

Non-Interference Compliance

Regarding Facility id 151894

Channel 255

Description of Exhibit 13 Contents

This exhibit demonstrates that the proposed facility complies with contour overlap and interference protection provisions in all of the applicable rule sections and that this application for a construction permit is in full compliance with 47 C.F.R. § 74.1204.

Let it be noted that should any actual real world interference occur, the applicant acknowledges that it will promptly suspend operation of this translator in accordance with 47 C.F.R. § 74.1203.

Page 2 of this exhibit is an explanation of the method used to demonstrate compliance with contour overlap and interference provisions based on 47 C.F.R. § 74.1204(d), which states:

[A]n 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.

Page 3 contains a tabulation of the vertical radiation pattern of the proposed antenna and the minimum ground clearance of the interfering contour based on this pattern.

Pages 4 through 5 include a tabulation of the vertical radiation pattern for the proposed antenna provided by the antenna manufacturer.

Page 6 of this exhibit contains the tabulated data from the interference analysis, which shows all stations whose protected contours come within 50 km of the 34 dB μ F(50,10) contour of the proposed translator. These tabulated values were calculated using data from the FCC's CDBS files and 30 arc second terrain data. The column labeled "Adj" shows the number of channels difference between the entry and the proposed translator. The column labeled "Dist" shows the distance in km. The column labeled "Overlap" shows the area of contour overlap in square kilometers.

Page 7 of this exhibit is a portion of a USGS 1:24,000 scale 7.5 minute quadrangle at full scale with the calculated area of interference overlaid. The sheet includes the quadrangle name and measurement scale at the bottom-left corner (note: "Mt" refers to meters). The area of interference was calculated using the free space equation and 120 radials.

Page 8 of this exhibit is an aerial photo of the vicinity surrounding the proposed translator's tower site.

Compliance with 47 C.F.R. § 74.1204(d)

All authorized second and third adjacent stations with which the proposed translator has contour overlap are tabulated below. Column four show the station's signal level at the proposed translator's tower site, and column five gives the minimum value within the entire standard interfering contour of the proposed translator (100 dBμ for most classes, 94 for class B, 97 for class B1). The minimum second or third adjacent F(50,50) contour within the proposed translator's standard interfering contour was used to calculate the proposed translator's actual "worst-case" interfering contour.

Application id	File Number	Callsign	Contour at Tower	Min. Contour
1096023	BLH20051104ACY	WHHD	91.3	89.9
1636061	BMLH20140507ADV	WKXC-FM	79.3	79.3

Minimum F(50,50) Contour of Adjacent Station within
Proposed Translator's Standard Interfering Contour **79.3**

FCC 02-244 at Section II.A.5 states that "when demonstrating that 'no actual interference will occur due to . . . other factors,' pursuant to Section 74.1204(d), an applicant may use the undesired-to-desired signal ratio method." The undesired-to-desired ratio for second and third adjacent stations required by § 74.1204(a) is 40 dB. Since the minimum protected contour strength within the proposed translator's standard interference contour is **79.3 dBμ**, this makes the proposed translator's worst-case interfering contour **119.3 dBμ**. By the free-space equation, this contour is calculated to extend a maximum of **48.1 m** from the transmit antenna.

The maximum horizontal plane of the interfering contour was calculated for 120 radials and plotted on the pertinent portion of a USGS quadrangle (page 7 of this exhibit). However, the field strength of the proposed translator's antenna varies with angle of depression from horizontal. The antenna relative fields are tabulated on the following page at 5 degree increments, starting at 5 degrees below horizontal. Antenna relative field strength data was provided and certified by the manufacturer of the proposed antenna. Using a free-space calculation that neglects any loss due to reflection, the vertical ground clearance of the proposed translator's interference contour has been tabulated. As shown on the following page, the area of interference clears the tower ground level (TGL) by **24.9 m** at the lowest point.

Note: This application proposes a 2 bay 6832 antenna mounted on a 20ft (6.1m) pole on the top of a building 27.4m tall. This proposal provides 24.9m ground clearance which is more than adequate to protect the highest occupied floor which is 72ft (22m) AGL so , in accordance with 47 C.F.R. § 74.1204(d) and the clarification provided by the FCC in the decision *Re: Living Way Ministries* (FCC 02-244), a lack of population has been demonstrated within the area of interference and this application is therefore in full compliance with 47 C.F.R. § 74.1204.

