Federal Communications Commission
Washington, D. C. 20554

Approved by OMB
3060-0627
Expires 01/31/98

FOR FCC USE ONLY

FCC 302-AM

APPLICATION FOR AM BROADCAST STATION LICENSE

(Please read instructions before filling out form.)

FOR COMMISSION USE ONLY
FILE NO. BMML-20110620AIF

SECTION I - APPLICANT FEE INFORMATION

1. PAYOR NAME (Last, First, Middle Initial)

TOWNSQUARE MEDIA CASPER LICENSE, LLC

MAILING ADDRESS (Line 1) (Maximum 35 characters)
C/O TOWNSQUARE MANAGEMENT COMPANY, LLC

MAILING ADDRESS (Line 2) (Maximum 35 characters)
240 Greenwich Avenue

CITY	STATE OR COUNTRY (if foreign address)	ZIP CODE
GREENWICH	CT	06830

TELEPHONE NUMBER (include area code)	CALL LETTERS	OTHER FCC IDENTIFIER (If applicable)
(203) 861-0900	KTWO	11924

2. A. Is a fee submitted with this application? [✓] Yes [ ] No

B. If No, indicate reason for fee exemption (see 47 C.F.R. Section

[ ] Governmental Entity [ ] Noncommercial educational licensee [ ] Other (Please explain):

C. If Yes, provide the following information:

Enter in Column (A) the correct Fee Type Code for the service you are applying for. Fee Type Codes may be found in the "Mass Media Services Fee Filing Guide." Column (B) lists the Fee Multiple applicable for this application. Enter fee amount due in Column (C).

(A) FEE TYPE CODE	(B) FEE MULTIPLE	(C) FEE DUE FOR FEE TYPE CODE IN COLUMN (A)	FOR FCC USE ONLY
MMR	0001	$ 615.00	

To be used only when you are requesting concurrent actions which result in a requirement to list more than one Fee Type Code.

(A)	(B)	(C)	FOR FCC USE ONLY
MOR	0001	$ 705.00	

ADD ALL AMOUNTS SHOWN IN COLUMN C,
AND ENTER THE TOTAL HERE.
THIS AMOUNT SHOULD EQUAL YOUR ENCLOSED REMITTANCE.

TOTAL AMOUNT REMITTED WITH THIS APPLICATION	FOR FCC USE ONLY
$ 1320.00	

SECTION II - APPLICANT INFORMATION		
1. NAME OF APPLICANT TOWNSQUARE MEDIA CASPER LICENSE, LLC		
MAILING ADDRESS C/O TOWNSQUARE MANAGEMENT COMPANY, LLC 240 Greenwich Avenue		
CITY GREENWICH	STATE CT	ZIP CODE 06830

2. This application is for:

☑ Commercial ☐ Noncommercial

☑ AM Directional ☐ AM Non-Directional

Call letters	Community of License	Construction Permit File No.	Modification of Construction Permit File No(s).	Expiration Date of Last Construction Permit
KTWO(AM)	CASPER, WY	N/A	N/A	N/A

3. Is the station now operating pursuant to automatic program test authority in accordance with 47 C.F.R. Section 73.1620?

☐ Yes ☐ No

If No, explain in an Exhibit.

Exhibit No. N/A

4. Have all the terms, conditions, and obligations set forth in the above described construction permit been fully met?

☐ Yes ☐ No

If No, state exceptions in an Exhibit.

Exhibit No. N/A

5. Apart from the changes already reported, has any cause or circumstance arisen since the grant of the underlying construction permit which would result in any statement or representation contained in the construction permit application to be now incorrect?

☐ Yes ☐ No

If Yes, explain in an Exhibit.

Exhibit No. N/A

6. Has the permittee filed its Ownership Report (FCC Form 323) or ownership certification in accordance with 47 C.F.R. Section 73.3615(b)?

☐ Yes ☐ No

☑ Does not apply

If No, explain in an Exhibit.

Exhibit No. N/A

7. Has an adverse finding been made or an adverse final action been taken by any court or administrative body with respect to the applicant or parties to the application in a civil or criminal proceeding, brought under the provisions of any law relating to the following: any felony; mass media related antitrust or unfair competition; fraudulent statements to another governmental unit; or discrimination?

☐ Yes ☑ No

If the answer is Yes, attach as an Exhibit a full disclosure of the persons and matters involved, including an identification of the court or administrative body and the proceeding (by dates and file numbers), and the disposition of the litigation. Where the requisite information has been earlier disclosed in connection with another application or as required by 47 U.S.C. Section 1.65(c), the applicant need only provide: (i) an identification of that previous submission by reference to the file number in the case of an application, the call letters of the station regarding which the application or Section 1.65 information was filed, and the date of filing; and (ii) the disposition of the previously reported matter.

Exhibit No.

8. Does the applicant, or any party to the application, have a petition on file to migrate to the expanded band (1605-1705 kHz) or a permit or license either in the existing band or expanded band that is held in combination (pursuant to the 5 year holding period allowed) with the AM facility proposed to be modified herein?

☐ Yes ☑ No

If Yes, provide particulars as an Exhibit.

Exhibit No.

The APPLICANT hereby waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because use of the same, whether by license or otherwise, and requests and authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended).

The APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in

CERTIFICATION

1. By checking Yes, the applicant certifies, that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, or, in the case of a non-individual applicant (e.g., corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits that includes FCC benefits pursuant to that section. For the definition of a "party" for these purposes, see 47 C.F.R. Section 1.2002(b).

☑ Yes ☐ No

2. I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Name	Signature	
ALEX BERKETT		
Title	Date	Telephone Number
SVP	6/15/11	203. 861. 0903

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION

FCC NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT AND THE PAPERWORK REDUCTION ACT

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The Commission will use the information provided in this form to determine whether grant of the application is in the public interest. In reaching that determination, or for law enforcement purposes, it may become necessary to refer personal information contained in this form to another government agency. In addition, all information provided in this form will be available for public inspection. If information requested on the form is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Your response is required to obtain the requested authorization.

