

**W240BX (FACILITY #150570)
MINOR MODIFICATION PER DA-1491
"250 MILE AM WAIVER" TO
WATERLOO, IA ON
CHANNEL 224 FOR
KNWS(AM) #49784**

The proposed translator will rebroadcast KNWS(AM) at Waterloo, IA (facility ID # 49784). A change in channel to 224 (92.7) is proposed in accordance with the waiver provisions. The proposed facility is located 103.6 miles from the existing, licensed W240BX facility.

Distance between

N Latitude 42 45 44.00, W Longitude 90 23 23.00 (Point 1)

and N Latitude 42 26 45.00, W Longitude 92 22 29.00 (Point 2)

166.648 kilometers; 103.550 miles

Allocation discussion:

All exhibits utilize the FCC 30 second terrain database.

- E1 Channel study
- E1A Interference analysis to KKHQ-FM (application to correct coordinates)
- E1B Aerial photograph of interference area
- E2 60 dBu and 2 mV/m contours
- E3 ASR

A channel study is included as E1 demonstrating compliance with §74.1204 with the exception of 3rd adjacent station KKHQ-FM. A plot of the proposed 60 dBu contour is provided as E2 showing that it is entirely contained within primary station KNWS(AM)'s 2 mV/m and 40 km radius.

Anderson Associates

KKHQ-FM analysis:

The proposed facility will be located inside the protected contour of KKHQ-FM on 222C0. An interference analysis has been conducted based on the U/D ratio of +40 dB at the proposed site. KKHQ-FM places a 71.47 dBu (50:50) contour at the site (E1A). The corresponding interference contour is 111.47 which clears the ground by 22.7 meters at the closest point. E1B and an associated street view show that the tallest building is a 14.6 meter (48 foot) barn at a distance of 222-255 meters from the tower where the calculated clearance (E1A) is at least 30.5 meters (100 feet) which is clearly well above the highest working area in the barn.

It is clear from E1A and E1B that the interference contours will not reach any populated area or major highways. Based on this showing, a waiver of Section 74.1204 is requested in accordance with *Living Way Ministries, Inc.* (FCC 08-242).

RF Exposure Calculation:

The proposed facility will utilize a Bext TFC-2K two bay 0.75 wavelength spaced, circularly polarized antenna. The RF contribution of the proposed translator was calculated using a worst case F factor of 1.0 and the formula included below to be 2.42 $\mu\text{Watts/cm}^2$ or 0.24% of the maximum permissible 200 microwatts/cm² exposure for general population/uncontrolled exposure, and well below the 5% of that limit which requires consideration. The proposed translator clearly complies with Commission RF radiation limits.

$$S \text{ (RF in } \mu\text{Watts/cm}^2\text{)} = \frac{33.4 (F^2 \text{ Vertical Factor}) \times (H \text{ ERP} + V \text{ ERP in Watts})}{R^2 \text{ (distance to radiation center in meters} - 2 \text{ m)}}$$



Charles M. Anderson 1-16-2016

E1 CHANNEL STUDY

REFERENCE
42 26 45.0 N.
92 22 29.0 W.

CH# 224D - 92.7 MHz, Pwr= 0.25 kW, HAAT= 103.9 M, COR= 378 M
Average Protected F(50-50)= 13.11 km
Omni-directional

DISPLAY DATES
DATA 01-15-16
SEARCH 01-15-16

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*
222C0 Oelwein	KKHQ-FM	APP_CY IA		56.8 237.1	48.26 BPH20151228ANJ	42 40 56.7 91 52 50.0	100.000 302	10.4 632	73.9 The Cedar Rapids Divesti tu	24.1	-26.7*
222C0 Oelwein	KKHQ-FM	LIC_CY IA		56.9 237.2	48.16 BLH19871215KC	42 40 53.0 91 52 52.0	100.000 302	10.4 630	73.7 The Cedar Rapids Divesti tu	24.0	-26.7*
224C2 Ottumwa	KTWA	LIC_NC_ IA		182.9 2.8	158.19 BLH20000825AHB	41 01 29.0 92 28 09.0	50.000 97	128.3 331	42.3 O-town Communications, Inc	17.9	75.4
225C1 Dubuque	KATF	LIC_NC_ IA		85.7 266.9	144.47 BLH20030130ACU	42 31 44.0 90 36 58.0	92.000 309	104.7 556	72.0 Radio Dubuque, Inc.	26.1	51.7
223C2 West Des Moines	KJJY	LIC_C_ IA		233.2 52.3	143.37 BMLH20000525AAP	41 39 53.0 93 45 24.0	41.000 165	78.3 443	52.9 Radio License Holding Cbc,	51.8	71.4
227C1 Des Moines	KIOA	LIC_C_ IA		225.0 44.3	127.18 BLH20000207ABQ	41 37 55.0 93 27 26.0	82.000 325	10.0 596	72.1 Saga Communications Of low	104.3	54.0
224L1 Coralville	KOUR-LP	LIC_ IA		141.3 321.8	107.78 BLL20050425ACM	41 41 12.0 91 33 45.0	0.080 33	259	77.2 Our Lady Of Perpetual Help		57.6
226D Cedar Rapids	K226B0	LIC_C_ IA		128.3 308.8	73.78 BLFT20110701ACG	42 01 57.0 91 40 24.4	0.250 100	1.1 347	13.4 Sellers Broadcasting, Inc	58.9	59.2

Terrain database is FCC NGDC 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= West Zone, 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.