Antenna Manufacturer: SHI
Antenna Model: 6832-2(.75)
CORAGL: 33.5m
Maximum ERP: 0.04 kW
Interfering Contour: 119.3 dBμ
Max Int. Contour Distance: 48.1 m
Min Ground Clearance: 24.9 m

The following table shows how the interfering contour ground clearance was calculated.

The formula used to calculate the vertical radiation pattern for the multi-bay antenna array is the exact formula used by the FCC's Office of Engineering and Technology in the FM Model program used to calculate ground-level power density for multi-bay antenna arrays for purposes of compliance with OET65. According to the source code of FM Model, this formula was "derived from Kraus (eqn 4-51 & 5-52), Gailey and Tell, and material from Ben Dawson, Hatfield and Dawson."

- The Depression Angle is the angle below horizontal for the radial.
- The Single-Bay Relative Field value is the relative field value for the depression angle either provided by the antenna manufacturer or interpolated from the values provided by the manufacturer.
- The Relative Field Multiplier is equal to $\text{Sin}(N * \pi \text{Sin}\phi) / (N * \text{Sin}(\pi \text{Sin}\phi))$, where N is the number of antenna elements in the array, S is the spacing between elements, π is the ratio of a circle's circumference to its diameter, and ϕ is the Depression Angle.
- The Relative Field Value for the Array is the absolute value of the product of the Relative Field Factor and the Single-Bay Relative Field value for that radial.
- The ERP on the Radial is the square of the Relative Field Value for the Array multiplied by the maximum ERP.
- The Contour Direct Distance is found by using the free space equation.
- The Horizontal and Vertical Contour Distances are calculated from the Direct Distance using trigonometry.
- The Contour Ground Clearance is the Vertical Contour Distance subtracted from the overall antenna height above the ground.

Depression Angle (degree)	Single-Bay Relative Field	Relative Field (hor)	$\pi \text{Sin}\phi$	Relative Field Multiplier	Relative Field for Array	ERP on Radial (W)	Contour Direct Distance (m)	Contour Horizontal Distance (m)	Contour Vertical Distance (m)	Contour Ground Clearance (m)
5	0.996	0.998	0.2054	0.9790	0.975	38.0	46.4	46.2	4.0	31.5
10	0.985	0.997	0.4091	0.9175	0.904	32.7	43.0	42.3	7.5	28.0
15	0.967	0.997	0.6098	0.8197	0.793	25.1	37.7	36.4	9.8	25.7
20	0.942	0.995	0.8059	0.6925	0.652	17.0	31.0	29.1	10.6	24.9
25	0.910	0.994	0.9958	0.5439	0.495	9.8	23.5	21.3	9.9	25.6
30	0.871	0.992	1.1781	0.3827	0.333	4.4	15.8	13.7	7.9	27.6
35	0.826	0.99	1.3515	0.2176	0.180	1.3	8.5	7.0	4.9	30.6
40	0.774	0.987	1.5145	0.0562	0.044	0.1	2.1	1.6	1.3	34.2
45	0.717	0.983	1.6661	-0.0951	0.068	0.2	3.2	2.3	2.3	33.2
50	0.654	0.981	1.8049	-0.2320	0.152	0.9	7.2	4.6	5.5	30.0
55	0.586	0.978	1.9301	-0.3516	0.206	1.7	9.8	5.6	8.0	27.5
60	0.514	0.973	2.0405	-0.4526	0.233	2.2	11.1	5.5	9.6	25.9
65	0.437	0.97	2.1354	-0.5351	0.234	2.2	11.1	4.7	10.1	25.4
70	0.357	0.965	2.2141	-0.5998	0.214	1.8	10.2	3.5	9.6	25.9
75	0.273	0.961	2.2759	-0.6481	0.177	1.3	8.4	2.2	8.1	27.4
80	0.186	0.956	2.3204	-0.6813	0.127	0.6	6.0	1.0	5.9	29.6
85	0.096	0.952	2.3472	-0.7007	0.067	0.2	3.2	0.3	3.2	32.3
90	0.000	0.947	2.3562	-0.7071	0.000	0.0	0.0	0.0	0.0	35.5
									Min Ground Clearance (m):	24.9

