

Exhibit EE-1: Engineering Statement in support of
FCC FORM 349
APPLICATION FOR AUTHORITY TO CONSTRUCT OR MAKE CHANGES IN AN FM TRANSLATOR OR FM BOOSTER
STATION
(For an Existing FM Translator)

CircuitWerkes, Inc., the licensee of translator W231CT (Facility ID 157706), requests authority to move the translator location to a tower 15.62km from the presently licensed location. The height will change to 138m AGL (164m AMSL). A directional antenna will be used.

The proposed W231CT 100dBu contour is within the protected contour of 2nd adjacent station, WCFB, Daytona Beach, FL (FID# 10343). A D/U analysis shows that no population and no roads are affected by interference. WCFB's 82dBu contour completely encompasses the W231CT proposed 122 dBu interfering contour. A D/U analysis shows that no interference reaches or approaches the ground nor any occupied structure or elevated roadway. Therefore this proposal should be acceptable under 74.1204(d) and a "Living Way" waiver is hereby requested.

The proposed facility is in compliance with 47 C.F.R. Section 1.1306 with regards to radio-frequency electromagnetic exposure in that the contribution to the rf environment is less than 5% of the maximum public exposure.

This application was prepared using FCC 30-arc-second terrain data.

This translator will operate as a fill-in facility for WRSO, an AM radio station licensed to Orlovista, Florida. The maximum ERP is limited by interference, the WRSO 2mV contour and the 250W class limit.

Attached as Figure 1 is a color coded map showing the protected contours and interfering contours of all relevant FM facilities.

Figure 2 shows the proposed 1mV service contour of this application compared with the 2mV service contour of WRSO.

Figure 3 demonstrates that there is overlap of the 60dBu contours between the licensed location and this proposal, therefore this proposal is a minor change.

The proposal is sufficiently distant from all facilities mentioned in 73.1030(a), (b) & (c) so that notification under 73.1030 is not required.

Respectfully submitted

Kyle Magrill, President

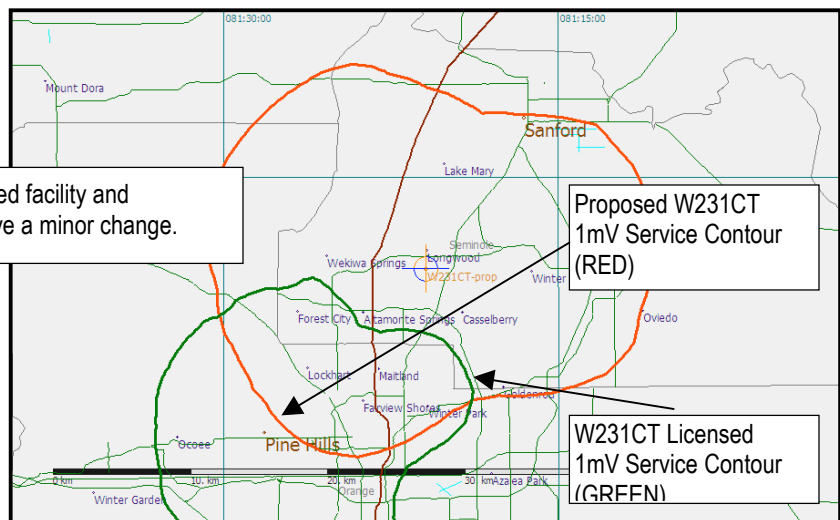
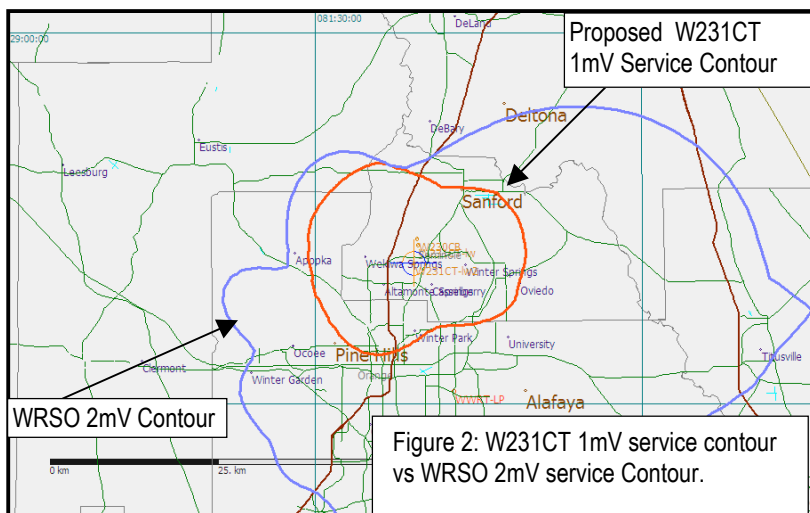
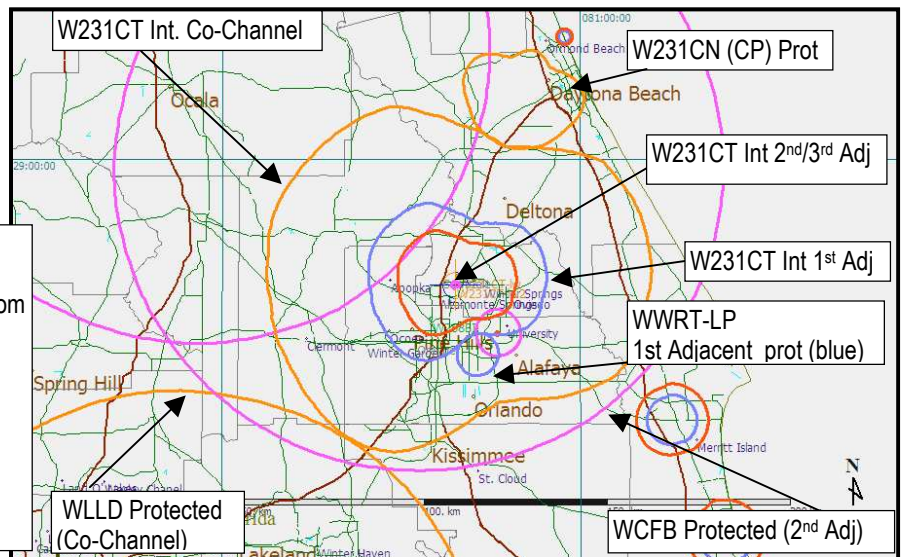
PG-7T-6155
28 October 2014