- (1) See E1A and E1B for disproof of interference to KKHQ-FM. Note that the proposed facility clears the license and application which corrects the coordinates for the licensed facility.

E1A KKHQ-FM ANALYSIS

W240BX Waterloo, IA

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.25

Translator or LPFM Antenna Height AG = 85 Meters

W240BX Antenna Model = BEXT TFC2K-2-75% WAVELENGTH SPACING

Protected Station's Contour = 71.46742 dBu

Translator's or LPFM's full Interference contour 111.46742

Review Azimuth = 0 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW

Distance between stations = 48.3 km

Protected Station= KKHQ-F, 100 kW, 632 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.00	1.0	0.2500	296.2095	296.2095	085.000
01.00	0.997	1.0	0.2485	295.3209	295.2759	079.846
02.00	0.99	1.0	0.2450	293.2474	293.0688	074.766
03.00	0.983	1.0	0.2416	291.1739	290.7749	069.761
04.00	0.97	1.0	0.2352	287.3232	286.6233	064.957
05.00	0.955	1.0	0.2280	282.8801	281.8036	060.345
06.00	0.942	1.0	0.2218	279.0294	277.5008	055.833
07.00	0.921	1.0	0.2121	272.8090	270.7755	051.753
08.00	0.9	1.0	0.2025	266.5886	263.9941	047.898
09.00	0.877	1.0	0.1923	259.7757	256.5775	044.362
10.00	0.859	1.0	0.1845	254.4440	250.5784	040.816
11.00	0.834	1.0	0.1739	247.0387	242.4999	037.863
12.00	0.809	1.0	0.1636	239.6335	234.3969	035.177
13.00	0.786	1.0	0.1544	232.8207	226.8535	032.627
14.00	0.76	1.0	0.1444	225.1192	218.4322	030.539
15.00	0.737	1.0	0.1358	218.3064	210.8678	028.498
16.00	0.715	1.0	0.1276	211.6417	203.4430	026.664
17.00	0.692	1.0	0.1197	204.9770	196.0205	025.071
18.00	0.667	1.0	0.1112	197.5717	187.9019	023.947
19.00	0.641	1.0	0.1027	189.8703	179.5259	023.184
20.00	0.615	1.0	0.0946	182.1689	171.1827	022.695
21.00	0.595	1.0	0.0885	176.2447	164.5386	021.840
22.00	0.569	1.0	0.0809	168.5432	156.2705	021.863
23.00	0.542	1.0	0.0734	160.5456	147.7830	022.270
24.00	0.515	1.0	0.0663	152.5479	139.3594	022.953
25.00	0.494	1.0	0.0610	146.3275	132.6177	023.159
26.00	0.465	1.0	0.0541	137.7374	123.7976	024.620
27.00	0.436	1.0	0.0475	129.1473	115.0711	026.368
28.00	0.413	1.0	0.0426	122.3345	108.0150	027.567
29.00	0.382	1.0	0.0365	113.1520	098.9650	030.143
30.00	0.35	1.0	0.0306	103.6733	089.7837	033.163
31.00	0.318	1.0	0.0253	094.1946	080.7406	036.486
32.00	0.293	1.0	0.0215	086.7894	073.6016	039.009
33.00	0.26	1.0	0.0169	077.0145	064.5898	043.055
34.00	0.227	1.0	0.0129	067.2396	055.7441	047.400
35.00	0.194	1.0	0.0094	057.4646	047.0723	052.040
36.00	0.169	1.0	0.0071	050.0594	040.4989	055.576
37.00	0.136	1.0	0.0046	040.2845	032.1726	060.756
38.00	0.104	1.0	0.0027	030.8058	024.2753	066.034

(1)

(2)