Public reporting burden for this collection of information is estimated to average 639 hours and 53 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, can be sent to the Federal Communications Commission, Records Management Branch, Paperwork Reduction Project (3060-0627), Washington, D. C. 20554. Do NOT send completed forms to this address.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552a(e)(3), AND THE PAPERWORK REDUCTION ACT OF 1980, P.L. 96-511, DECEMBER 11, 1980, 44 U.S.C. 3507

SECTION III - LICENSE APPLICATION ENGINEERING DATA

Name of Applicant
TOWNSQUARE MEDIA CASPER LICENSE, LLC

PURPOSE OF AUTHORIZATION APPLIED FOR: (check one)

☑ Station License ☐ Direct Measurement of Power

1. Facilities authorized in construction permit

Call Sign	File No. of Construction Permit (if applicable)	Frequency (kHz)	Hours of Operation	Power in kilowatts	
				Night	Day
KTWO		1030	UNLIMITED	50	50

2. Station location

State	City or Town
WYOMING	CASPER

3. Transmitter location

State	County	City or Town	Street address (or other identification)
WY	NATRONA	Evansville	1422 Hat Six Rd

4. Main studio location

State	County	City or Town	Street address (or other identification)
WY	NATRONA	CASPER	150 N Nichols Ave

5. Remote control point location (specify only if authorized directional antenna)

State	County	City or Town	Street address (or other identification)
WY	NATRONA	CASPER	150 N Nichols Ave

6. Has type-approved stereo generating equipment been installed? ☐ Yes ☑ No

7. Does the sampling system meet the requirements of 47 C.F.R. Section 73.68? ☑ Yes ☐ No ☐ Not Applicable

Attach as an Exhibit a detailed description of the sampling system as installed. Exhibit No.

8. Operating constants:

RF common point or antenna current (in amperes) without modulation for night system	RF common point or antenna current (in amperes) without modulation for day system
32.4	31.6

Measured antenna or common point resistance (in ohms) at operating frequency		Measured antenna or common point reactance (in ohms) at operating frequency	
Night	Day	Night	Day
50	50	0	+j68

Antenna indications for directional operation

Towers	Antenna monitor Phase reading(s) in degrees		Antenna monitor sample current ratio(s)		Antenna base currents	
	Night	Day	Night	Day	Night	Day
1 East	0.0 REF		1.00 REF			
2 West	-85.9		0.899			

Manufacturer and type of antenna monitor: POTOMAC INSTRUMENTS AM19D (TYPE 210)

SECTION III - Page 2

9. Description of antenna system ((f directional antenna is used, the information requested below should be given for each element of the array. Use separate sheets if necessary.)

Type Radiator	Overall height in meters of radiator above base insulator, or above base, if grounded.	Overall height in meters above ground (without obstruction lighting)	Overall height in meters above ground (include obstruction lighting)	If antenna is either top loaded or sectionalized, describe fully in an Exhibit.
GUYED TOWER	ALL 72.8M	ALL 73.8M	ALL 75.2M	Exhibit No.

Excitation ☑ Series ☐ Shunt

Geographic coordinates to nearest second. For directional antenna give coordinates of center of array. For single vertical radiator give tower location.

North Latitude	West Longitude
42 ° 50 ' 34 "	106 ° 13 ' 07 "

If not fully described above, attach as an Exhibit further details and dimensions including any other antenna mounted on tower and associated isolation circuits. Exhibit No.

Also, if necessary for a complete description, attach as an Exhibit a sketch of the details and dimensions of ground system. Exhibit No.

10. In what respect, if any, does the apparatus constructed differ from that described in the application for construction permit or in the permit? NONE

11. Give reasons for the change in antenna or common point resistance.

I certify that I represent the applicant in the capacity indicated below and that I have examined the foregoing statement of technical information and that it is true to the best of my knowledge and belief.

Name (Please Print or Type)	Signature (check appropriate box below)
TIMOTHY C CUTFORTH	Timothy C Cutforth
Address (include ZIP Code)	Date
BROADCAST ENGINEERING CONSUL 965 S. IRVING STREET DENVER, CO 80219	06/05/2011
	Telephone No. (Include Area Code) 303-937-1900

☐ Technical Director

☑ Registered Professional Engineer

☐ Chief Operator

☐ Technical Consultant

☐ Other (specify)

EXHIBIT E-1

APPLICATION FOR LICENSE INFORMATION
RADIO STATION KTWO
CASPER, WYOMING

TOWNSQUARE MEDIA CASPER LICENSE, LLC.

June 5, 2011

1030 kHz 50 kW DA-N

EXECUTIVE SUMMARY

This engineering exhibit supports an application for modification of license for the existing nighttime directional antenna system of radio station KTWO in Casper, Wyoming (FCC FID No. 11924) pursuant to the recently enacted AM technical rules permitting moment-method modeling of eligible AM directional arrays.

KTWO operates on 1030 kHz and has been operating pursuant to the terms of its license. The instant application Proposes only to change to Method of Moment (MoM) proof of performance for the KTWO nighttime array. No changes have been made or proposed to the night site or antenna or to the day or night operating system previously described.

Information is provided herein showing that the directional antenna parameters for the nighttime pattern authorized by the FCC have been determined in accordance with the requirements of 47 C.F.R. §73.151(c). The system has been adjusted to produce antenna monitor parameters within ±5 percent in ratio and ±3 degrees in phase of the modeled values, as required by the Rules. A modified station license is requested herewith specifying the new nighttime operating parameters.

Analysis of Tower Impedance Measurements to Verify Method of Moments Model

Tower base impedance measurements were made at the final J-plugs within the Antenna Tuning Units (ATUs) using a Delta OIB-1 impedance bridge. The other tower was open-circuited at the same points where the impedance measurements were made. The static drain choke on tower 1 at the ATU outputs was reconnected for the self impedance measurement and measurements both with and without the SD coil indicated a barely measureable effect consistent with the approximately 4070 Ohms reactance of the 630 microHenry static drain so the static drain was included in the model. The KTWO tower 2 ATU is configured with a tuning coil to ground both in the night configuration and in the daytime detuned configuration so no static drain coil is installed at tower two. This arrangement left only the short feed tubing between the ATU outputs and the tower base in series in the impedance measurements. ACSModel (MININEC 3.1 core) was used to model the KTWO nighttime array.

A lumped load with a reactance of –j10,000 was modeled at the base of the other towers to simulate an open circuit at each tower base for the self impedance model.

Towers 1 and 2 are physically 85.3m tall (86.8m overall AGL including base and lighting beacon) for an electrical height of 90 degrees All towers are base insulated.