Antenna Mfg.: Shively Labs

Date: 10/9/2015

Antenna Type: 6832-1

Station: Scott Alexander

Beam Tilt 0

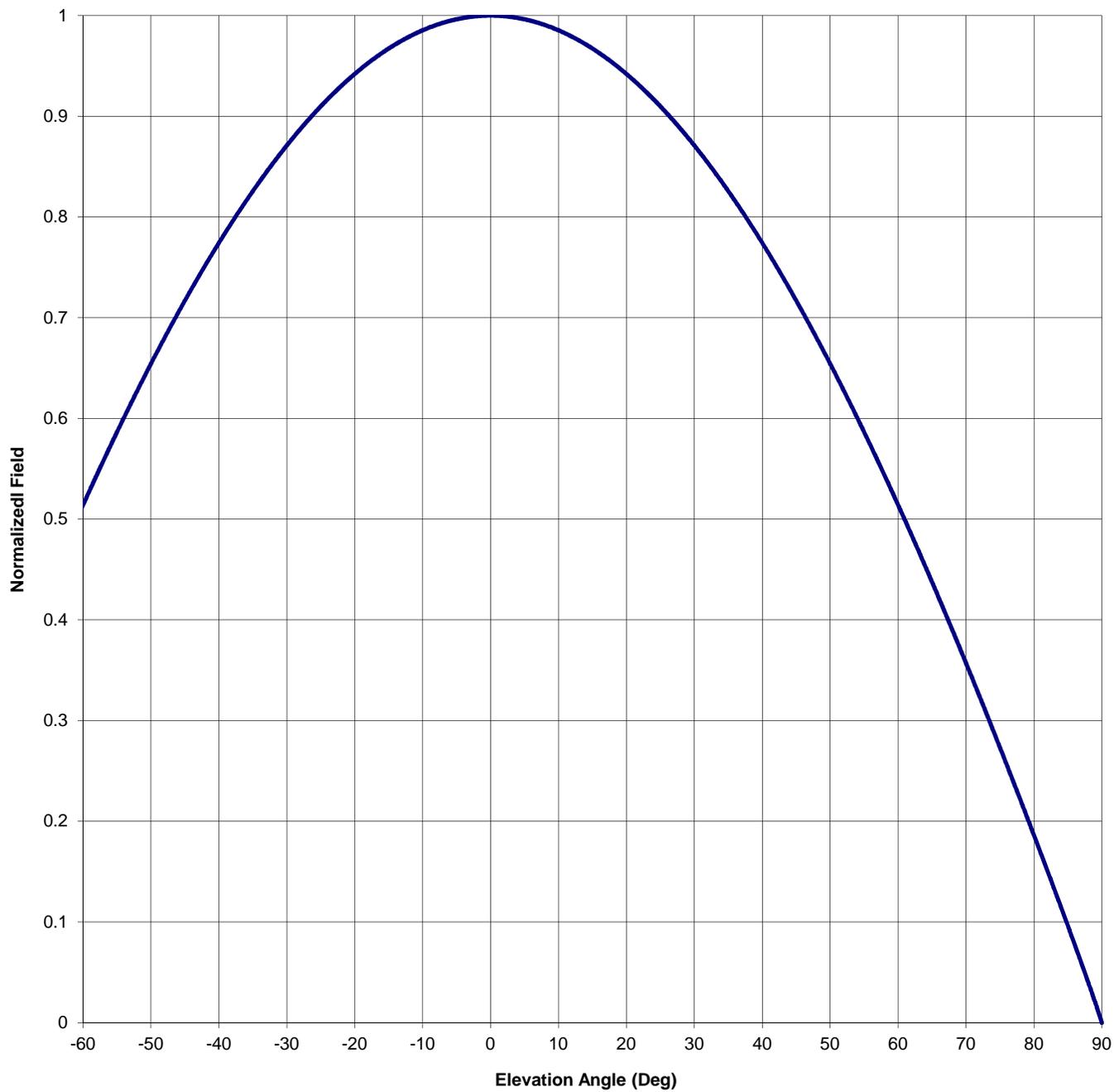
Frequency: 100.1

Gain (Max) 0.463 -3.344 dB

Channel #: 261

Gain (Horizon) 0.463 -3.344 dB

Figure: Note: dB is ref dipole. Hpol



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Figure: Note: dB is ref dipole. Hpol

