

# Comprehensive Engineering Exhibit

## Long Form for BNPFT-20030317AKS

### Facility ID No. 138406

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This exhibit is for the “Long Form” of translator application BNPFT-20030317AKS.

#### Antenna Location

The proposed antenna is to be mounted on ASR 1028060, 150 meters above ground, to serve as a fill-in translator for station KFFF(FM). Below as **Figure 1** is an overlap and spacing study from which it can be determined that this proposal is within the protected contour of **second** adjacent channel primary stations KOOO(FM) channel 270, La Vista, NE as well as **second** adjacent channel primary station KVSS(FM) channel 274, Papillion, NE.

Concerning KVSS(FM), Section 74.1204(d) states that *“The provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. In addition, an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population or such other factors as may be applicable.”*

We will demonstrate that a lack of population and/or other factors allow this proposal to be compliant with 74.1204. The process commonly called “Living Way”<sup>1</sup>, allows for the use of U/D Analysis, also known as “signal strength ratio methodology” to be utilized. In this instant case the facilities of to be protected are second adjacent and are to be afforded protection from signals 40 dB stronger<sup>2</sup> than they present in the location of the proposed antenna location.

**Figure 2** is a map showing the predicted 80 dBu signal contour of KVSS at the proposed translator antenna location of utilizing the FCC F50:50 curves. Thus only a signal exceeding 120 dBu in a habitable area is predicted to cause interference to KVSS from this instant proposal. Utilizing the line of sight equation<sup>3</sup> it has been determined that a 120 dBu signal developed by 99 watts, as proposed, emitted by the proposed antenna mounted 150 meters above ground, will not reach ground level and will extend a maximum of 69.8 meters in the main lobe of the antenna as demonstrated in **Figure 3**. With examination of the images in **Figures 4** it can be determined that no habitable space extends above this height within the confines of this contour. Thus the provisions of the rules section concerning prohibited overlap will not apply as it has been demonstrated that no actual interference will occur due to a lack of population and other factors as applied in this instant proposal.

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<sup>1</sup> As recently described in FCC 08-242 in connection with BPFT-19981001TA

<sup>2</sup> See 74.1204(a)(3)

<sup>3</sup>  $\text{ReachDistMeters} = 106.92 - (20 * (\text{LOG10}[\text{DistMeters}/1000])) + [\text{ERP in dBk}]$

Concerning KOOO, from Figure 2 it can be seen that a stronger signal than that of KVSS is presented at the proposed location, 82.5 dBu for KOOO – 80.0 dBu for KVSS. As the same ratios exist for protection of KOOO, the KVSS protection schema is also applicable.

## **RF Radiation Statement**

The proposed facilities were evaluated in terms of potential radio frequency radiation exposure at ground level in accordance with OET Bulletin No. 65, “Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio frequency Radiation.”

The proposed antenna system is a RFS, CPF-500, 2-level (bay) antenna mounted 150 meters above ground. As this element type is not modeled in any current computer program, for purposes of this analysis the FM Model program has been set to calculate values for a “worst case” type of antenna element array of “Ring Stub”, operated with an effective radiated power of 0.099 Kilowatts in vertical and horizontal. At 2 meters above the surface, at 28 meters from the base of the tower, this proposal will contribute worst case, 0.03 microwatts per square centimeter, or 0.003 percent of the allowable ANSI limit for controlled exposure, and 0.015 percent of the allowable limit for uncontrolled exposure. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

Further, the applicant will see that signs are posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The site itself is restricted from public access. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection.

## **LPFM Preclusion Showing**

In Figure 5 are the results of the Commissions computer program demonstrating that no co-channel or adjacent channel LPFM grid point locations exist in the market, thus no LPFM opportunity will be precluded from use by this application.