The tower heights were adjusted in the model in order to achieve calibration of the model with the measured base impedances. All modeled tower heights were within 75 to 125 percent of the physical tower height as required by the FCC Rules.

The radius for each tower is the physical radius of the tower as determined by the formula $3T/2\pi$, where T is the tower face width in meters. The KTWO radiators are uniform cross-section triangular towers with a face width of 15 inches. The tower radius computes to 0.1820 meter for all towers. Towers 1 and 2 are fed with a short length of large-diameter copper tubing that exhibits a small amount of series inductive reactance. This tubing connects to each tower immediately above the base insulator.

A circuit model was constructed for each tower using the assumed series feed tubing and includes the relatively small shunt capacitance (80pf) of the base insulator shown in the WCAP printout as 0.0001mfd. and the Austin Transformer lighting isolation capacitance (50pf) shown in the WCAP printout as 0.0001mfd. This model was used with the Westberg Circuit Analysis Program (WCAP) to determine the effects of these reactances on the ATU output impedance at each tower. In each of the WCAP tabulations, node 2 represents the ATU output reference point and node 3 represents the tower base. Node 0 represents ground potential. The ATU output impedances can be found in the "TO NODE IMPEDANCE" column of each WCAP tabulation, following the phantom 1.0 ohm resistor inserted in the model to provide a calculation point for the impedance. The complex base impedance of each tower from the moment method model is represented in each case by the complex load from node 3 to ground. The WCAP circuit model tabulation immediately follows the model for each tower.

§73.151(c)(1)(vii) permits the use of a lumped series inductance of 10 uH or less between the output port of each antenna tuning unit and the associated tower. In each case, the value of lumped series inductance was below this 10 uH limit.

The modeled and measured impedances at the ATU output J-plugs with the other towers open-circuited at their ATU output J-plugs agree within ±2 ohms and ±4 percent as required by the FCC rules.

Table 1 – Analysis of Tower Impedance Measurements to Verify Moment Method Model

Twr.	Z_{BASE} (Modeled)	Z_{ATU} (Modeled)	Z_{ATU} (Measured)	Series L (uH)	Phys. Height (deg.)	Model Height (deg.)	% Phys. Height
1	47.7 +j47.8	49.9 +j68.0	50.0 +j68	3.23	90	94.5	105.0
2	44.9 +j38.8	47.9 +j68.0	47.5 +j68	4.59	90	93.0	103.3

****
ACSModel
(MININEC 3.1 Core)
05-18-2011 16:10:41
****

KTWO
calibration
tower 1 driven tower 2 floated

Frequency = 1.030 MHz Wavelength = 291.06797 Meters

No. of Wires: 2

Wire No. 1 Coordinates X	Y	Z	Radius	End Connection	No. of Segments
0	0	0		-1	
0	0	76.40534	0.182	0	20

Wire No. 2 Coordinates X	Y	Z	Radius	End Connection	No. of Segments
-12.63572	-71.66071	0		-2	
-12.63572	-71.66071	75.19256	0.182	0	20

**** ANTENNA GEOMETRY ****

Wire No. 1 Coordinates X	Y	Z	Radius	Connection End1	End2	Pulse No.
0	0	0	0.182	-1	1	1
0	0	3.820267	0.182	1	1	2
0	0	7.640534	0.182	1	1	3
0	0	11.4608	0.182	1	1	4
0	0	15.28107	0.182	1	1	5
0	0	19.10134	0.182	1	1	6
0	0	22.9216	0.182	1	1	7
0	0	26.74187	0.182	1	1	8
0	0	30.56214	0.182	1	1	9
0	0	34.3824	0.182	1	1	10
0	0	38.20267	0.182	1	1	11
0	0	42.02294	0.182	1	1	12
0	0	45.84321	0.182	1	1	13
0	0	49.66348	0.182	1	1	14
0	0	53.48374	0.182	1	1	15
0	0	57.304	0.182	1	1	16
0	0	61.12428	0.182	1	1	17
0	0	64.94454	0.182	1	1	18
0	0	68.76481	0.182	1	1	19
0	0	72.58508	0.182	1	0	20

Wire No. 2 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-12.63572	-71.66071	0	0.182	-2	2	21
-12.63572	-71.66071	3.759628	0.182	2	2	22
-12.63572	-71.66071	7.519256	0.182	2	2	23
-12.63572	-71.66071	11.27888	0.182	2	2	24
-12.63572	-71.66071	15.03851	0.182	2	2	25
-12.63572	-71.66071	18.79814	0.182	2	2	26
-12.63572	-71.66071	22.55777	0.182	2	2	27
-12.63572	-71.66071	26.31739	0.182	2	2	28
-12.63572	-71.66071	30.07702	0.182	2	2	29
-12.63572	-71.66071	33.83665	0.182	2	2	30
-12.63572	-71.66071	37.59628	0.182	2	2	31
-12.63572	-71.66071	41.35591	0.182	2	2	32
-12.63572	-71.66071	45.11553	0.182	2	2	33
-12.63572	-71.66071	48.87516	0.182	2	2	34
-12.63572	-71.66071	52.63479	0.182	2	2	35
-12.63572	-71.66071	56.39442	0.182	2	2	36
-12.63572	-71.66071	60.15405	0.182	2	2	37
-12.63572	-71.66071	63.91367	0.182	2	2	38
-12.63572	-71.66071	67.6733	0.182	2	2	39
-12.63572	-71.66071	71.43293	0.182	2	0	40

```
Sources:  1
Pulse No., Voltage Magnitude, Phase (Degrees): 1, 100.0, 0.0

Number of Loads:  1
Pulse No., Resistance, Reactance:  21 , 0 ,-10000

********************    SOURCE DATA     **********************
Pulse  1      Voltage = (100.0, 0.0j)
              Current = (1.0466, -1.0493j)
              Impedance = (47.65, 47.776j)
              Power = 52.33 Watts
```

