

August 2014
FM Translator W282BA
Sterling, Virginia Channel 283D
Allocation Study

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study map demonstrates compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The proposed translator transmitter site is located within the 54 dBu protected contour of third-adjacent channel station WAVA-FM 286B Arlington. The proposed site is 29.37 km from the WAVA-FM transmitter site at a bearing of 298 degrees True. Given the WAVA-FM antenna's 149 meter HAAT and 33 kW ERP along this radial, WAVA-FM places a 70 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is $70 + 40 = 110$ dBu. Given that the transmitting antenna will be installed at a height of 52 meters above roof level, and taking into consideration the vertical plane pattern of the Shively 6812B-4-SS antenna to be used, the attached calculations demonstrate that the interference area will not reach ground level. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to WAVA-FM.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

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SEARCH PARAMETERS FM Database Date: 140728

Channel: 283A 104.5 MHz
 Latitude: 39 1 3
 Longitude: 77 25 48
 Safety Zone: 50 km
 Job Title: 283 AT 1039866

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
WKYS	WASHINGTON		230B	24.500	38-56-24	105.9	31.39	15
LIC	DC	BMLH-80505ACH	93.9	215.0	077-04-54		16.39	CLEAR
WKYSaux	WASHINGTON		230B	5.800	38-57-19	100.5	37.54	0
LIC	DC	BXLH-90306AAG	93.9	100.0	077-00-15		0.00	AUX
WKYSaux	WASHINGTON		230B	25.000	38-56-24	105.9	31.39	0
LIC	DC	BXLH-90421AAJ	93.9	151.0	077-04-54		0.00	AUX
WKYSaux	WASHINGTON		230B	0.245	38-56-24	105.9	31.39	0
LIC	DC	BXLH-30103ABS	93.9	209.0	077-04-54		0.00	AUX
WTLP	BRADDOCK HEIGHTS		280A	0.350	39-27-50	353.5	49.88	31
LIC	MD	BLH-60612ABE	103.9	292.0	077-29-44		18.88	CLEAR
WPRSaux	WALDORF		281B	50.000	38-37-07	131.0	67.45	0
LIC	MD	BXMLH-70809ABC	104.1	147.0	076-50-39		0.00	AUX
WPRS-FM	WALDORF		281B	20.000	38-37-07	131.0	67.45	69
LIC	MD	BMLH-70809ABE	104.1	244.0	076-50-39		-1.55	SHORT
WPRSaux	WALDORF		281B	0.450	38-57-19	100.5	37.54	0
LIC	MD	BXLH-00324AAR	104.1	100.0	077-00-15		0.00	AUX
WZFTaux	BALTIMORE		282B	1.800	39-20-10	62.0	76.14	0
LIC	MD	BXLH-90302AAM	104.3	169.0	076-38-59		0.00	AUX
WZFTaux	BALTIMORE		282B	29.000 DA	39-25-45	61.2	96.16	0
LIC	MD	BXLH-00122ABA	104.3	145.0	076-27-01		0.00	AUX
WZFTaux	BALTIMORE		282B	20.000	39-18-50	65.0	78.90	0
LIC	MD	BXLH-285	104.3	40.0	076-36-01		0.00	AUX
WZFT	BALTIMORE		282B	13.000 DA	39-20-10	62.0	76.14	113
LIC	MD	BLH-90123AAG	104.3	294.0	076-38-59	SS	-36.86	SHORT
NEW	BERRYVILLE		282L1	0.100	39-07-03	283.5	48.25	56
CP	VA	BNPL-31114BHB	104.3	25.9	077-58-21		-7.75	SHORT
W282BA	LEESBURG		282D	0.100 DA	39-06-38	313.1	15.17	0
LIC	VA	BLFT-40902ACB	104.3	71.0	077-33-30		0.00	TRANS

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SEARCH PARAMETERS FM Database Date: 140728

