

TECHNICAL SUMMARY
APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT
FCC FILE NO. BPFT-20181102AAL
FM TRANSLATOR STATION W268DJ
PONCE, PUERTO RICO
CHANNEL 268 (101.5 MHZ) 0.25 KW (DA)

1. **Application Purpose:** It is proposed to change the authorized W268DJ directional antenna (DA) system make and model from a Scala model HDCA-5CP/FM array to a PSI model PSIFML-1A-DA antenna. No other changes are proposed, including no change in channel, transmitter site, antenna height, DA pattern envelope or ERP.

2. **Fill-in Translator Coverage/Minor Change Compliance:** W268DJ is a fill-in FM translator for AM station WAPA (formerly WISO) on 1260 kHz at Ponce, PR (Facility ID 61147). Figure 1 is a map demonstrating that the proposed 60 dBu contour is entirely within a 25 mile circle from the WAPA transmitter site as required for fill-in compliance. Furthermore, as there will be no change in the authorized transmitter site, the proposal is considered to be a minor change in facilities.

3. **Section 74.1204 Compliance:** Figure 2 is an allocation study for channel 268 based on Section 74.1204. Figure 2 lists the results of a numerical analysis of the potential for contour overlap to all nearby co-channel, first, second and third-adjacent channel facilities as well as IF related stations. For the purposes of the numerical study, the maximum HAAT (59 meters) and ERP (0.25 Watts) values were used in determining the maximum distance in any direction to the predicted coverage and interfering contours. Figure 3 demonstrates that the proposal complies with the contour overlap provisions of Section 74.1204 of the FCC rules, except with respect to the licensed operations of WRIO and WZAR discussed below.

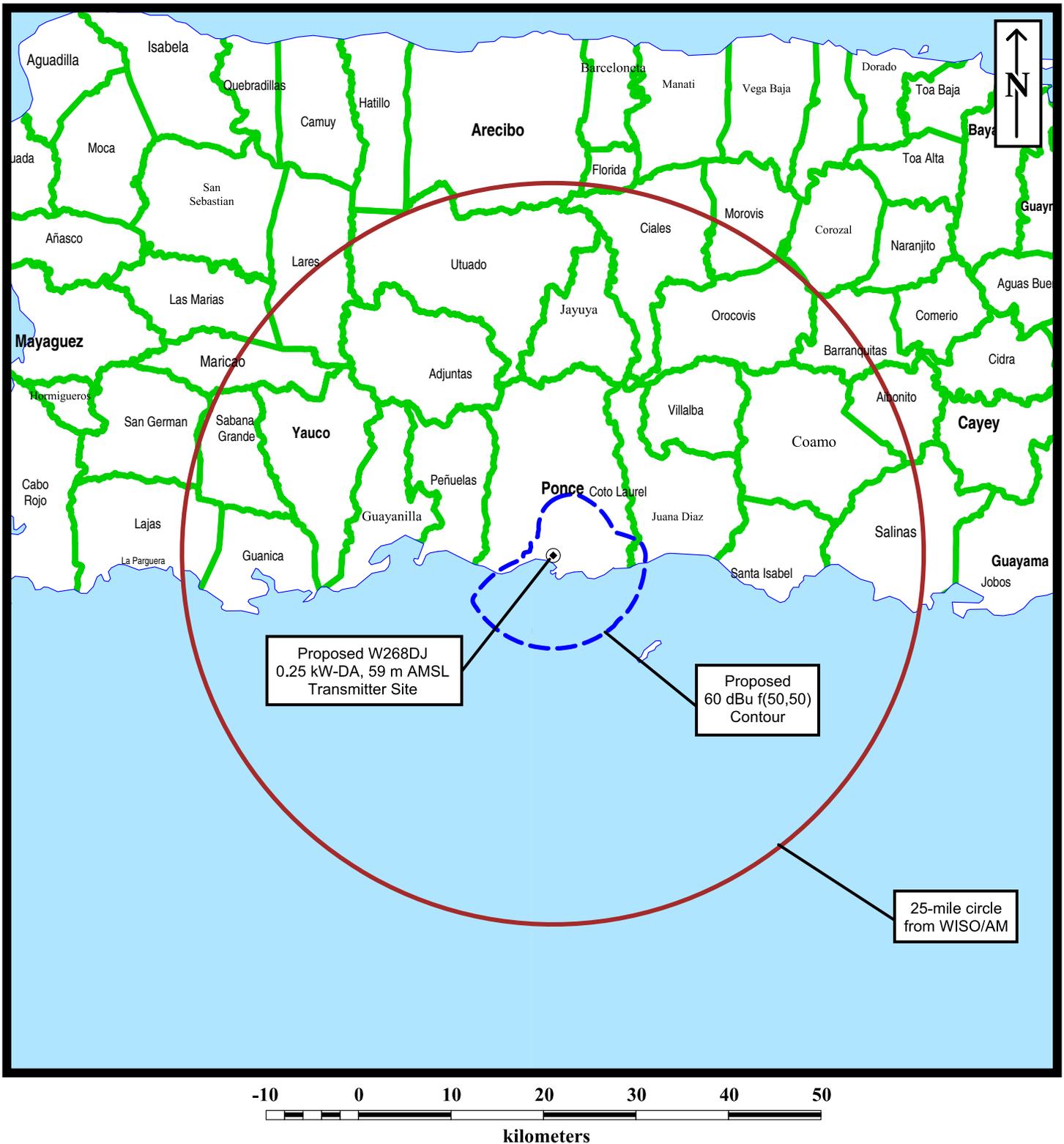
As noted above, the contour overlap requirements are not met with respect to second-adjacent-channel stations: WRIO, Ponce, PR (Ch. 266) and WZAR, Ponce, PR (Ch. 270). A waiver of section 74.1204 of the FCC Rules is requested to the extent necessary since it shall be demonstrated that no actual interference will occur with respect to WRIO and WZAR. Based on the undesired-to-desired (U/D) signal strength interference ratio methodology, which is permitted by the FCC (per Living Way Ministries, Inc., 17 FCC Rcd 17054, 17056 (2002)), it has been determined that no actual interference would occur due to lack of population under Section 73.1204(d). Specifically, the calculated $f(50,50)$ desired field strength of WRIO at the proposed transmitter site is 102.5 dBu. Using the 40 dB U/D ratio contained in Section 73.1204 of the FCC Rules, the proposed $f(50,10)$ undesired interfering signal is 142.5 dBu with respect to the WRIO facility. The calculated $f(50,50)$ desired field strength of WZAR at the proposed transmitter site is 90.9 dBu. Using the same 40 dB U/D ratio, the proposed $f(50,10)$ undesired interfering signal is 130.9 dBu with respect to the WZAR facility. As demonstrated in the interference analysis tabulations attached hereto, the predicted interference zones with respect to the WRIO (see Figure 4) and WZAR (see Figure 5) facilities do not reach ground level; and they are completely devoid of

