

**Initial Evaluation of the
Performance of Prototype TV- Band
White Space Devices**

(Appendices A and B)

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Appendix A - Measurement Systems

This appendix provides information regarding the measurement equipment used to perform this test/measurement program. Table A-1 provides a list of the equipment used, including the manufacturer and model number, a brief description and where appropriate, the most recent calibration date.

Calibration information resulting from measurements performed in the laboratory to determine the signal attenuation in various circuits used to support the test/measurements is also provided.

Table A-1. List of Measurement Equipment.

Equipment	Quantity	Manufacturer and Model	Specifications	Last Calibrated
Spectrum Analyzer	1	Agilent E4448 PSA	3 Hz-50 GHz	06/09/06
Spectrum Analyzer	1	Agilent E4440 PSA	3 Hz – 26.5 GHz (w/ internal PA)	07/18/06
Spectrum Analyzer	1	Agilent E7405A EMC	9 kHz – 26.5 GHz	09/01/06
Modulation Analyzer	1	Agilent 8901A		02/27/06
Audio Analyzer	1	Agilent 8903B		09/25/03
Signal Generator	1	Agilent E4437B ESG	250 kHz-4 GHz	05/25/06
Signal Generator	1	Agilent 4438C ESG	250 kHz – 6 GHz	02/22/05
Signal Generator	1	Agilent 8640B	500 kHz – 1024 MHz	09/06
Broadcast Test System	2	Rhode and Schwarz SFU	w/ ATSC Signal Generator	-
Step Attenuator	1	Hewlett-Packard 355D	10-dB steps	-
Step Attenuator	1	Hewlett-Packard 355 C	1-dB steps	-
Step Attenuator	1	Agilent 8494B	0 to 11 dB DC – 18 GHz	11/09/04
Step Attenuator	1	Agilent 8495B	0 to 70 dB DC – 18 GHz	08/05/05
TV Channel Rejection Filter	1	TLE Model CE7569-N30	566-572 MHz	-
Signal Combiner	2	MiniCircuits ZFSC-2-1W	50 Ω	-
Log Periodic Antenna	1	A.R.A. LPB-2520/A	25 MHz – 2.0 GHz	-
Impedance Matching Transformer	1	Trilithic ZMT-57	75-50 Ω	-

The following information is provided with respect to calibrations performed as a part of this program to determine the signal attenuation (or gain) associated with the various components used to support the test/measurements.

The input signal level used in the detection threshold was set at the input to the WSD scanner antenna input port and thus, no signal calibration was necessary.

A short length (2-feet) of RG-223/U coaxial cable was used to connect the WSD transmitter output port directly to the spectrum analyzer for performing the transmitter emissions measurements. The signal attenuation in this cable was measured and found to exhibit a maximum loss of 0.4 dB over the frequency range involved (512-698 MHz). The insertion loss associated with the channel-reject (notch) filter is 2.9 dB, including the additional coaxial cable used to integrate into the measurements system.

The OTA interference test utilized a log periodic antenna as the test antenna and it was connected to the DTV receiver (or spectrum analyzer) with a 20-ft length of RG-55 coaxial cable. The signal attenuation in the cable run was measured and determined to be a maximum of 2.3 dB. In addition, there was a measured signal loss associated with the impedance-matching transformer of 0.9 dB and the antenna gain over the 512-698 MHz frequency range is 7.1-7.5 dBi.

Appendix B - Service Contours of TV Stations at Field Test Sites

This appendix contains plots depicting the service contours of each full service and low power TV station on channels within the prototype WSD tuning range that have been authorized for use by a licensed television broadcaster relative to each site where field measurements were performed. The test location is represented on these plots by a red star. All broadcast licensees and construction permits within a 150-km (94-mile) of the test site were included in the contour plots. Red circles indicate DTV stations; blue circles indicate analog TV stations. There are a total of thirty plots provided for each test site, one for each channel in the WSD's tuning range.

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TEST SITE 1

Channel 21 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

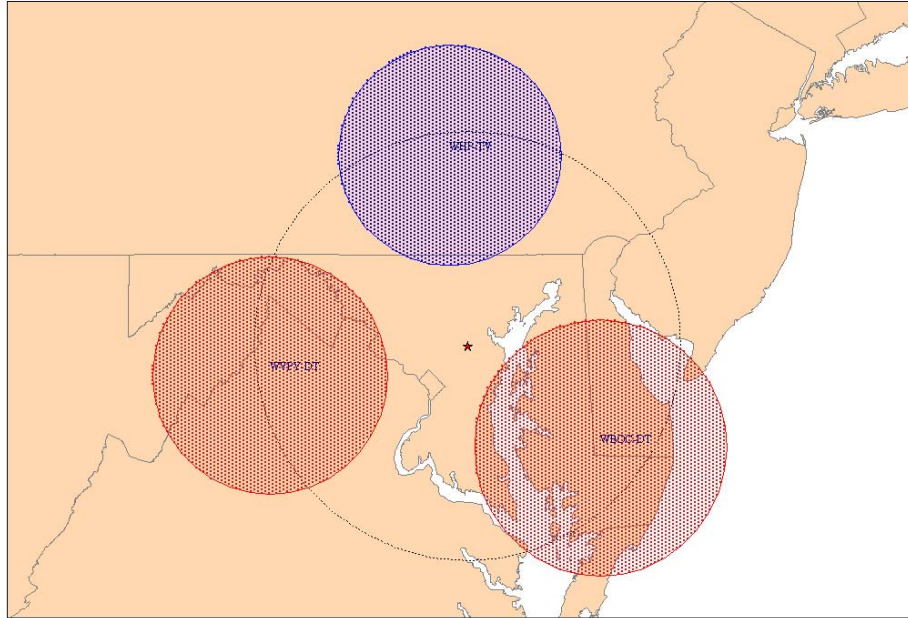


Figure 1. Channel 21 Coverage Contours Relative to Test Site.

Channel 22 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

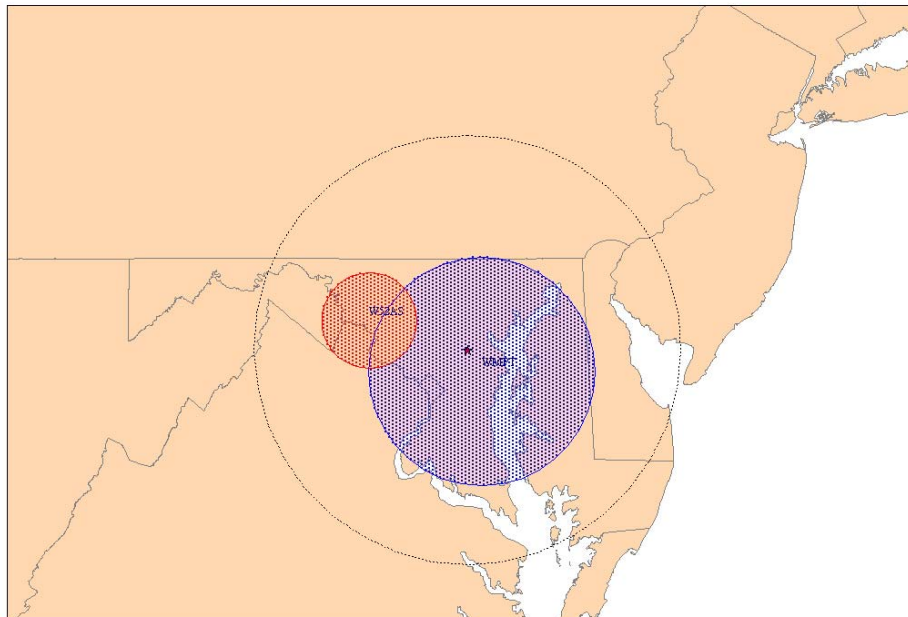


Figure 2. Channel 22 (WMPT-TV) Grade-B Contour Relative to Test Site 1.

Channel 23 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

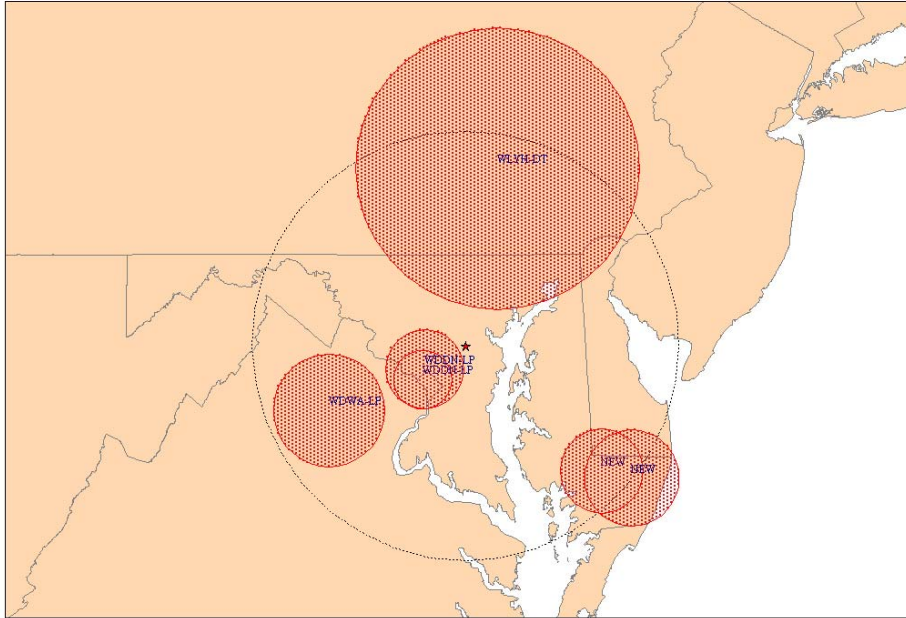


Figure 3. Channel 23 Coverage Contours Relative to Test Site 1.

Channel 24 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

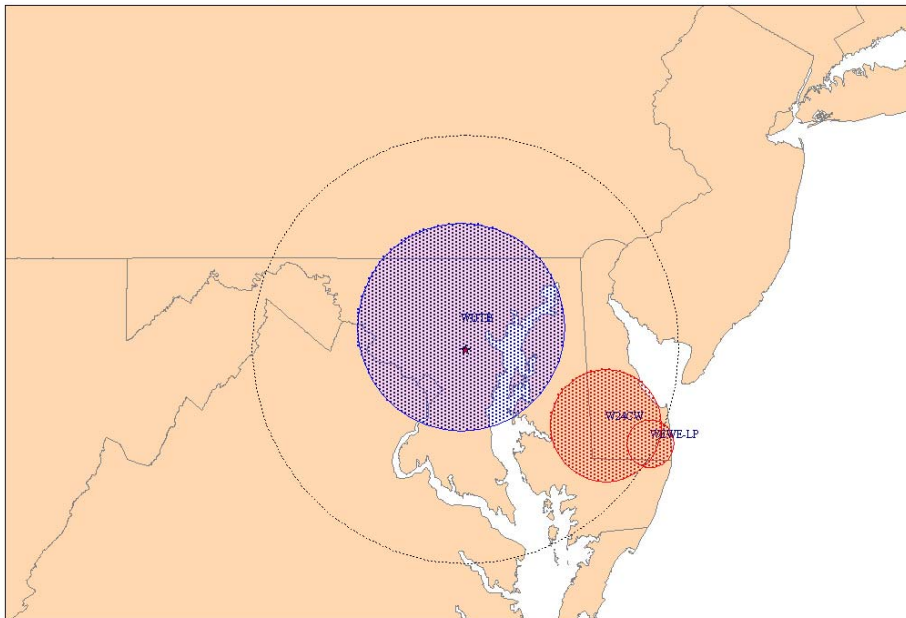


Figure 4. Channel 24 (WUTB-TV) Grade-B Contour Relative to Test Site 1.

Channel 25 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

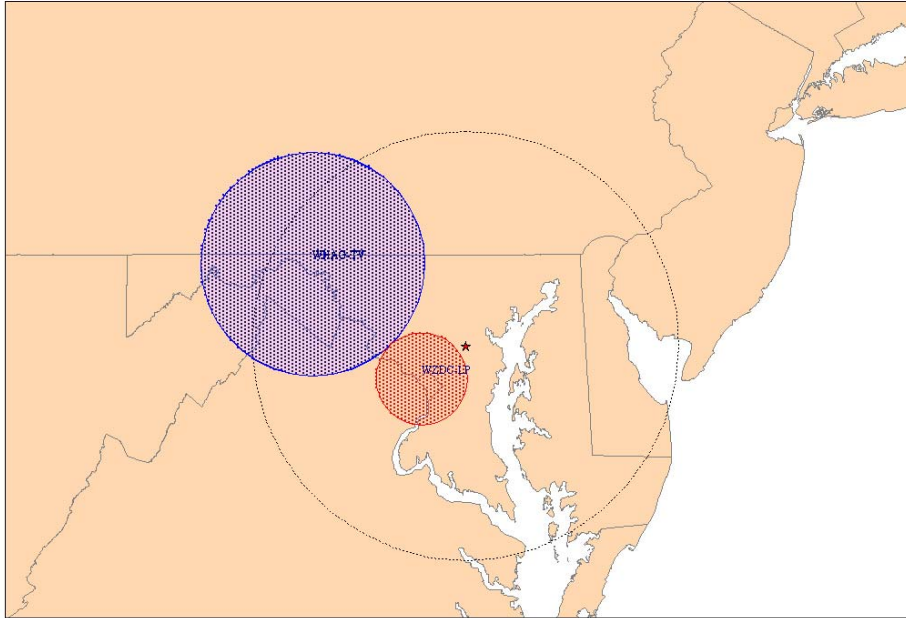


Figure 5. Channel 25 Coverage Contours Relative to Test Site 1.

Channel 26 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

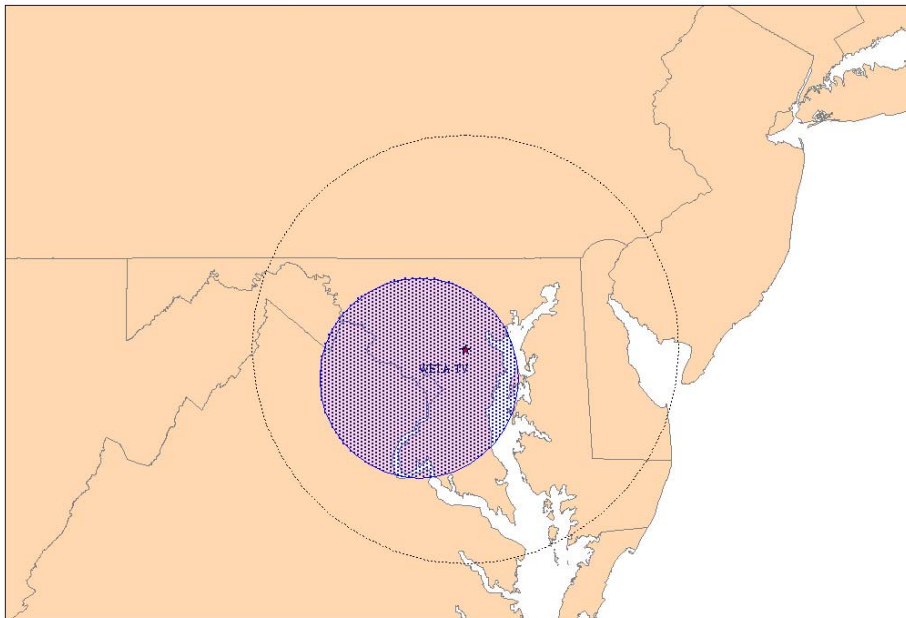


Figure 6. Channel 26 (WETA-TV) Grade-B Contour Relative to Test Site 1.

Channel 27 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

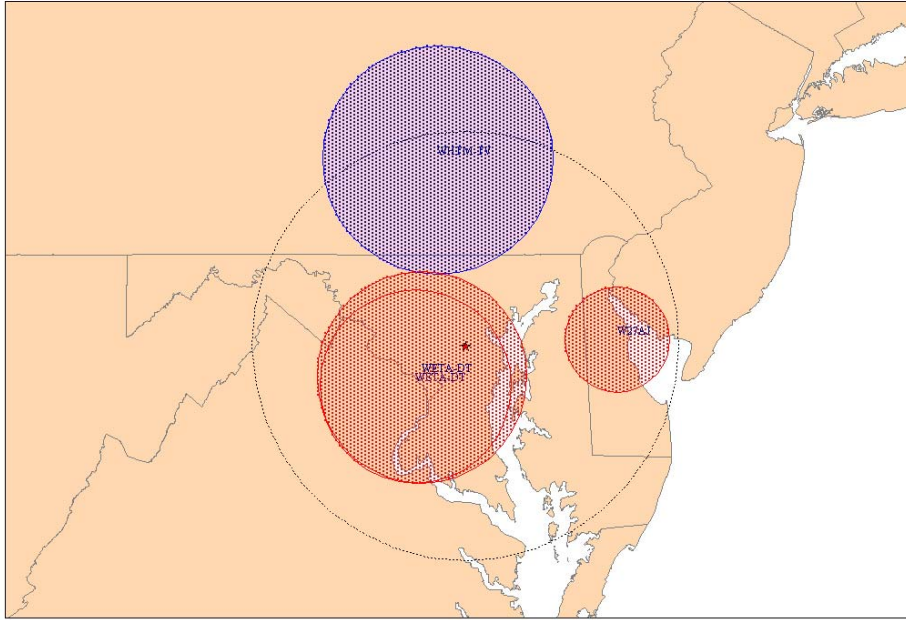


Figure 7. Channel 27 (WETA-DT) Coverage Contour Relative to Test Site 1.