Channel: 283A 104.5 MHz Page 2

Latitude: 39 1 3

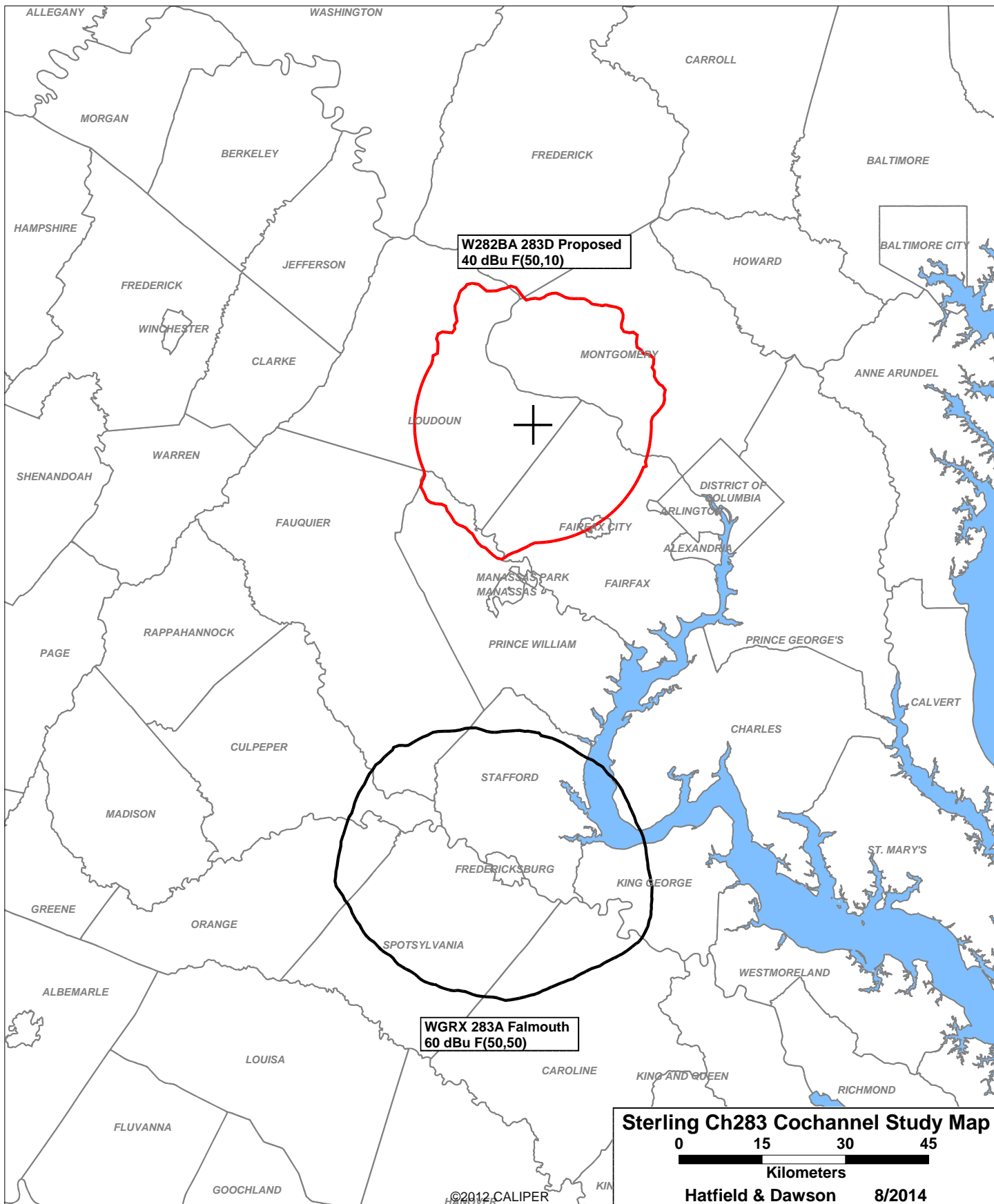
Longitude: 77 25 48

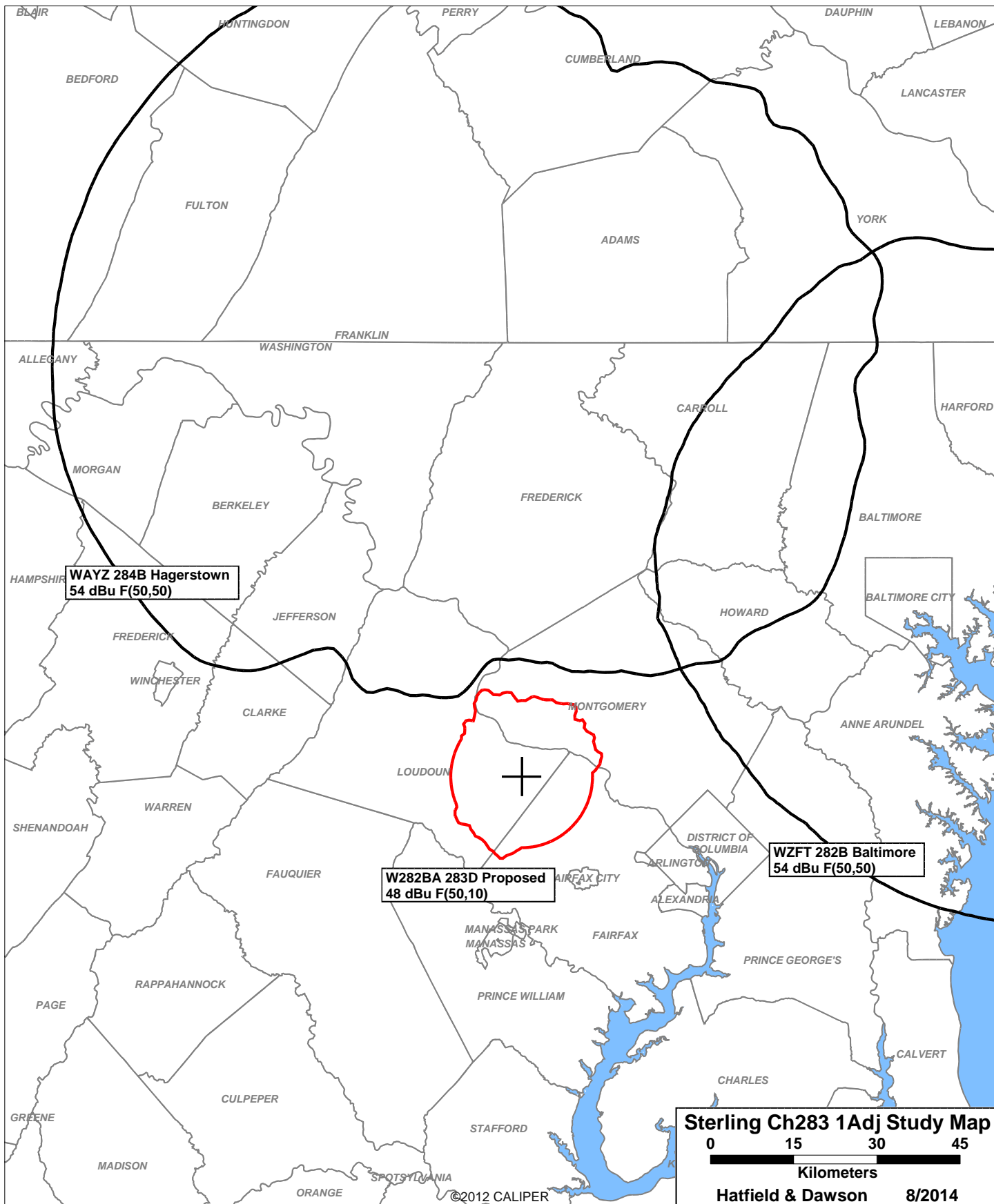
Safety Zone: 50 km

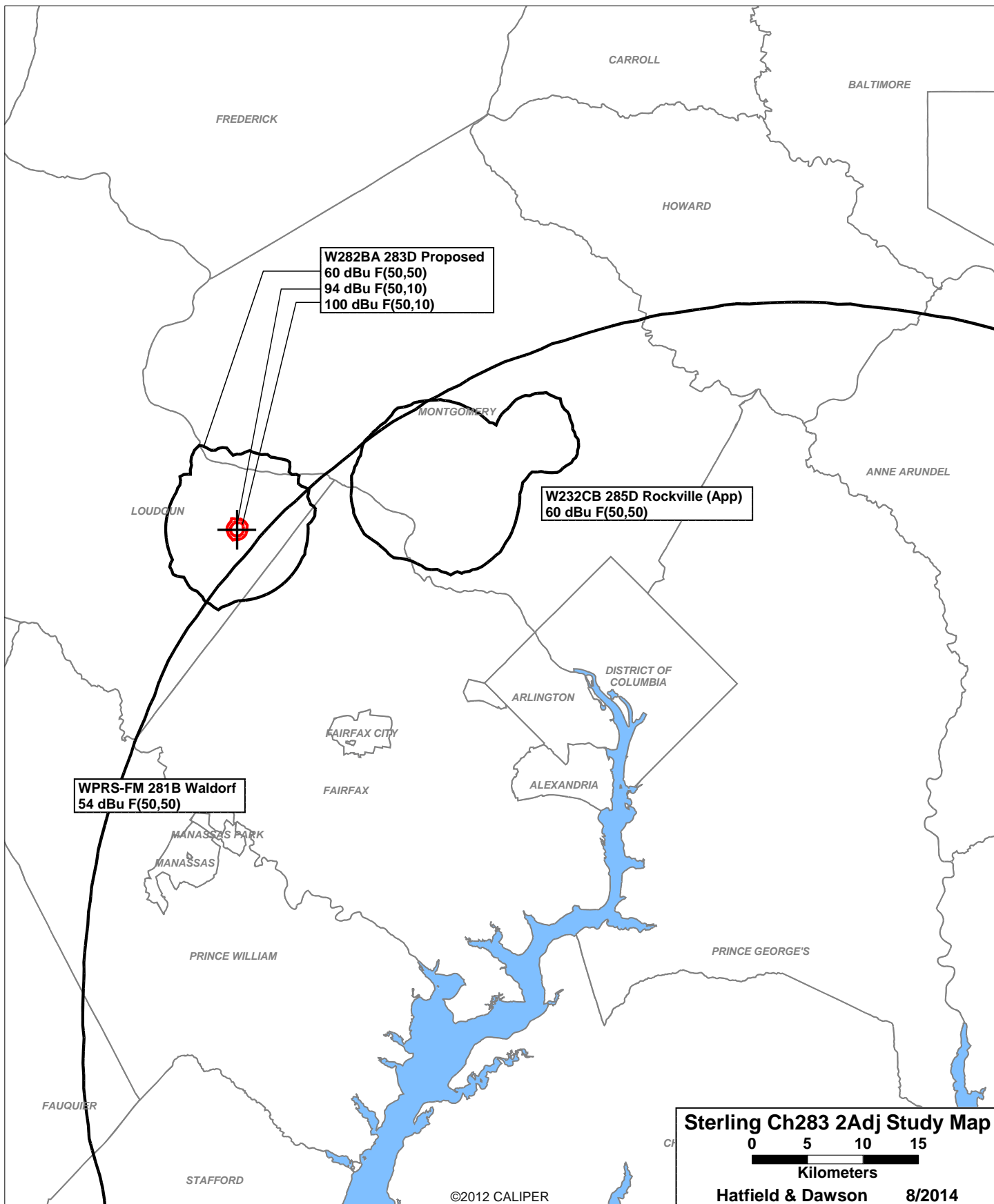
Job Title: 283 AT 1039866

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
NEW-T APP	RIO GRANDE NJ	BNPFT-30311ACN	283D 104.5	0.038 75.0	39-00-33 075-52-13	89.9	135.09 0.00	0 TRANS
WRFFaux LIC	PHILADELPHIA PA	BMLH-880301KB	283B 104.5	11.000 308.0	40-02-30 075-14-24	58.1	219.96 0.00	0 AUX
WRFF LIC	PHILADELPHIA PA	BMLH-90513AAG	283B 104.5	11.500 308.0	40-02-30 075-14-24	58.1	219.96 41.96	178 CLEAR