population, buildings and publicly accessible roads. Therefore, the proposal meets the requirements of Section 74.1204(d) of the FCC Rules for such circumstances as clarified in the Living Way Ministries, Inc., Memorandum Opinion and Order, Released: September 9, 2002

4. Figure 6 is a no objection letter from the Arecibo Observatory.

5. RFR Compliance: The attached RF Hazard statement demonstrates compliance with the FCC's RFR exposure limits.

Figure 1



OVERVIEW MAP OF PROPOSAL

duTreil, Lundin & Rackley, Inc. Sarasota, Florida

FM Contour Study LMS

du Treil, Lundin, & Rackley, Inc., Sarasota, Florida



Channel: 268 **Coordinates:** 017-59-16 066-37-10 (NAD 83) **ERP:** 0.25 kW **Max. HAAT:** 59 m **Considering Only Interference Caused**

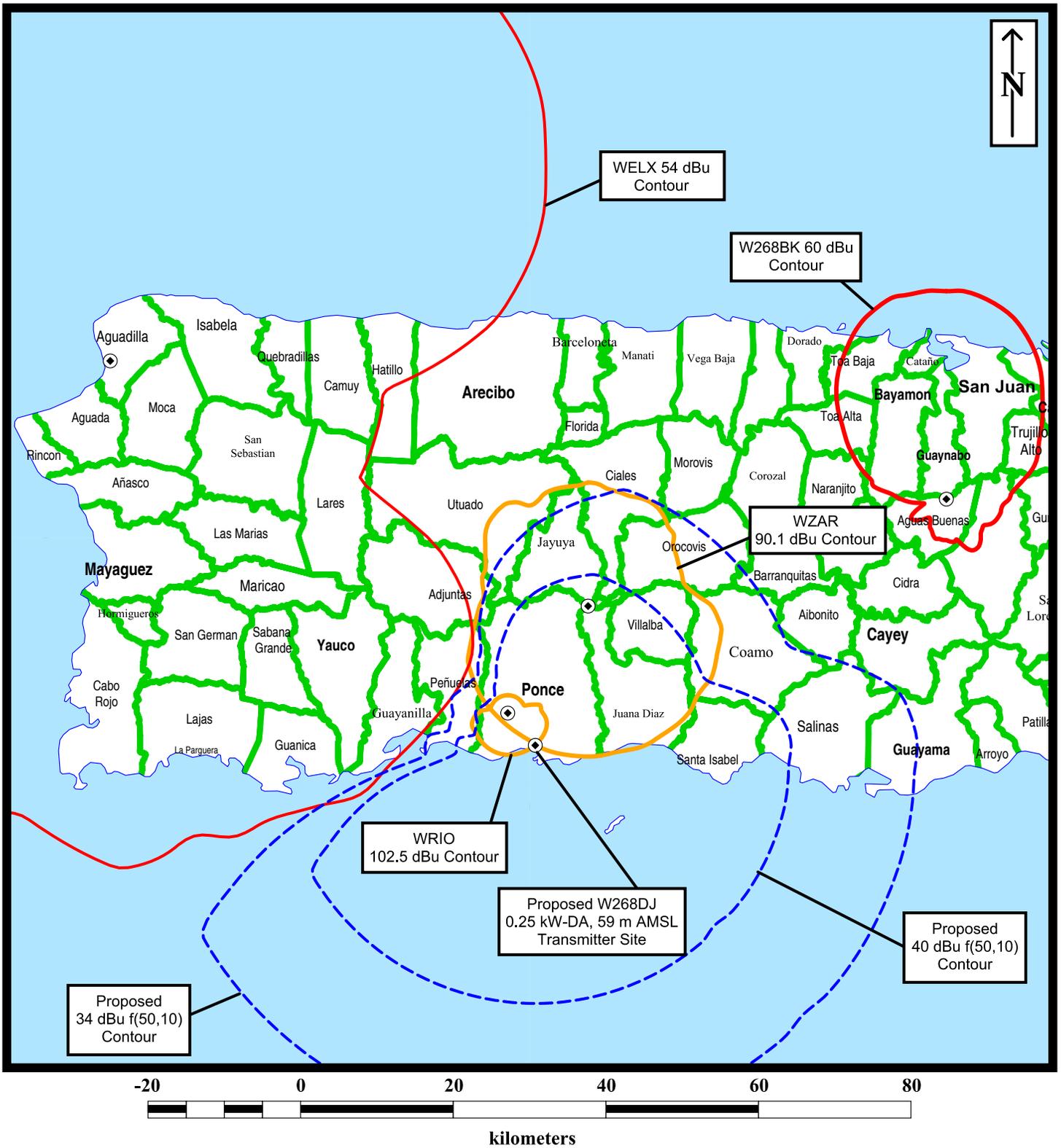
Comment: Proposed W268DJ

Callsign	Chan.	Service	Status	Freq.	City	State	Co.	Rec.	Latitude	Dist. (km)	Sep. (km)	Spac. (km)
Facility ID	ARN			Class	DA	73.215	ERP (kW)	HAAT (m)	Longitude	Bear. (deg)	Comment	
WRIO	268	FM	L2C	101.1	PONCE	PR	US	C	18-01-32.8	5.36	37.5	-32.14