138406 As Filed											
Capstar Tx Limited Partnership											
CH# 272D - 102.3 MHz, Pwr= 0.099 kw, HAAT= 0.0 M, COR= 481 M											
Average Protected F(50-50)= 5.62 km											
Omni-directional											
DISPLAY DATES DATA 08-08-13 SEARCH 08-08-13											
REFERENCE	CH#	CALL	TYPE ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
41 15 26.0 N. 95 57 48.9 W.											
<b>272C1 KQNU</b>		LIC _CN		341.1	107.82	42 10 29.0	100.000	161.3	63.3	-64.5*<	6.7
onawa		IA		160.9	BLH19951120KG	96 23 13.0	196	562	Powell Broadcasting Compan		
<b>270C0 KOOO</b>		RSV-A		219.9	29.95	41 03 01.0	100.000	12.2	83.6	5.2	-54.4*<
La Vista		NE		39.7		96 11 33.0	450	796	Nrg License Sub, Llc		
One Step Application											
<b>272D 1564825</b>		APP _C_		0.0	0.00	41 15 26.0	0.099	41.5	12.4	-53.8*	-53.8*
Council Bluffs		IA		0.0	BNPFT20030317AKS	95 57 48.9		481	Capstar Tx Limited Partner		
<b>270C0 KOOO</b>		LIC _C_		219.9	29.95	41 03 01.0	100.000	11.2	77.8	6.1	-48.5*<
La Vista		NE		39.7	BLH20120203ABL	96 11 33.0	365	716	Nrg License Sub, Llc		
<b>274C1 KVSS</b>		LIC _CX		226.7	30.16	41 04 15.9	46.100	9.4	72.3	8.2	-42.8*<
Papillion		NE		46.5	BLED20090622ACI	96 13 31.2	409	757	Vss Catholic Communication		
<b>272D K272DY</b>		LIC _C_		112.5	69.03	41 01 03.0	0.250	35.7	10.5	19.5	12.9
Red Oak		IA		293.0	BLFT20111202ADF	95 12 18.0		399	Hawkeye Communications, In		
<b>272C1 KARNY</b>		LIC _C_		254.2	252.88	40 36 08.0	79.000	171.1	72.9	69.6	138.8
Kearney		NE		72.3	BMLH20020430AAL	98 50 21.0	331	967	Nrg License Sub, Llc		
<b>273C KSTZ</b>		LIC _CY		72.1	205.68	41 48 01.0	100.000	117.7	79.3	74.8	106.6
Des Moines		IA		253.7	BLHRB1104ZZ	93 36 27.0	384	675	Saga Communications Of Iow		
File no. entered as BLH-RB1104ZZ instead of BLH-850508KA on license to avoid duplicate file numbers											

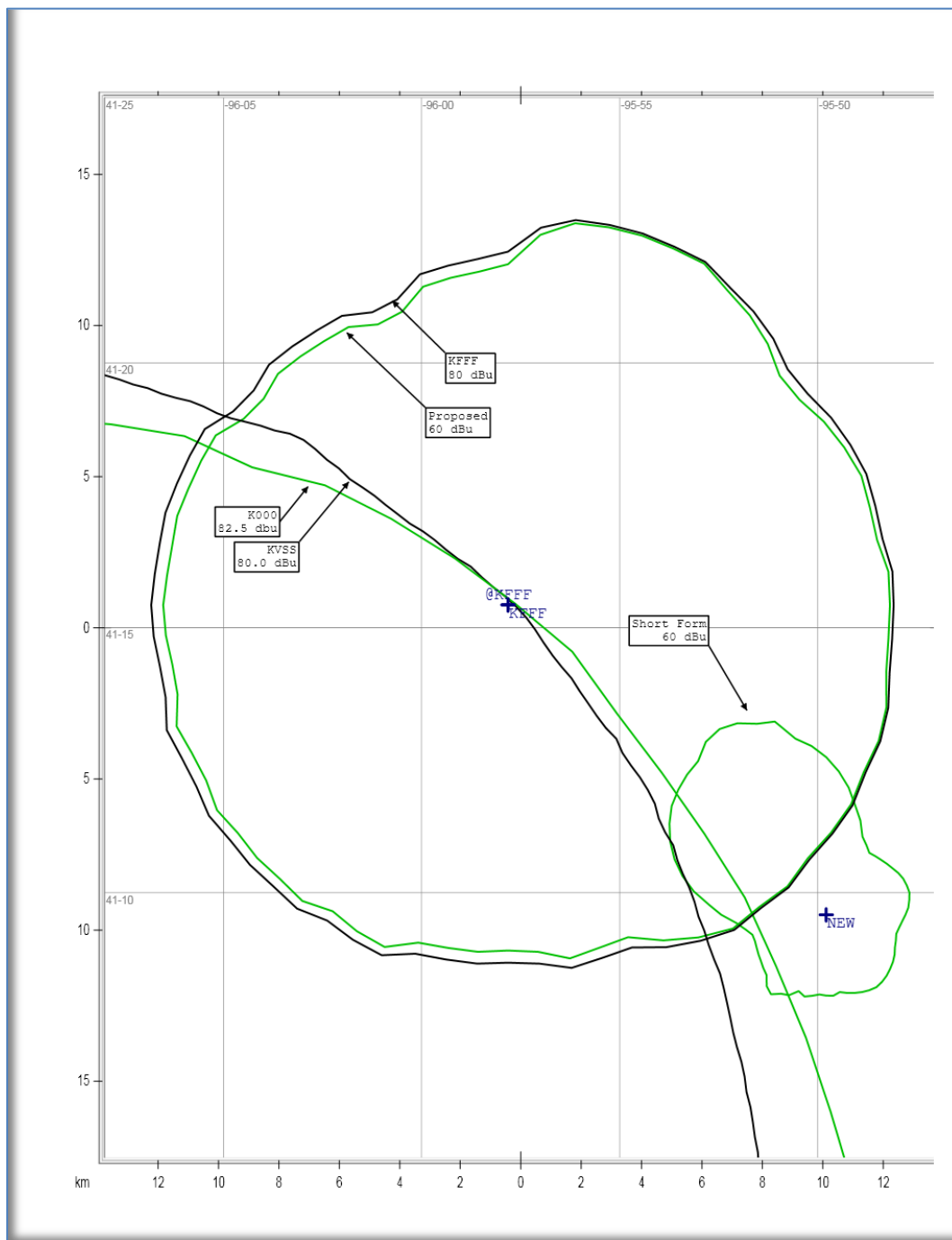
Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM Contour distances are on direct line to and from reference station. Reference zone= , Co to 3rd adjacent.