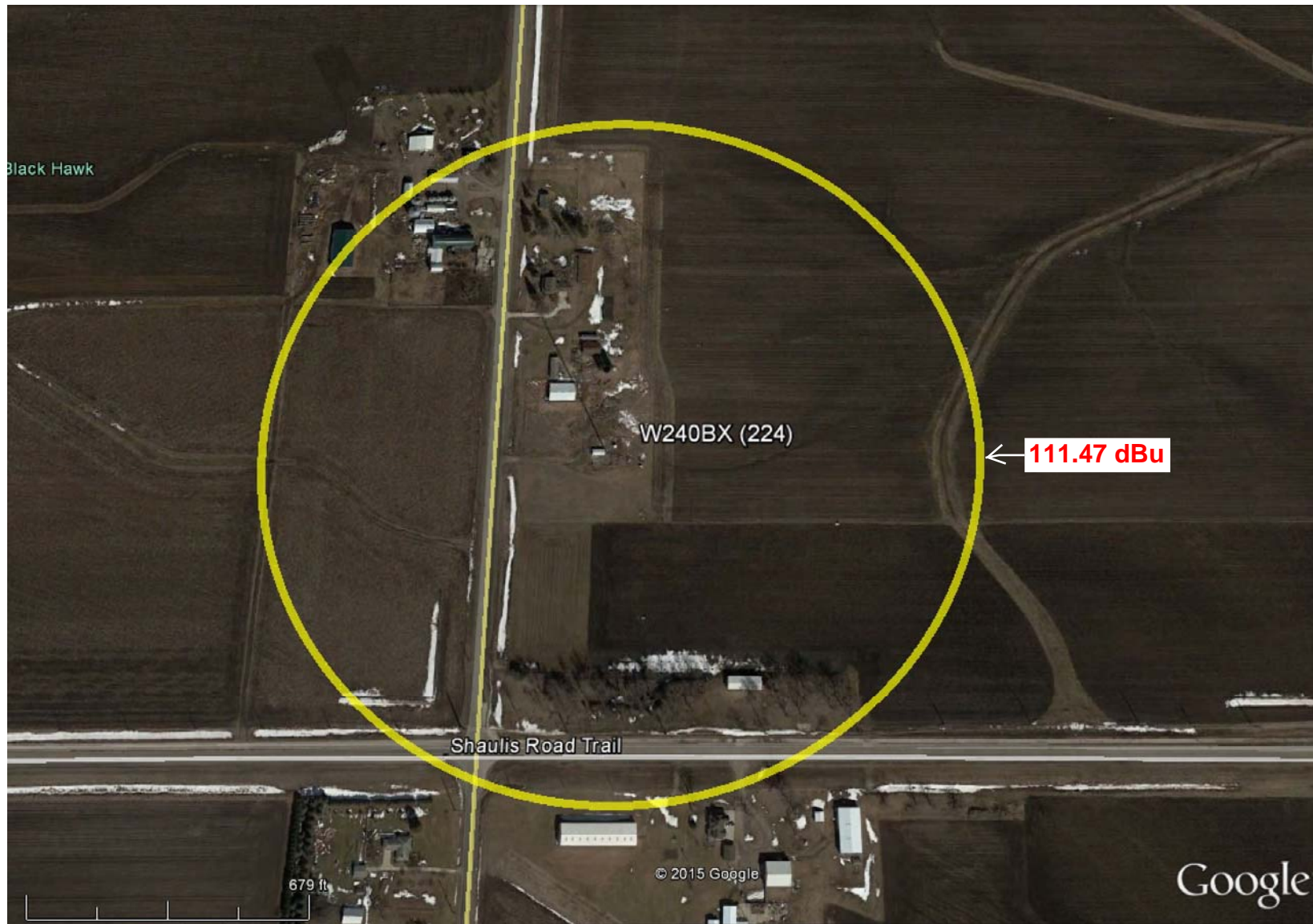
E1A KKHQ-FM ANALYSIS CONTINUED

39.00	0.081	1.0	0.0016	023.9930	018.6460	069.901
40.00	0.051	1.0	0.0007	015.1067	011.5724	075.290
41.00	0.022	1.0	0.0001	006.5166	004.9181	080.725
42.00	0.005	1.0	0.0000	001.4810	001.1006	084.009
43.00	0.024	1.0	0.0001	007.1090	005.1992	080.152
44.00	0.048	1.0	0.0006	014.2181	010.2276	075.123
45.00	0.071	1.0	0.0013	021.0309	014.8711	070.129
46.00	0.091	1.0	0.0021	026.9551	018.7246	065.610
47.00	0.105	1.0	0.0028	031.1020	021.2115	062.253
48.00	0.121	1.0	0.0037	035.8414	023.9825	058.365
49.00	0.132	1.0	0.0044	039.0997	025.6517	055.491
50.00	0.149	1.0	0.0056	044.1352	028.3696	051.190
51.00	0.157	1.0	0.0062	046.5049	029.2665	048.859
52.00	0.166	1.0	0.0069	049.1708	030.2726	046.253
53.00	0.174	1.0	0.0076	051.5405	031.0178	043.838
54.00	0.18	1.0	0.0081	053.3177	031.3394	041.865
55.00	0.184	1.0	0.0085	054.5026	031.2614	040.354
56.00	0.187	1.0	0.0087	055.3912	030.9744	039.079
57.00	0.189	1.0	0.0089	055.9836	030.4909	038.048
58.00	0.19	1.0	0.0090	056.2798	029.8238	037.272
59.00	0.191	1.0	0.0091	056.5760	029.1388	036.505
60.00	0.19	1.0	0.0090	056.2798	028.1399	036.260
61.00	0.189	1.0	0.0089	055.9836	027.1414	036.036
62.00	0.187	1.0	0.0087	055.3912	026.0046	036.092
63.00	0.185	1.0	0.0086	054.7988	024.8781	036.174
64.00	0.181	1.0	0.0082	053.6139	023.5028	036.812
65.00	0.178	1.0	0.0079	052.7253	022.2827	037.215