20591	BLANK	BLH-19860609K/	B	NDI			50	-14	066-39-12.6	318.31	SHORT	/1
WRIO 54.0 dBu desired distance: 36.1 km				Proposed 94.0 dBu undesired distance: 1.4 km								
W268DJ	268	FX	MOD	101.5	PONCE	PR	US	C	17-59-16	0	43.96	-43.96
202168	BLANK	BPFT-20181102A	D	DRL			0.25		066-37-10	0	SHORT	/2
W268DJ 60.0 dBu desired distance: 10.1 km				Proposed 40.0 dBu undesired distance: 33.9 km								
WELX	268	FM	L2C	101.5	ISABELA	PR	US	C	18-26-28.8	74.88	112.43	-37.55
29219	BLANK	BLH-19920107K/	B	NDI			50	129	067-08-48.6	312.13	SHORT	/3
WELX 54.0 dBu desired distance: 62.0 km				Proposed 34.0 dBu undesired distance: 50.4 km								
W268BK	268	FX	L2C	101.5	SAN JUAN	PR	US	C	18-16-41.8	62.75	63.93	-1.18
157307	BLANK	BLFT-20140509A	D	DRI			0.25		066-06-33.5	59.17	SHORT	/3
W268BK 60.0 dBu desired distance: 30.1 km				Proposed 40.0 dBu undesired distance: 33.9 km								
WZAR	270	FM	MOD	101.9	PONCE	PR	US	C	18-09-07.8	19.29	94.02	-74.73
52946	BLANK	BMLH-19820630,	B	OT:			14	789	066-33-13.6	21.09	SHORT	/1
WZAR 54.0 dBu desired distance: 92.6 km				Proposed 94.0 dBu undesired distance: 1.4 km								

