

CONSOLIDATED TECHNICAL STATEMENT

prepared April 2021 for

Dick Broadcasting Company, Inc. of Tennessee

WQSL(FM) Jacksonville, North Carolina

Ch. 222C1 92.3 MHz 100 kW 246 m

Introduction

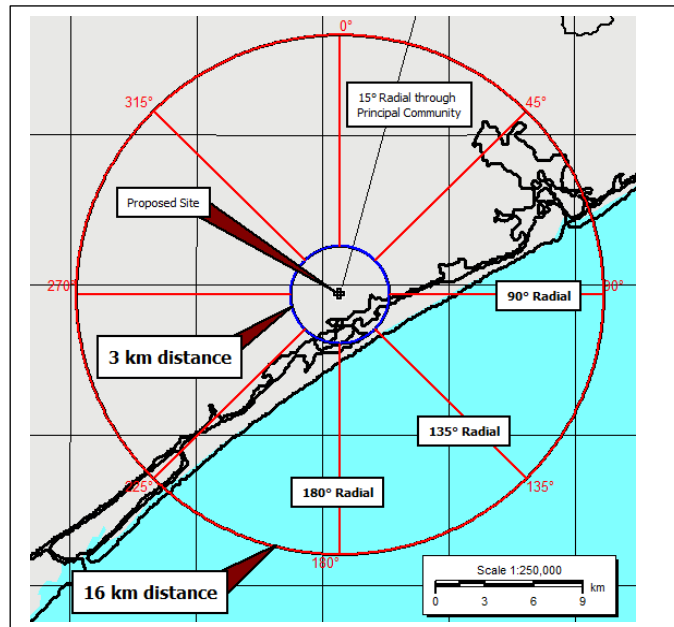
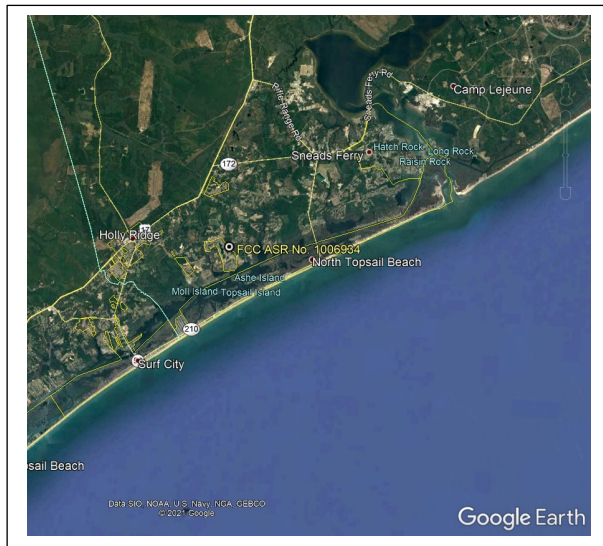
Dick Broadcasting Company, Inc. of Tennessee (“*DBC*”) is the licensee of Station WQSL(FM) Jacksonville, North Carolina (FCC Facility ID 28171). WQSL(FM) is authorized to operate as a Class C2 facility on Channel 222 under FCC File No. BLH-19950612KD. *DBC* herein seeks authorization for a modification of license including a new transmitting location and antenna system for WQSL(FM), along with a change in Class from C2 to C1, and an increase in Effective Radiated Power (“ERP”) from 22.5 kW to 100 kW. This would be a “minor change” under the FCC’s Rules.

Proposed Facility

DBC proposes to use an existing tower site¹, which is located approximately 4.65 km from the presently licensed WQSL(FM) location as the new site for WQSL(FM). The specified tower is identified as FCC Antenna Structure Registration Number 1006934; the coordinates of record (NAD-83) shown therein for this structure are:

34° 29’ 42” North Latitude 77° 29’ 18” West Longitude

As can be seen below, the proposed site is located in close proximity to the Atlantic Ocean. Since three of the eight cardinal radials from the site extend into the Ocean, (i.e., 90°, 135°, and 180°), and do not reencounter U.S. land area within the predicted 34 dBμ contour, the average terrain for this location must be calculated in accordance with the provisions of FCC Rule Section 73.313(d), as shown in the following.



¹ This location is also being separately proposed as a new transmitter location for *DBC*’s WXQR-FM, FCC Facility ID 28172, FCC File No. BLH-19950612KC. A common antenna system is being proposed for the two *DBC* stations.

The proposed tower presently hosts WRMR(FM), FCC Facility ID 47884, FCC File No. BLH-19990401KE, and WPXU-TV, FCC Facility ID 37971, LMS File No. 0000129487.