2805 NW 6th Street
Gainesville, FL 32609
352-335-6555

W231CT is a licensed facility inside the Orlando radio market. This application changes the antenna height and location of the facility.

Key:

Orange = Interfering 40dBu vs Protected (Co-chan)
 Blue or cyan = Interfering 54dBu vs Protected (1st Adj)
 Violet = Interfering 100dBu vs Protected (2nd/3rd adj)
 Red = W231CT 60dBu



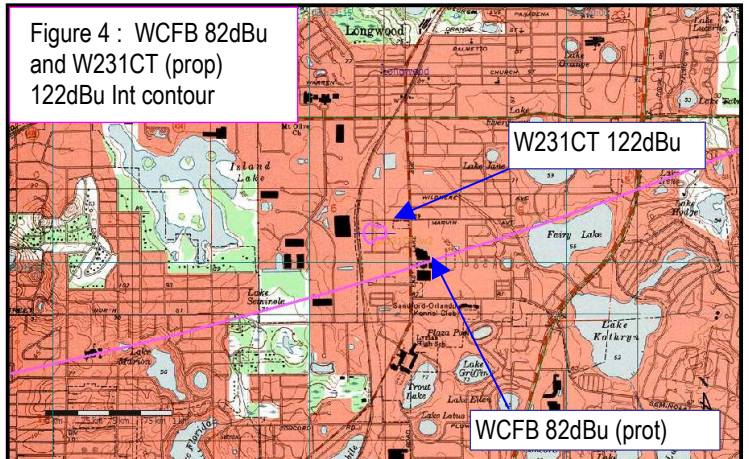
Desired to Undesired ratio (D/U) studies of W231CT vs WCFB

Methodology:

The WCFB 82dbu contour encompasses the proposed W231CT location. As shown in figure 4, the W231CT 122dBu contour is completely contained within the WCFB 82dBu contour. Therefore the worst case scenario for interference is $82\text{dBu} + 40\text{dBu} = 122\text{dBu}$.

Two elements are presented to show why this proposal is acceptable under 74.1204(d). First, a computer analysis is made and is presented as study 1. Results are generated by computer software based on 0.1 arc-second resolution, using 2010 population data.

No population = no interference.