/1 Although there will be contour overlap normally prohibited by Section 74.1204, it is demonstrated herein that no interference will be caused to any populated area based on the undesired-to-desired (U/D) signal strength ratio method which is permitted by Living Way Ministries, Inc. under Section 74.1204(d).

/2 Current W268DJ being modified by the instant application.

/3 The contour overlap requirements are met. See Figure 3, Allocation Study Map exhibit.



ALLOCATION STUDY MAP

duTreil, Lundin & Rackley, Inc. Sarasota, Florida

TABULATION OF PREDICTED INTERFERENCE ANALYSIS
WITH RESPECT TO WRIO, PONCE, PR (CHANNEL 266B)
FM TRANSLATOR W268DJ, CHANNEL 268, PONCE, PR

Depression Angle from Antenna	Distance from Base (m)	Elevation Pattern Relative Field*	Direct Ray Distance (m)	Effective Radiated Power (kW)	Effective Radiated Power (dBk)	Distance to IX Contour (m) [†]	Height Above Receive Antenna (m) [‡]
85.0	4.9	1.000	56.2	0.2500	-6.02	8.0	48.2
80.0	9.9	1.000	56.9	0.2500	-6.02	8.0	48.9
75.0	15.0	1.000	58.0	0.2500	-6.02	8.0	50.0
70.0	20.4	1.000	59.6	0.2500	-6.02	8.0	51.6
65.0	26.1	1.000	61.8	0.2500	-6.02	8.0	53.8
60.0	32.3	1.000	64.7	0.2500	-6.02	8.0	56.7
55.0	39.2	1.000	68.4	0.2500	-6.02	8.0	60.4
50.0	47.0	1.000	73.1	0.2500	-6.02	8.0	65.1
45.0	56.0	1.000	79.2	0.2500	-6.02	8.0	71.2
40.0	66.7	1.000	87.1	0.2500	-6.02	8.0	79.1
35.0	80.0	1.000	97.6	0.2500	-6.02	8.0	89.6
30.0	97.0	1.000	112.0	0.2500	-6.02	8.0	104.0
25.0	120.1	1.000	132.5	0.2500	-6.02	8.0	124.5
20.0	153.9	1.000	163.7	0.2500	-6.02	8.0	155.7
15.0	209.0	1.000	216.4	0.2500	-6.02	8.0	208.4
10.0	317.6	1.000	322.5	0.2500	-6.02	8.0	314.5
5.0	640.1	1.000	642.5	0.2500	-6.02	8.0	634.5
4.0	800.8	1.000	802.8	0.2500	-6.02	8.0	794.8
3.0	1068.5	1.000	1070.0	0.2500	-6.02	8.0	1062.0
2.0	1603.6	1.000	1604.6	0.2500	-6.02	8.0	1596.6
1.0	3208.2	1.000	3208.7	0.2500	-6.02	8.0	3200.7

* This is a worst-case analysis, which utilizes a relative field value of 1.000 for all depression angles.

[†] The interfering contour is the 142.2 dBu contour.

[‡] Positive figures indicate no contact of predicted contour with surface; and, thus, no interference predicted in accessible areas.