Angle of Depression (Deg)	Relative Field						
-90	0.000	-44	0.729	0	1.000	46	0.705
-89	0.021	-43	0.741	1	1.000	47	0.693
-88	0.040	-42	0.752	2	0.999	48	0.680
-87	0.059	-41	0.763	3	0.999	49	0.667
-86	0.078	-40	0.774	4	0.998	50	0.654
-85	0.096	-39	0.785	5	0.996	51	0.641
-84	0.114	-38	0.796	6	0.995	52	0.628
-83	0.133	-37	0.806	7	0.993	53	0.614
-82	0.151	-36	0.816	8	0.991	54	0.600
-81	0.168	-35	0.826	9	0.988	55	0.586
-80	0.186	-34	0.835	10	0.985	56	0.572
-79	0.204	-33	0.845	11	0.982	57	0.558
-78	0.221	-32	0.854	12	0.979	58	0.544
-77	0.239	-31	0.862	13	0.975	59	0.529
-76	0.256	-30	0.871	14	0.971	60	0.514
-75	0.273	-29	0.879	15	0.967	61	0.499
-74	0.290	-28	0.887	16	0.963	62	0.484
-73	0.307	-27	0.895	17	0.958	63	0.469
-72	0.324	-26	0.903	18	0.953	64	0.453
-71	0.341	-25	0.910	19	0.948	65	0.437
-70	0.357	-24	0.917	20	0.942	66	0.422
-69	0.373	-23	0.924	21	0.936	67	0.406
-68	0.390	-22	0.930	22	0.930	68	0.390
-67	0.406	-21	0.936	23	0.924	69	0.373
-66	0.422	-20	0.942	24	0.917	70	0.357
-65	0.437	-19	0.948	25	0.910	71	0.341
-64	0.453	-18	0.953	26	0.903	72	0.324
-63	0.469	-17	0.958	27	0.895	73	0.307
-62	0.484	-16	0.963	28	0.887	74	0.290
-61	0.499	-15	0.967	29	0.879	75	0.273
-60	0.514	-14	0.971	30	0.871	76	0.256
-59	0.529	-13	0.975	31	0.862	77	0.239
-58	0.544	-12	0.979	32	0.854	78	0.221
-57	0.558	-11	0.982	33	0.845	79	0.204
-56	0.572	-10	0.985	34	0.835	80	0.186
-55	0.586	-9	0.988	35	0.826	81	0.168
-54	0.600	-8	0.991	36	0.816	82	0.151
-53	0.614	-7	0.993	37	0.806	83	0.133
-52	0.628	-6	0.995	38	0.796	84	0.114
-51	0.641	-5	0.996	39	0.785	85	0.096
-50	0.654	-4	0.998	40	0.774	86	0.078
-49	0.667	-3	0.999	41	0.763	87	0.059
-48	0.680	-2	0.999	42	0.752	88	0.040
-47	0.693	-1	1.000	43	0.741	89	0.021
-46	0.705	0	1.000	44	0.729	90	0.000
-45	0.717			45	0.717		

**Adjacent Channel Study
For Station W255AS, Facility_id: 151894**

Co-channel through third adjacent:

App_id	Fac_id	File_Number	Call	Licensee	Class	City	State	Status	ERP	RCAMSL	Chan	Adj	Dist	Overlap
1096023	24148	BLH-20051104ACY	WHHD	BEASLEY MEDIA GROUP LICENS	C3	CLEARWATER	SC	LIC	11.5	242.8	252	3	7.6	0.2387
1636061	24147	BMLH-20140507ADV	WKXC-FM	BEASLEY MEDIA GROUP LICENS	C2	AIKEN	SC	LIC	24	341	258	3	20.2	0.2387
1729403	171006	BPH-20160526ABG	WLCZ	GLORY COMMUNICATIONS, INC.	C3	LINCOLNTON	GA	CP	19.5	225	254	1	52.2	0
1502547	171006	BLH-20120604ADO	WLCZ	GLORY COMMUNICATIONS, INC.	A	LINCOLNTON	GA	LIC	0.48	259.1	254	1	55.8	0
1584929	184539	BLED-20131031AAM	WHBJ	AUGUSTA RADIO FELLOWSHIP IN	C3	BARNWELL	SC	LIC	25	177	256	1	66	0
1185824	156940	BLFT-20070514ABD	W252BH	LARGE TIME RADIO NETWORK LI	D	WASHINGTON	GA	LIC	0.027	193	252	3	71.4	0
1791041	156229	BLFT-20180829AAN	W253BL	FMX LLC	D	GREENWOOD	SC	LIC	0.25	289	253	2	82.4	0
1086057	37200	BLH-20051110AAA	WOMG	RADIO LICENSE HOLDING CBC, L	A	LEXINGTON	SC	LIC	6	212	253	2	86.5	0

AUGUSTA WEST QUADRANGLE
GEORGIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