66.00	0.174	1.0	0.0076	051.5405	020.9634	037.915
67.00	0.17	1.0	0.0072	050.3556	019.6755	038.647
68.00	0.165	1.0	0.0068	048.8746	018.3087	039.684
69.00	0.16	1.0	0.0064	047.3935	016.9843	040.754
70.00	0.156	1.0	0.0061	046.2087	015.8043	041.578
71.00	0.15	1.0	0.0056	044.4314	014.4655	042.989
72.00	0.144	1.0	0.0052	042.6542	013.1809	044.433
73.00	0.139	1.0	0.0048	041.1731	012.0379	045.626
74.00	0.133	1.0	0.0044	039.3959	010.8590	047.130
75.00	0.126	1.0	0.0040	037.3224	009.6597	048.949
76.00	0.119	1.0	0.0035	035.2489	008.5275	050.798
77.00	0.113	1.0	0.0032	033.4717	007.5295	052.386
78.00	0.105	1.0	0.0028	031.2007	006.4870	054.481
79.00	0.098	1.0	0.0024	028.9298	005.5201	056.602
80.00	0.09	1.0	0.0020	026.6589	004.6293	058.746
81.00	0.083	1.0	0.0017	024.5854	003.8460	060.717
82.00	0.075	1.0	0.0014	022.2157	003.0918	063.000
83.00	0.066	1.0	0.0011	019.5498	002.3825	065.596
84.00	0.06	1.0	0.0009	017.7726	001.8577	067.325
85.00	0.051	1.0	0.0007	015.1067	001.3166	069.951
86.00	0.043	1.0	0.0005	012.7370	000.8885	072.294
87.00	0.035	1.0	0.0003	010.3673	000.5426	074.647
88.00	0.031	1.0	0.0002	009.1825	000.3205	075.823
89.00	0.026	1.0	0.0002	007.7014	000.1344	077.300
90.00	0.02	1.0	0.0001	005.9242	000.0000	079.076

(1) Lowest ground clearance over tall barn is 30.54 meters (100 feet).

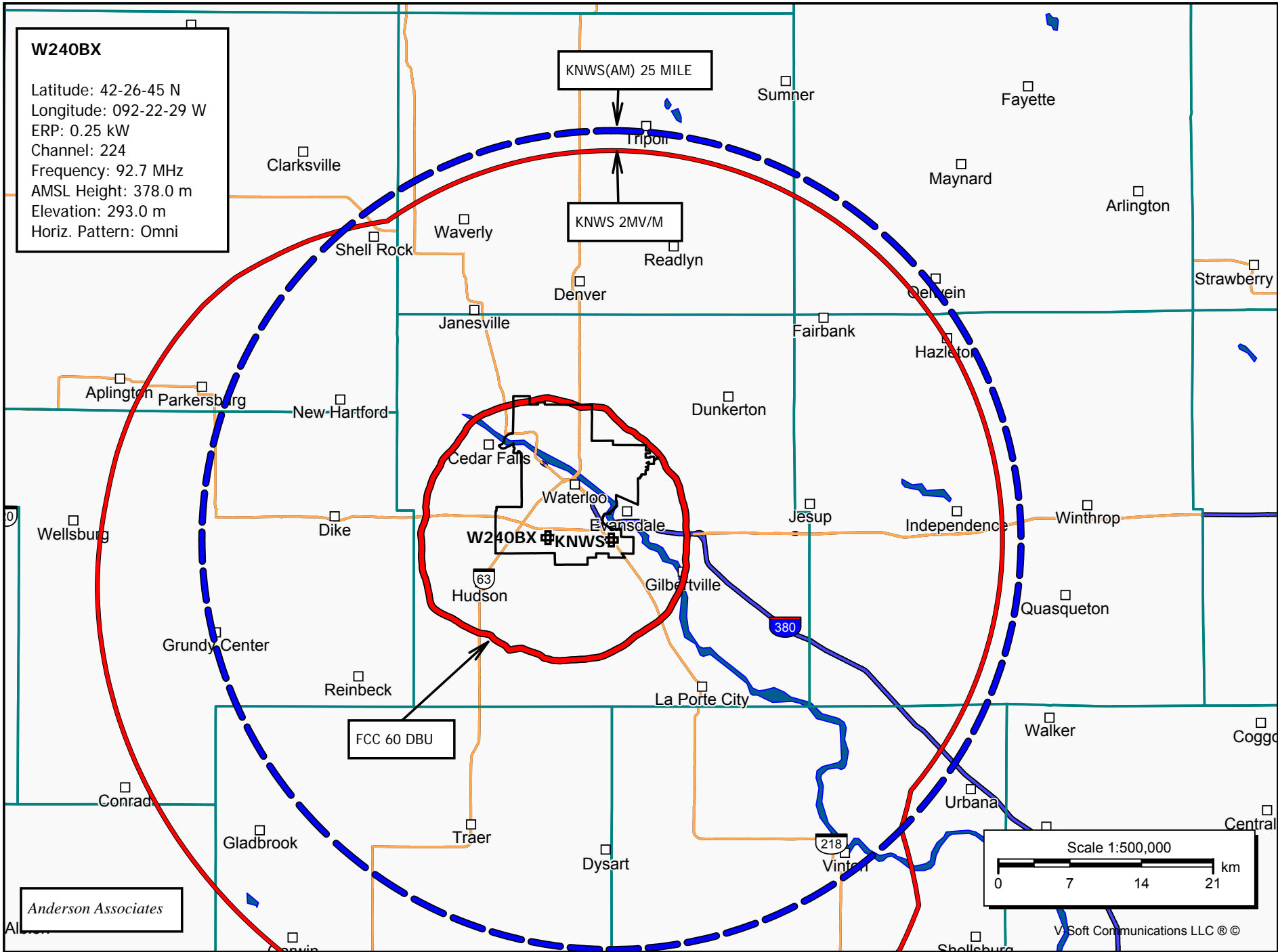
(2) Minimum clearance overall is 21.84 meters.