Channel 28 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

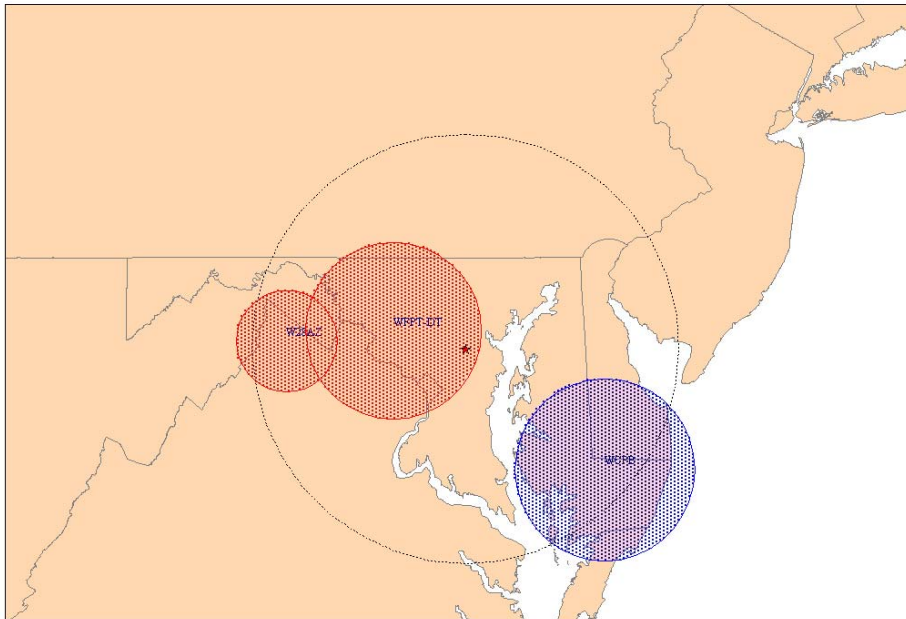


Figure 8. Channel 28 (WFPT-DT) Coverage Contour Relative to Test Site 1.

Channel 29 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

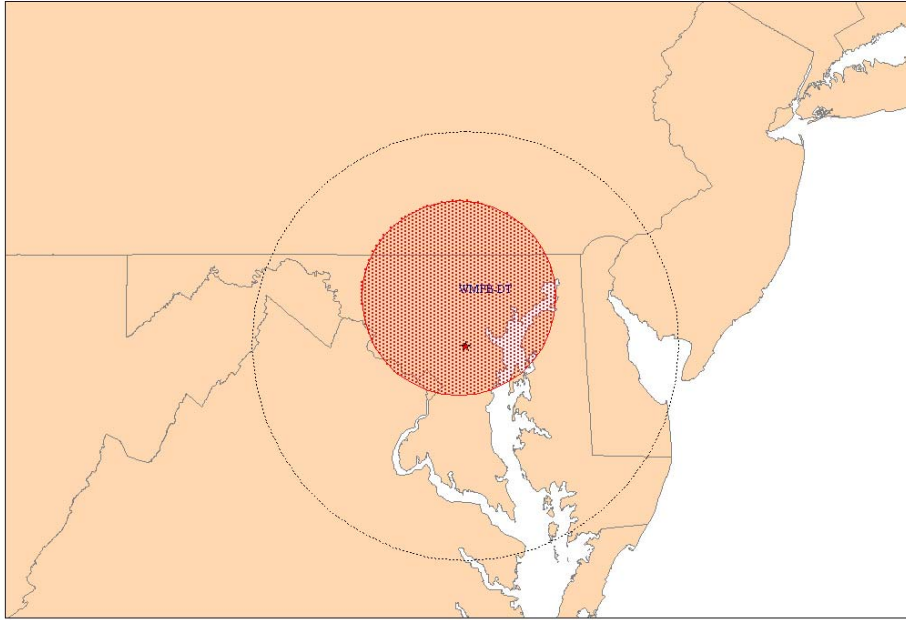


Figure 9. Channel 29 (WMPB-DT) Coverage Contour Relative to Test Site 1.

Channel 30 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

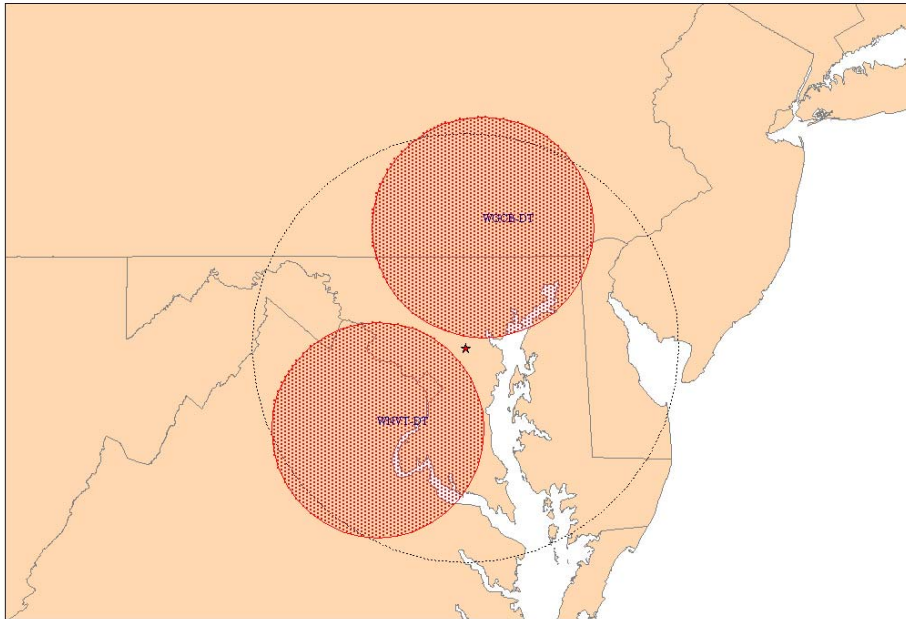


Figure 10. Channel 30 Coverage Contours Relative to Test Site 1.

Channel 31 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

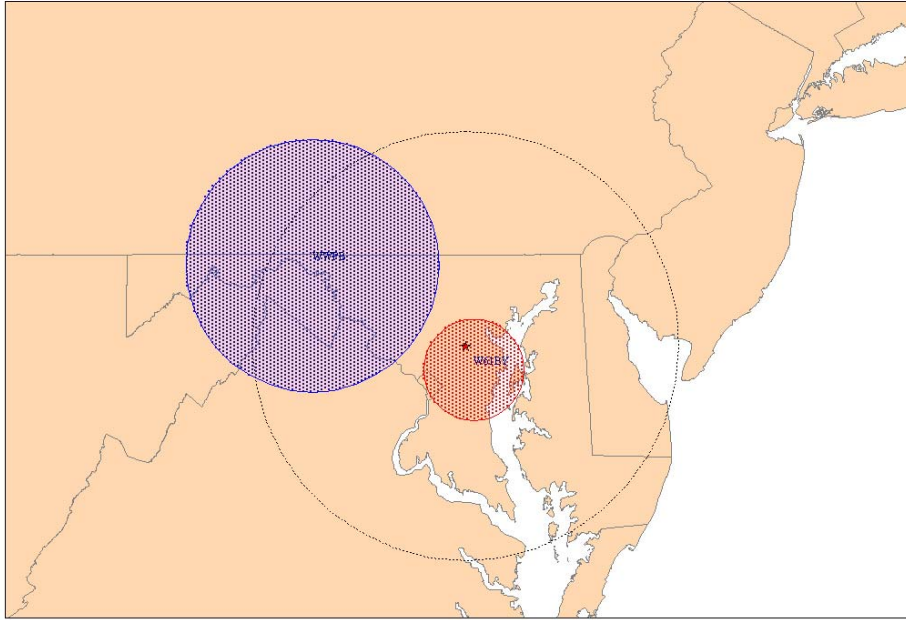


Figure 11. Channel 31 Coverage Contours Relative to Test Site 1.

Channel 32 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

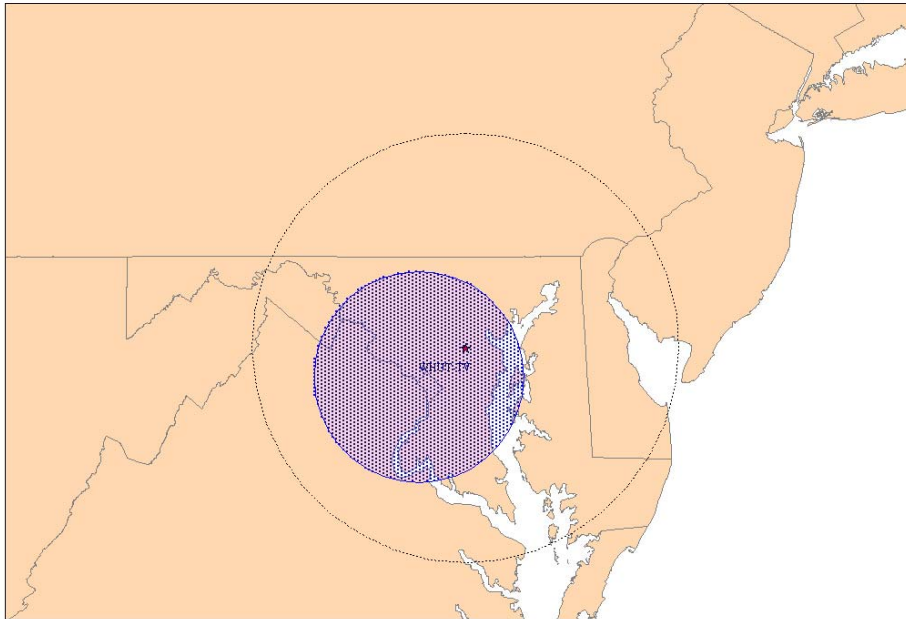


Figure 12. Channel 32 (WHUT-TV) Grade-B Contour Relative to Test Site 1.

Channel 33 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

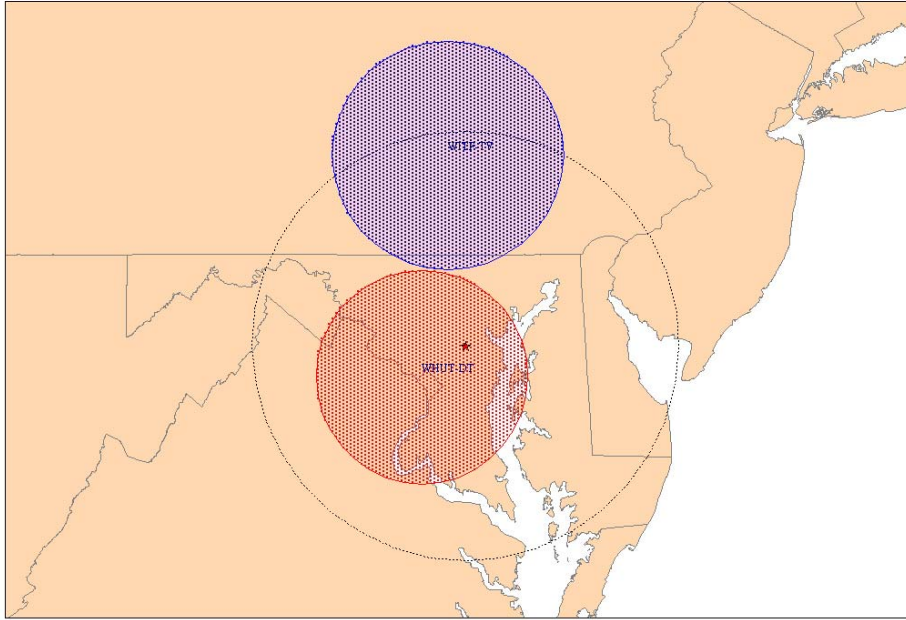


Figure 13. Channel 33 (WHUT-DT) Coverage Contour Relative to Test Site 1.

Channel 34 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

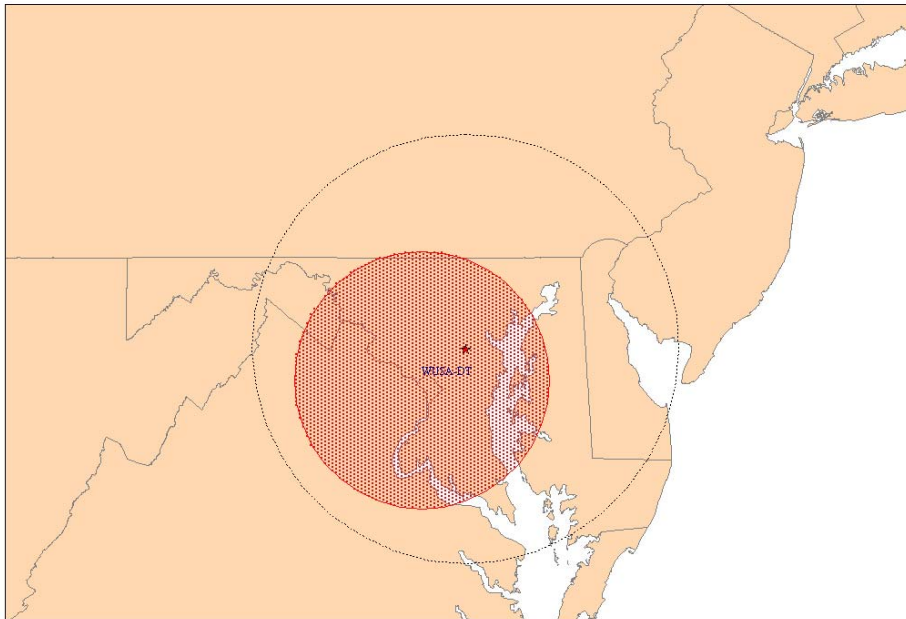


Figure 14. Channel 34 (WUSA-DT) Coverage Contour Relative to Test Site 1.

Channel 35 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

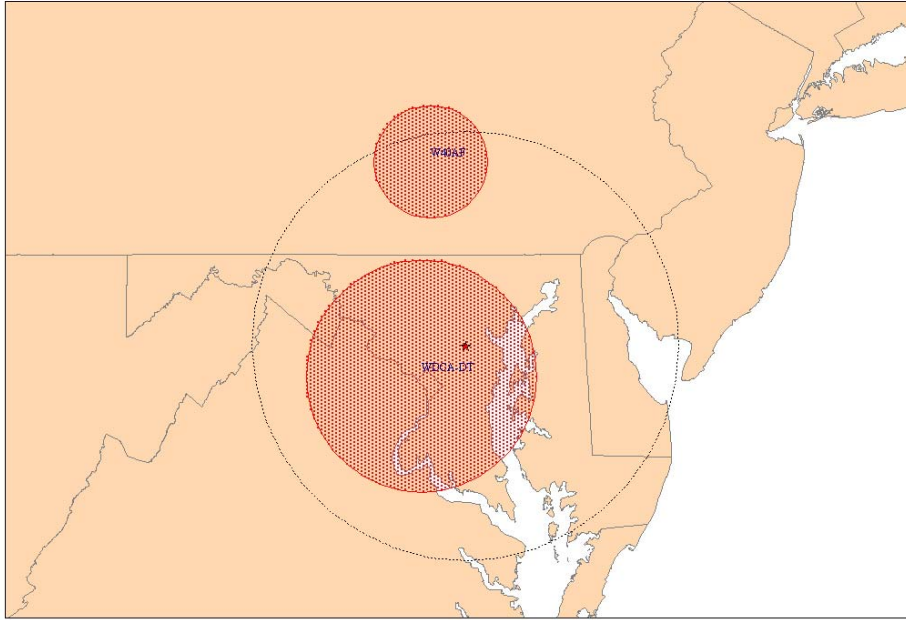


Figure 15. Channel 35 (WDCA-DT) Coverage Contour Relative to Test Site 1.

Channel 36 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

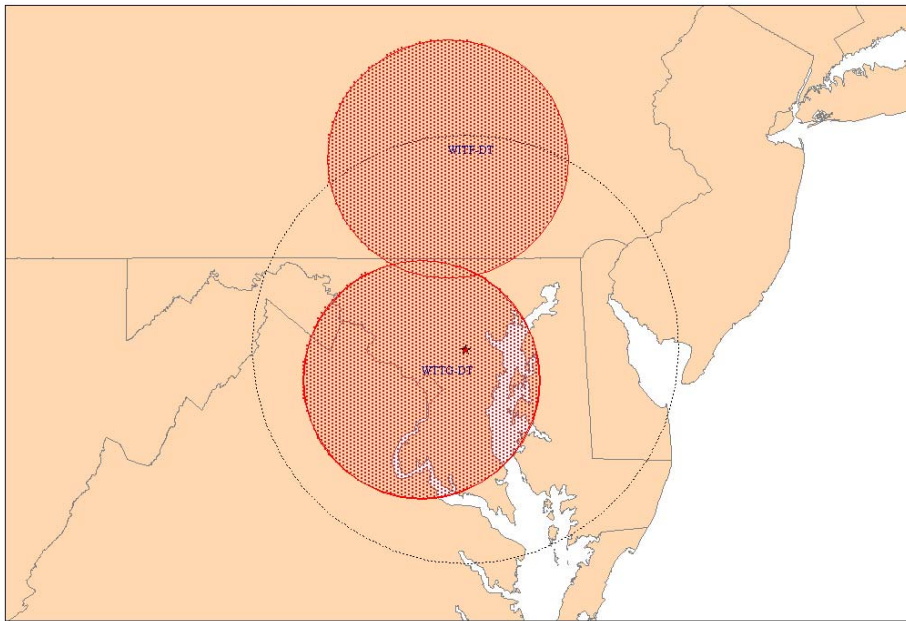


Figure 16. Channel 36 (WTTG-DT) Coverage Contour Relative to Test Site 1.

Channel 38 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

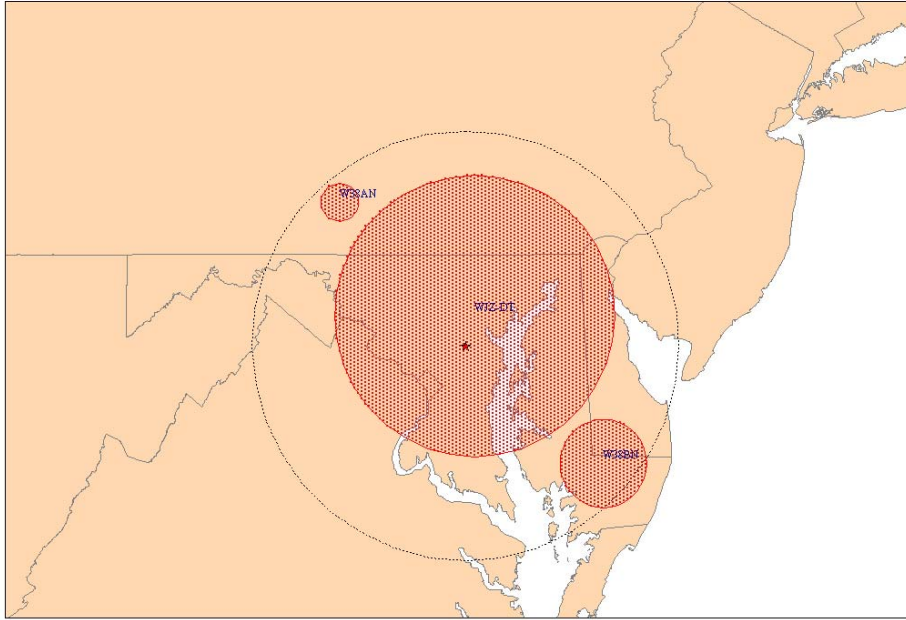


Figure 17. Channel 38 (WJZ-DT) Coverage Contour Relative to Test Site 1.