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Calculation of Average Terrain

Radial (°T)	Distance (km)	Average Elevation (AMSL)	Effective Antenna Height
0°	3 – 16	17.78 m	235.22 m
45°	3 – 16	6.98 m	246.02 m
90°	3 – 6.92	0.59 m	252.41 m
135°	3 – 3.70	0.61 m	252.39 m
180°	3 – 4.30	0.35 m	252.65 m
225°	3 – 16	1.22 m	251.78 m
270°	3 – 16	13.56 m	239.44 m
315°	3 – 16	13.53 m	239.47 m

Average Terrain:	6.83 m AMSL
Radiation Center Height:	244 m AGL
Radiation Center Height:	253 m AMSL
Antenna Center HAAT:	246 m

As summarized above, the proposed antenna system² will be mounted so as to place the WQSL(FM) center of radiation at 244 meters above ground level (253 meters above mean sea level). Based upon the above, the antenna radiation center will be located at 246 meters above average terrain, when rounded to the nearest meter per FCC Rule Section 73.212(b).

Proposed Effective Radiated Power

WQSL(FM) is presently authorized as a Class “C2” FM station. As will be discussed further in following sections of this Statement, DBC is proposing to change WQSL(FM)’s station class from C2 to C1.

Referencing FCC Rule Section 73.211, “power and antenna height requirements”, for Class C1 stations, an Effective Radiated Power of 100 kW may be requested, up to an effective antenna height of 299 meters above average terrain (“HAAT”). The proposed Class C1 power/height combination of 100 kW ERP at 246 meters HAAT does not exceed FCC Rule Section 73.211(b) maximum limits. The minimum power/height limits stipulated in FCC Rule Section 73.211(a) are also met under this proposal.

² The antenna to be employed for this proposal will be an eight-element, full-wave spaced, non-directional, circularly polarized system. As discussed previously, this antenna will be shared with DBC’s sister station, WXQR-FM, which is the subject of a separate minor modification of license application.

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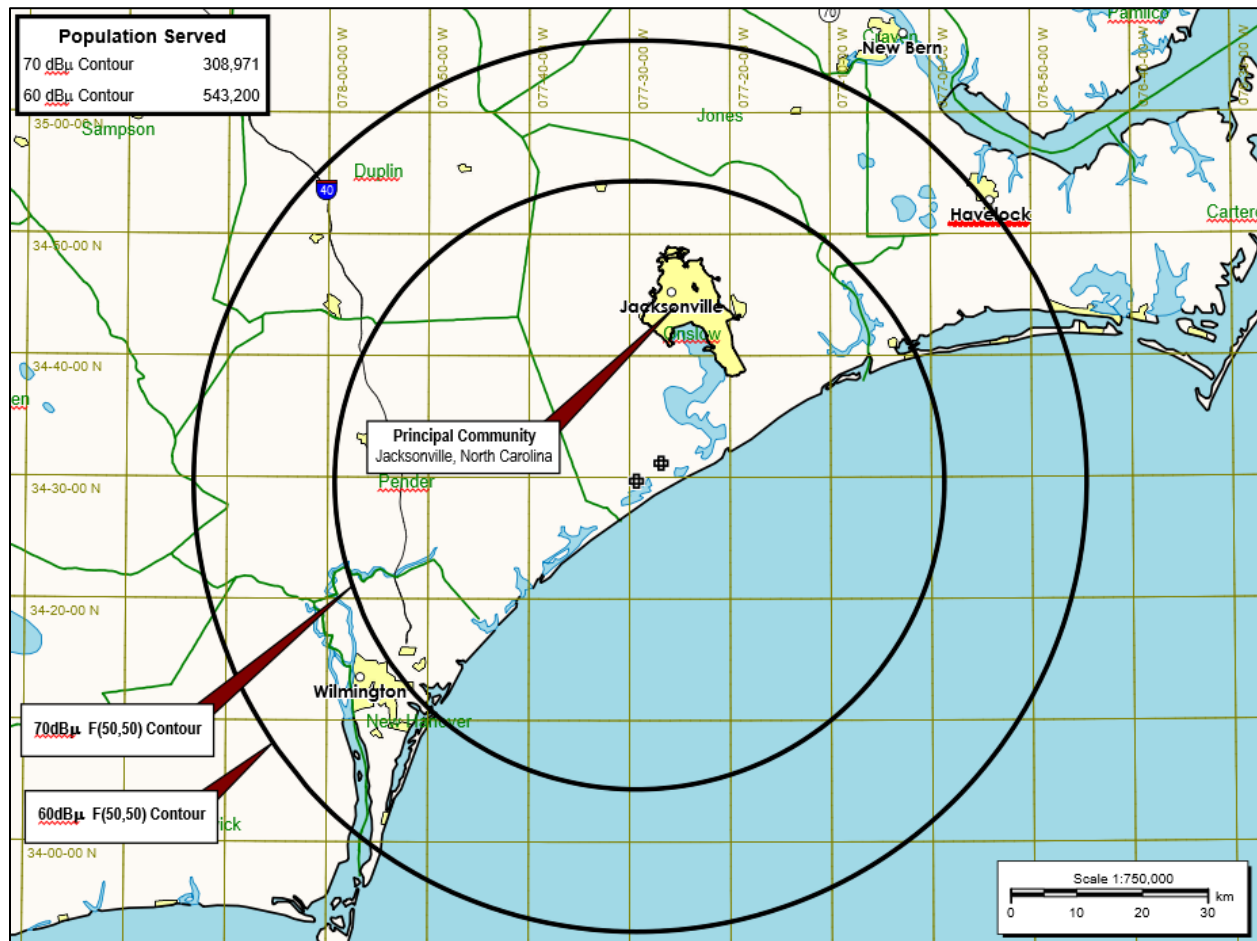
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Coverage Considerations

The locations of the conventionally predicted 60 dB μ and 70 dB μ coverage contours developed from the facilities proposed herein are shown in the map provided below.