********** CURRENT DATA **********

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	1.0466	-1.0493	1.482	-45.0753
2	1.0435	-1.0937	1.5116	-46.345
3	1.0344	-1.1153	1.5212	-47.1561
4	1.0193	-1.1251	1.5182	-47.8265
5	0.9982	-1.1246	1.5037	-48.4078
6	0.9714	-1.1145	1.4784	-48.9247
7	0.9388	-1.095	1.4424	-49.392
8	0.9008	-1.0667	1.3962	-49.8193
9	0.8576	-1.0298	1.3401	-50.2138
10	0.8093	-0.9846	1.2745	-50.5807
11	0.7563	-0.9314	1.1998	-50.9242
12	0.6987	-0.8705	1.1163	-51.2476
13	0.637	-0.8024	1.0245	-51.5537
14	0.5713	-0.7272	0.9248	-51.8449
15	0.5021	-0.6455	0.8177	-52.1231
16	0.4294	-0.5574	0.7036	-52.3901
17	0.3535	-0.4632	0.5827	-52.6475
18	0.2745	-0.3629	0.455	-52.8968
19	0.1919	-0.2559	0.3199	-53.1399
20	0.1044	-0.1404	0.175	-53.3803
E	0.0	0.0	0.0	0.0

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
21	-0.0048	-0.0001	0.0048	-178.2702
22	-0.0273	-0.0008	0.0273	-178.2418
23	-0.0418	-0.0013	0.0419	-178.1966
24	-0.0535	-0.0017	0.0535	-178.1425
25	-0.063	-0.0021	0.0631	-178.0812
26	-0.0707	-0.0025	0.0707	-178.0134
27	-0.0766	-0.0028	0.0767	-177.9397
28	-0.0809	-0.003	0.0809	-177.8604
29	-0.0835	-0.0032	0.0836	-177.7757
30	-0.0846	-0.0034	0.0847	-177.686
31	-0.0842	-0.0035	0.0842	-177.5916
32	-0.0822	-0.0036	0.0823	-177.4928
33	-0.0788	-0.0036	0.0789	-177.3903
34	-0.0741	-0.0035	0.0741	-177.2844
35	-0.0679	-0.0033	0.068	-177.1757
36	-0.0604	-0.0031	0.0605	-177.0651
37	-0.0516	-0.0027	0.0516	-176.9532
38	-0.0414	-0.0023	0.0415	-176.8408
39	-0.0299	-0.0017	0.03	-176.7287
40	-0.0168	-0.001	0.0168	-176.6165

********** BASE OPERATING PARAMETERS **********

Twr.	Ratio	Phase
1	1.000	0.0
2	0.003	-133.2

```
WESTBERG CIRCUIT ANALYSIS PROGRAM
FILE NAME = ktwo-1.cir
I      1.0000     0     1      .0000      .0000      .0000
R      1.0000     1     2      .0000      .0000      .0000
L      3.2300     3     2      .0000      .0000      .0000
L    630.0000     2     0      .0000      .0000      .0000
C       .0001     3     0      .0000      .0000      .0000
C       .0000     3     0      .0000      .0000      .0000
R     47.6500     3     0    47.7760      .0000      .0000
EX      .0000     0     0      .0000      .0000      .0000


FREQ = 1.030

   NODE       VOLT MAG      VOLT PHASE
    1         84.9707         53.1710
    2         84.3751         53.7146
    3         69.0746         43.3975
                          BRANCH VOLTAGE       BRANCH CURRENT FROM NODE IMPEDANCE  TO NODE IMPEDANCE
                          MAG      PHASE       MAG      PHASE RESISTANCE REACTANCE RESISTANCE REACTANCE
VSWR
 R     1-  2      1.000     1.00      .000      1.00      .000     50.93     68.01     49.93     68.01
 L     3-  2      3.230    20.56   -89.286       .98  -179.286    -51.63    -47.62    -51.63    -68.52
 L     2-  0    630.000    84.38    53.715       .02   -36.285       .00   4077.16       .00       .00
 C     3-  0       .000    69.07    43.398       .04   133.398       .00  -1931.49       .00       .00
 C     3-  0       .000    69.07    43.398       .02   133.398       .00  -3090.39       .00       .00
 R     3-  0     47.650    69.07    43.398      1.02    -1.678     47.65     47.78       .00       .00
```

```
KTWO-1.cir  original WCAP input file
1.03 0. 1
I 1 0 1
R 1.0000 1 2
L 3.23 3 2
L 630 2 0
C 0.00008 3 0
C 0.00005 3 0
R 47.65 3 0 47.776
EX
```

```
****************************************
                ACSModel
            (MININEC 3.1 Core)
        05-18-2011          16:23:55
****************************************

KTWO
calibration
tower 2 driven tower 1 floated

Frequency = 1.030 MHz      Wavelength = 291.06797 Meters

No. of Wires: 2

Wire No. 1   Coordinates                              End          No. of
   X             Y             Z          Radius     Connection
Segments
 0             0             0                       -1
 0             0             76.40534    0.182       0              20

Wire No. 2   Coordinates                              End          No. of
   X             Y             Z          Radius     Connection
Segments
-12.63572     -71.66071     0                       -2
-12.63572     -71.66071     75.19256    0.182       0              20

                **** ANTENNA GEOMETRY ****

Wire No.  1  Coordinates                                  Connection  Pulse
X             Y             Z             Radius        End1 End2   No.
 0             0             0             0.182         -1   1      1
 0             0             3.820267      0.182         1    1      2
 0             0             7.640534      0.182         1    1      3
 0             0             11.4608       0.182         1    1      4
 0             0             15.28107      0.182         1    1      5
 0             0             19.10134      0.182         1    1      6
 0             0             22.9216       0.182         1    1      7
 0             0             26.74187      0.182         1    1      8
 0             0             30.56214      0.182         1    1      9
 0             0             34.3824       0.182         1    1      10
 0             0             38.20267      0.182         1    1      11
 0             0             42.02294      0.182         1    1      12
 0             0             45.84321      0.182         1    1      13
 0             0             49.66348      0.182         1    1      14
 0             0             53.48374      0.182         1    1      15
 0             0             57.304        0.182         1    1      16
 0             0             61.12428      0.182         1    1      17
 0             0             64.94454      0.182         1    1      18
 0             0             68.76481      0.182         1    1      19
 0             0             72.58508      0.182         1    0      20
```