WGRX LIC	FALMOUTH VA	BLH-10522AAM	283A 104.5	2.700 DA 150.0	38-16-31 077-32-34	186.8 SS	82.97 -32.03	115 SHORT
NEW CP	ANNAPOLIS MD	BNPL-31112AZD	284L1 104.7	0.071 35.7	38-58-44 076-27-16	92.6	84.62 28.62	56 CLEAR
WAYZ LIC	HAGERSTOWN MD	BLH-900814KF	284B 104.7	8.300 420.0	39-41-47 077-30-47	354.6	75.71 -37.29	113 SHORT
W232CB APP	ROCKVILLE MD	BPFT-40616ABO	285D 104.9	0.250 DA 157.0	39-05-01 077-08-55	73.1	25.44 0.00	0 TRANS
WAVA-FM LIC	ARLINGTON VA	BLH-70426ACO	286B 105.1	33.000 184.0	38-53-30 077-07-55	118.4	29.37 -39.63	69 SHORT
WAVAaux LIC	ARLINGTON VA	BXLH-90313ACB	286B 105.1	19.500 74.0	38-58-35 077-06-52	99.4	27.72 0.00	0 AUX

===== END OF FM SPACING STUDY FOR CHANNEL 283 =====







Free Space Interference Area Calculator

Interference Area to WAVA-FM

Antenna Height: 52 meters AGL
 Contour Level: 110 dBu equals 0.3 V/m
 ERP in Watts: 160 Watts

Maximum distance
 to interfering contour is: 920.0 feet equals 280.4 meters

Antenna: 6812B-4-SS

Depression Angle (degrees)	Shively 6812B-4-SS Relative Field	Adjusted ERP (Watts)	Free Space Distance To 110 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (meters)
-90	0.000	0.0	0.0 meters	0	52.0
-89	0.000	0.0	0.0	0.0	52.0