Study #1:

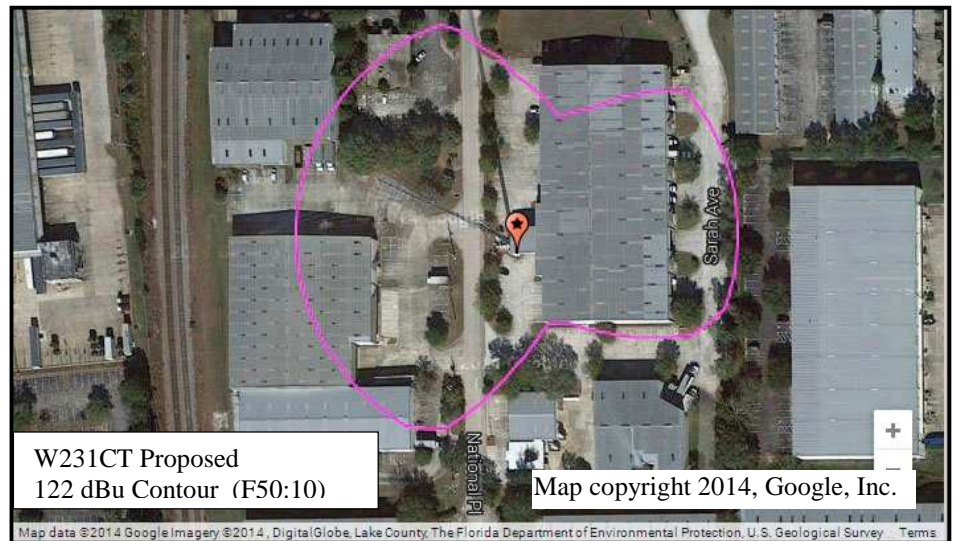
FM D/U Interference study performed
10/28/2014

Interfering Station: W231CT (prop)

- : Channel 231
- : Antenna Height 164meters AMSL
- : Max ERP 0.25 kW
- : Latitude +028:41:22.4 (NAD83)
- : Longitude -081:20:56.0

Protected Station: WCFB

- : Antenna Height 460 meters AMSL
- : Max ERP 100 kW
- : Latitude +028:58:48 (NAD83)
- : Longitude -081:27:19



Population and Area in Predicted Interference Zone:

Census Block Data:

Polygon 0

Pop Count = 0

Interference Zone Area = 0.00km^2

Range of Protected Station Contours: 82.00dBu to 84.00dBu

This study indicates no interference.

The second element presented is a visual representation of the interfering 122dBu contour overlay on a Google map. The interfering contour is shown on the plane of the antenna. The interfering contour would encompass parts of several structures and two nearby roads. However, as is shown in the following study, no actual interference will exist due to the antenna elevation of 138m AGL.

The second study is a spreadsheet that plots the distance to the interfering contour and shows the margin of clearance (in dB) at a point two meters AGL. Where the interfering contour reaches near the ground, the table indicates how far from the tower the interference will reach.

Study 2

Terms and Methodology

Max ERP: The power specified in the application, expressed in kW.

Angle below the Horizon: The radiation angle below the antenna's horizontal plane.

Field at Angle: The field supplied by the antenna manufacturer for each Angle below the Horizon.

ERP at Angle: The ERP for an Angle given Max ERP & Field:

$$\text{ERP@Angle} = \text{Max ERP} * \text{Field}^2$$

Signal at Point: The predicted signal level assuming Free Space attenuation at a point:

$$\text{Signal} = 106.92 - (20 * \text{Log}(\text{Dist}(\text{km}))) + (10 * \text{Log}(\text{ERP@Angle}(\text{kW})))$$

$$\text{Log}(\text{ERP@Angle}(\text{kW}))$$

Distance to Point: The radiation path distance from the antenna to a point.

$$\text{DistToPoint} = \text{Antenna Rad Center in meters AGL} / (\text{Cos}(90^\circ - \text{Angle}^\circ))$$

Distance From Tower: The distance from the tower base to a point.

$$\text{DistToPoint} * \text{Sin}(90^\circ - \text{Angle}^\circ)$$

Interference Threshold = Protected station's predicted contour value at a point +40dBu

Over Threshold: The amount that the Proposal's signal exceeds the interference threshold.

$$\text{OverThresh} = \text{Signal} - \text{Interference Threshold value}$$

A negative Over Threshold value indicates no interference.