Channel 39 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

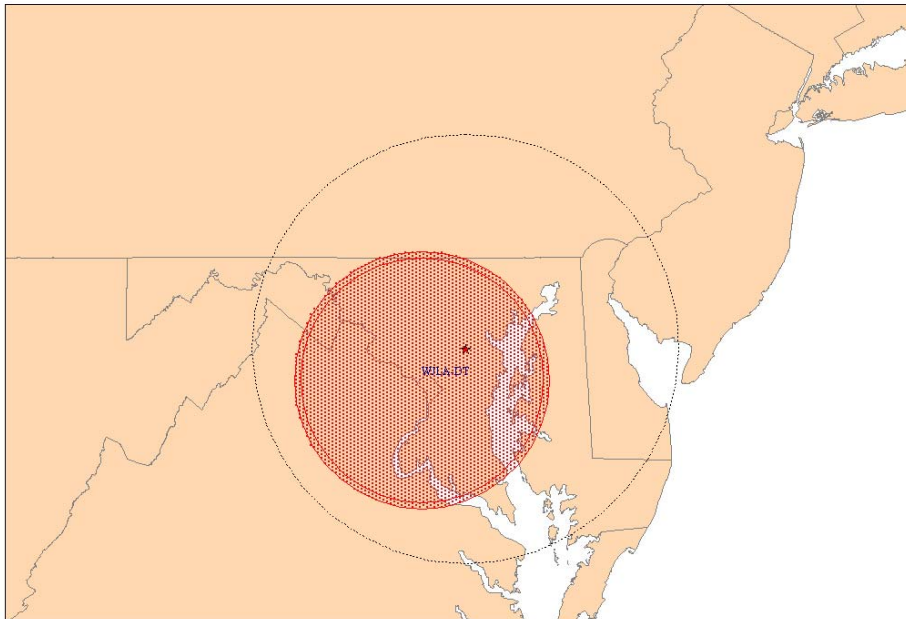


Figure 18. Channel 39 (WJLA-DT) Coverage Contour Relative to Test Site 1.

Channel 40 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

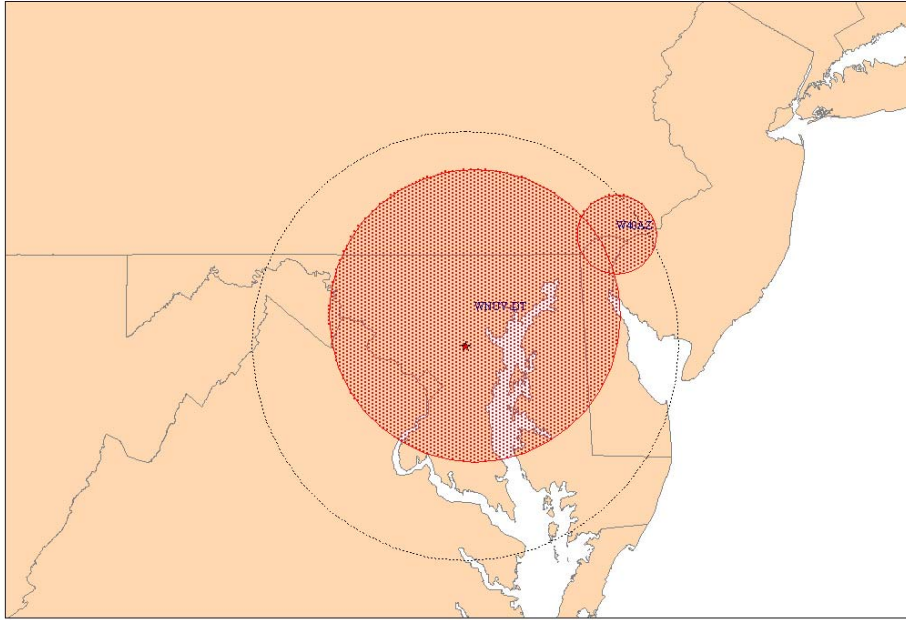


Figure 19. Channel 40 (WNUV-DT) Coverage Contour Relative to Test Site 1.

Channel 41 - 39 degrees 08 minutes North; 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

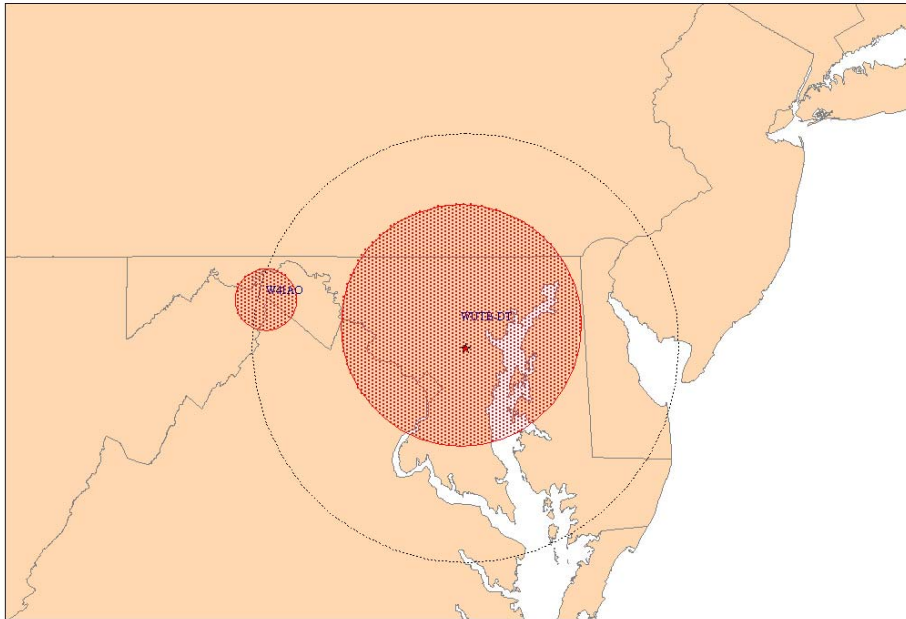


Figure 20. Channel 41 (WUTB-DT) Coverage Contour Relative to Test Site 1.

Channel 42 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

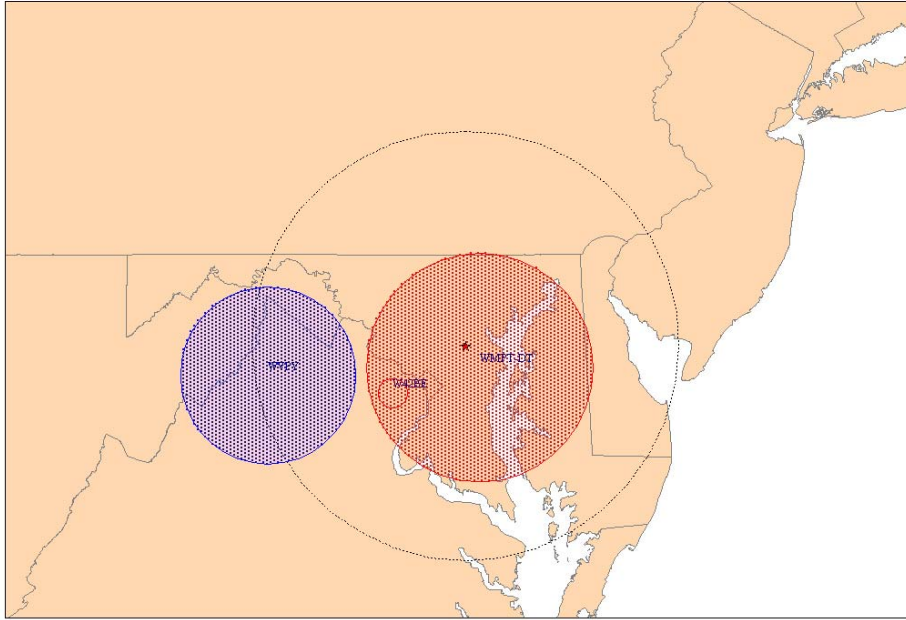


Figure 21. Channel 42 (WMPT-DT) Coverage Contour Relative to Test Site 1.

Channel 43 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

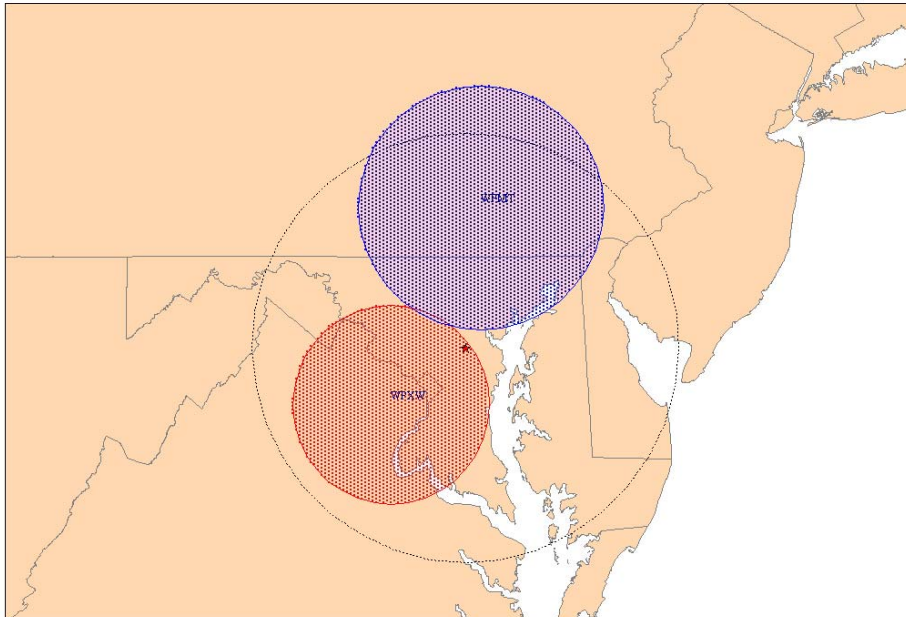


Figure 22. Channel 43 Coverage Contour Relative to Test Site 1.

Channel 44 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

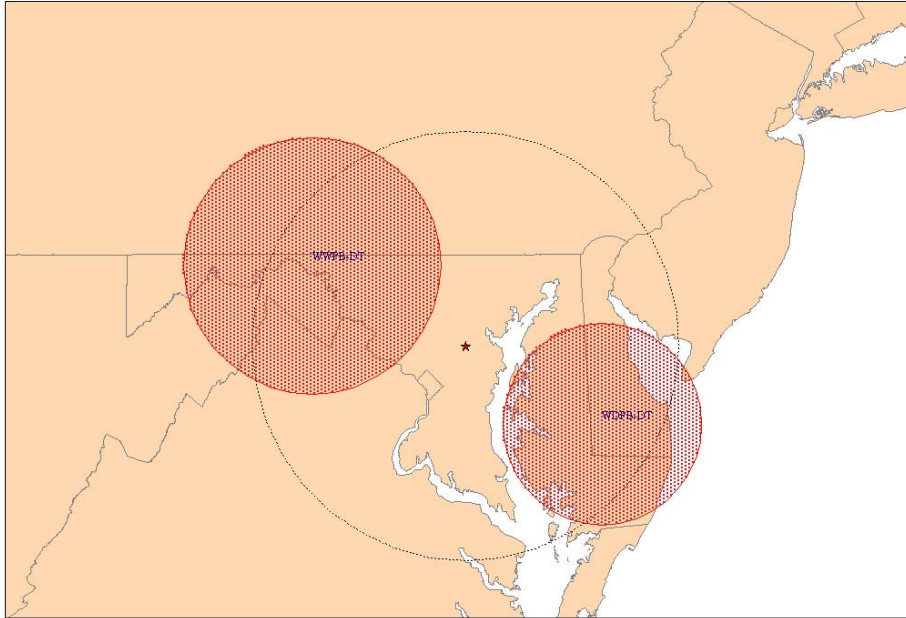


Figure 23. Channel 44 Coverage Contours Relative to Test Site 1.

Channel 45 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

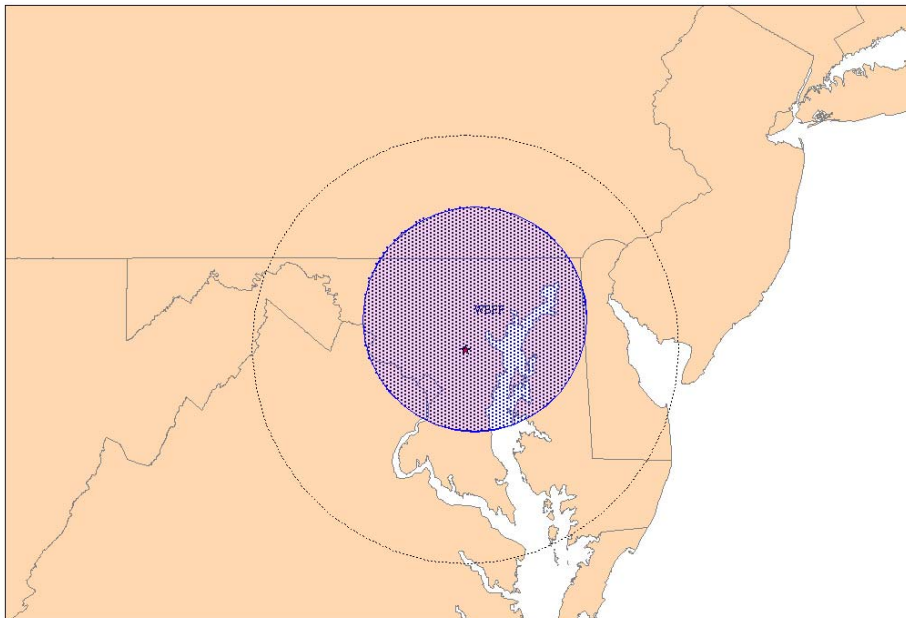


Figure 24. Channel 45 (WBFF-TV) Grade-B Contour Relative to Test Site 1.

Channel 46 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

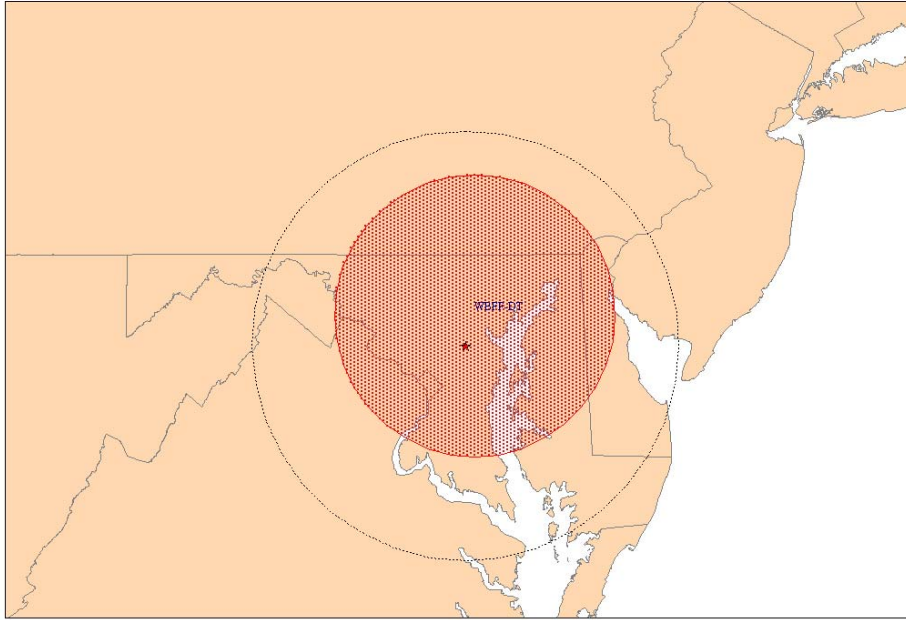


Figure 25. Channel 46 (WBFF-DT) Coverage Contour Relative to Test Site 1.

Channel 47 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

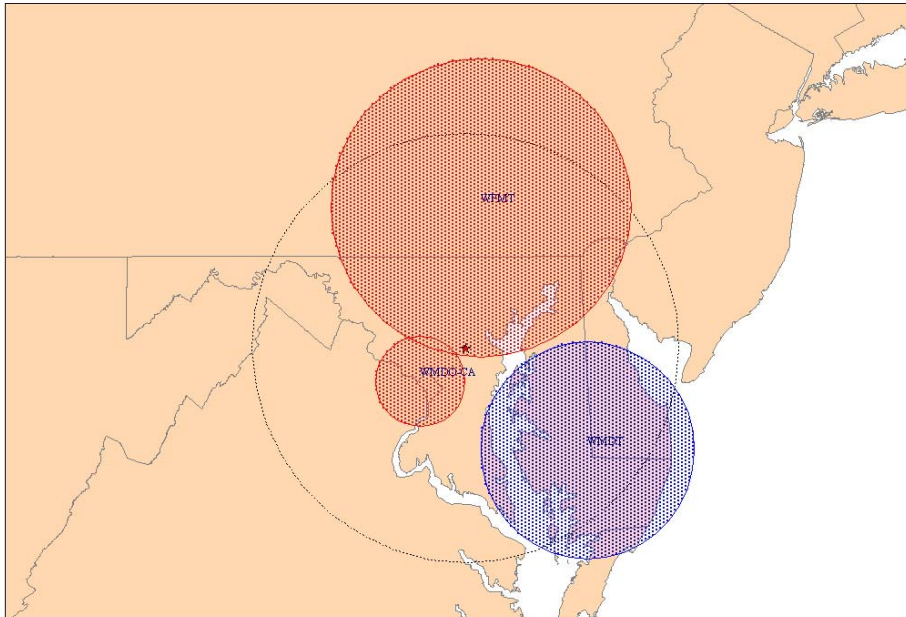


Figure 26. Channel 47 Coverage Contours Relative to Test Site 1.