E1B AERIAL VIEW OF 111.47 DBU (50:10) CONTOUR



E1B ROADSIDE VIEW OF TALLEST BUILDING IN CONTOUR. ALL OTHER 1-2 STORIES.





E3 Registration 1018166

 [Map Registration](#)

Registration Detail

Reg Number	1018166	Status	Constructed
File Number	A0021787	Constructed	09/01/1985
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	42-26-45.0 N 092-22-30.0 W	Address	4813 ANSBOROUGH AVE
City, State	WATERLOO , IA		
Zip	50701	County	BLACK HAWK
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
293.2	132.5
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
425.7	132.5

Painting and Lighting Specifications

FAA Chapters 3, 4, 5, 9

Paint and Light in Accordance with FAA Circular Number 70/7460-1F

FAA Notification

FAA Study	85-ACE-250-OE	FAA Issue Date	04/17/1985
-----------	---------------	----------------	------------

Owner & Contact Information

FRN	Owner Entity Type
-----	-------------------

Owner

BRAINARD, RONALD E	P: (319)234-3511
1657 FALLS AVE	F:
WATERLOO , IA 50701	E: RADCOMM@FORBIN.COM

Contact

P:
F:
E:

Last Action Status

Status	Constructed	Received	03/31/1997
Purpose	New	Entered	04/04/1997
Mode	Mail In (Manual)		

Related Applications

03/31/1997	A0021787 - New (NE)
------------	---------------------

Comments

Comments

None

Output from NADCON for station W240BX (224)

North American Datum Conversion

NAD 83 to NAD 27

NADCON Program Version 2.11

=====

Transformation #: 1 Region: Conus

Latitude Longitude

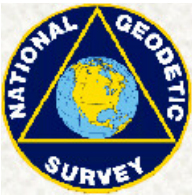
NAD 27 datum values: 42 26 45.04779 92 22 29.32805

NAD 83 datum values: 42 26 45.00000 92 22 30.00000

NAD 27 - NAD 83 shift values: 0.04779 -0.67195(secs.)

1.475 -15.356 (meters)

Magnitude of total shift: 15.427(meters)



[NGS HOME PAGE](#)