Notes:

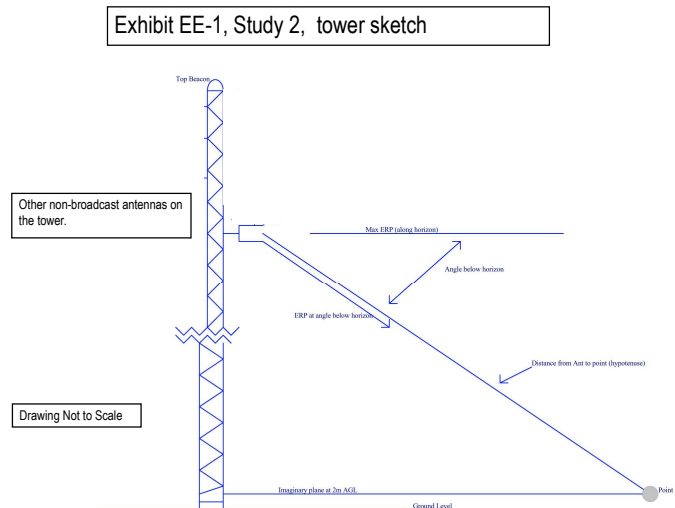
When a worst case prediction is desired, a point source radiator is assumed. The following would be true of point sources:

Field at Angle: All angles have a field of 1.0.

ERP at Angle: With a field of 1.0, all ERPs are the same.

$$\text{ERP@Angle} = \text{Max ERP} * \text{Field}^2 \text{ \{not necessary for point source\}}$$

When finding a value for a point two meters above ground, then: $\text{DistToPoint} = \text{Antenna Rad Center in meters above the plane, not ground} / (\text{Cos}(90^\circ - \text{Angle}^\circ))$. Subtracting 2 meters from the antenna RC yealds the desired result.



Results:

Tables 1 (below) show the angle and distance to a point 2meters AGL from the proposed antenna. Table 1 shows the distance to the interfering contour at 250W.

The field strength is calculated at each end point and compared to the worst case protected contour of WCFB (82dBu). Using an isotropic radiator of the specified power for Table 1, the results show that, at 2 meters above the ground, the interference threshold of 122dBu will not reach any occupied structure or roadway. In fact, the interfering contour does not approach the ground at any point and the highest RF fields are predicted at the base of the tower, well within the property boundaries. No elevated public roads nor occupied multi-story buildings extend into the zone of interference on any radial. It can be concluded that no interference is predicted to occur to WCFB as a result of this proposal.

Table 1 (D/U analysis of W231CT with WCFB)