Based upon the U.S. 2010 Census, a 210,331 person net increase in population served within the 60 dB μ contour will be realized upon completion of construction of the facilities proposed herein (from 332,869 to 543,200 persons). Accordingly, a grant of this proposal would serve the public interest.



Principal Community Coverage

As shown above, the proposed WQSL(FM) 70 dB μ contour will cover 100% of Jacksonville, North Carolina, the Station's principal community of license. This proposal satisfies FCC Rule Section 73.315(a).

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Allocation Considerations

WQSL(FM) is presently authorized as a Class C2 station on FM Channel 222. A “one step” upgrade in Class (from Class C2 to Class C1) is being proposed herein, along with a change in antenna location and height. A change in station class is permitted under FCC Rule Section 73.203(b). This application for modification of license can be classified as a “minor change” under FCC Rule Section 73.3573(a)(1)(ii).

The proposed transmitter location meets all of the minimum distance separation requirements of FCC Rule Section 73.207 with one exception, that being first-adjacent Class C1 Station WMYB(FM), Myrtle Beach, South Carolina. This is documented in the allocation study shown below, which is based on the FCC Rule Section 73.207 separation tables:

Call	Channel	Relationship	Location	Azimuth (° True)	Distance (km)	§73.207 Required Distance (km)	Margin (km)
WBKU	219C1	3rd Adjacent	Ahoskie, NC	8.1	179.5	82.0	97.5
WFSS	220C1	2nd Adjacent	Fayetteville, NC	297.1	143.5	82.0	61.5
WAAE	220A	2nd Adjacent	New Bern, SC	31.5	83.8	75.0	8.8
WMYB	221C1	1st Adjacent	Myrtle Beach, SC	235.5	175.5	177.0	-1.5
WRSV	221A	1st Adjacent	Elm City, NC	341.2	162.7	133.0	29.7
WKRR	222C0	Co-Channel	Asheboro, NC	305.6	260.2	259.0	1.2
WZPR	222C3	Co-Channel	Nags Head, NC	47.9	226.7	211.0	15.7
WYFL	223C0	1st Adjacent	Henderson, NC	341.6	202.6	196.0	6.6
WBNK	224C2	2nd Adjacent	Pine Knoll Shores, NC	64.0	99.8	79.0	20.8
WEGX	225C	3rd Adjacent	Dillon, SC	265.7	169.2	105.0	64.2
WELS-FM	275A	IF (53 Chan)	Kinston, NC	349.7	89.0	22.0	67.0

This proposal meets the more permissive spacing requirements of FCC Rule Section 73.215(e) with respect to WYMB(FM).

Call	Channel	Relationship	Location	Azimuth (°T)	Distance (km)	§73.215(e) Required Distance (km)	Margin (km)
WMYB	221C1	1st Adjacent	Myrtle Beach, SC	235.5	175.5	158.0	17.5

Specifically, the Class “C1 to C1” minimum spacing requirement specified under FCC Rule Section 73.215(e) is 158 km, while the actual separation proposed herein is 175.5 km – a margin of 17.5 km.

Further, under this proposal, sufficient contour protection is provided as required by FCC Rule Section 73.215(a), and assuming maximum facilities for WYMB(FM), using a non-directional antenna system as is shown on the following page.

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Based on the above information, processing under FCC Rule Section 73.215 is herein respectfully requested. It should be noted that, with respect to the change in class, a fully-spaced Class C1 allocations “reference point” exists (*the presently licensed WQSL(FM) location*) at 34° 31’10.5” N, 77° 26’50.8” W (NAD 83). This location satisfies FCC Rule Section 73.207 spacing requirements, as demonstrated below:

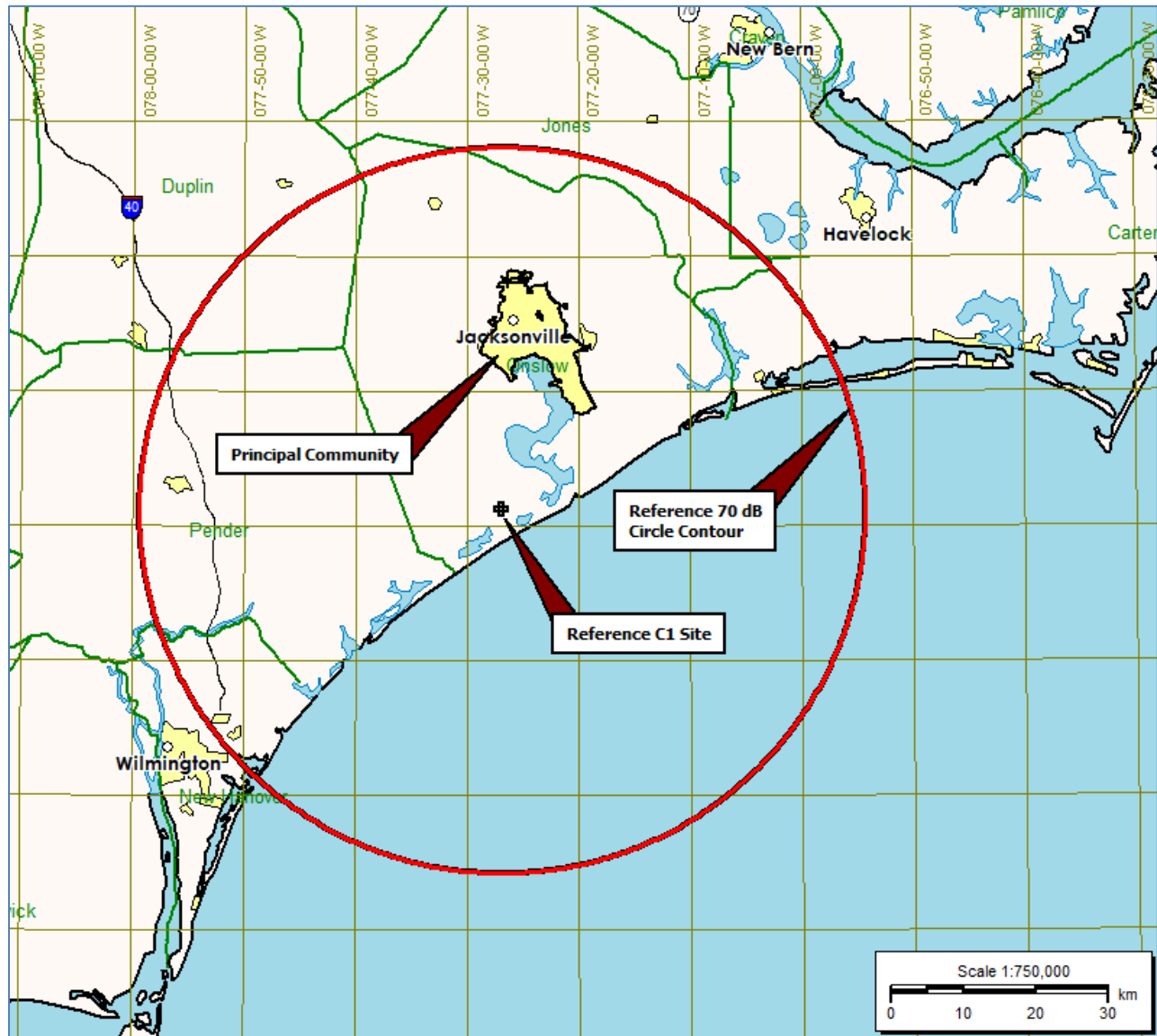
Call	Channel	Relationship	Location	Azimuth	Distance	Required Distance	Margin
WBKU	219C1	3rd Adjacent	Ahoskie, NC	7.0	176.2	82.0	94.2
WFSS	220C1	2nd Adjacent	Fayetteville, NC	295.4	145.6	82.0	63.6
WAAE	220A	2nd Adjacent	New Bern, SC	30.3	79.6	75.0	4.6
WMYB	221C1	1st Adjacent	Myrtle Beach, SC	235.5	180.2	177.0	3.2
WRSV	221A	1st Adjacent	Elm City, NC	339.7	161.4	133.0	28.4
WKRR	222C0	Co-Channel	Asheboro, NC	304.6	261.7	259.0	2.7
WZPR	222C3	Co-Channel	Nags Head, NC	47.8	222.1	211.0	11.1
WYFL	223C0	1st Adjacent	Henderson, NC	340.4	201.3	196.0	5.3
WBNK	224C2	2nd Adjacent	Pine Knoll Shores, NC	64.5	95.3	79.0	16.3
WEGX	225C	3rd Adjacent	Dillon, SC	264.9	173.1	105.0	68.1
WELS-FM	275A	IF (53 Chan)	Kinston, NC	347.0	87.1	22.0	65.1

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Additionally, as shown on the map provided below, the entire community of Jacksonville, North Carolina will receive a minimum field strength of 70 dB μ (3.16 mV/m) from the proposed C1 facility located at the designated allocation reference point (the current licensed site) as required by FCC Rule Section 73.315.