2 Bay TFC2K .75 Wave 97.7MHz

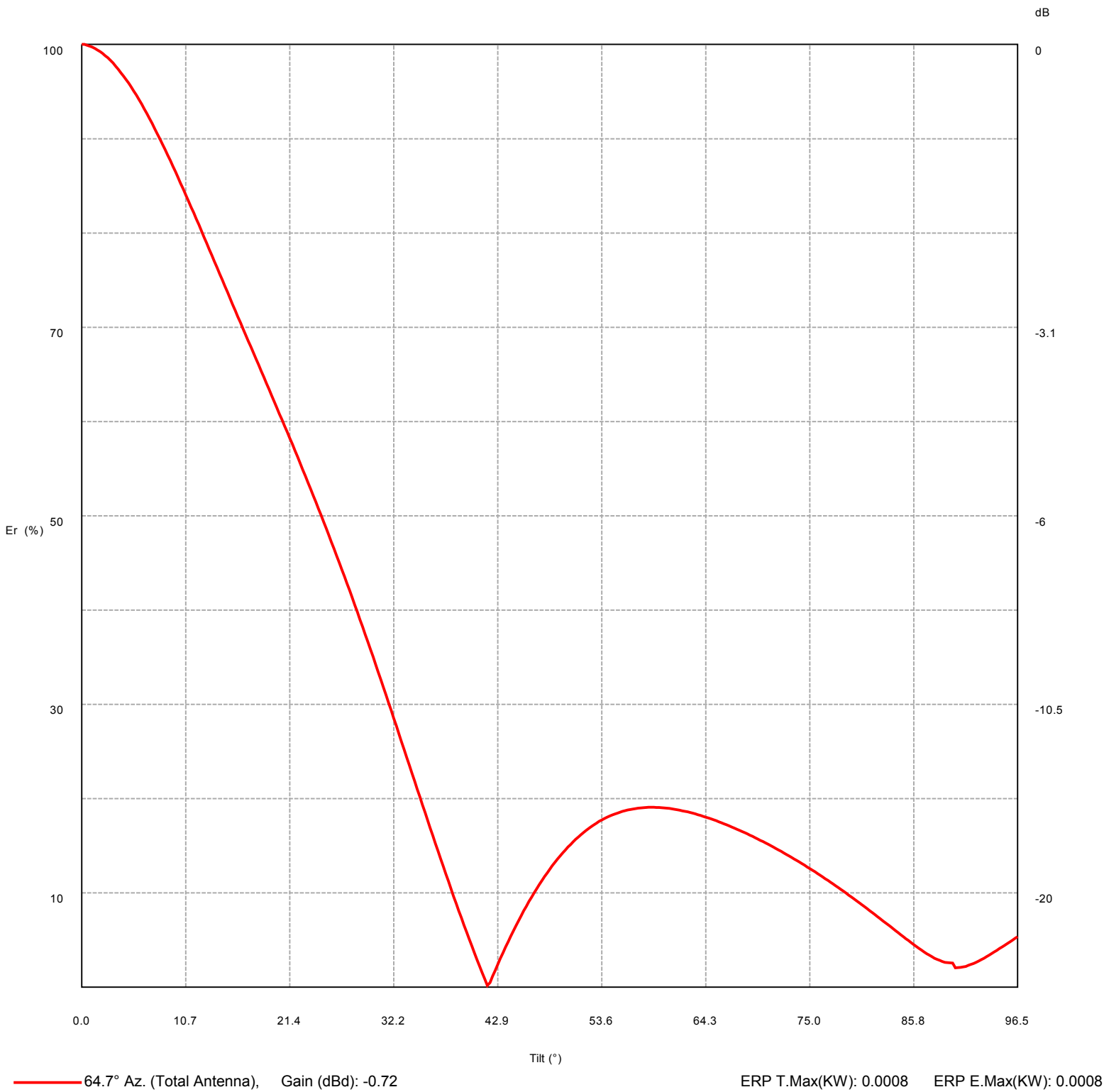
September 8, 2014



Geometrical and electrical data of antenna System

	<i>Power (%)</i>	<i>Tilt (°)</i>	<i>Az. (°/N)</i>	<i>Phase (°)</i>	<i>V dist. (m)</i>	<i>Scr-d (cm)</i>	<i>Scr-Az (°/N)</i>	<i>Rot. (1÷4)</i>	<i>Type (1÷2)</i>	<i>L cables (cm)</i>	<i>Car. phase (°)</i>
1	50.000	0	0	0 +0.0	1.15	0.0	0.0	1	1	0.0	0.0
2	50.000	0	0	0 +0.0	-1.15	0.0	0.0	1	1	0.0	0.0