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 protected contour.

< = Contour overlap

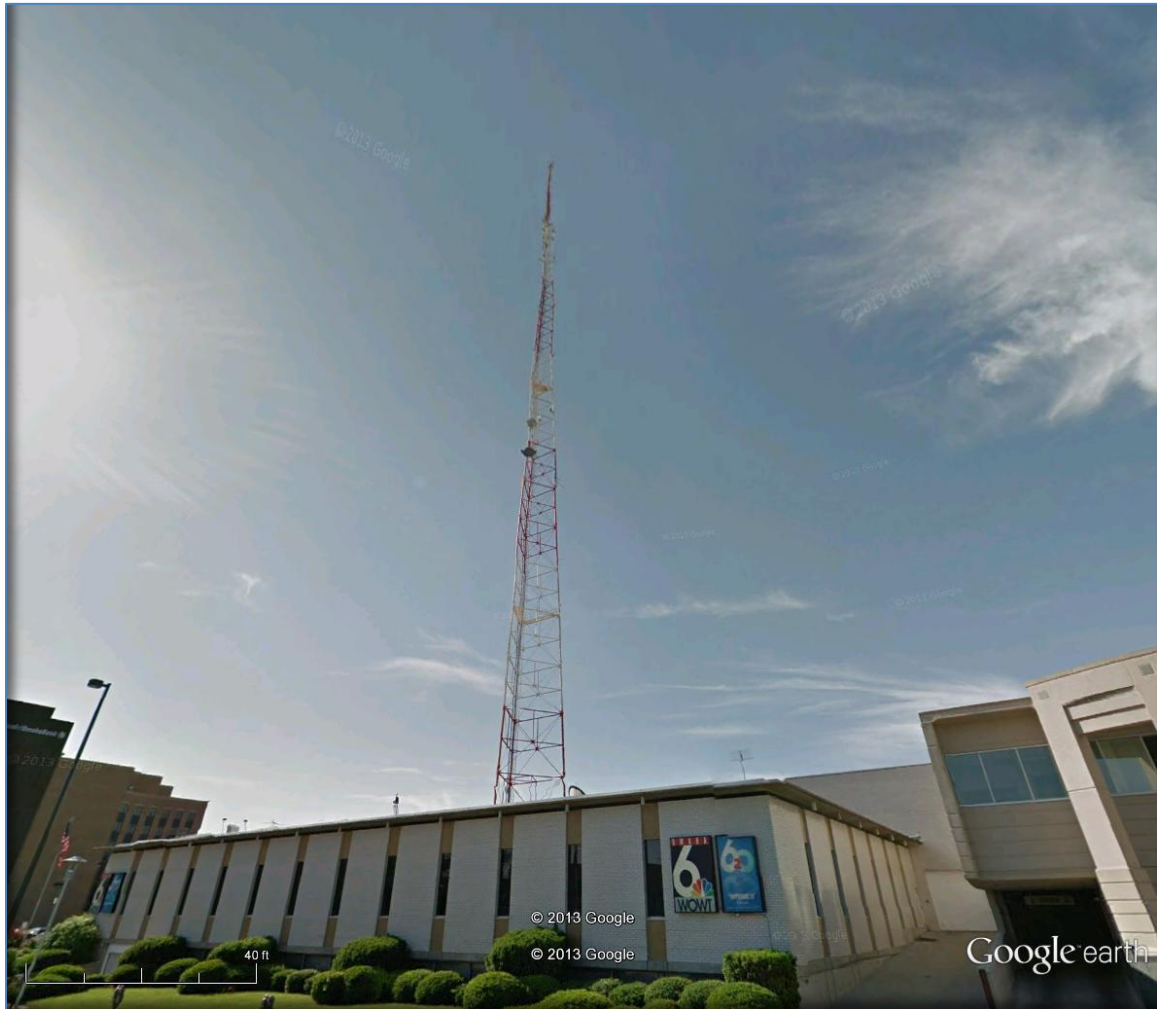
**Figure 2. Contour Map**



**Figure 3. Distance to Signal Contour**

RFS CPF500-2								
Proposed Power:		0.099 kW				Fill in "yellow" cells		
Antenna Height AGL:		152 meters						
Interference Contour:		120 dBu						
Artificial Rcv Antenna Height:		2 meters						
Distance (Free Space) Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20))} * 1000$								
Field Strength (dBu) Equation $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$								
Depression				Distance				
Angle	Antenna			from Ant.	Distance	Field Stren	Distance	eld Strengt
Below	Relative	ERP	ERP	to Interf	from Ant. to	in dBu @	from Ant.	in dBu @
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level
0°	1.000	0.099	-10.04	69.79 m	infinite	---	infinite	---
-5°	0.970	0.093	-10.31	67.68 m	1721.06 m	91.89 dBu	1744.00 m	91.78 dBu
-10°	0.886	0.078	-11.10	61.82 m	863.82 m	97.09 dBu	875.33 m	96.98 dBu
-15°	0.757	0.057	-12.47	52.81 m	579.56 m	99.19 dBu	587.28 m	99.08 dBu
-20°	0.596	0.035	-14.54	41.58 m	438.57 m	99.54 dBu	444.42 m	99.42 dBu
-25°	0.418	0.017	-17.62	29.16 m	354.93 m	98.29 dBu	359.66 m	98.18 dBu
-30°	0.238	0.006	-22.50	16.62 m	300.00 m	94.87 dBu	304.00 m	94.76 dBu
-35°	0.071	0.000	-33.07	4.93 m	261.52 m	85.50 dBu	265.00 m	85.39 dBu
-40°	0.075	0.001	-32.57	5.22 m	233.36 m	86.99 dBu	236.47 m	86.88 dBu
-45°	0.191	0.004	-24.40	13.36 m	212.13 m	95.98 dBu	214.96 m	95.87 dBu
-50°	0.276	0.008	-21.22	19.28 m	195.81 m	99.86 dBu	198.42 m	99.75 dBu
-55°	0.330	0.011	-19.67	23.05 m	183.12 m	102.00 dBu	185.56 m	101.88 dBu
-60°	0.357	0.013	-19.00	24.90 m	173.21 m	103.15 dBu	175.51 m	103.04 dBu