International Allocations Considerations

The proposed transmitter site is located over 900 km from the U. S. – Canada border and over 2,000 km from the U.S. – Mexico border. Therefore, international coordination is not necessary for the instant proposal.

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Monitoring Stations and Quiet Zones

The nearest FCC monitoring station is at Laurel, Maryland at a distance of over 500 km from the proposed site. This exceeds by a significant margin the minimum distance specified in Section 73.1030(c)(3) that would suggest consideration of the monitoring station. This site is located over 300 km from the National Radio Astronomy Observatory (“NRAO”) “quiet zone” located at Green Bank, West Virginia. Advance coordination is not required since the proposed operation does not fall under the quiet zone bounds contained in Section 73.1030(a)(1) of the FCC’s Rules.

Nearby Broadcast Stations – Interference Considerations

AM Stations: Based on data extracted from the FCC’s CDBS database, it was determined that there are no AM broadcast stations located within the notification/study distances set forth in FCC Rule Sections 1.30002(a) and (b). Further, the addition of the proposed FM antenna on the existing structure would not be defined as a signification modification under FCC Rule Section 1.30002(d). Accordingly, the construction proposed herein falls outside the criteria described in the above cited rule sections and may therefore be presumed not to have a significant effect on any nearby AM station.

TV Stations: WPXU-TV is located on the proposed tower structure and operates on RF Channel 16; no other TV stations are located in the vicinity. Due to antenna placement and frequency differences, undesired interaction and the generation of intermodulation products is not expected to occur.

FM Stations: The proposed tower is also utilized by WRMR(FM), which operates on 98.7 MHz. While a separate antenna will be installed on the tower to accommodate the WQSL(FM) facility proposed herein, filters and traps will be employed as necessary to prevent or address any undesired interaction. It is also proposed to diplex DBC’s WXQR-FM, 105.5 MHz into the proposed WQSL(FM) antenna. A custom combiner will be utilized to combine the two stations while also ensuring isolation from the collocated WRMR(FM) operation. Spectral analysis measurements will be conducted prior to placing the combined stations into normal operation to document system operation and to ensure that the FCC’s rules on out of band emissions have been satisfied. No other FM stations are located nearby.

Environmental Considerations

The antenna system to be employed for the proposed WSQL-FM operation will be side-mounted on an existing tower which serves as antenna supporting structure for a television station and one other FM radio station. No change in structure height is being proposed; no changes will be required in existing marking or lighting specifications.

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The use of existing transmitting locations such as the one proposed herein has been characterized as being environmentally preferable by the Commission, according to **Note 1** of Section 1.1306 of the FCC Rules, therefore this application is categorically excluded from environmental processing.

Human Exposure to Radiofrequency Radiation

In keeping with Section 1.1307(b) of the FCC's Rules, the proposed operation has been evaluated for human exposure to radiofrequency ("RF") energy using the procedures outlined by the Federal Communications Commission in *FCC OET Bulletin No. 65* ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines specified in Section 1.1310 of the FCC's Rules. Under present FCC policy, a facility may be presumed to comply with the limits contained in Rule Section 1.1310 if it satisfies the exposure criteria set forth in OET 65. Applying that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the guidelines.

In this instance, one television broadcast station (WPXU-TV, FCC Facility ID 37971) and one FM broadcast station (WRMR(FM), FCC Facility ID 47884) presently occupy the tower. *DBC* herein proposes to add the WQSL(FM) facility described herein to the structure, and, via a separate application for modification of license, *DBC's* WXQR-FM operation. In particular, it is proposed to combine WQSL(FM) and WXQR(FM) into a shared antenna system. Since three FM stations and one TV station will be utilizing this structure at the completion of construction, and the WQSL(FM) exceeds five percent of the MPE, the collective RF energy will be calculated, per Section 1.1307(b)(3) of the FCC's Rules.

Television Station Analysis

According to information on file with the FCC, WPXU-TV operates on RF Channel 16. Its antenna center of radiation is located 216.41 meters above ground level. An effective radiated power ("ERP") of 425 kilowatts, elliptically polarized, is being employed utilizing a Dielectric model TFU26DSC/VP-R C160 UHF antenna. Based on the antenna manufacturer's data, a "worst-case" elevation pattern relative field value of 0.11 can be assumed for purposes of the calculation. (The value of 0.11 field is not exceeded from 7 degrees to 90 degrees of depression angle.) Since elliptical polarization is employed for this antenna, 35% vertical polarization has been assumed, and included in the calculation. The "uncontrolled/general population" maximum permissible exposure limit ("MPE") specified for Channel 16 (center frequency 485 MHz) is $323.3 \mu\text{W}/\text{cm}^2$.

OET 65's formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For the DTV facility in the instant proposal, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the average

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power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (10) in OET 65:

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where: S = power density in microwatts/cm²

ERP = total (average) ERP in Watts

F = relative field factor

D = distance in meters

Using this formula and the above assumptions, the proposed facility would contribute a power density of 5.5 µW/cm² at two meters above ground level near the antenna support structure, or 1.56 percent of the general population/uncontrolled limit.