Vertical diagram at an azimuth of 64.7°



Vertical diagram at an azimuth of 64.7°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.1	0.8	16.1	71.1	0.4	32.2	28.5	0.1
0.3	100.0	0.8	16.3	70.5	0.4	32.4	27.7	0.1
0.5	99.9	0.8	16.6	69.8	0.4	32.7	26.8	0.1
0.8	99.8	0.8	16.9	69.2	0.4	33.0	26.0	0.1
1.1	99.7	0.8	17.2	68.5	0.4	33.2	25.2	0.1
1.3	99.6	0.8	17.4	67.9	0.4	33.5	24.3	0.1
1.6	99.4	0.8	17.7	67.3	0.4	33.8	23.5	0.0
1.9	99.2	0.8	18.0	66.7	0.4	34.0	22.7	0.0
2.1	99.0	0.8	18.2	66.0	0.4	34.3	21.9	0.0
2.4	98.8	0.8	18.5	65.4	0.4	34.6	21.0	0.0
2.7	98.6	0.8	18.8	64.7	0.4	34.8	20.2	0.0
2.9	98.3	0.8	19.0	64.1	0.3	35.1	19.4	0.0
3.2	98.0	0.8	19.3	63.4	0.3	35.4	18.5	0.0
3.5	97.7	0.8	19.6	62.8	0.3	35.6	17.7	0.0
3.8	97.4	0.8	19.8	62.1	0.3	35.9	16.9	0.0
4.0	97.0	0.8	20.1	61.5	0.3	36.2	16.1	0.0
4.3	96.6	0.8	20.4	60.8	0.3	36.4	15.2	0.0
4.6	96.3	0.8	20.6	60.2	0.3	36.7	14.4	0.0
4.8	95.9	0.8	20.9	59.5	0.3	37.0	13.6	0.0
5.1	95.5	0.8	21.2	58.9	0.3	37.3	12.8	0.0
5.4	95.1	0.8	21.4	58.2	0.3	37.5	12.0	0.0
5.6	94.6	0.8	21.7	57.6	0.3	37.8	11.2	0.0
5.9	94.2	0.8	22.0	56.9	0.3	38.1	10.4	0.0
6.2	93.7	0.7	22.2	56.2	0.3	38.3	9.6	0.0
6.4	93.2	0.7	22.5	55.6	0.3	38.6	8.9	0.0
6.7	92.7	0.7	22.8	54.9	0.3	38.9	8.1	0.0
7.0	92.1	0.7	23.0	54.2	0.2	39.1	7.3	0.0
7.2	91.6	0.7	23.3	53.5	0.2	39.4	6.6	0.0
7.5	91.1	0.7	23.6	52.8	0.2	39.7	5.8	0.0
7.8	90.5	0.7	23.9	52.2	0.2	39.9	5.1	0.0
8.0	90.0	0.7	24.1	51.5	0.2	40.2	4.4	0.0
8.3	89.4	0.7	24.4	50.8	0.2	40.5	3.6	0.0
8.6	88.9	0.7	24.7	50.1	0.2	40.7	2.9	0.0
8.8	88.3	0.7	24.9	49.4	0.2	41.0	2.2	0.0
9.1	87.7	0.7	25.2	48.7	0.2	41.3	1.5	0.0
9.4	87.1	0.6	25.5	47.9	0.2	41.5	0.8	0.0
9.6	86.5	0.6	25.7	47.2	0.2	41.8	0.2	0.0
9.9	85.9	0.6	26.0	46.5	0.2	42.1	0.5	0.0
10.2	85.3	0.6	26.3	45.8	0.2	42.3	1.1	0.0
10.5	84.7	0.6	26.5	45.0	0.2	42.6	1.8	0.0
10.7	84.0	0.6	26.8	44.3	0.2	42.9	2.4	0.0
11.0	83.4	0.6	27.1	43.6	0.2	43.1	3.0	0.0
11.3	82.8	0.6	27.3	42.8	0.2	43.4	3.6	0.0
11.5	82.1	0.6	27.6	42.1	0.1	43.7	4.2	0.0
11.8	81.5	0.6	27.9	41.3	0.1	44.0	4.8	0.0
12.1	80.9	0.6	28.1	40.6	0.1	44.2	5.4	0.0
12.3	80.2	0.5	28.4	39.8	0.1	44.5	6.0	0.0
12.6	79.6	0.5	28.7	39.0	0.1	44.8	6.5	0.0
12.9	78.9	0.5	28.9	38.2	0.1	45.0	7.1	0.0
13.1	78.3	0.5	29.2	37.4	0.1	45.3	7.6	0.0
13.4	77.6	0.5	29.5	36.6	0.1	45.6	8.1	0.0
13.7	77.0	0.5	29.7	35.8	0.1	45.8	8.6	0.0
13.9	76.3	0.5	30.0	35.0	0.1	46.1	9.1	0.0
14.2	75.7	0.5	30.3	34.2	0.1	46.4	9.5	0.0
14.5	75.0	0.5	30.6	33.4	0.1	46.6	10.0	0.0
14.7	74.4	0.5	30.8	32.6	0.1	46.9	10.5	0.0
15.0	73.7	0.5	31.1	31.8	0.1	47.2	10.9	0.0
15.3	73.1	0.5	31.4	31.0	0.1	47.4	11.3	0.0
15.5	72.4	0.4	31.6	30.2	0.1	47.7	11.7	0.0
15.8	71.8	0.4	31.9	29.3	0.1	48.0	12.1	0.0