Ch231 Nicom BKG77 or equiv		W231CT							
		1 bay	Proposed	138m AGL	Threshold= 122.00				
Maximum ERP (kW)	Angle below Horizon (de- grees)	Field at Angle	ERP at Angle (kW)	Field at Point (dB(uV))	Distance to point (me- ters)	Distance from Tower (meters)	Over Threshold (dBuV)	Threshold	AGL+2M
0.250	0	1.000	0.250						
0.250	1	1.000	0.250	83.07	7792.62	7791.43	-38.93	122	136.000
0.250	2	1.000	0.250	89.09	3896.90	3894.53	-32.91	122.000	136.000
0.250	3	1.000	0.250	92.60	2598.60	2595.03	-29.40	122.000	136.000
0.250	4	1.000	0.250	95.10	1949.64	1944.89	-26.90	122.000	136.000
0.250	5	1.000	0.250	97.03	1560.43	1554.49	-24.97	122.000	136.000
0.250	6	1.000	0.250	98.61	1301.08	1293.95	-23.39	122.000	136.000
0.250	7	1.000	0.250	99.95	1115.95	1107.63	-22.05	122.000	136.000
0.250	8	1.000	0.250	101.10	977.20	967.69	-20.90	122.000	136.000
0.250	9	1.000	0.250	102.12	869.37	858.67	-19.88	122.000	136.000
0.250	10	1.000	0.250	103.02	783.19	771.29	-18.98	122.000	136.000
0.250	11	1.000	0.250	103.84	712.75	699.66	-18.16	122.000	136.000
0.250	12	1.000	0.250	104.59	654.12	639.83	-17.41	122.000	136.000
0.250	13	1.000	0.250	105.27	604.58	589.08	-16.73	122.000	136.000
0.250	14	1.000	0.250	105.90	562.16	545.47	-16.10	122.000	136.000
0.250	15	1.000	0.250	106.49	525.46	507.56	-15.51	122.000	136.000
0.250	16	1.000	0.250	107.04	493.40	474.29	-14.96	122.000	136.000
0.250	17	1.000	0.250	107.55	465.16	444.84	-14.45	122.000	136.000
0.250	18	1.000	0.250	108.03	440.11	418.56	-13.97	122.000	136.000
0.250	19	1.000	0.250	108.48	417.73	394.97	-13.52	122.000	136.000
0.250	20	1.000	0.250	108.91	397.64	373.66	-13.09	122.000	136.000
0.250	21	1.000	0.250	109.32	379.50	354.29	-12.68	122.000	136.000
0.250	22	1.000	0.250	109.70	363.05	336.61	-12.30	122.000	136.000
0.250	23	1.000	0.250	110.07	348.07	320.40	-11.93	122.000	136.000
0.250	24	1.000	0.250	110.41	334.37	305.46	-11.59	122.000	136.000
0.250	25	1.000	0.250	110.75	321.80	291.65	-11.25	122.000	136.000
0.250	26	1.000	0.250	111.07	310.24	278.84	-10.93	122.000	136.000
0.250	27	1.000	0.250	111.37	299.57	266.92	-10.63	122.000	136.000
0.250	28	1.000	0.250	111.66	289.69	255.78	-10.34	122.000	136.000
0.250	29	1.000	0.250	111.94	280.52	245.35	-10.06	122.000	136.000
0.250	30	1.000	0.250	112.21	272.00	235.56	-9.79	122.000	136.000
0.250	31	1.000	0.250	112.47	264.06	226.34	-9.53	122.000	136.000
0.250	32	1.000	0.250	112.71	256.64	217.65	-9.29	122.000	136.000
0.250	33	1.000	0.250	112.95	249.71	209.42	-9.05	122.000	136.000
0.250	34	1.000	0.250	113.18	243.21	201.63	-8.82	122.000	136.000
0.250	35	1.000	0.250	113.40	237.11	194.23	-8.60	122.000	136.000
0.250	36	1.000	0.250	113.61	231.38	187.19	-8.39	122.000	136.000
0.250	37	1.000	0.250	113.82	225.98	180.48	-8.18	122.000	136.000
0.250	38	1.000	0.250	114.02	220.90	174.07	-7.98	122.000	136.000
0.250	39	1.000	0.250	114.21	216.11	167.95	-7.79	122.000	136.000
0.250	40	1.000	0.250	114.39	211.58	162.08	-7.61	122.000	136.000
0.250	41	1.000	0.250	114.57	207.30	156.45	-7.43	122.000	136.000
0.250	42	1.000	0.250	114.74	203.25	151.04	-7.26	122.000	136.000
0.250	43	1.000	0.250	114.90	199.41	145.84	-7.10	122.000	136.000
0.250	44	1.000	0.250	115.06	195.78	140.83	-6.94	122.000	136.000
0.250	45	1.000	0.250	115.22	192.33	136.00	-6.78	122.000	136.000