Wire No. 2 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-12.63572	-71.66071	0	0.182	-2	2	21
-12.63572	-71.66071	3.759628	0.182	2	2	22
-12.63572	-71.66071	7.519256	0.182	2	2	23
-12.63572	-71.66071	11.27888	0.182	2	2	24
-12.63572	-71.66071	15.03851	0.182	2	2	25
-12.63572	-71.66071	18.79814	0.182	2	2	26
-12.63572	-71.66071	22.55777	0.182	2	2	27
-12.63572	-71.66071	26.31739	0.182	2	2	28
-12.63572	-71.66071	30.07702	0.182	2	2	29
-12.63572	-71.66071	33.83665	0.182	2	2	30
-12.63572	-71.66071	37.59628	0.182	2	2	31
-12.63572	-71.66071	41.35591	0.182	2	2	32
-12.63572	-71.66071	45.11553	0.182	2	2	33
-12.63572	-71.66071	48.87516	0.182	2	2	34
-12.63572	-71.66071	52.63479	0.182	2	2	35
-12.63572	-71.66071	56.39442	0.182	2	2	36
-12.63572	-71.66071	60.15405	0.182	2	2	37
-12.63572	-71.66071	63.91367	0.182	2	2	38
-12.63572	-71.66071	67.6733	0.182	2	2	39
-12.63572	-71.66071	71.43293	0.182	2	0	40

```
Sources:  1
Pulse No., Voltage Magnitude, Phase (Degrees): 21, 100.0, 0.0

Number of Loads:  1
Pulse No., Resistance, Reactance:  1 , 0 ,-10000

********************    SOURCE DATA     ********************
Pulse  21      Voltage = (100.0, 0.0j)
               Current = (1.2741, -1.1022j)
               Impedance = (44.893, 38.836j)
               Power = 63.7 Watts
```

********** CURRENT DATA **********

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	-0.0054	-0.0006	0.0055	-174.0733
2	-0.0312	-0.0033	0.0314	-174.0411
3	-0.0478	-0.005	0.0481	-173.9899
4	-0.0612	-0.0065	0.0616	-173.9288
5	-0.0721	-0.0078	0.0726	-173.8597
6	-0.0809	-0.0088	0.0814	-173.7836
7	-0.0877	-0.0097	0.0882	-173.701
8	-0.0925	-0.0104	0.0931	-173.6124
9	-0.0956	-0.0109	0.0962	-173.5183
10	-0.0968	-0.0112	0.0974	-173.419
11	-0.0962	-0.0113	0.0969	-173.315
12	-0.094	-0.0112	0.0947	-173.2068
13	-0.0901	-0.0109	0.0907	-173.0949
14	-0.0846	-0.0104	0.0852	-172.9801
15	-0.0775	-0.0097	0.0781	-172.863
16	-0.0689	-0.0088	0.0694	-172.7445
17	-0.0588	-0.0076	0.0593	-172.6254
18	-0.0472	-0.0062	0.0476	-172.5068
19	-0.0341	-0.0046	0.0344	-172.3892
20	-0.0191	-0.0026	0.0193	-172.2727
E	0.0	0.0	0.0	0.0

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
21	1.2741	-1.1022	1.6846	-40.8623
22	1.2704	-1.1459	1.7109	-42.0514
23	1.2594	-1.1668	1.7168	-42.8146
24	1.2411	-1.1756	1.7095	-43.4481
25	1.2156	-1.1739	1.6899	-43.9992
26	1.1831	-1.1623	1.6585	-44.4909
27	1.1438	-1.1413	1.6158	-44.9366
28	1.0978	-1.1111	1.562	-45.3452
29	1.0454	-1.0722	1.4975	-45.7232
30	0.9869	-1.0247	1.4227	-46.0754
31	0.9226	-0.9691	1.338	-46.4058
32	0.8528	-0.9056	1.2439	-46.7173
33	0.7779	-0.8346	1.1409	-47.0126
34	0.6981	-0.7564	1.0293	-47.2939
35	0.6139	-0.6714	0.9097	-47.5629
36	0.5254	-0.5799	0.7825	-47.8214
37	0.4329	-0.482	0.6478	-48.0709
38	0.3364	-0.3777	0.5058	-48.3127
39	0.2354	-0.2665	0.3556	-48.5487
40	0.1282	-0.1464	0.1946	-48.7823
E	0.0	0.0	0.0	0.0

********** BASE OPERATING PARAMETERS **********

Twr.	Ratio	Phase
1	0.003	-133.2
2	1.000	0.0

```
WESTBERG CIRCUIT ANALYSIS PROGRAM

 FILE NAME = ktwo-2.cir

 I     1.0000    0    1     .0000     .0000     .0000
 R     1.0000    1    2     .0000     .0000     .0000
 L     4.5900    3    2     .0000     .0000     .0000
 C      .0000    3    0     .0000     .0000     .0000
 C      .0001    3    0     .0000     .0000     .0000
 R    44.8930    3    0   38.8360     .0000     .0000
 EX     .0000    0    0     .0000     .0000     .0000


 FREQ = 1.030

   NODE       VOLT MAG      VOLT PHASE
    1         83.7448         54.2702
    2         83.1648         54.8295
    3         61.3183         38.6264
                          BRANCH VOLTAGE       BRANCH CURRENT FROM NODE IMPEDANCE  TO NODE IMPEDANCE
                          MAG      PHASE       MAG      PHASE RESISTANCE REACTANCE RESISTANCE REACTANCE
VSWR
 R    1-  2     1.000      1.00      .000      1.00      .000     48.90     67.98     47.90     67.98
 L    3-  2     4.590     29.71   -90.000      1.00   180.000    -47.90    -38.28    -47.90    -67.98
 C    3-  0      .000     61.32    38.626       .02   128.626       .00  -3090.39       .00       .00
 C    3-  0      .000     61.32    38.626       .03   128.626       .00  -1931.49       .00       .00
 R    3-  0    44.893     61.32    38.626      1.03    -2.236     44.89     38.84       .00       .00
```

```
KTWO-2.cir Original WCAP input file
1.03 0. 1
I 1 0 1
R 1.0000 1 2
L 4.59 3 2
C 0.00005 3 0
C 0.00008 3 0
R 44.893 3 0 38.836
EX
```

Derivation of Operating Parameters for Nighttime Directional Antenna

Once calibrated against the measured individual open-circuited base impedances, the moment method model was utilized for nighttime directional antenna calculations. These calculations were made to determine the complex voltage source values to be applied at ground level for each tower of the array to produce the current moment sums for the towers which, when normalized to the reference tower, equate to the theoretical field parameters of the authorized directional pattern. These voltage sources were then applied in the model and the tower currents were calculated.