-88	0.000	0.0	0.0	0.0	52.0
-87	0.000	0.0	0.0	0.0	52.0
-86	0.000	0.0	0.0	0.0	52.0
-85	0.001	0.0	0.3	0.0	51.7
-84	0.001	0.0	0.3	0.0	51.7
-83	0.002	0.0	0.6	0.1	51.4
-82	0.002	0.0	0.6	0.1	51.4
-81	0.003	0.0	0.8	0.1	51.2
-80	0.004	0.0	1.1	0.2	50.9
-79	0.006	0.0	1.7	0.3	50.3
-78	0.008	0.0	2.2	0.5	49.8
-77	0.010	0.0	2.8	0.6	49.3
-76	0.012	0.0	3.4	0.8	48.7
-75	0.014	0.0	3.9	1.0	48.2
-74	0.017	0.0	4.8	1.3	47.4
-73	0.021	0.1	5.9	1.7	46.4
-72	0.025	0.1	7.0	2.2	45.3
-71	0.029	0.1	8.1	2.6	44.3
-70	0.033	0.2	9.3	3.2	43.3
-69	0.038	0.2	10.7	3.8	42.1
-68	0.043	0.3	12.1	4.5	40.8
-67	0.049	0.4	13.7	5.4	39.4

(Straight down)