FM Radio Station Analysis

The FCC's "FM Model" on-line tool³ was used herein to determine the extent of radiofrequency electromagnetic field exposure at ground level from the proposed facility as well as other known FM stations utilizing, or proposing to utilize, the subject tower. Each station's contribution is addressed in the following.

WRMR(FM) - Station WRMR(FM), FCC Facility ID 47884, uses this site for its main and auxiliary antennas. Since both antennas would not be simultaneously operated, each will be considered individually.

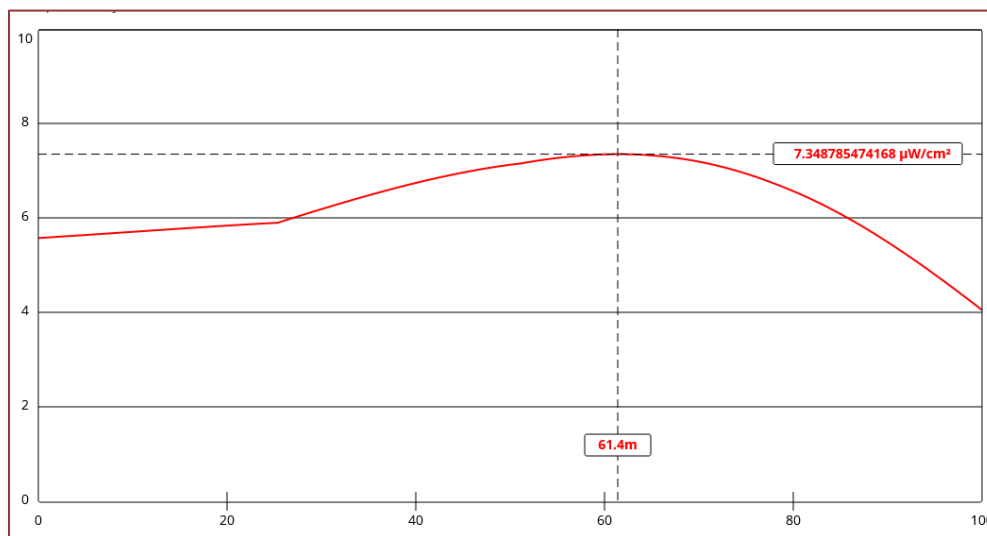
WRMR(FM) Main Antenna - Based upon information contained in FCC records and provided by a DBC engineering representative, the WRMR(FM) "main" antenna operates on 98.7 MHz, with an ERP of 100 kW. Its antenna radiation center is located 294 meters above ground level. A ten element, one wavelength spaced, opposed V dipole array antenna system has been installed. The general population/uncontrolled maximum permitted exposure ("MPE") limit specified in Section 1.1310 for Channel 254 (98.7 MHz) is 200 µW/cm². Using the FCC's "FM Model" program and an "EPA Type 2" antenna, it was determined from the FCC's FM Model tool that the WRMR(FM) licensed main facility, when operational, will contribute a worst-case RF power density of 7.35 µW/cm² at two meters above ground level near the antenna support structure, or 3.67 percent of the FCC's general population/uncontrolled limit. The graphical output of the FM Model tool is shown below.

³ FM Model was developed by the FCC and was originally based on measured data published in 1985 by the EPA.

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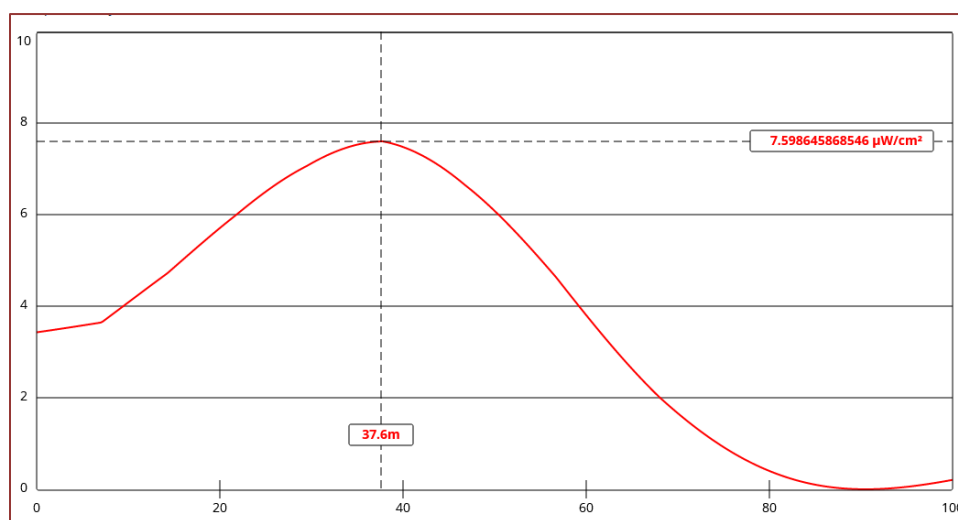
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WRMR(FM) Auxiliary Antenna - The WRMR(FM) auxiliary antenna operates with an ERP of 4.8 kW. Its antenna radiation center is located 85 meters above ground level. A three element, one wavelength spaced, helix antenna system has been installed.