Channel 48 - 39 degrees 08 minutes North, 076 degrees 43 minutes West
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

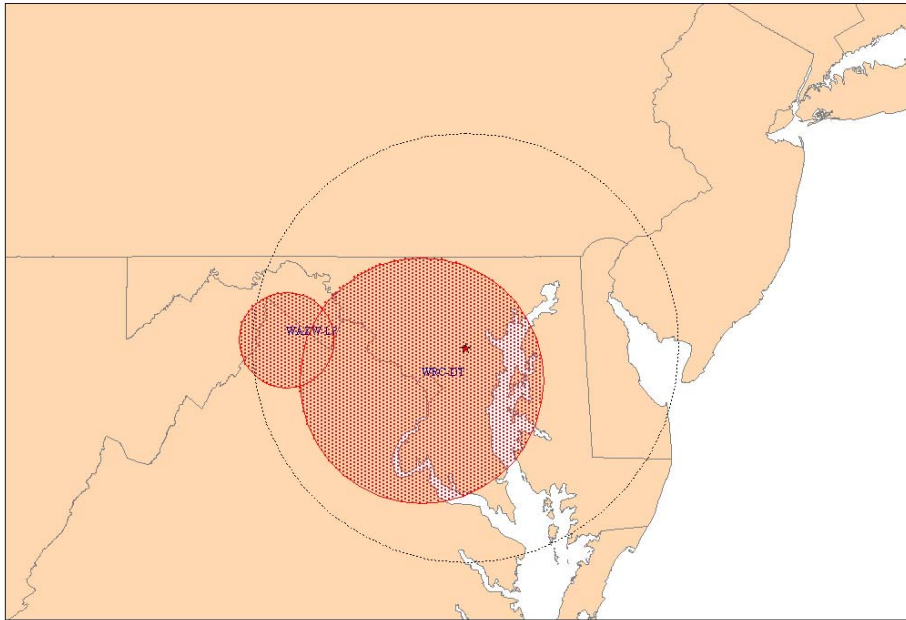


Figure 27. Channel 48 (WRC-DT) Coverage Contour Relative to Test Site 1.

Channel 49 - 39 degrees 08 minutes North, 076 degrees 43 minutes West
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

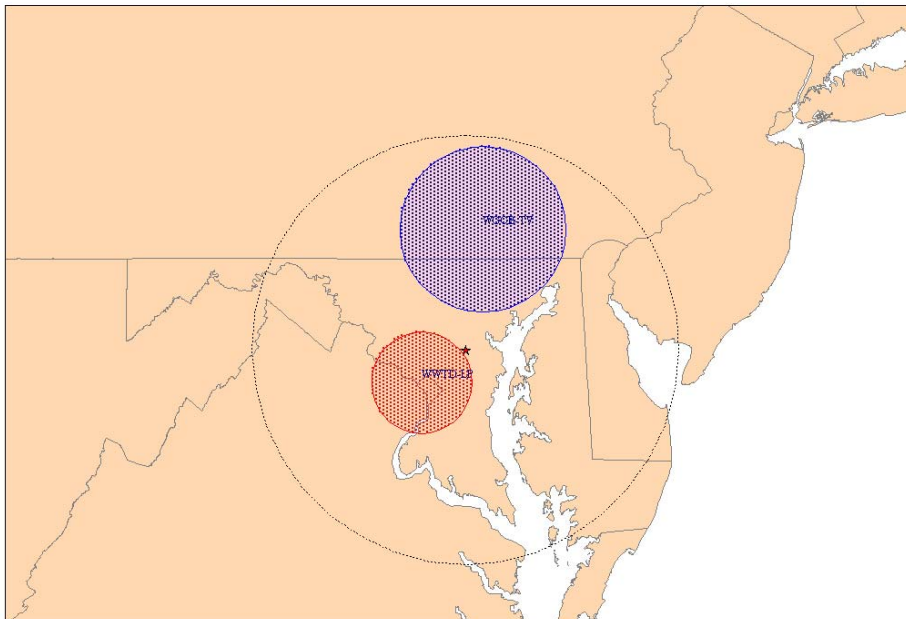


Figure 28. Channel 49 Coverage Contours Relative to Test Site 1.

Channel 50 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

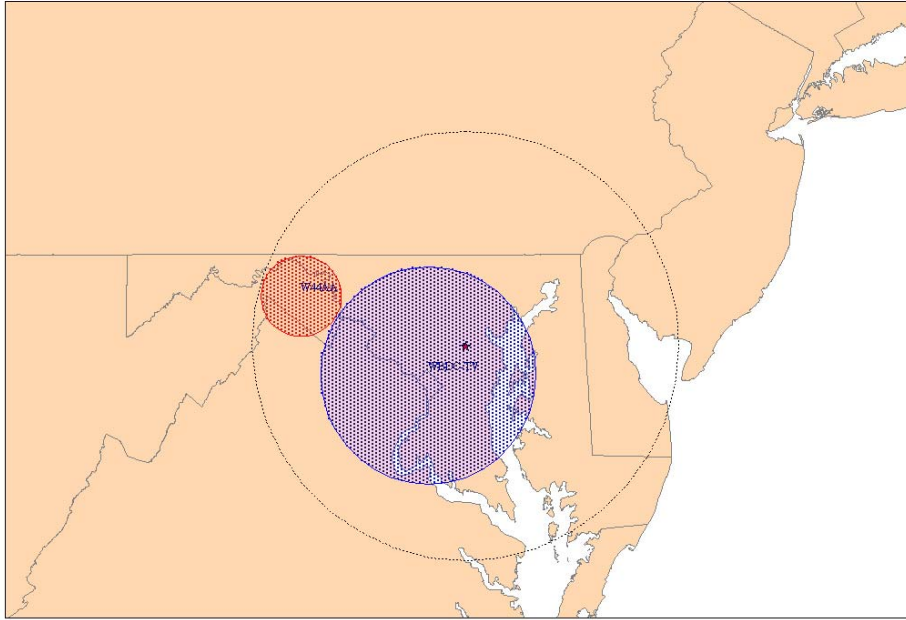


Figure 29. Channel 50 (WDCW-TV) Grade-B Contour Relative to Test Site 1.

Channel 51 - 39 degrees 08 minutes North, 076 degrees 43 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

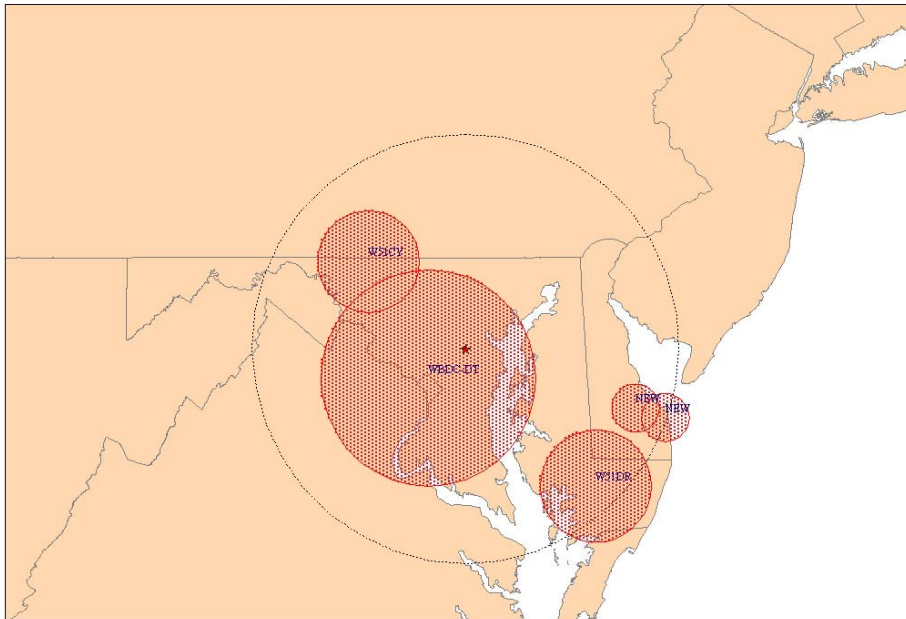


Figure 30. Channel 51 (WDCW-DT) Coverage Contour Relative to Test Site 1.

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Channel 21 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

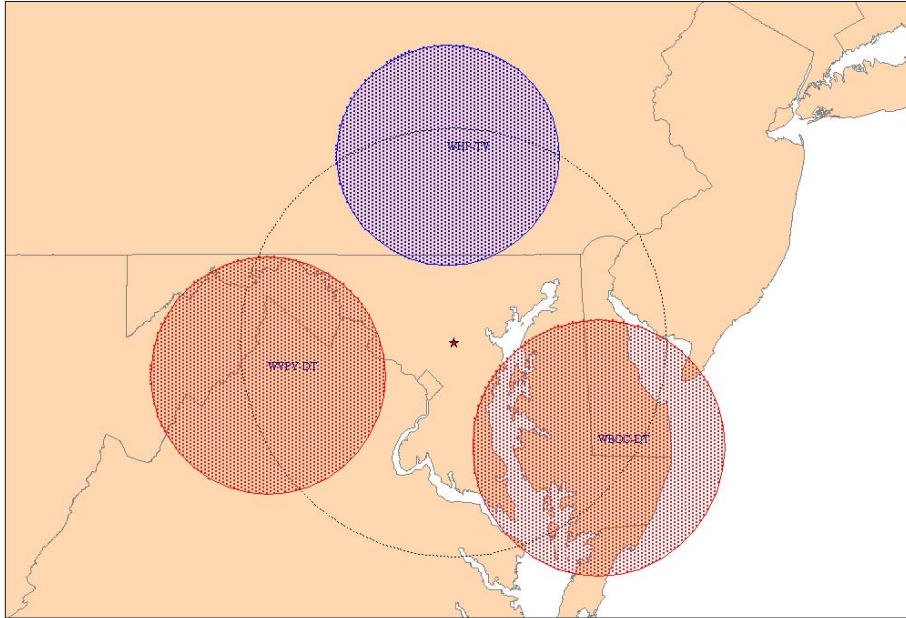


Figure 31. Channel 21 Service Contours Relative to Test Site.

Channel 22 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

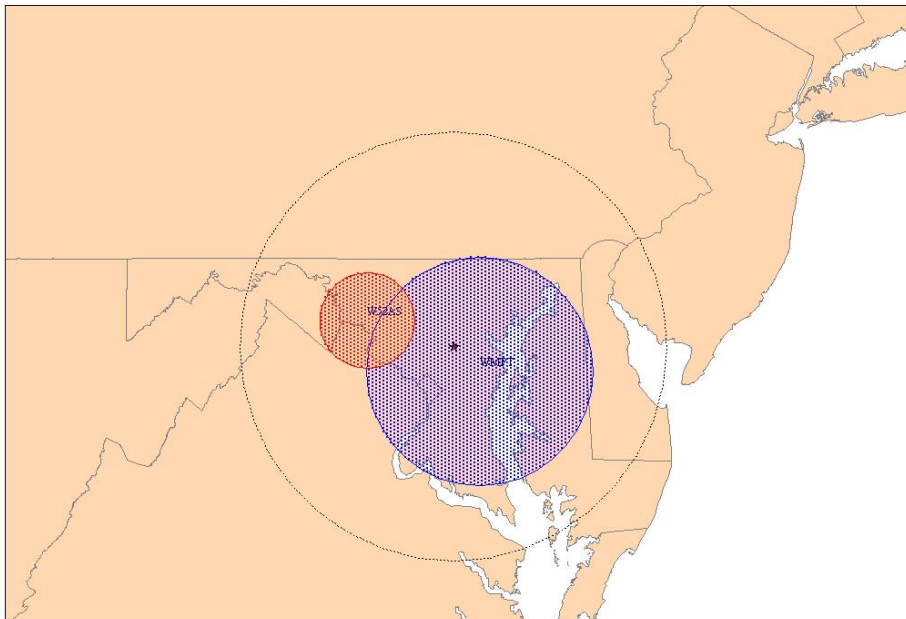


Figure 32. Channel 22 (WMPT-TV) Service Contour Relative to Test Site.

Channel 23 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

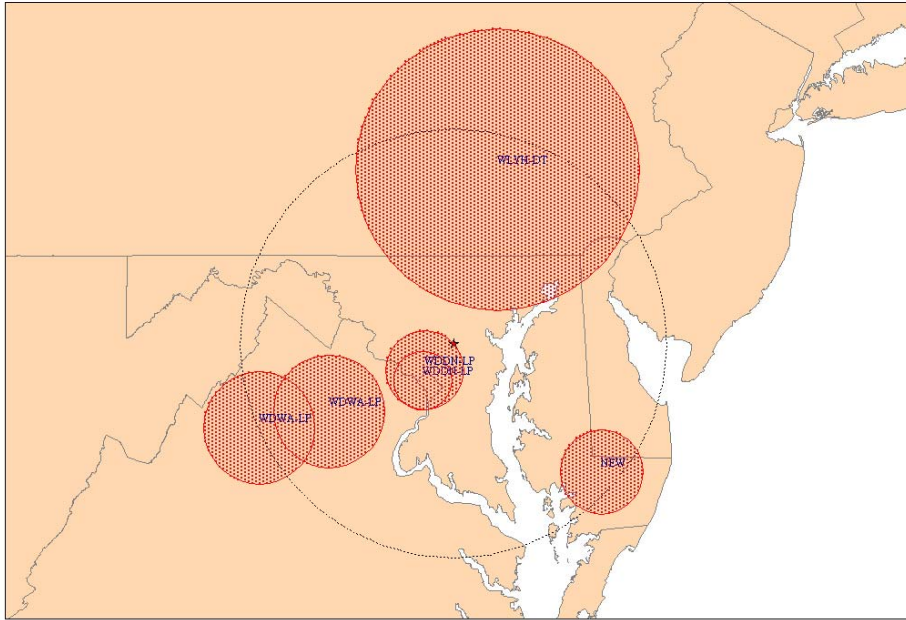


Figure 33. Channel 23 Service Contours Relative to Test Site 2.

Channel 24 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

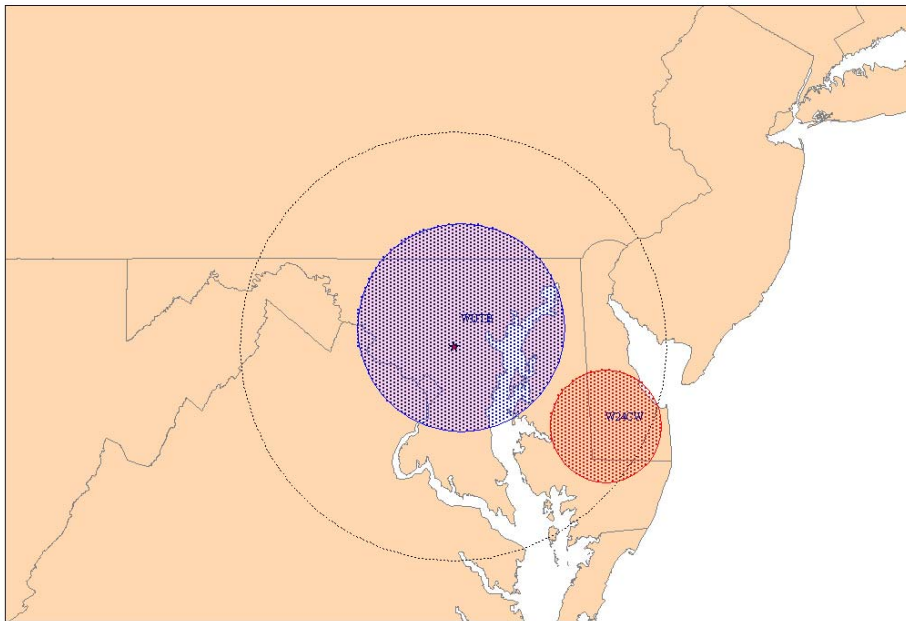


Figure 34. Channel 24 (WUTB-TV) Service Contour Relative to Test Site 2.

Channel 25 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

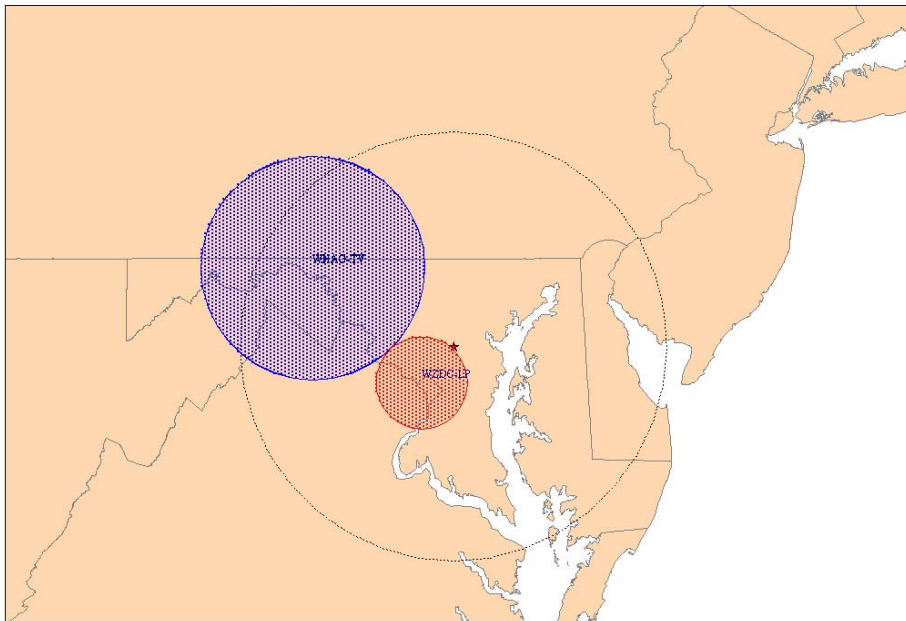


Figure 35. Channel 25 Service Contours Relative to Test Site 2.