Nicom BKG77 or equiv		W231CT								
		1 bay		Proposed		138m AGL	Threshold= 122.00			
Maximum ERP (kW)	Angle below Horizon (de- grees)	Field at Angle	ERP at Angle (kW)	Field at Point (dB(uV))	Distance to point (me- ters)	Distance from Tower (meters)	Over Threshold (dBuV)	Threshold	AGL+2M	
0.250	46	1.000	0.250	115.37	189.06	131.33	-6.63	122.000	136.000	
0.250	47	1.000	0.250	115.51	185.96	126.82	-6.49	122.000	136.000	
0.250	48	1.000	0.250	115.65	183.01	122.45	-6.35	122.000	136.000	
0.250	49	1.000	0.250	115.78	180.20	118.22	-6.22	122.000	136.000	
0.250	50	1.000	0.250	115.91	177.54	114.12	-6.09	122.000	136.000	
0.250	51	1.000	0.250	116.04	175.00	110.13	-5.96	122.000	136.000	
0.250	52	1.000	0.250	116.16	172.59	106.25	-5.84	122.000	136.000	
0.250	53	1.000	0.250	116.28	170.29	102.48	-5.72	122.000	136.000	
0.250	54	1.000	0.250	116.39	168.11	98.81	-5.61	122.000	136.000	
0.250	55	1.000	0.250	116.50	166.03	95.23	-5.50	122.000	136.000	
0.250	56	1.000	0.250	116.60	164.05	91.73	-5.40	122.000	136.000	
0.250	57	1.000	0.250	116.70	162.16	88.32	-5.30	122.000	136.000	
0.250	58	1.000	0.250	116.80	160.37	84.98	-5.20	122.000	136.000	
0.250	59	1.000	0.250	116.89	158.66	81.72	-5.11	122.000	136.000	
0.250	60	1.000	0.250	116.98	157.04	78.52	-5.02	122.000	136.000	
0.250	61	1.000	0.250	117.07	155.50	75.39	-4.93	122.000	136.000	
0.250	62	1.000	0.250	117.15	154.03	72.31	-4.85	122.000	136.000	
0.250	63	1.000	0.250	117.23	152.64	69.30	-4.77	122.000	136.000	
0.250	64	1.000	0.250	117.30	151.31	66.33	-4.70	122.000	136.000	
0.250	65	1.000	0.250	117.37	150.06	63.42	-4.63	122.000	136.000	
0.250	66	1.000	0.250	117.44	148.87	60.55	-4.56	122.000	136.000	
0.250	67	1.000	0.250	117.51	147.75	57.73	-4.49	122.000	136.000	
0.250	68	1.000	0.250	117.57	146.68	54.95	-4.43	122.000	136.000	
0.250	69	1.000	0.250	117.63	145.68	52.21	-4.37	122.000	136.000	
0.250	70	1.000	0.250	117.69	144.73	49.50	-4.31	122.000	136.000	
0.250	71	1.000	0.250	117.74	143.84	46.83	-4.26	122.000	136.000	
0.250	72	1.000	0.250	117.79	143.00	44.19	-4.21	122.000	136.000	
0.250	73	1.000	0.250	117.84	142.21	41.58	-4.16	122.000	136.000	
0.250	74	1.000	0.250	117.89	141.48	39.00	-4.11	122.000	136.000	
0.250	75	1.000	0.250	117.93	140.80	36.44	-4.07	122.000	136.000	
0.250	76	1.000	0.250	117.97	140.16	33.91	-4.03	122.000	136.000	
0.250	77	1.000	0.250	118.00	139.58	31.40	-4.00	122.000	136.000	
0.250	78	1.000	0.250	118.04	139.04	28.91	-3.96	122.000	136.000	
0.250	79	1.000	0.250	118.07	138.55	26.44	-3.93	122.000	136.000	
0.250	80	1.000	0.250	118.10	138.10	23.98	-3.90	122.000	136.000	
0.250	81	1.000	0.250	118.12	137.70	21.54	-3.88	122.000	136.000	
0.250	82	1.000	0.250	118.14	137.34	19.11	-3.86	122.000	136.000	
0.250	83	1.000	0.250	118.16	137.02	16.70	-3.84	122.000	136.000	
0.250	84	1.000	0.250	118.18	136.75	14.29	-3.82	122.000	136.000	
0.250	85	1.000	0.250	118.20	136.52	11.90	-3.80	122.000	136.000	
0.250	86	1.000	0.250	118.21	136.33	9.51	-3.79	122.000	136.000	
0.250	87	1.000	0.250	118.22	136.19	7.13	-3.78	122.000	136.000	
0.250	88	1.000	0.250	118.22	136.08	4.75	-3.78	122.000	136.000	
0.250	89	1.000	0.250	118.23	136.02	2.37	-3.77	122.000	136.000	

Section VII Engineering Data:

Tech Box Data:

1. Channel: **231**

Primary Station: **FID: 129548**
WRSO
Orlovista, FL
810 kHz

Delivery Method: **Direct**

Antenna Location Coordinates: (NAD27):
28° 41' 21.4" N
81° 20' 56.8" W

Antenna Structure Registration: **1030219**

Antenna Location Site Elevation Above Mean Sea Level: **26.5 meters**

Overall Tower Height Above Ground Level: **142.3 meters**

Height of Radiation Center Above Ground Level: **138 meters AGL**

ERP:
0.25 kW (H)
0.25 kW (V)

Transmitting Antenna: **Composite**

Fill-in Translator: **Yes** (see EE-1, Figure 3)

Interference: **Yes**
Section 74.1204, **Checked**. See EE-1, Figure 1
Section 74.1205, **Not Checked**.

Unattended operation: **Yes**

Multiple Translators: **Yes**

NEPA: **Yes**. This proposal is excluded from environmental processing: The rf exposure was modeled using "FM Model" for windows (from the FCC website) using a ring-stub single element antenna at a height of 138m. The modeled maximum rf near the base of the tower is under 0.56uW/cm2, so no further processing is required. No changes to structure, lighting, land or water are proposed. Applicant will cease radiating if workers are near the antenna.

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