Using the FCC's "FM Model" program and an "EPA Type 1" antenna, it was determined from the FCC's FM Model tool that the WRMR(FM) licensed auxiliary, when operating, will contribute a worst-case RF power density of 7.599 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 3.80 percent of the FCC's general population/uncontrolled limit. The graphical output of the FM Model software is shown below.



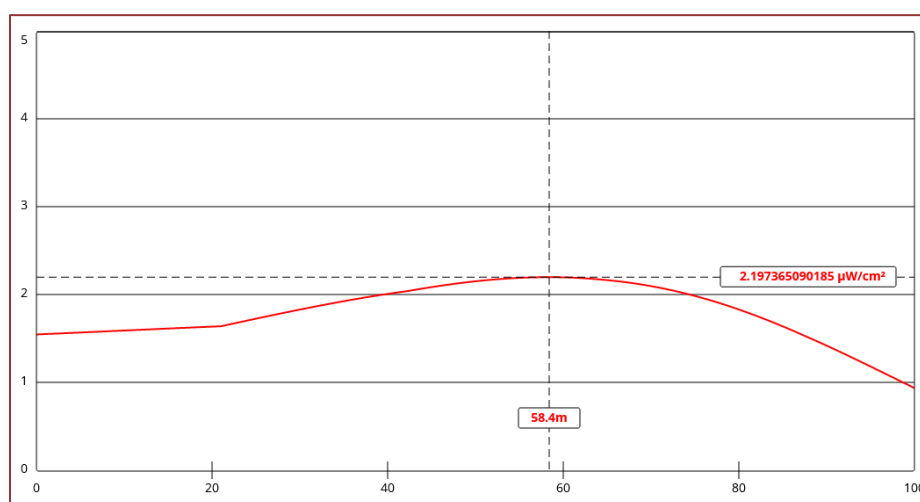
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WXQR-FM (Being Proposed Separately) - The proposed WXQR-FM antenna will operate on 105.5 MHz, with an ERP of 19 kW. Its antenna radiation center will be located 244 meters above ground level. An eight element, one wavelength spaced, opposed V dipole array antenna system will be installed. The general population/uncontrolled maximum permitted exposure (“MPE”) limit specified in §1.1310 for Channel 288 (105.5 MHz) is $200 \mu\text{W}/\text{cm}^2$.

Using the FCC’s “FM Model” program and an “EPA Type 2” antenna, it was determined from the FCC’s FM Model tool that the proposed WXQR-FM facility will contribute a worst-case RF power density of $2.197 \mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 1.1 percent of the FCC’s general population/uncontrolled limit. The graphical output of the FM Model software is shown below.



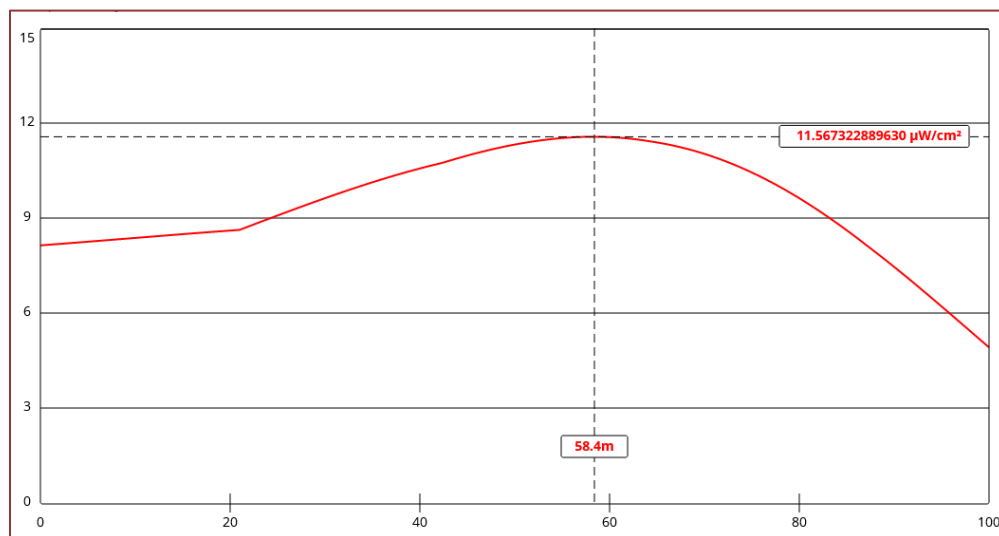
WQSL(FM) (Proposed) – As discussed in this Statement, DBC intends to combine co-owned WQSL(FM) and WXQR-FM into a common antenna system. (The WXQR-FM Application for Modification of License is being filed concurrently but separately.) The proposed WQSL(FM) antenna will operate on 92.3 MHz, with an ERP of 100 kW. As with WXQR-FM, the WQSL(FM) antenna radiation center will be located 244 meters above ground level. An eight element, one wavelength spaced, opposed V dipole array antenna system will be installed. The general population/uncontrolled maximum permitted exposure (“MPE”) limit specified in Section 1.1310 for Channel 222 (92.3 MHz) is $200 \mu\text{W}/\text{cm}^2$.