Channel 26 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

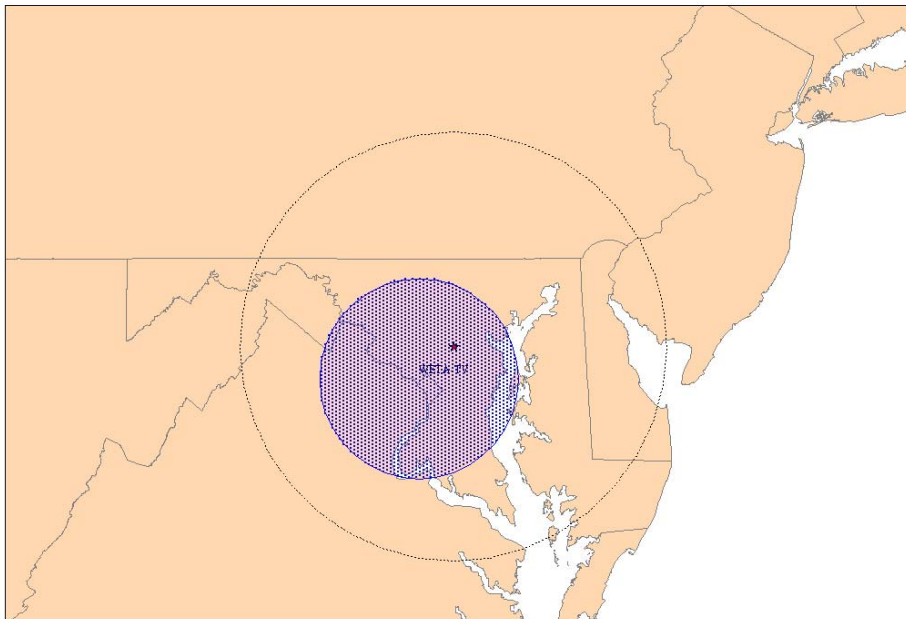


Figure 36. Channel 26 (WETA-TV) Service Contour Relative to Test Site 2.

Channel 27 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

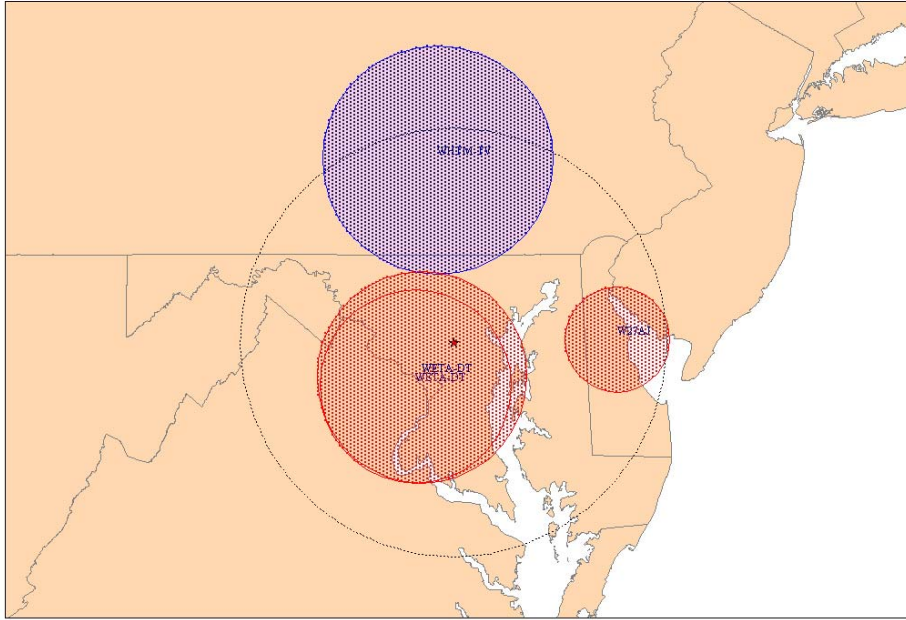


Figure 37. Channel 27 (WETA-DT) Service Contour Relative to Test Site 2.

Channel 28 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

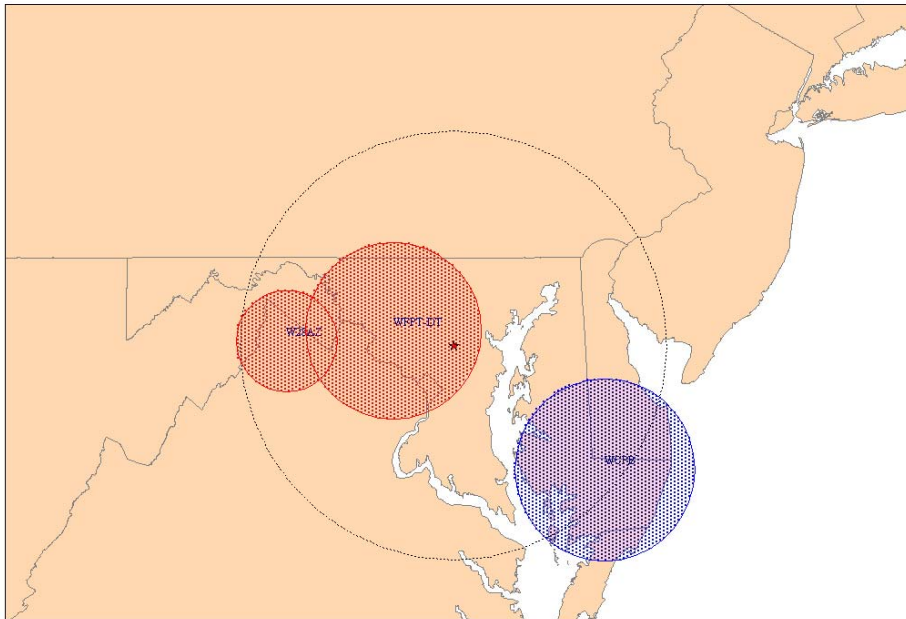


Figure 38. Channel 28 (WFPT-DT) Service Contour Relative to Test Site 2.

Channel 29 - 39 degrees 10 minutes North; 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

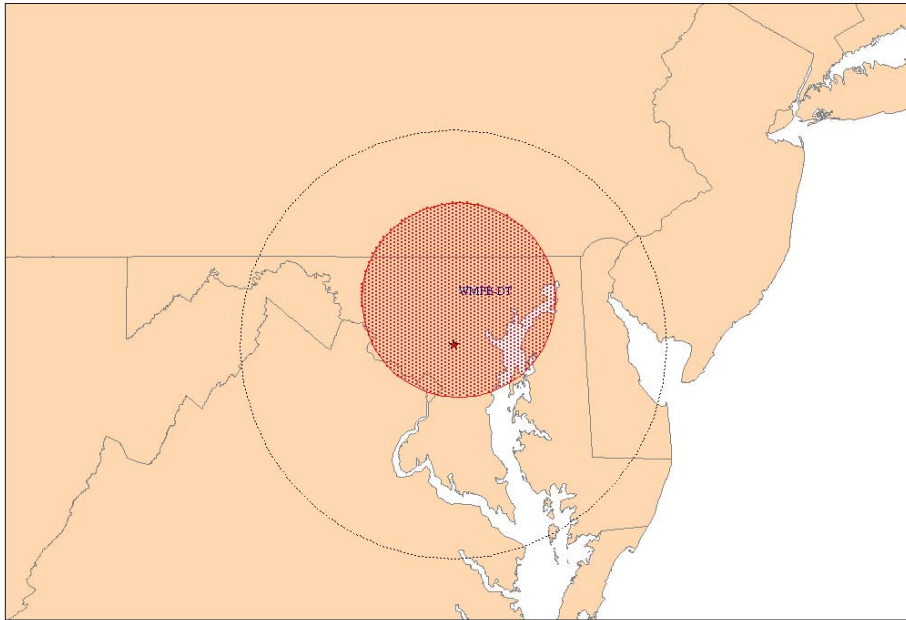


Figure 39. Channel 29 (WMPB-DT) Service Contour Relative to Test Site 2.

Channel 30 - 39 degrees 10 minutes North; 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

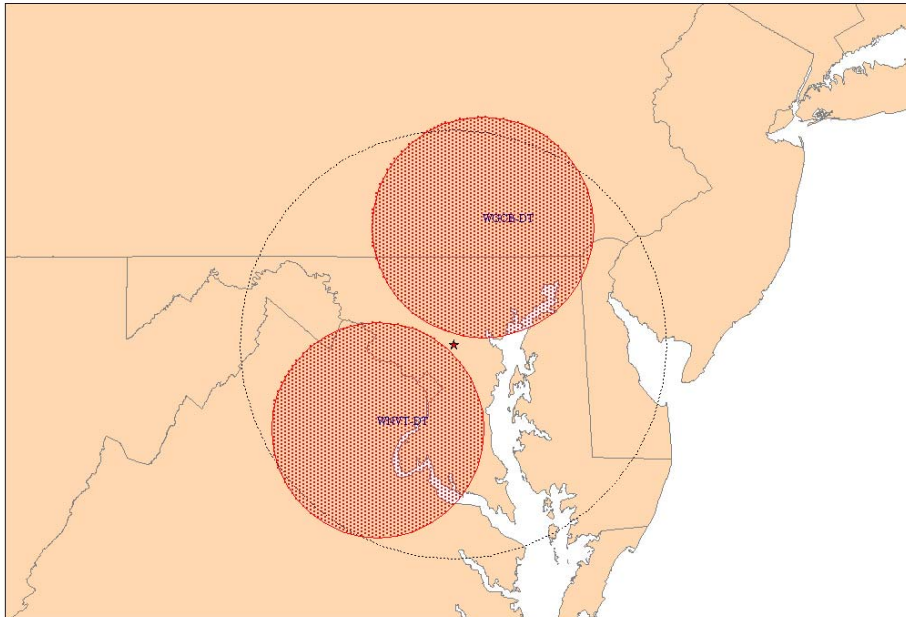


Figure 40. Channel 30 Service Contours Relative to Test Site 2.

Channel 31 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

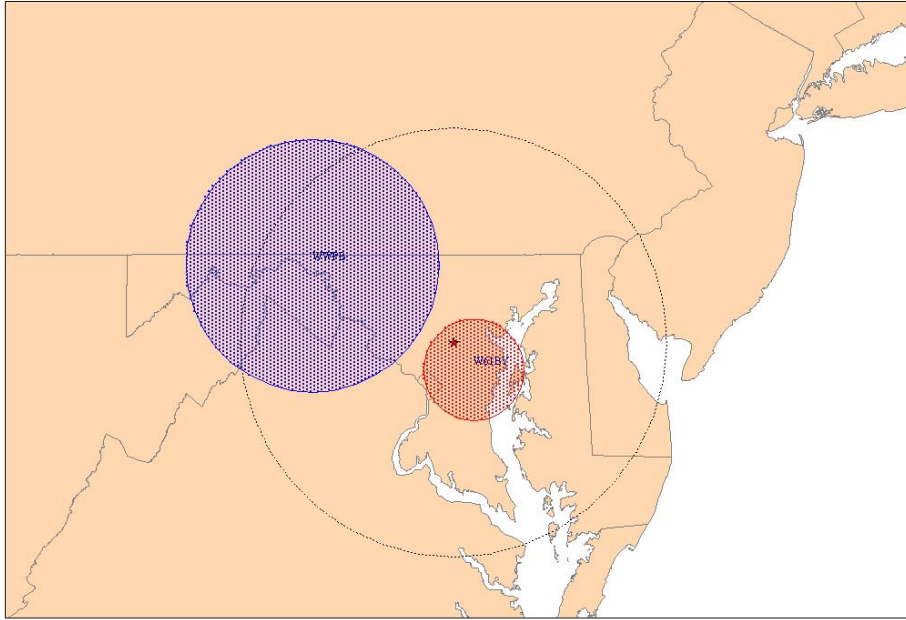


Figure 41. Channel 31 Service Contours Relative to Test Site 2.

Channel 32 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

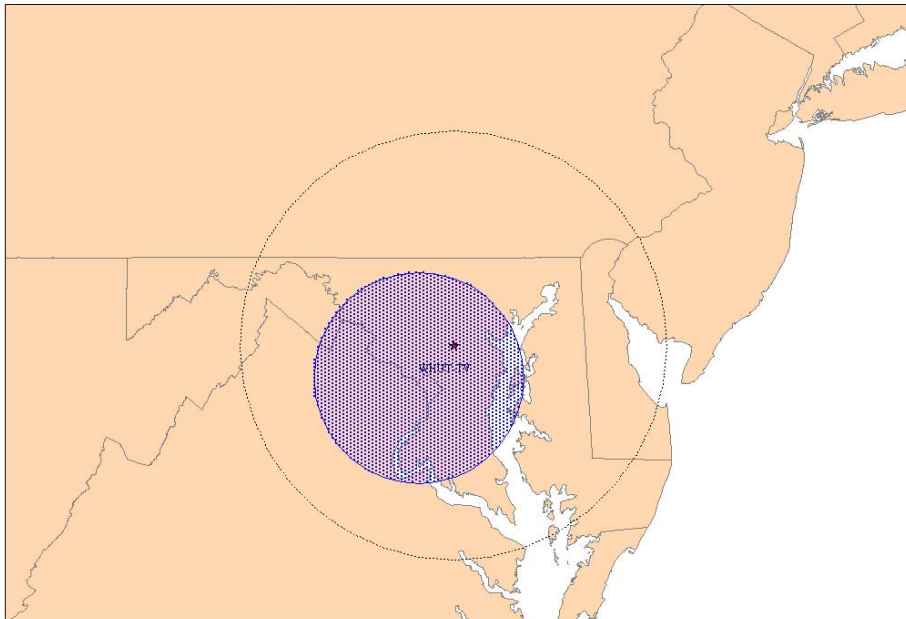


Figure 42. Channel 32 (WHUT-TV) Service Contour Relative to Test Site 2.

Channel 33 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

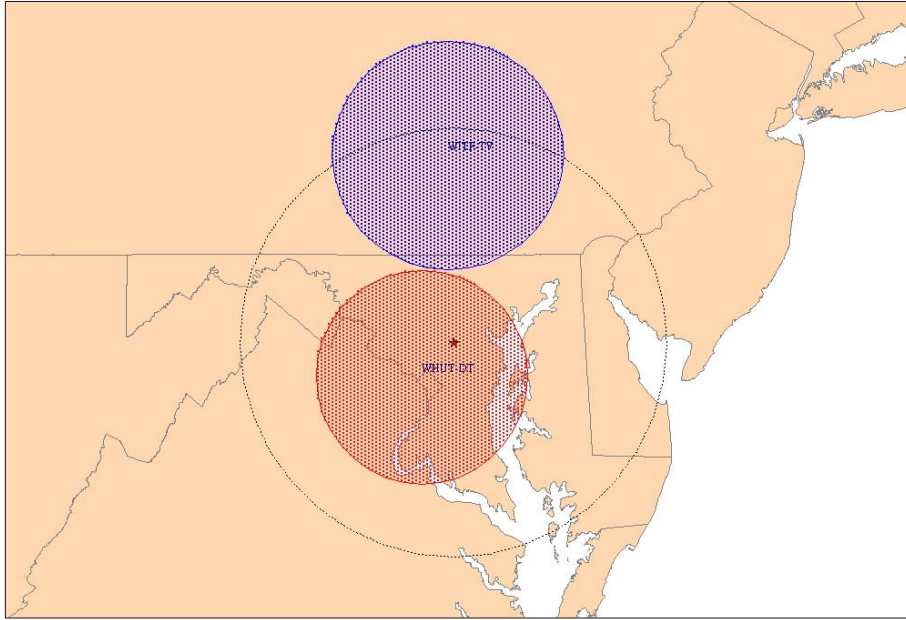


Figure 43. Channel 33 (WHUT-DT) Service Contour Relative to Test Site 2.

Channel 34 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

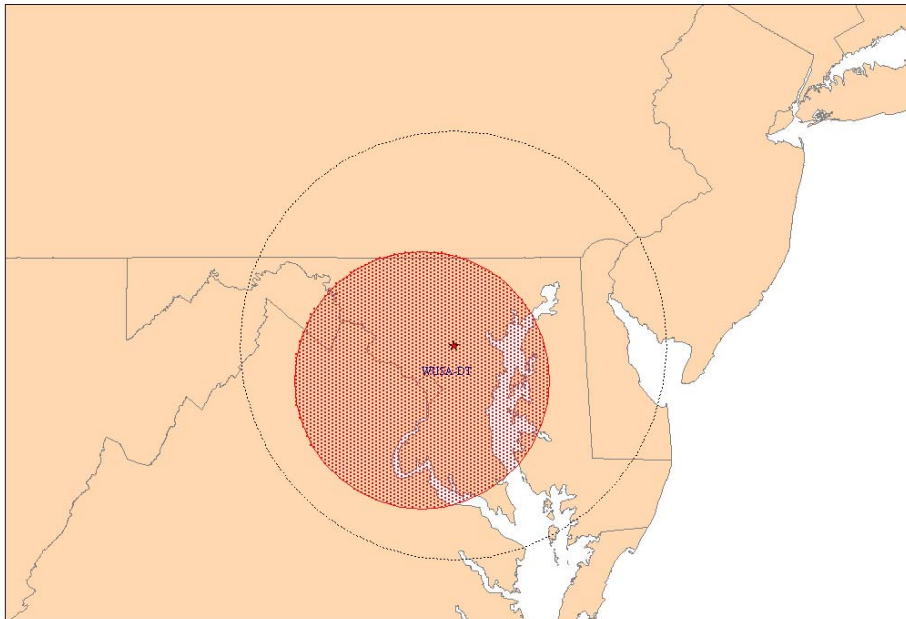


Figure 44. Channel 34 (WUSA-DT) Service Contour Relative to Test Site 2.