Twenty segments were used for each tower. The KTWO towers are base sampled, which is permitted for towers of 120 electrical degrees or less. As such, the first (ground) segment of each tower was used to determine the model operating parameters of the array.

A circuit model was constructed to determine the effect of the series feed inductance, and shunt static drain choke reactance on the ATU output current. The static drain choke on tower 1 is 630 microhenry and the circuit model for each tower is essentially the circuit model used for model verification above with the inductance of the static drain choke at tower 1 included and using the model-predicted operating impedance for each tower. Again, this model was used with the Westberg Circuit Analysis Program (WCAP).

This effect was, as expected, minimal, and the results are tabulated in the table below along with the base operating parameters for the nighttime array.

Twr	Node	Current Magnitude (amperes)	Current Magnitude Ratio	Current Phase (degrees)	WCAP Current Offset for Unity I_{BASE}	WCAP Phase Offset for Unity $Ø_{BASE}$ (degrees)	Antenna Monitor Ratio	Antenna Monitor Phase (degrees)
1	1	33.597	1.00 Ref	2.84	0.990	+0.963	1.000	0.0 Ref
2	21	31.525	0.938	-85.58	1.054	+3.516	0.899	-85.9

```
****************************************
                ACSModel
            (MININEC 3.1 Core)
        05-18-2011          16:04:38
****************************************

KTWO
operating parameters
all towers driven

Frequency = 1.030 MHz      Wavelength = 291.06797 Meters

No. of Wires: 2

Wire No. 1   Coordinates                                  End          No. of
   X             Y             Z          Radius      Connection
Segments
 0             0             0                          -1
 0             0             76.40534     0.182          0              20

Wire No. 2   Coordinates                                  End          No. of
   X             Y             Z          Radius      Connection
Segments
-12.63572     -71.66071     0                          -2
-12.63572     -71.66071     75.19256     0.182          0              20

                **** ANTENNA GEOMETRY ****

Wire No.  1  Coordinates                                  Connection  Pulse
X             Y             Z          Radius      End1  End2   No.
 0             0             0          0.182       -1    1      1
 0             0             3.820267   0.182       1     1      2
 0             0             7.640534   0.182       1     1      3
 0             0             11.4608    0.182       1     1      4
 0             0             15.28107   0.182       1     1      5
 0             0             19.10134   0.182       1     1      6
 0             0             22.9216    0.182       1     1      7
 0             0             26.74187   0.182       1     1      8
 0             0             30.56214   0.182       1     1      9
 0             0             34.3824    0.182       1     1      10
 0             0             38.20267   0.182       1     1      11
 0             0             42.02294   0.182       1     1      12
 0             0             45.84321   0.182       1     1      13
 0             0             49.66348   0.182       1     1      14
 0             0             53.48374   0.182       1     1      15
 0             0             57.304     0.182       1     1      16
 0             0             61.12428   0.182       1     1      17
 0             0             64.94454   0.182       1     1      18
 0             0             68.76481   0.182       1     1      19
 0             0             72.58508   0.182       1     0      20
```

Wire No. 2 Coordinates				Connection		Pulse
X	Y	Z	Radius	End1	End2	No.
-12.63572	-71.66071	0	0.182	-2	2	21
-12.63572	-71.66071	3.759628	0.182	2	2	22
-12.63572	-71.66071	7.519256	0.182	2	2	23
-12.63572	-71.66071	11.27888	0.182	2	2	24
-12.63572	-71.66071	15.03851	0.182	2	2	25
-12.63572	-71.66071	18.79814	0.182	2	2	26
-12.63572	-71.66071	22.55777	0.182	2	2	27
-12.63572	-71.66071	26.31739	0.182	2	2	28
-12.63572	-71.66071	30.07702	0.182	2	2	29
-12.63572	-71.66071	33.83665	0.182	2	2	30
-12.63572	-71.66071	37.59628	0.182	2	2	31
-12.63572	-71.66071	41.35591	0.182	2	2	32
-12.63572	-71.66071	45.11553	0.182	2	2	33
-12.63572	-71.66071	48.87516	0.182	2	2	34
-12.63572	-71.66071	52.63479	0.182	2	2	35
-12.63572	-71.66071	56.39442	0.182	2	2	36
-12.63572	-71.66071	60.15405	0.182	2	2	37
-12.63572	-71.66071	63.91367	0.182	2	2	38
-12.63572	-71.66071	67.6733	0.182	2	2	39
-12.63572	-71.66071	71.43293	0.182	2	0	40

Sources: 2
Pulse No., Voltage Magnitude, Phase (Degrees): 1, 1254.6, 44.9
Pulse No., Voltage Magnitude, Phase (Degrees): 21, 2957.4, -43.1

Number of Loads: 0

********** SOURCE DATA **********
Pulse 1 Voltage = (888.3783, 885.9018j)
Current = (33.5558, 1.6669j)
Impedance = (27.718, 25.024j)
Power = 15643.45 Watts

Pulse 21 Voltage = (2160.7361, -2019.1984j)
Current = (2.4288, -31.4309j)
Impedance = (69.142, 63.403j)
Power = 34356.55 Watts

Total Power = 50000.000 Watts

********** CURRENT DATA **********

Wire No. 1 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
1	33.5558	1.6669	33.5971	2.8438
2	33.8786	1.2401	33.9013	2.0963
3	33.8596	0.9505	33.8729	1.608
4	33.5966	0.7019	33.604	1.1968
5	33.1049	0.4819	33.1084	0.834
6	32.3933	0.2859	32.3945	0.5056
7	31.4689	0.1119	31.4691	0.2037
8	30.3388	-0.0409	30.3388	-0.0773
9	29.0106	-0.1727	29.0111	-0.341
10	27.4923	-0.2834	27.4937	-0.5906
11	25.7927	-0.3729	25.7954	-0.8282
12	23.9211	-0.4408	23.9251	-1.0558
13	21.8871	-0.487	21.8925	-1.2748
14	19.7004	-0.5112	19.7071	-1.4865
15	17.3705	-0.5131	17.3781	-1.6919
16	14.9056	-0.4924	14.9137	-1.8921
17	12.3114	-0.4488	12.3196	-2.0879
18	9.5883	-0.3818	9.5959	-2.2801
19	6.7235	-0.29	6.7298	-2.4698
20	3.6685	-0.1704	3.6725	-2.6595
E	0.0	0.0	0.0	0.0