TABULATION OF PREDICTED INTERFERENCE ANALYSIS
WITH RESPECT TO WZAR, PONCE, PR (CHANNEL 270B)
FM TRANSLATOR W268DJ, CHANNEL 268, PONCE, PR

Depression Angle from Antenna	Distance from Base (m)	Elevation Pattern Relative Field*	Direct Ray Distance (m)	Effective Radiated Power (kW)	Effective Radiated Power (dBk)	Distance to IX Contour (m) [†]	Height Above Receive Antenna (m) [‡]
85.0	4.9	1.000	56.2	0.2500	-6.02	34.0	22.2
80.0	9.9	1.000	56.9	0.2500	-6.02	34.0	22.9
75.0	15.0	1.000	58.0	0.2500	-6.02	34.0	24.0
70.0	20.4	1.000	59.6	0.2500	-6.02	34.0	25.6
65.0	26.1	1.000	61.8	0.2500	-6.02	34.0	27.8
60.0	32.3	1.000	64.7	0.2500	-6.02	34.0	30.7
55.0	39.2	1.000	68.4	0.2500	-6.02	34.0	34.4
50.0	47.0	1.000	73.1	0.2500	-6.02	34.0	39.1
45.0	56.0	1.000	79.2	0.2500	-6.02	34.0	45.2
40.0	66.7	1.000	87.1	0.2500	-6.02	34.0	53.1
35.0	80.0	1.000	97.6	0.2500	-6.02	34.0	63.6
30.0	97.0	1.000	112.0	0.2500	-6.02	34.0	78.0
25.0	120.1	1.000	132.5	0.2500	-6.02	34.0	98.5
20.0	153.9	1.000	163.7	0.2500	-6.02	34.0	129.7
15.0	209.0	1.000	216.4	0.2500	-6.02	34.0	182.4
10.0	317.6	1.000	322.5	0.2500	-6.02	34.0	288.5
5.0	640.1	1.000	642.5	0.2500	-6.02	34.0	608.5
4.0	800.8	1.000	802.8	0.2500	-6.02	34.0	768.8
3.0	1068.5	1.000	1070.0	0.2500	-6.02	34.0	1036.0
2.0	1603.6	1.000	1604.6	0.2500	-6.02	34.0	1570.6
1.0	3208.2	1.000	3208.7	0.2500	-6.02	34.0	3174.7

* This is a worst-case analysis, which utilizes a relative field value of 1.000 for all depression angles.

[†] The interfering contour is the 130.1 dBu contour.

[‡] Positive figures indicate no contact of predicted contour with surface; and, thus, no interference predicted in accessible areas.

ARECIBO OBSERVATORY

The William E. Gordon Telescope
Angel Ramos Foundation Science and Visitor Center



August 2, 2018

Mr. Louis R. du Treil Jr.
du Treil, Lundin & Rackley, Inc.
3135 Southgate Circle Sarasota, FL 34239-5515

Re: New FM translator station EIRP of 0.41 kW, Channel 268 (101.5 MHz center)
Ponce , Puerto Rico

Dear Eng. Louis R. du Treil Jr.

Thank you very much for your PRCZ approval request sent to us in accordance with the Puerto Rico Coordination zone agreements. We have considered the technical aspects of your application and find that the modification of this station is unlikely to cause harmful interference to the passive use of the Radio Astronomy bands at the Arecibo Observatory.

We therefore have no objection to your proposed installation.

Sincerely yours,



Angel M. Vázquez
Spectrum Manager

AMV /ic

Cc: PRCZ files [File #02Aug18_01]

RF HAZARD STATEMENT

FM TRANSLATOR W268DJ
PONCE, PUERTO RICO
CHANNEL 268

With respect to the potential for human exposure to radio frequency (RF) energy, calculations prepared in accordance with FCC Bulletin OET-65 (Edition 97-01)* indicate that the proposal will not result in human exposure to RF energy at ground level in excess of FCC standards. The calculation of RF energy at 2-m above ground was made using the following formula from the OET-65 document:

$$S = \frac{(33.4)F^2 P}{R^2}$$

where, S = power density in $\mu\text{W}/\text{cm}^2$, F = relative field factor at the angle to the calculation point, P = the total effective radiated power relative to a dipole in watts, and R = distance from the antenna radiation center to the calculation point in meters. Based on the conservative assumption of a relative field factor of 1.0 with a total effective radiated power of 0.5 kW, and an antenna radiation center height above ground of 58 m, the calculated power density will not exceed $5.33 \mu\text{W}/\text{cm}^2$. Therefore, the calculated RF exposure at 2 m above ground will not exceed 2.67% of the FCC limit of $200 \mu\text{W}/\text{cm}^2$ for general population / uncontrolled environments.

The transmitter site shall be restricted from access. In the event that personnel are required to climb the tower structure, the proposed FM translator transmissions shall be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

* Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).