Channel 35 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

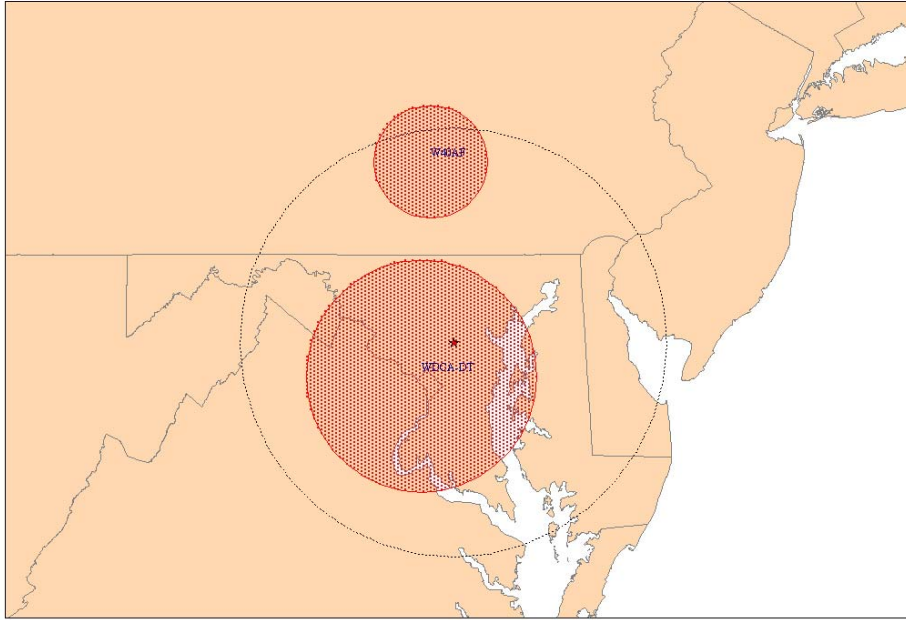


Figure 45. Channel 35 (WDCA-DT) Service Contour Relative to Test Site 2.

Channel 36 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

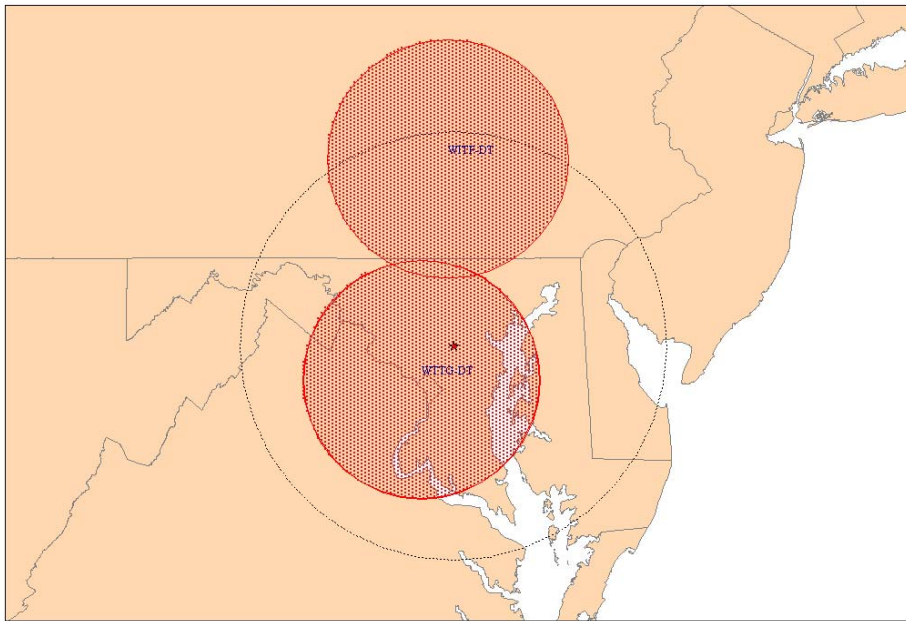


Figure 46. Channel 36 (WTTG-DT) Service Contour Relative to Test Site 2.

Channel 38 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

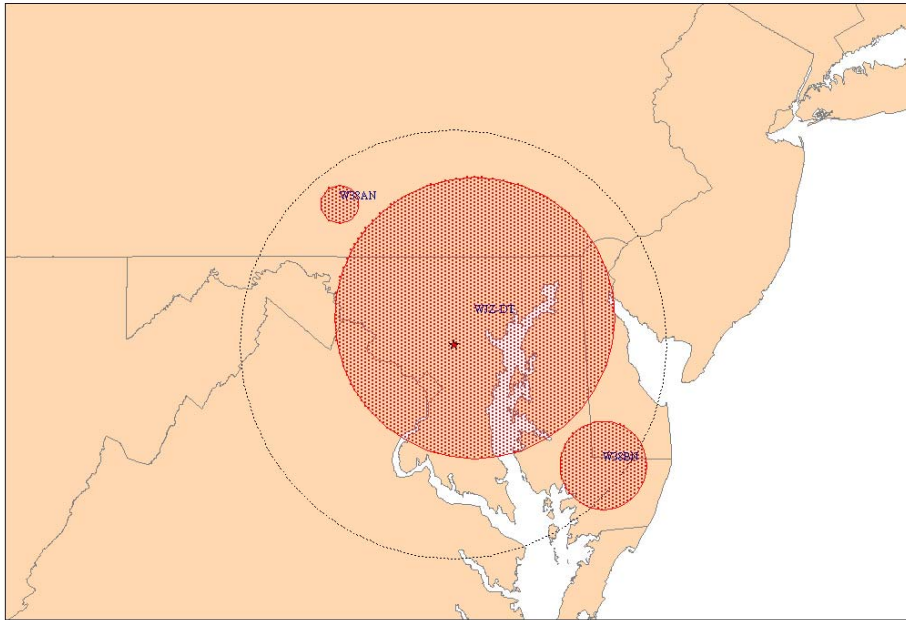


Figure 47. Channel 38 (WJZ-DT) Service Contour Relative to Test Site 2.

Channel 39 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

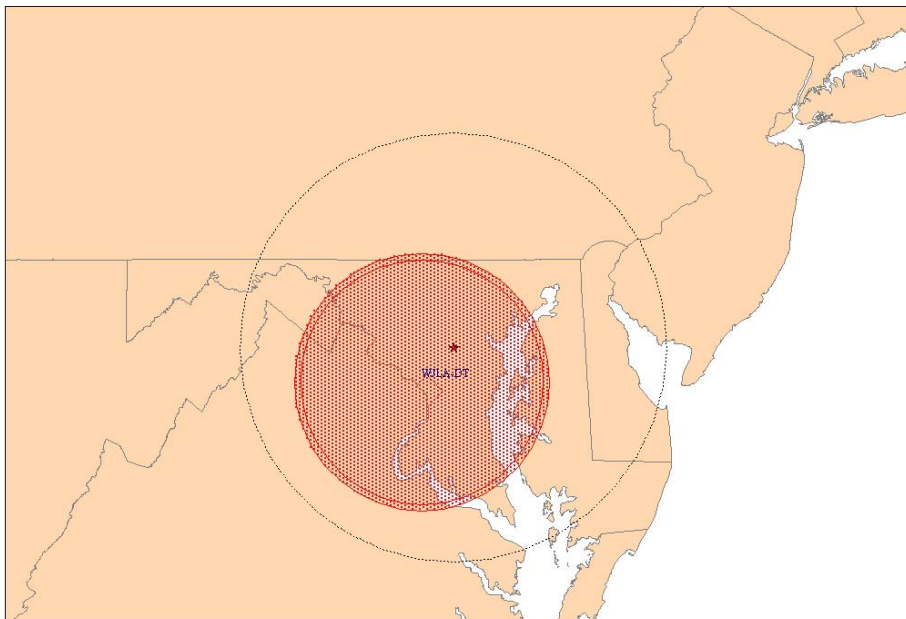


Figure 48. Channel 39 (WJLA-DT) Service Contour Relative to Test Site 2.

Channel 40 - 39 degrees 10 minutes North; 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

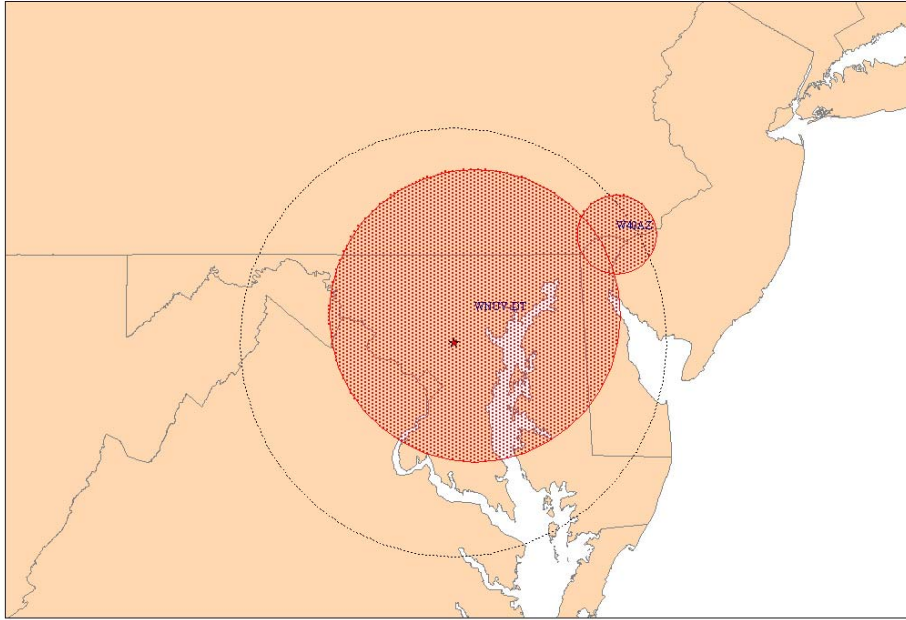


Figure 49. Channel 40 (WNUV-DT) Service Contour Relative to Test Site 2.

Channel 41 - 39 degrees 10 minutes North; 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

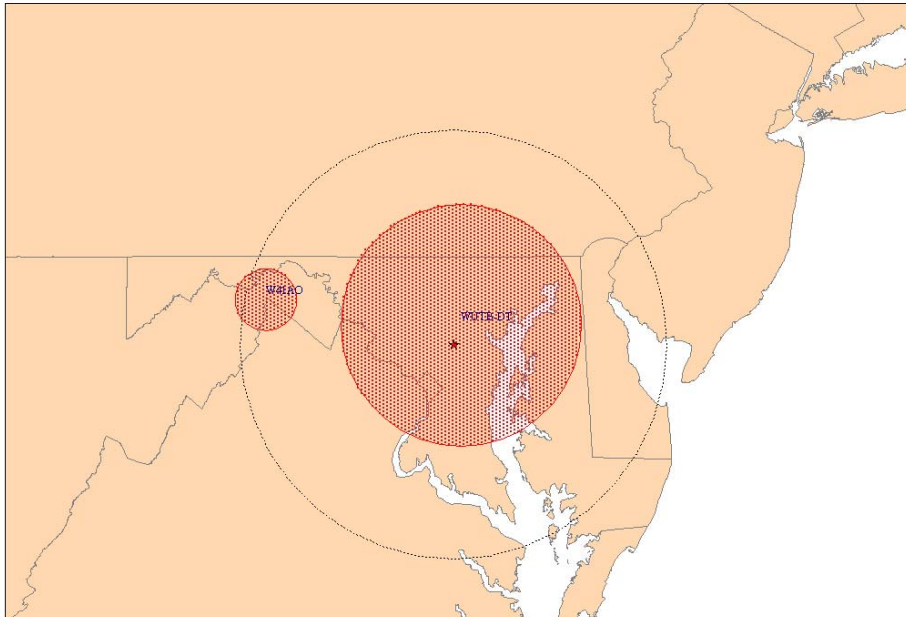


Figure 50. Channel 41 (WUTB-DT) Service Contour Relative to Test Site 2.

Channel 42 - 39 degrees 10 minutes North, 076 degrees 49 minutes West
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

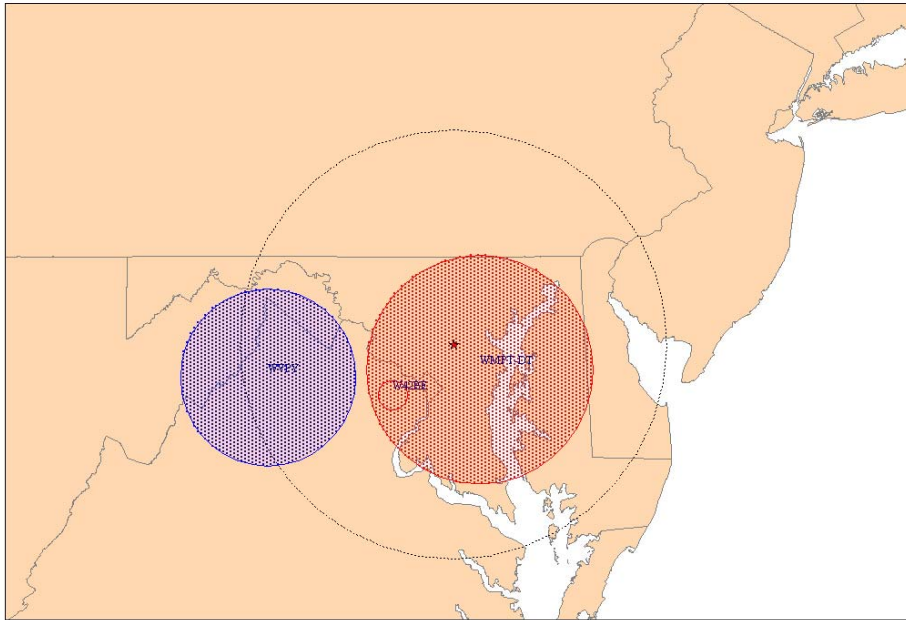


Figure 51. Channel 42 (WMPT-DT) Service Contour Relative to Test Site 2.

Channel 43 - 39 degrees 10 minutes North, 076 degrees 49 minutes West
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

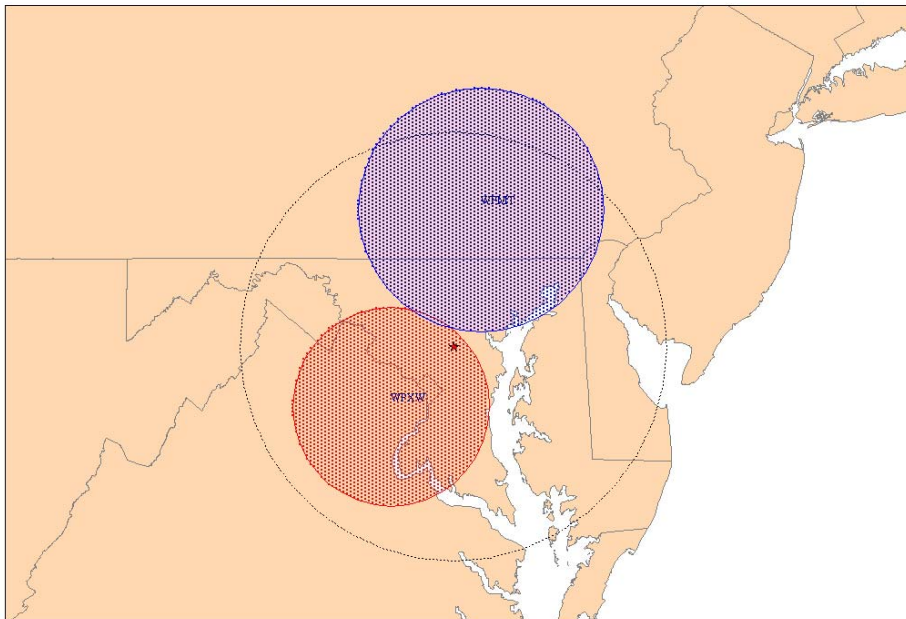


Figure 52. Channel 43 (WPXW-DT) Service Contour Relative to Test Site 2.

Channel 44 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

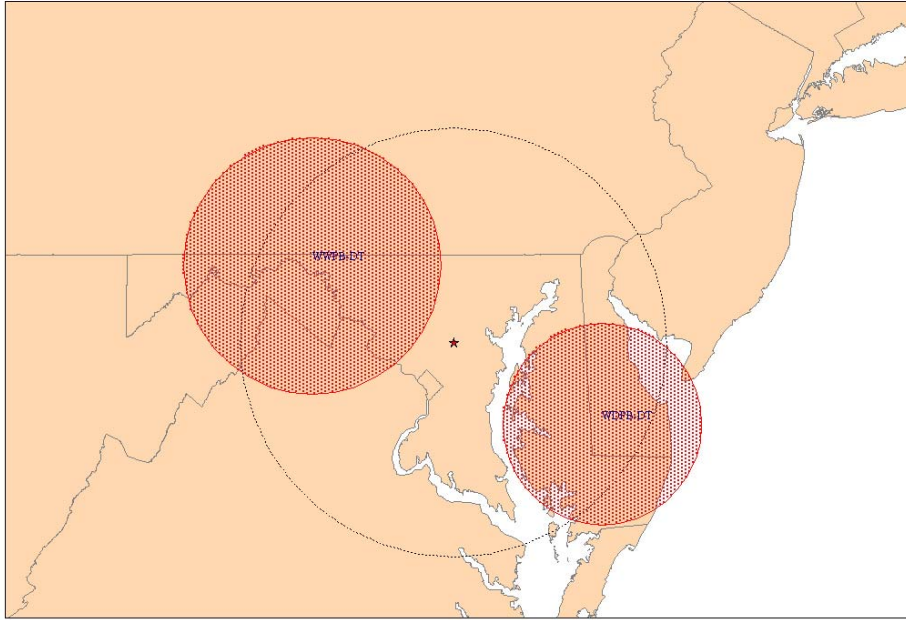


Figure 53. Channel 44 Service Contours Relative to Test Site 2.