Vertical diagram at an azimuth of 64.7°

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
48.2	12.5	0.0	64.3	18.0	0.0	80.4	8.8	0.0
48.5	12.9	0.0	64.6	17.9	0.0	80.7	8.5	0.0
48.8	13.2	0.0	64.9	17.8	0.0	80.9	8.3	0.0
49.0	13.6	0.0	65.1	17.8	0.0	81.2	8.1	0.0
49.3	13.9	0.0	65.4	17.7	0.0	81.5	7.9	0.0
49.6	14.2	0.0	65.7	17.6	0.0	81.7	7.7	0.0
49.8	14.6	0.0	65.9	17.4	0.0	82.0	7.5	0.0
50.1	14.9	0.0	66.2	17.3	0.0	82.3	7.3	0.0
50.4	15.1	0.0	66.5	17.2	0.0	82.5	7.1	0.0
50.7	15.4	0.0	66.7	17.1	0.0	82.8	6.9	0.0
50.9	15.7	0.0	67.0	17.0	0.0	83.1	6.6	0.0
51.2	15.9	0.0	67.3	16.9	0.0	83.3	6.4	0.0
51.5	16.2	0.0	67.5	16.8	0.0	83.6	6.2	0.0
51.7	16.4	0.0	67.8	16.6	0.0	83.9	6.0	0.0
52.0	16.6	0.0	68.1	16.5	0.0	84.2	5.8	0.0
52.3	16.8	0.0	68.3	16.4	0.0	84.4	5.6	0.0
52.5	17.0	0.0	68.6	16.3	0.0	84.7	5.4	0.0
52.8	17.2	0.0	68.9	16.1	0.0	85.0	5.1	0.0
53.1	17.4	0.0	69.1	16.0	0.0	85.2	4.9	0.0
53.3	17.6	0.0	69.4	15.9	0.0	85.5	4.7	0.0
53.6	17.7	0.0	69.7	15.7	0.0	85.8	4.5	0.0
53.9	17.9	0.0	69.9	15.6	0.0	86.0	4.3	0.0
54.1	18.0	0.0	70.2	15.4	0.0	86.3	4.1	0.0
54.4	18.1	0.0	70.5	15.3	0.0	86.6	3.9	0.0
54.7	18.3	0.0	70.8	15.2	0.0	86.8	3.7	0.0
54.9	18.4	0.0	71.0	15.0	0.0	87.1	3.5	0.0
55.2	18.5	0.0	71.3	14.9	0.0	87.4	3.4	0.0
55.5	18.6	0.0	71.6	14.7	0.0	87.6	3.2	0.0
55.7	18.6	0.0	71.8	14.6	0.0	87.9	3.1	0.0
56.0	18.7	0.0	72.1	14.4	0.0	88.2	2.9	0.0
56.3	18.8	0.0	72.4	14.2	0.0	88.4	2.8	0.0
56.5	18.8	0.0	72.6	14.1	0.0	88.7	2.7	0.0
56.8	18.9	0.0	72.9	13.9	0.0	89.0	2.6	0.0
57.1	18.9	0.0	73.2	13.8	0.0	89.2	2.6	0.0
57.4	19.0	0.0	73.4	13.6	0.0	89.5	2.6	0.0
57.6	19.0	0.0	73.7	13.4	0.0	89.8	2.5	0.0
57.9	19.0	0.0	74.0	13.3	0.0	90.0	2.0	0.0
58.2	19.1	0.0	74.2	13.1	0.0	90.3	2.1	0.0
58.4	19.1	0.0	74.5	12.9	0.0	90.6	2.1	0.0
58.7	19.1	0.0	74.8	12.8	0.0	90.9	2.1	0.0
59.0	19.1	0.0	75.0	12.6	0.0	91.1	2.2	0.0
59.2	19.1	0.0	75.3	12.4	0.0	91.4	2.3	0.0
59.5	19.1	0.0	75.6	12.2	0.0	91.7	2.4	0.0
59.8	19.0	0.0	75.8	12.0	0.0	91.9	2.5	0.0
60.0	19.0	0.0	76.1	11.9	0.0	92.2	2.6	0.0
60.3	19.0	0.0	76.4	11.7	0.0	92.5	2.8	0.0
60.6	19.0	0.0	76.6	11.5	0.0	92.7	2.9	0.0
60.8	18.9	0.0	76.9	11.3	0.0	93.0	3.1	0.0
61.1	18.9	0.0	77.2	11.1	0.0	93.3	3.2	0.0
61.4	18.8	0.0	77.5	10.9	0.0	93.5	3.4	0.0
61.6	18.8	0.0	77.7	10.8	0.0	93.8	3.6	0.0
61.9	18.7	0.0	78.0	10.6	0.0	94.1	3.7	0.0
62.2	18.6	0.0	78.3	10.4	0.0	94.3	3.9	0.0
62.4	18.6	0.0	78.5	10.2	0.0	94.6	4.1	0.0
62.7	18.5	0.0	78.8	10.0	0.0	94.9	4.3	0.0
63.0	18.5	0.0	79.1	9.8	0.0	95.1	4.4	0.0
63.2	18.4	0.0	79.3	9.6	0.0	95.4	4.6	0.0
63.5	18.3	0.0	79.6	9.4	0.0	95.7	4.8	0.0
63.8	18.2	0.0	79.9	9.2	0.0	95.9	5.0	0.0
64.1	18.1	0.0	80.1	9.0	0.0	96.2	5.2	0.0