Wire No. 2 :

Pulse No.	Real (Amps)	Imaginary (Amps)	Magnitude (Amps)	Phase (Degrees)
21	2.4288	-31.4309	31.5246	-85.5813
22	1.4743	-32.3544	32.388	-87.3909
23	0.8413	-32.7389	32.7497	-88.528
24	0.3114	-32.8196	32.8211	-89.4564
25	-0.1436	-32.6292	32.6296	-90.2522
26	-0.5349	-32.1835	32.188	-90.9522
27	-0.8676	-31.4926	31.5046	-91.5781
28	-1.1446	-30.565	30.5865	-92.1446
29	-1.3673	-29.4088	29.4406	-92.6619
30	-1.5368	-28.0324	28.0745	-93.138
31	-1.654	-26.4444	26.4961	-93.5789
32	-1.7195	-24.6541	24.7139	-93.9897
33	-1.7343	-22.6709	22.7371	-94.3744
34	-1.6989	-20.5045	20.5748	-94.7365
35	-1.6143	-18.1641	18.2357	-95.0788
36	-1.4812	-15.6576	15.7275	-95.404
37	-1.2999	-12.9904	13.0553	-95.7144
38	-1.0703	-10.162	10.2182	-96.0122
39	-0.7902	-7.1576	7.201	-96.2999
40	-0.4528	-3.9238	3.9498	-96.5821
E	0.0	0.0	0.0	0.0

********** BASE OPERATING PARAMETERS **********

Twr.	Ratio	Phase
1	1.000	0.0
2	0.938	-88.4

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = ktwo-1n.cir

I	33.2710	0	1	3.8070	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	3.2300	3	2	.0000	.0000	.0000
L	630.0000	2	0	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
R	27.7180	3	0	25.0240	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.030

NODE	VOLT MAG	VOLT PHASE
1	1799.0350	61.0378
2	1781.2470	61.9377
3	1254.6750	44.9201

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
VSWR											
R	1-	2	1.000	33.27	3.807	33.27	3.807	29.27	45.47	28.27	45.47
L	3-	2	3.230	687.74	-85.791	32.90	-175.791	-28.91	-24.87	-28.91	-45.78
L	2-	0	630.000	1781.25	61.938	.44	-28.062	.00	4077.16	.00	.00
C	3-	0	.000	1254.68	44.920	.65	134.920	.00	-1931.49	.00	.00
C	3-	0	.000	1254.68	44.920	.41	134.920	.00	-3090.39	.00	.00
R	3-	0	27.718	1254.68	44.920	33.60	2.844	27.72	25.02	.00	.00

```
KTWO-1n.cir original WCAP input file
1.03 0. 1
I 33.271 0 1 3.807
R 1.0000 1 2
L 3.23 3 2
L 630 2 0
C 0.00008 3 0
C 0.00005 3 0
R 27.718 3 0 25.024
EX
```

WESTBERG CIRCUIT ANALYSIS PROGRAM

FILE NAME = ktwo-2n.cir

I	29.8980	0	1	-82.0650	.0000	.0000
R	1.0000	1	2	.0000	.0000	.0000
L	4.5900	3	2	.0000	.0000	.0000
C	.0000	3	0	.0000	.0000	.0000
C	.0001	3	0	.0000	.0000	.0000
R	69.1420	3	0	63.4030	.0000	.0000
EX	.0000	0	0	.0000	.0000	.0000

FREQ = 1.030

NODE	VOLT MAG	VOLT PHASE
1	3602.5380	-32.3206
2	3583.2910	-31.9558
3	2957.2340	-43.0606

				BRANCH VOLTAGE		BRANCH CURRENT		FROM NODE IMPEDANCE		TO NODE IMPEDANCE	
VSWR				MAG	PHASE	MAG	PHASE	RESISTANCE	REACTANCE	RESISTANCE	REACTANCE
R	1-	2	1.000	29.90	-82.065	29.90	-82.065	77.86	91.96	76.86	91.96
L	3-	2	4.590	888.12	-172.065	29.90	97.935	-76.86	-62.25	-76.86	-91.96
C	3-	0	.000	2957.23	-43.061	.96	46.939	.00	-3090.39	.00	.00
C	3-	0	.000	2957.23	-43.061	1.53	46.939	.00	-1931.49	.00	.00
R	3-	0	69.142	2957.23	-43.061	31.52	-85.581	69.14	63.40	.00	.00

KTWO-2n.cir Original WCAP input file

```
1.03 0. 1
I 29.898 0 1 -82.065
R 1.0000 1 2
L 4.59 3 2
C 0.00005 3 0
C 0.00008 3 0
R 69.142 3 0 63.403
EX
```

Current Moments (amp-meters) Peak

Frequency: 1,030 kHz
Input Power: 50,000 Watts

Wire	Real	Imag	Vert. Current Moment Magnitude	Phase
1	1748.8821	0.0000	1748.8821	0.00
2	-57.4047	-1730.4414	1731.3932	-91.90

Medium wave array vertical current moment (amps-meters) peak
(Calculation assumes tower wires are grouped together.
The first wire of each group must contain the source.)

Tower	Real	Imag	Magnitude	Phase
1	1748.8821	0.0000	1748.8821	0.00
2	-57.4047	-1730.4414	1731.3932	-91.90

Sampling System

The sampling system consists of two Delta Electronics TCT-1 current transformers installed at the output of each antenna tuning unit, immediately adjacent to the final J-plug. Samples from the current transformers are fed to the antenna monitor via equal lengths of 3/8-inch foam-dielectric coaxial transmission lines. The antenna monitor is a Potomac Instruments AM19D Type 210. The monitor calibration was verified using the internal calibrator according to the Potomac Instruments operating manual.

Impedance measurements were made of the antenna sampling system using an AIM 4170 network analyzer. The measurements were made looking into the antenna monitor ends of the sample lines with the tower ends of the sample lines open-circuited.

The table below shows the frequencies above and below the carrier frequency where resonance, defined as zero reactance corresponding with low resistance, was found. As the length of distortionless transmission line is 180 electrical degrees at the difference frequency between adjacent frequencies of resonance, and frequencies of resonance occur at odd multiples of 90 degrees electrical length, the sample line length at the resonant frequency below carrier frequency, which is the closest one to the carrier frequency, was found to be 90 electrical degrees. The electrical length at carrier frequency appearing in the table below was calculated by ratioing the frequencies.