-66	0.055	0.5	15.4	6.3	37.9
-65	0.061	0.6	17.1	7.2	36.5
-64	0.068	0.7	19.1	8.4	34.9
-63	0.075	0.9	21.0	9.5	33.3
-62	0.082	1.1	23.0	10.8	31.7
-61	0.090	1.3	25.2	12.2	29.9
-60	0.098	1.5	27.5	13.7	28.2
-59	0.106	1.8	29.7	15.3	26.5
-58	0.114	2.1	32.0	16.9	24.9
-57	0.122	2.4	34.2	18.6	23.3
-56	0.130	2.7	36.5	20.4	21.8
-55	0.138	3.0	38.7	22.2	20.3
-54	0.146	3.4	40.9	24.1	18.9
-53	0.154	3.8	43.2	26.0	17.5
-52	0.161	4.1	45.1	27.8	16.4
-51	0.168	4.5	47.1	29.6	15.4
-50	0.174	4.8	48.8	31.4	14.6
-49	0.180	5.2	50.5	33.1	13.9
-48	0.185	5.5	51.9	34.7	13.4
-47	0.188	5.7	52.7	36.0	13.4
-46	0.191	5.8	53.6	37.2	13.5
-45	0.193	6.0	54.1	38.3	13.7
-44	0.193	6.0	54.1	38.9	14.4
-43	0.192	5.9	53.8	39.4	15.3
-42	0.189	5.7	53.0	39.4	16.5
-41	0.185	5.5	51.9	39.2	18.0
-40	0.179	5.1	50.2	38.5	19.7
-39	0.171	4.7	48.0	37.3	21.8
-38	0.161	4.1	45.1	35.6	24.2
-37	0.148	3.5	41.5	33.1	27.0
-36	0.134	2.9	37.6	30.4	29.9
-35	0.118	2.2	33.1	27.1	33.0
-34	0.099	1.6	27.8	23.0	36.5
-33	0.078	1.0	21.9	18.3	40.1
-32	0.054	0.5	15.1	12.8	44.0
-31	0.028	0.1	7.9	6.7	48.0
-30	0.000	0.0	0.0	0.0	52.0
-29	0.030	0.1	8.4	7.4	47.9
-28	0.063	0.6	17.7	15.6	43.7
-27	0.097	1.5	27.2	24.2	39.7
-26	0.134	2.9	37.6	33.8	35.5
-25	0.172	4.7	48.2	43.7	31.6
-24	0.212	7.2	59.4	54.3	27.8
-23	0.254	10.3	71.2	65.6	24.2
-22	0.297	14.1	83.3	77.2	20.8
-21	0.341	18.6	95.6	89.3	17.7

-20	0.385	23.7	108.0	101.4	15.1
-19	0.430	29.6	120.6	114.0	12.7
-18	0.476	36.3	133.5	126.9	10.8
-17	0.521	43.4	146.1	139.7	9.3
-16	0.566	51.3	158.7	152.6	8.3
-15	0.610	59.5	171.1	165.2	7.7
-14	0.654	68.4	183.4	177.9	7.6
-13	0.696	77.5	195.2	190.2	8.1
-12	0.736	86.7	206.4	201.9	9.1
-11	0.775	96.1	217.3	213.3	10.5
-10	0.811	105.2	227.4	224.0	12.5
-9	0.845	114.2	237.0	234.0	14.9
-8	0.876	122.8	245.6	243.3	17.8
-7	0.904	130.8	253.5	251.6	21.1
-6	0.929	138.1	260.5	259.1	24.8
-5	0.950	144.4	266.4	265.4	28.8
-4	0.968	149.9	271.4	270.8	33.1
-3	0.982	154.3	275.4	275.0	37.6
-2	0.992	157.5	278.2	278.0	42.3
-1	0.998	159.4	279.9	279.8	47.1
0	1.000	160.0	280.4	280.4	52.0

(Horizontal)

August 2014
FM Translator W282BA
Sterling, Virginia Channel 283D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 283D (104.7 MHz) with an effective radiated power of 160 watts. Operation is proposed with an antenna to be mounted on an existing tower which has FCC Antenna Structure Registration Number 1039866. There are no other broadcast users of this site.