Using the FCC’s “FM Model” program with the assumption of an “EPA Type 2” antenna, it was determined from the FCC’s FM Model tool that the proposed WQSL(FM) facility will contribute a worst-case RF power density of $11.57 \mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 5.78 percent of the FCC’s general population/uncontrolled limit. The graphical output of the FM Model software is shown below.

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Consideration of all Facilities

Since the proposed site is a continuing multi-user installation, the contributions for all of the high power broadcast emitters operating at this site has been evaluated as a group, under the following two scenarios:

- 1) With all facilities operating, including the WRMR(FM) *main* antenna, but excluding the WRMR(FM) auxiliary antenna, and
- 2) With all facilities operating, including the WRMR(FM) *auxiliary* antenna, but excluding the WRMR(FM) main antenna.

(Please note that it is impossible for WRMR(FM) to operate its main and auxiliary facilities simultaneously.)

The individual exposure calculation results, along with a summary of the calculated maximum power density near the tower (in terms of the general population/uncontrolled limit), are provided below. The following table assumes that all existing and proposed broadcast facilities would be operational, except for the WRMR(FM) auxiliary antenna system.

Call Sign Facility Type	ERP Polarization	Antenna Height Above Ground	FCC MPE	Maximum Exposure	Percent of General Public Limit
WPXU-TV	425 kW Elliptical	216.41 m	323.3 $\mu\text{W}/\text{cm}^2$	5.5 $\mu\text{W}/\text{cm}^2$	1.56 Percent
WRMR(FM) Main Antenna	100 kW Circular	294 m	200 $\mu\text{W}/\text{cm}^2$	7.35 $\mu\text{W}/\text{cm}^2$	3.67 Percent
WXQR-FM	19 kW Circular	244 m	200 $\mu\text{W}/\text{cm}^2$	2.197 $\mu\text{W}/\text{cm}^2$	1.10 Percent
WQSL(FM)	100 kW Circular	244 m	200 $\mu\text{W}/\text{cm}^2$	11.57 $\mu\text{W}/\text{cm}^2$	5.78 Percent
				Total:	12.11 Percent

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The next table shows a similar summary, assuming that all existing and proposed broadcast facilities would be operational, except for the WRMR(FM) main antenna system (i.e., WRMR(FM) operating on its separate auxiliary antenna).

Call Sign Facility Type	ERP Polarization	Antenna Height Above Ground	FCC MPE	Maximum Exposure	Percent of General Public Limit
WPXU-TV	425 kW Elliptical	216.41 m	323.3 $\mu\text{W}/\text{cm}^2$	5.5 $\mu\text{W}/\text{cm}^2$	1.56 Percent
WRMR(FM) Aux. Antenna	4.8 kW Circular	85 m	200 $\mu\text{W}/\text{cm}^2$	7.599 $\mu\text{W}/\text{cm}^2$	3.80 Percent
WXQR-FM	19 kW Circular	244 m	200 $\mu\text{W}/\text{cm}^2$	2.197 $\mu\text{W}/\text{cm}^2$	1.10 Percent
WQSL(FM)	100 kW Circular	244 m	200 $\mu\text{W}/\text{cm}^2$	11.57 $\mu\text{W}/\text{cm}^2$	5.78 Percent
				Total:	12.24 Percent

As shown in the preceding, the “worst-case” combined total RF exposure is less than 12.3% of the FCC’s stipulated “General Public” maximum in either operating configuration, assuming that the individual contributions add up at the same location, which they will not. Accordingly, it is found that the proposed WXQR-FM facility will comply with the FCC’s RF exposure guidelines.

Safety of Tower Workers and the General Public

The proposed transmitting site is currently enclosed by a locked fence. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission’s guidelines. Tower site access will continue to be restricted and controlled. Additionally, appropriate RF exposure warning signs will continue to be posted. With respect to worker safety, a site exposure policy will be developed and employed protecting maintenance workers from excessive exposure when work must be performed in areas where high RF levels may be present while any of the stations are in operation. Such protective measures may include, but are not limited to, restriction of access to areas where levels in excess of the guidelines may be expected, facility power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the occupational exposure guidelines would otherwise be exceeded. DBC will appropriately coordinate with other licensees utilizing this site.

Conclusion

Based on the preceding, it is submitted that the instant proposal should be categorically excluded from environmental processing under Section 1.1306 of the Rules, and preparation of an Environmental Assessment is not required.