Twr.	Sample Line Open-Circuited 90 degree Resonance Below 1030 kHz (kHz)	Sample Line Open-Circuited 270 degree Resonance Above 1030 kHz (kHz)	Sample Line Calculated Electrical Length At 1030 kHz (deg.)
1	655.7	1991.9	141.4
2	652.5	1975.2	142.1

Because the electrical lengths were found to have a maximum variation between lines of 0.7 electrical degrees, the sample lines meet the requirement in the Rules that they be equal in length within one electrical degree.

To determine the characteristic impedance values of the sample lines, open-circuited measurements were made with frequencies offset to produce ± 45 degrees of electrical length from resonance.

The characteristic impedance was calculated using the following formula, where $R_1 + j X_1$ and $R_2 + j X_2$ are the measured impedances at the +45 and -45 degree offset frequencies, respectively: $Z_O = ((R_1^2 + X_1^2)^{1/2} \times (R_2^2 + X_2^2)^{1/2})^{1/2}$

Twr.	+ 45 Deg. Offset Frequency (kHz)	+45 Deg. Measured Impedance (ohms)	- 45 Deg. Offset Frequency (kHz)	-45 Deg. Measured Impedance (ohms)	Calculated Characteristic Impedance (ohms)
1	983.6	0.0 +j47.3	327.9	0.0 –j51.8	49.5
2	978.8	0.2 +j46.6	326.3	0.0 –j50.1	48.3

The sample line measured characteristic impedances meet the requirement that they be equal within 2 ohms.

The calibration of the Delta current transformers was verified by removing them all from the ATUs and installing them on a test jig so that each was located very close to the adjacent transformer (spacing of less than two inches). Short transmission lines of equal length were connected between the outputs of the current transformers and the inputs of the antenna monitor. The Potomac AM19 antenna monitor was calibrated using the internal calibration function. A single source of RF current on the carrier frequency was fed through a conductor passing through all of the current transformers, and the differential phases and ratios were noted on the antenna monitor as follows:

Twr.	Serial No.	Ratio	Phase (deg.)
1	1220	1.00Ref	0.0Ref
2	1150	1.015	+0.2

The requirement that the sample current transformers are accurate to within the manufacturer's specification (±2% ratio and ±2 degrees phase) has thus been demonstrated.

The impedance of each of the sample lines was measured at the operating frequency with the sample current transformers attached. These impedances are tabulated below:

Twr.	R (ohms)	X (ohms)
1	49.3	-j1.0
2	51.2	+j2.7

Direct Measurement of Power

Common point impedance measurements were made using the Delta CPB-1 bridge installed adjacent to the common point ammeter on the common point bus of the phasing and coupling system. The resistance value was adjusted to 50 ohms and the reactance value was adjusted to zero.

Appendix A

Reference Field Strength Measurements

Reference field strength measurements were made on May 26, 2011 using a Potomac Instruments FIM-41 field intensity meter of known calibration at three locations along radials at the azimuths with radiation values specified on the construction permit and, additionally, on the major lobe radial. The measured field strengths and descriptions and NAD-27 GPS coordinates for the reference measurement points are shown in the following tables.

Radial 68°

Point No.	Dist. km	Latitude	Longitude	Time	Field mV/m
1	3.58	42-51-15	106-10-40	1335	40
2	7.47	42-52-02	106-08-00	1415	25
3	8.58	42-52-16	106-07-15	1405	17

Radial 80°

Point No.	Dist. km	Latitude	Longitude	Time	Field mV/m
1	3.40	42-50-52	106-10-38	1330	20
2	7.23	42-51-12	106-07-52	1345	22
3	13.5	42-51-46	106-03-18	1353	12

Radial 92°

Point No.	Dist. km	Latitude	Longitude	Time	Field mV/m
1	7.09	42-50-23	106-07-53	1445	14
2	9.95	42-50-19	106-05-47	1435	16.5
3	12.3	42-50-22	106-04-01	1442	13

Radial 260°

Point No.	Dist. km	Latitude	Longitude	Time	Field mV/m
1	3.44	42-50-12	106-15-36	1503	780
2	5.20	42-50-02	106-16-53	1510	550
3	8.10	42-49-45	106-18-59	1530	330

REFERENCE POINT DESCRIPTIONS

Radial 68 Degrees

3.58km	at Picnic table by pine tree at Edna K. Wilkins State Park parking lot
7.47km	on South shoulder of East Henrie Roadway 100 yd West of Strand Road
8.58km	East edge of CR702 (Geary Dome Rd) 100ft South of farmhouse driveway

Radial 80 Degrees

3.40km	South shoulder of US20/26 (Glenrock Highway) just west of Park entrance
	100 ft North of orange pipeline marker
7.22km	On West edge of Roundup Rd. 9 fenceposts North of third driveway
13.5km	On East side of Coal Shadow Rd. North of US20/26 at winding road sign

Radial 92 Degrees

7.09km	On North shoulder of I25 WB at Adopt a Highway sign near Mile marker 178
9.95km	On South sholder of I25 EB opposite rock outcropping on N side of highway
12.3km	On graveled turnout of I25 EB by snow fence before no access overpass

Radial 260 Degrees

3.44km	In the driveway at 1170 Donegal
5.20km	In front of 1600 Kingsbury on sidewalk
8.10km	On the sidewalk on the Northeast corner of Oakcrest @ 20th

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WASHINGTON DC
WISCONSIN

June 17, 2011

Federal Communications Commission
P.O. Box 979089
SL-MO-C2-GL
1005 Convention Plaza
St. Louis, MO 63101

Re: KTWO(AM), Casper, WY, Facility No. 11924

Dear Sir or Madam:

On behalf of Townsquare Media Casper License, LLC, the licensee of KTWO(AM), Casper, WY, enclosed are the original and two copies of an application for modification of KTWO's license. This application is submitted on FCC Form 302-AM.

Also enclosed is a $1,320.00 check, payable to the Commission, for payment of the $615.00 station licensee fee and the $705.00 AM directional antenna fee associated with this application, as well as an FCC Form 159.

Please address any questions concerning this application to Howard Liberman of this firm at (202) 842-8876 or to me.

Sincerely,

Alisa R. Lahey

Alisa R. Lahey

DC01/ 2723078.1