Channel 45 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

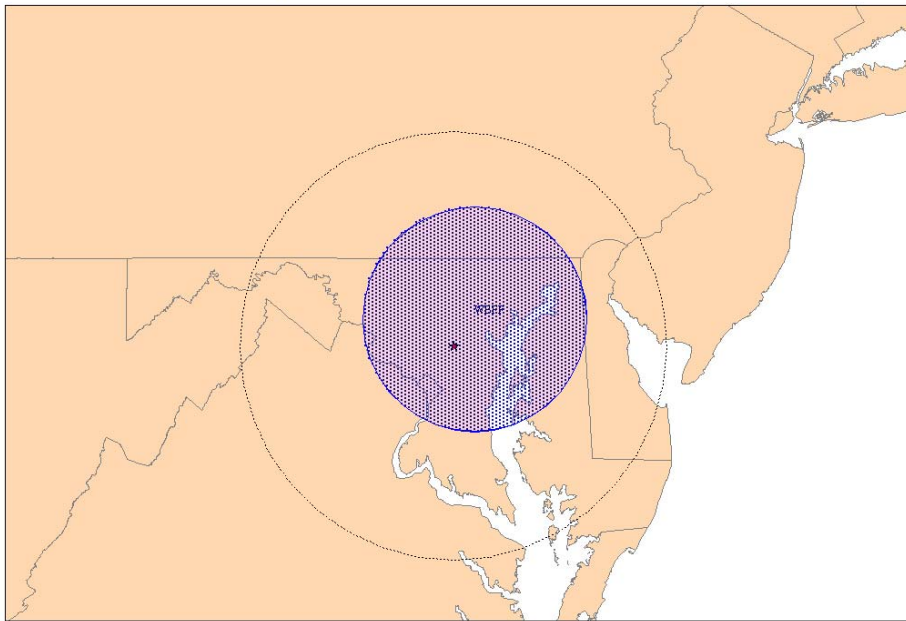


Figure 54. Channel 45 (WBFF-TV) Service Contour Relative to Test Site 2.

Channel 46 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

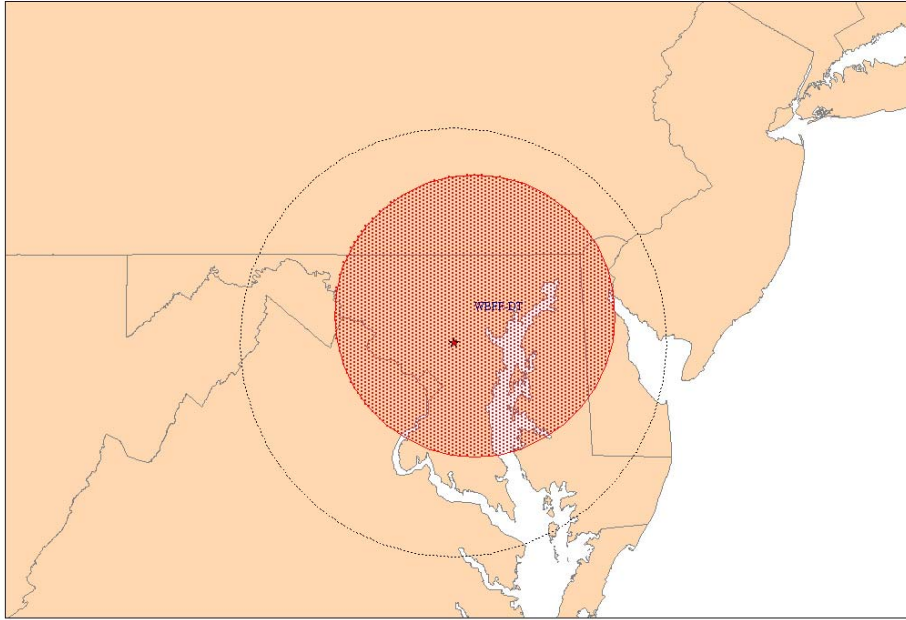


Figure 55. Channel 46 (WBFF-DT) Service Contour Relative to Test Site 2.

Channel 47 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

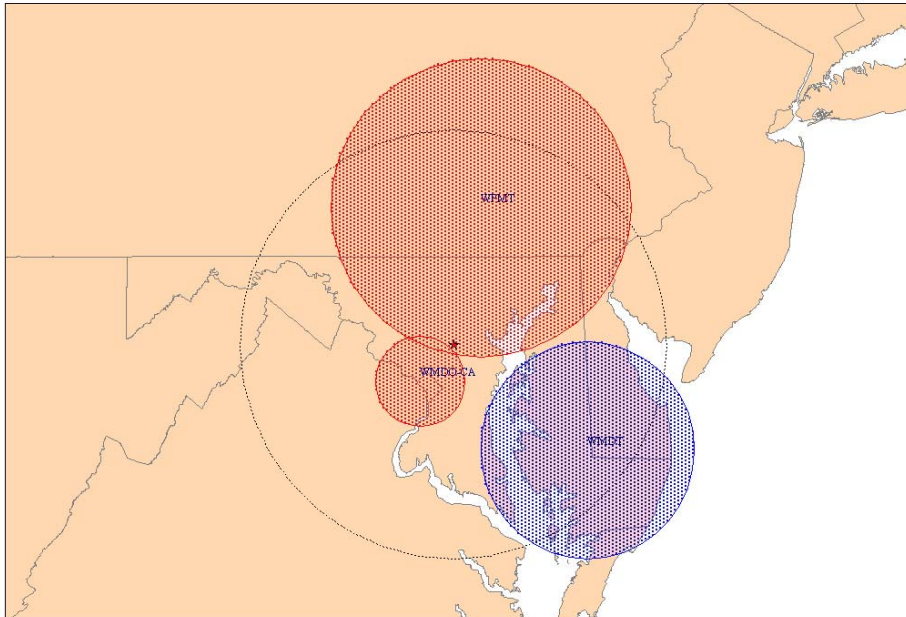


Figure 56. Channel 47 (WPMT-DT) Service Contour Relative to Test Site 2.

Channel 48 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

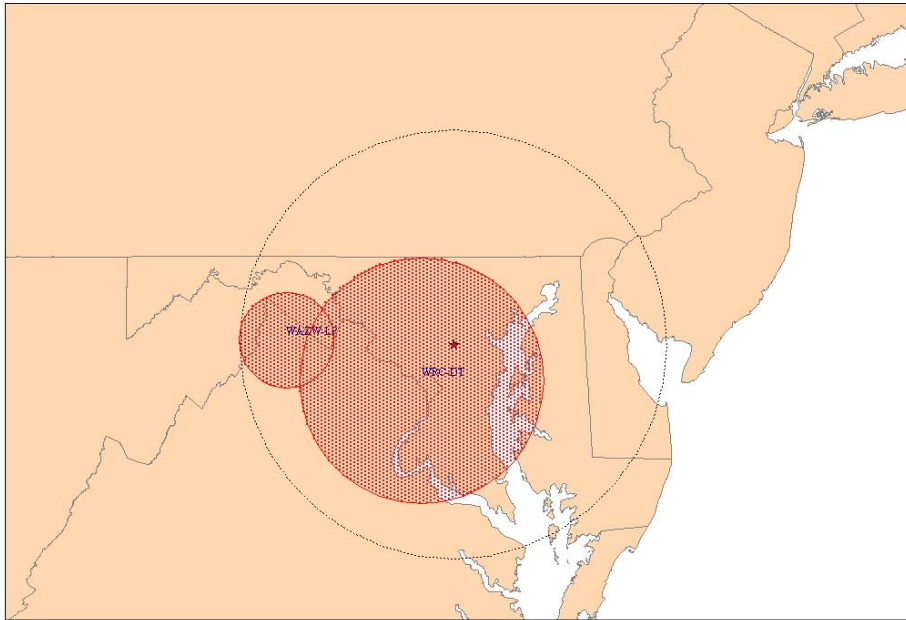


Figure 57. Channel 48 (WRC-DT) Service Contour Relative to Test Site 2.

Channel 49 - 39 degrees 10 minutes North, 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

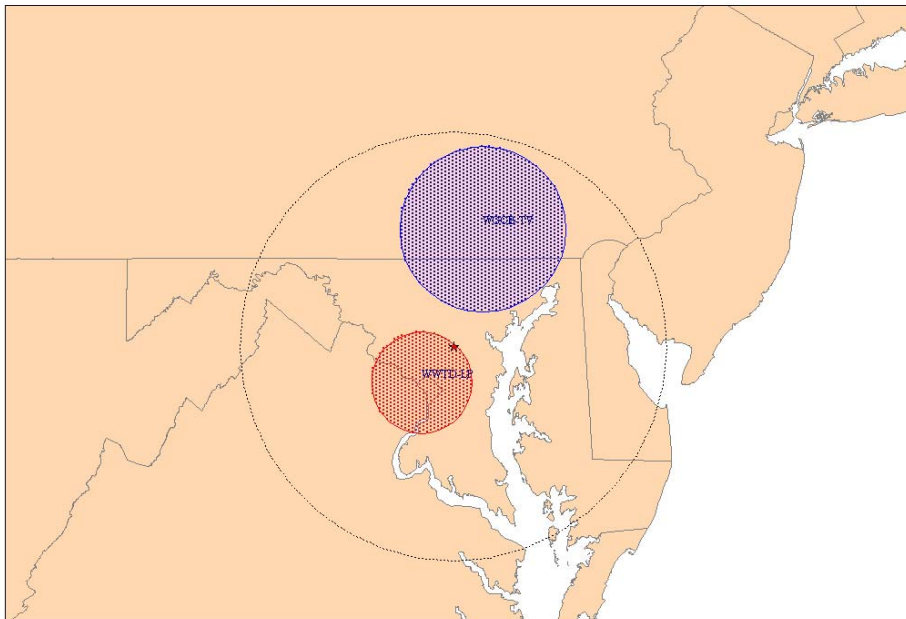


Figure 58. Channel 49 Service Contours Relative to Test Site 2.

Channel 50 - 39 degrees 10 minutes North; 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

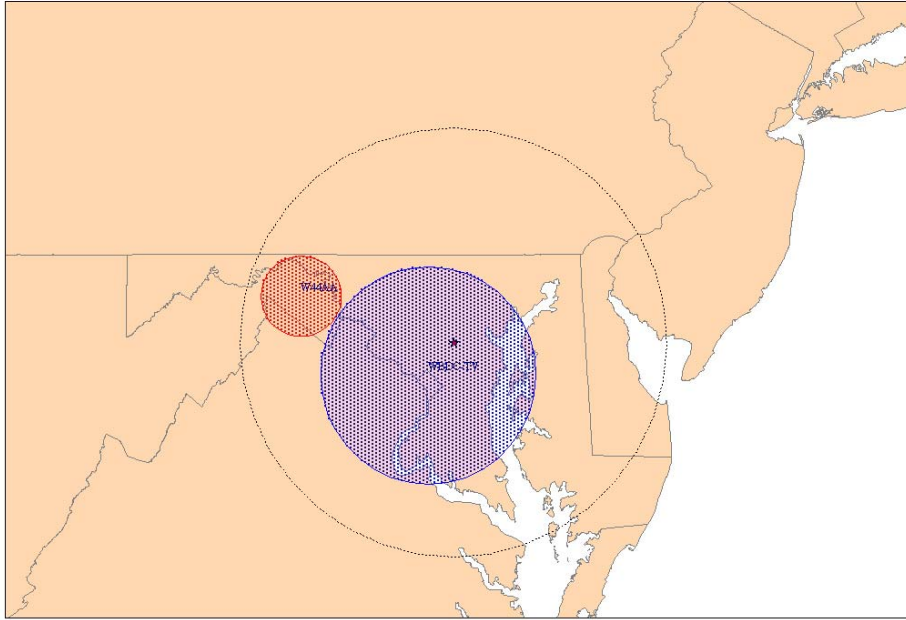


Figure 59. Channel 50 (WDCW-TV) Service Contour Relative to Test Site 2.

Channel 51 - 39 degrees 10 minutes North; 076 degrees 49 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

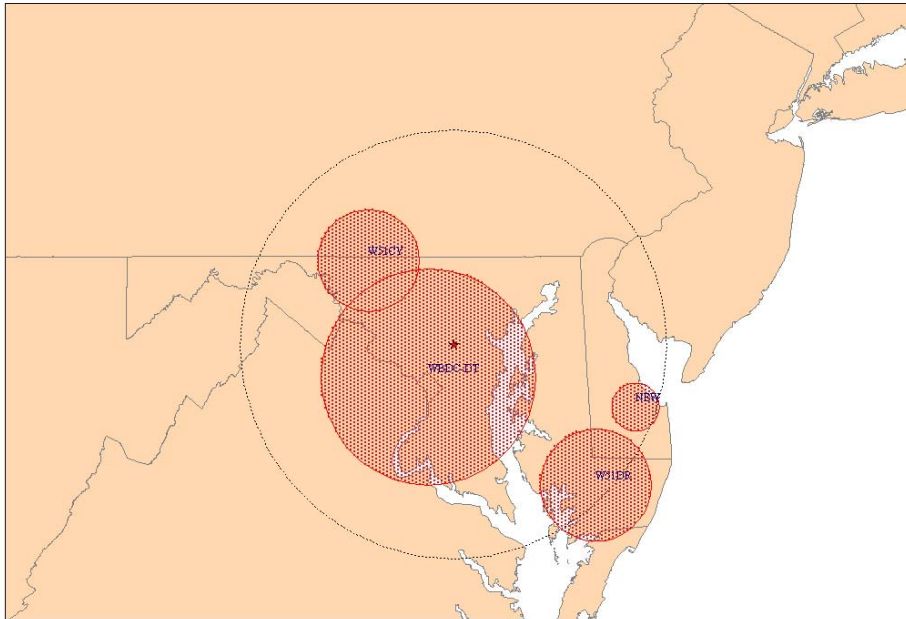


Figure 60. Channel 51 (WDCW-DT) Service Contour Relative to Test Site 2.

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Channel 21 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

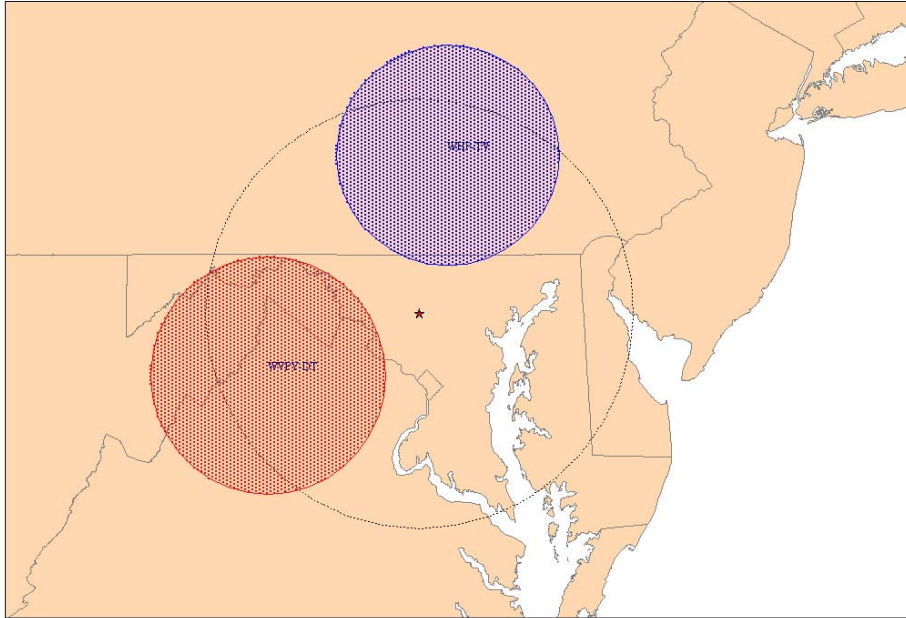


Figure 61. Channel 21 Service Contours Relative to Test Site 3.

Channel 22 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

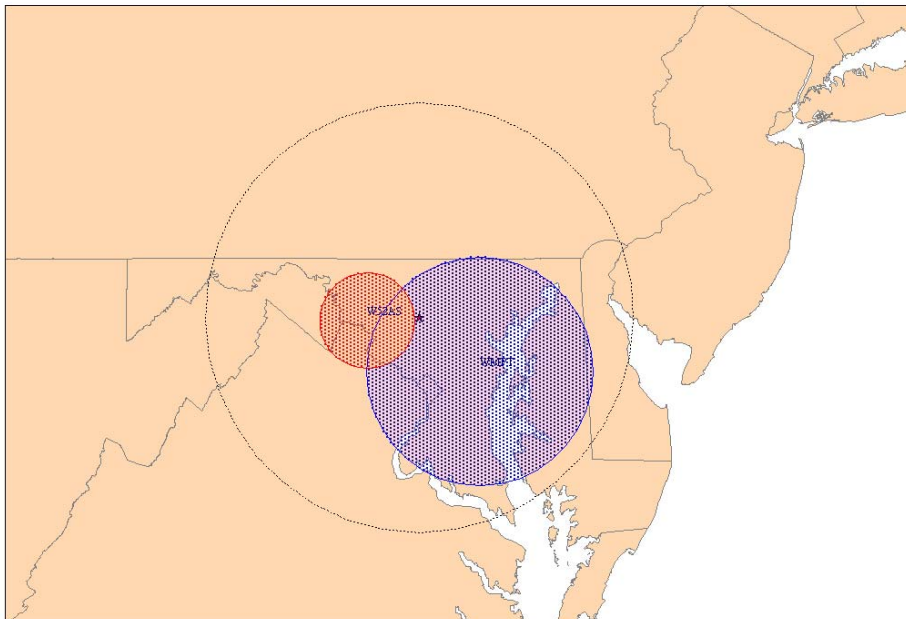


Figure 62. Channel 22 (WVBC-TV) Service Contour Relative to Test Site 3.

Channel 23 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

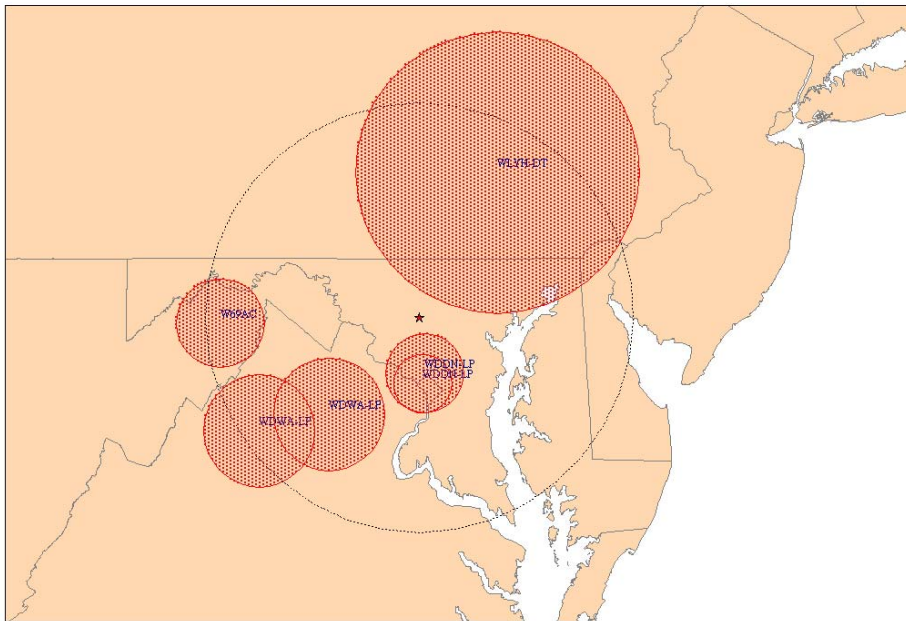


Figure 63. Channel 23 Service Contours Relative to Test Site 3.