-65°	0.361	0.013	-18.90	25.19 m	165.51 m	103.65 dBu	167.71 m	103.53 dBu
-70°	0.349	0.012	-19.18	24.39 m	159.63 m	103.68 dBu	161.76 m	103.57 dBu
-75°	0.329	0.011	-19.69	22.99 m	155.29 m	103.41 dBu	157.36 m	103.29 dBu
-80°	0.309	0.009	-20.26	21.53 m	152.31 m	103.01 dBu	154.34 m	102.89 dBu
-85°	0.294	0.009	-20.68	20.52 m	150.57 m	102.69 dBu	152.58 m	102.57 dBu
-90°	0.292	0.008	-20.75	20.34 m	150.00 m	102.65 dBu	152.00 m	102.53 dBu

**Figure 4. View of Antenna Location.**



**Figure 5. FCC "Grid Points" Program Results for Omaha, NE**

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MICRO_OMAHANE07221338.TXT

Omaha, NE
Latitude 41-15-31
Longitude 095-56-15
Grid Size 31 x 31
Micro FM 100 Watts at 30m HAAT
Co-Channel and 1st Adjacent Protected
2nd Adjacent Channel Protected
3rd Adjacent Channel Not Protected
I.F. Not Protected
TV Channel 6 Protected
CP Records Protected
APP Records Protected
FM Translators Protected
TV Channel 6 Translators/LP Protected
Auc83 FX App Records Protected

Chan Avail Chan Avail Chan Avail Chan Avail Chan Avail
200 0 220 0 240 0 260 0 280 0
201 0 221 0 241 0 261 0 281 0
202 0 222 0 242 0 262 0 282 0
203 0 223 0 243 0 263 0 283 0
204 0 224 0 244 0 264 0 284 0
205 0 225 0 245 0 265 0 285 0
206 0 226 0 246 0 266 0 286 24
207 0 227 0 247 0 267 961 287 1
208 0 228 0 248 0 268 0 288 0
209 0 229 0 249 0 269 0 289 0
210 0 230 0 250 0 270 0 290 0
211 0 231 0 251 0 271 0 291 0
212 0 232 0 252 0 272 0 292 0
213 0 233 0 253 0 273 0 293 14
214 0 234 70 254 0 274 0 294 0
215 0 235 0 255 0 275 0 295 0
216 0 236 0 256 0 276 0 296 0
217 0 237 0 257 91 277 0 297 0
218 0 238 175 258 0 278 0 298 92
219 0 239 0 259 0 279 0 299 4
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Total 1556
  
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