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

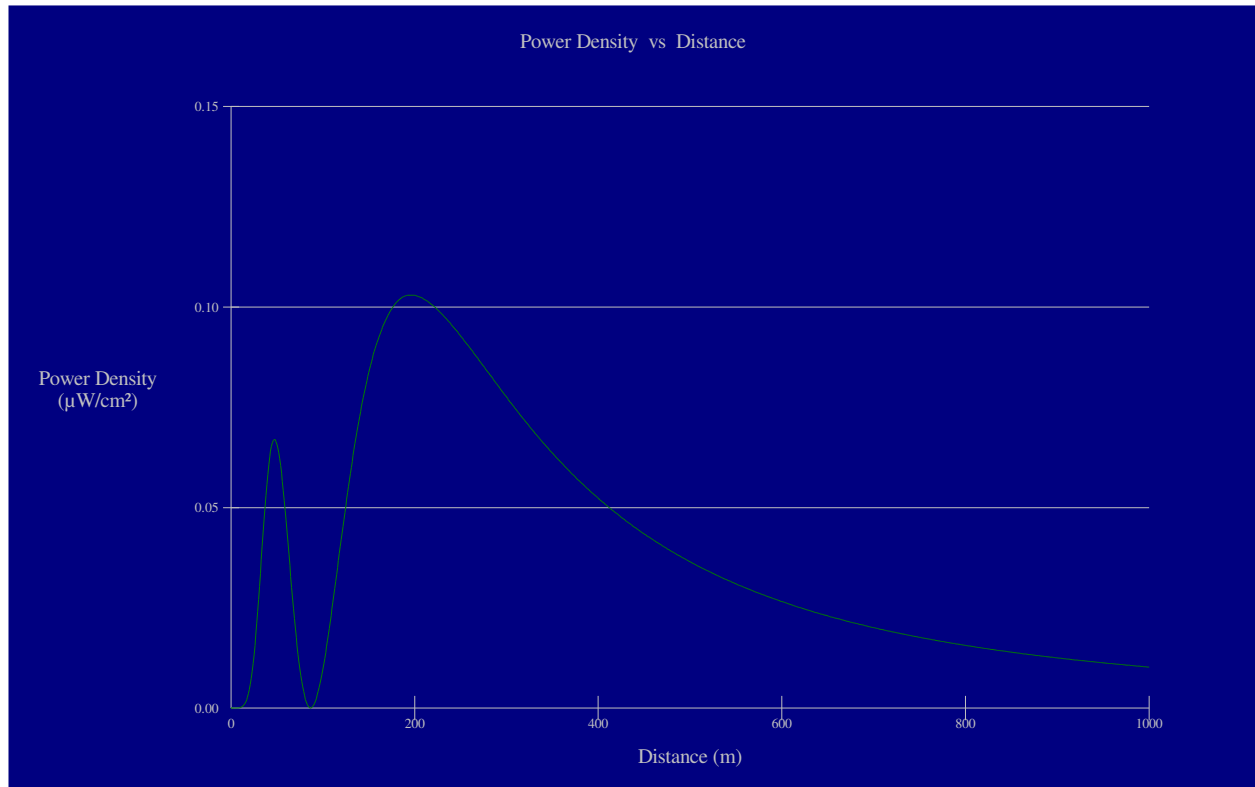
Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system have been made using the appropriate element model for the Shively 6812B-4-SS antenna to be used. The highest calculated ground level power density from the proposed facility occurs at a distance of 196 meters from the base of the antenna support structure. At this point the power density is calculated to be 0.1 $\mu W/cm^2$, which is <0.1% of 1000 $\mu W/cm^2$ (the FCC standard for controlled environments) and <0.1% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

W282BA Sterling

Antenna Type: Shively 6812B-4-SS

No. of Elements: 4

Element Spacing: 0.5 wavelength

Distance: 1000 meters

Horizontal ERP: 0.160 kW

Vertical ERP: 0.160 kW

Antenna Height: 52 meters AGL

Maximum Calculated Power Density is 0.1 $\mu\text{W}/\text{cm}^2$ at 196 meters from the antenna structure.