NE/4 HEPHZIBAH 15' QUADRANGLE

4651 III SW
(NORTH AUGUSTA)

403 2'30"

0.7 MI. TO GA. 28

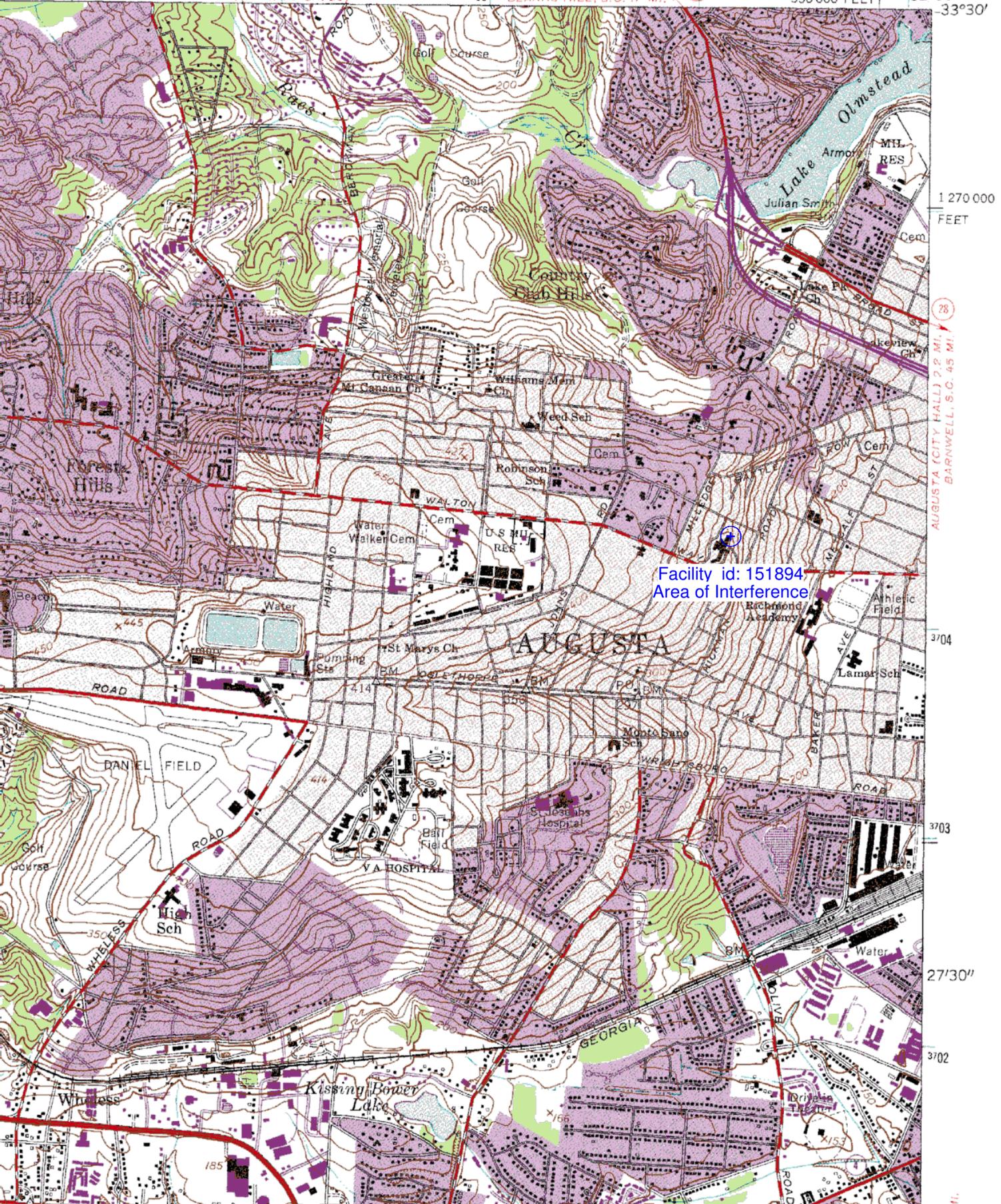
405

MC CORMICK, S.C. 36 MI.
CLARKS HILL, S.C. 17 MI.

28

550 000 FEET

82°00'
33'30"



1 270 000
FEET

28

AUGUSTA (CITY HALL) 7.2 MI.
BARNWELL, S.C. 45 MI.

3704

3703

27'30"

3702

9 MI.

