOX295	478.7	47.7	15.7	25.4	28.64	.50	121.26	20.6	12.1
KMOX300	550.6	44.8	13.4	22.2	29.00	.50	99.68	25.1	
KMOX305	624.0	43.2	11.6	19.5	29.41	.50	82.69	30.2	
KMOX310	697.8	42.5	10.1	17.3	29.79	.50	69.34	36.1	
KMOX315	771.2	42.3	8.8	15.5	29.97	.50	58.79	42.5	
KMOX320	843.7	42.5	7.8	13.9	29.66	.50	50.38	49.6	
KANN	741.8	292.0	9.3	16.2	7.03	1.71	66.37	128.6	32.4

Figure 11

**Aerial Photograph of Proposed Transmitter Site  
KLIM(AM), 1120 KHz  
Black Forest, Colorado**