Channel 24 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

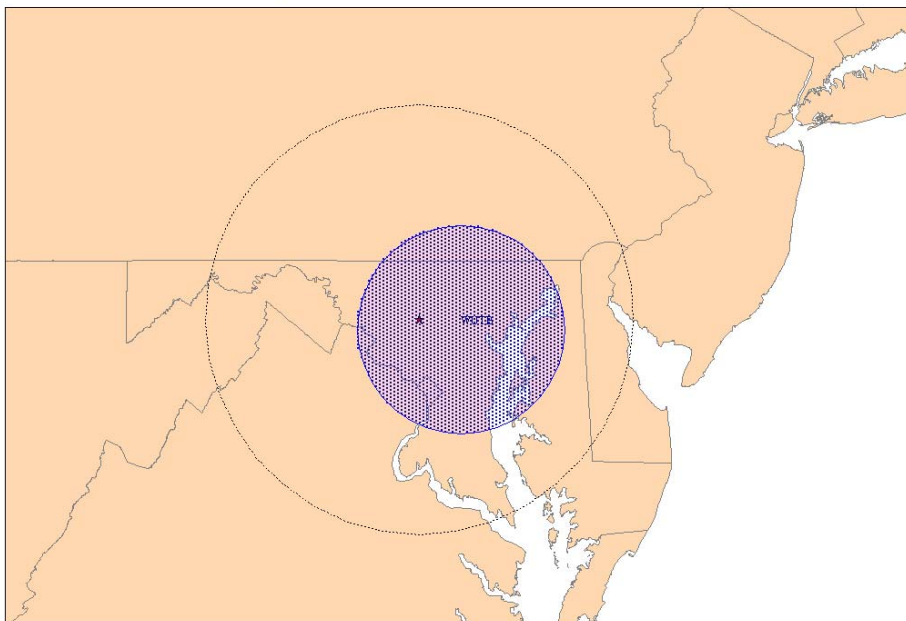


Figure 64. Channel 24 (WUTB-TV) Service Contour Relative to Test Site 3.

Channel 25 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

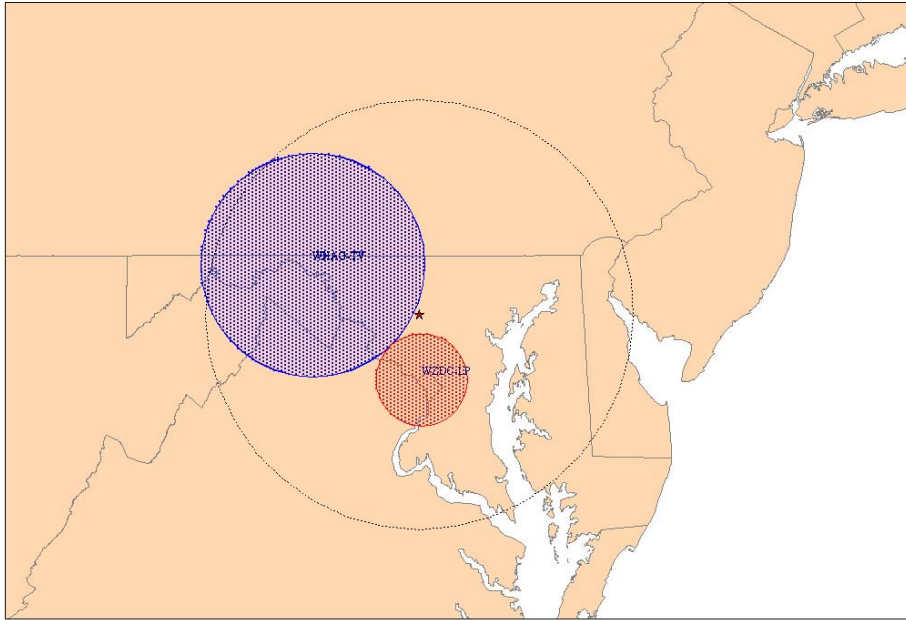


Figure 65. Channel 25 Service Contours Relative to Test Site 3.

Channel 26 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

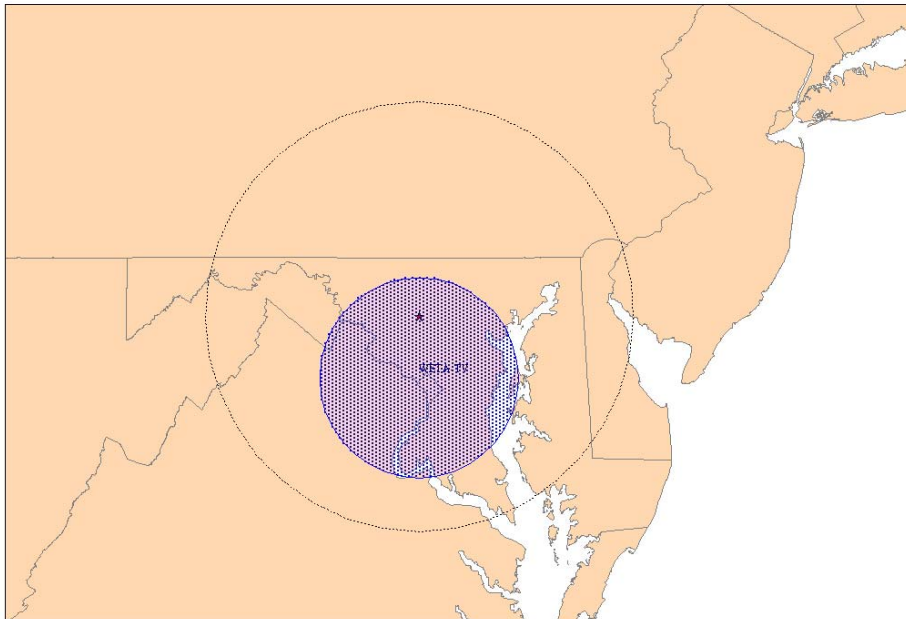


Figure 66. Channel 26 (WETA-TV) Service Contour Relative to Test Site 3.

Channel 27 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

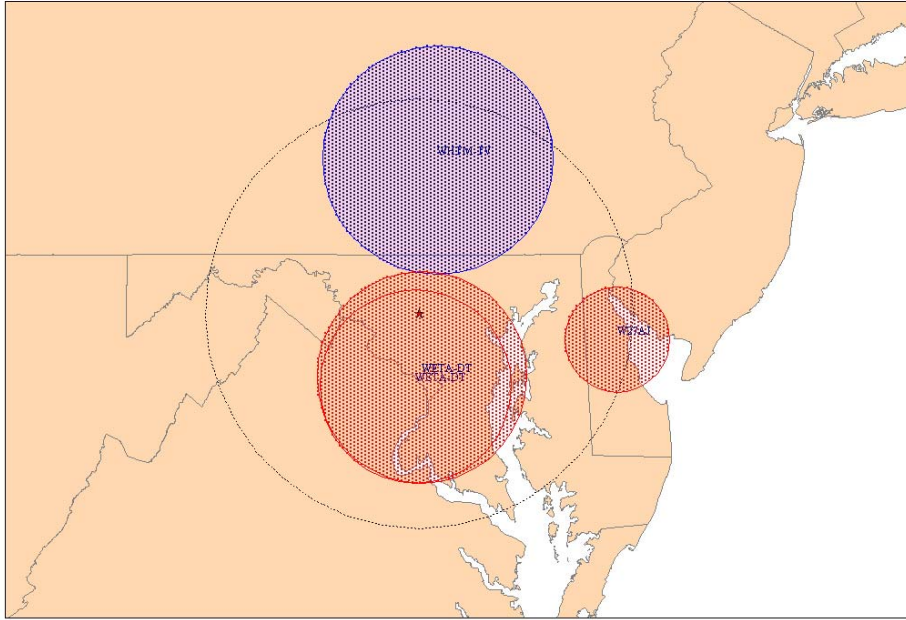


Figure 67. Channel 27 (WETA-DT) Service Contour Relative to Test Site 3.

Channel 28 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

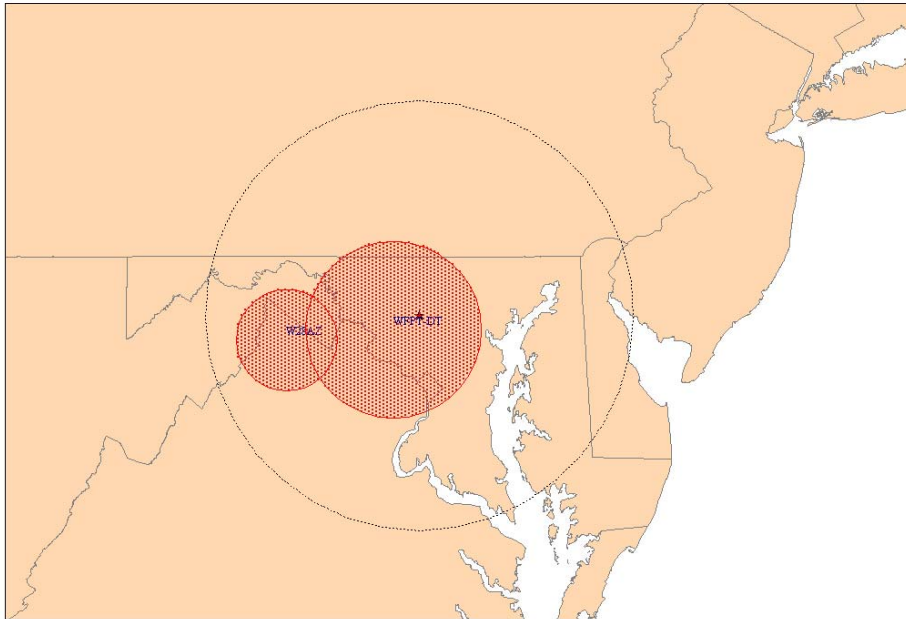


Figure 68. Channel 28 (WFPT-DT) Service Contour Relative to Test Site 3.

Channel 29 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

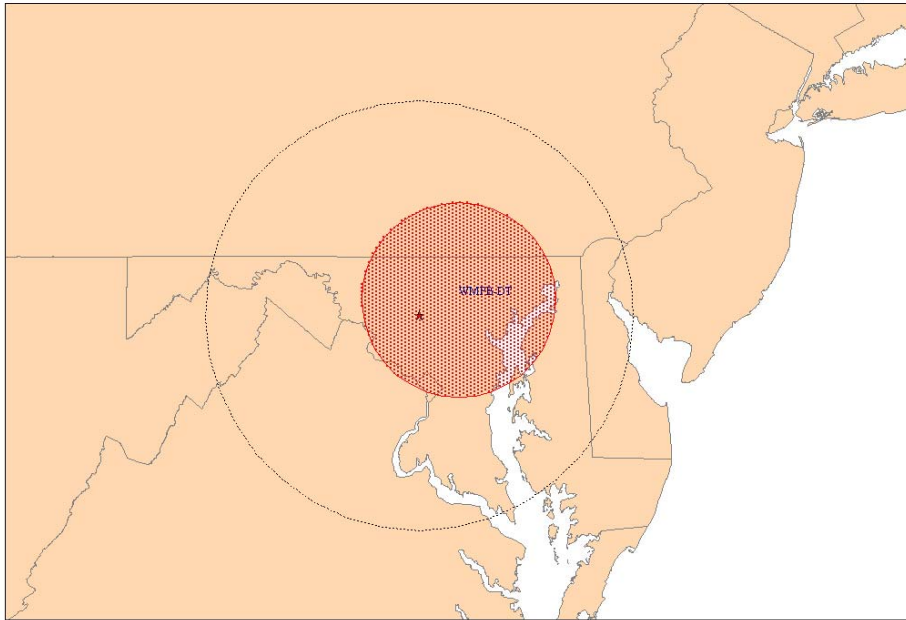


Figure 69. Channel 29 (WMPB-DT) Service Contour Relative to Test Site 3.

Channel 30 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

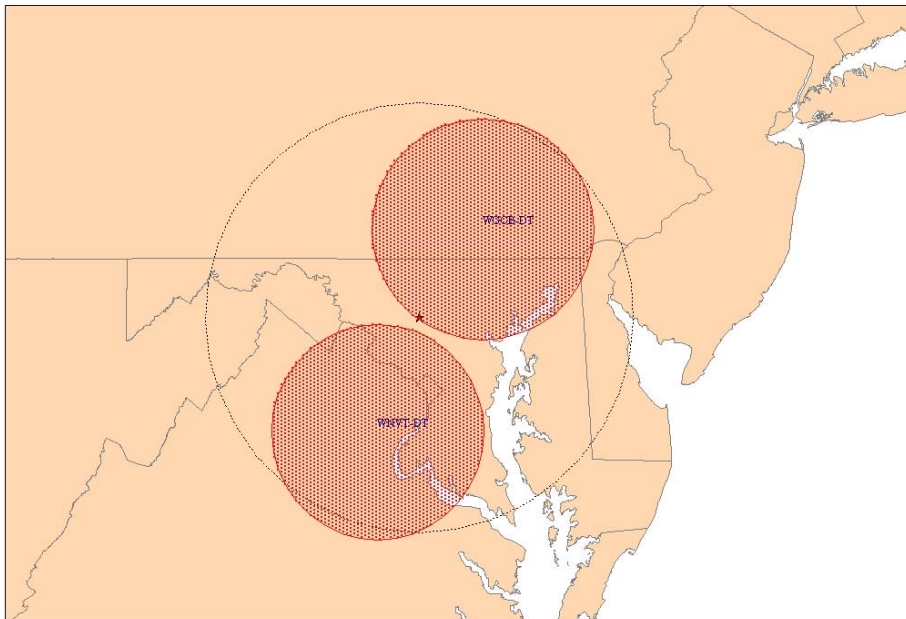


Figure 70. Channel 30 Service Contours Relative to Test Site 3.

Channel 31 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTN (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

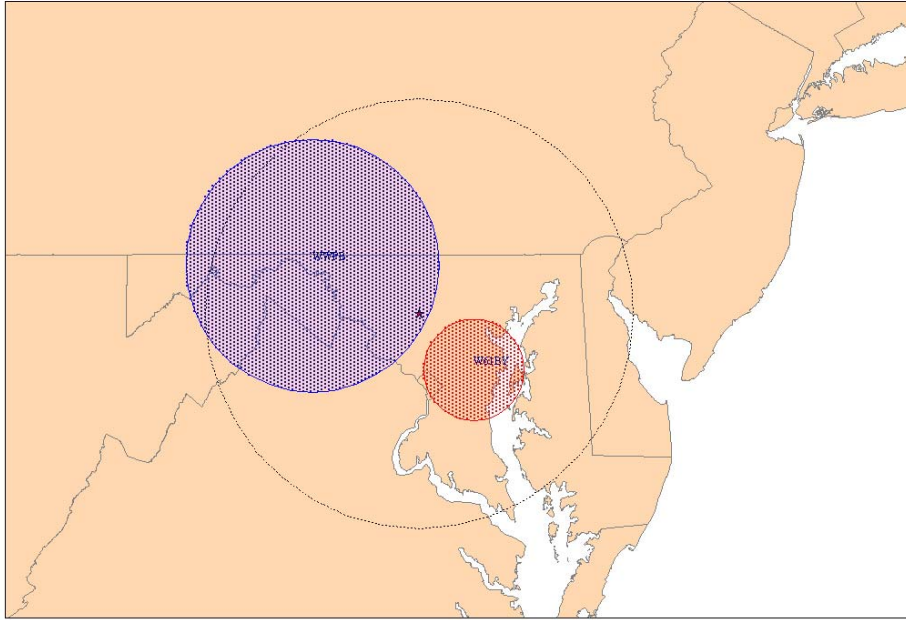


Figure 71. Channel 31 Service Contours Relative to Test Site 3.

Channel 32 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTN (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

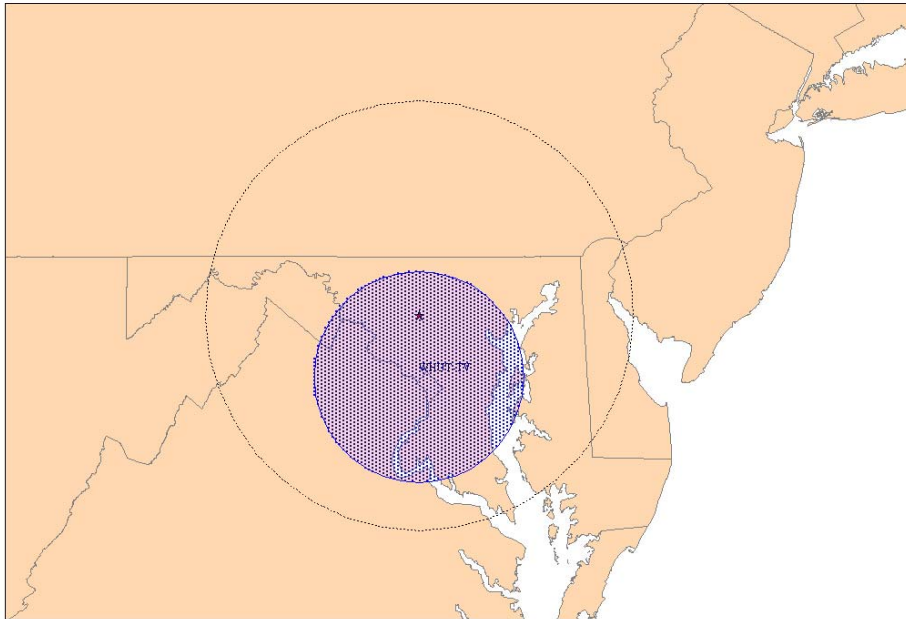


Figure 72. Channel 32 (WHUT-TV) Service Contour Relative to Test Site 3.

Channel 33 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

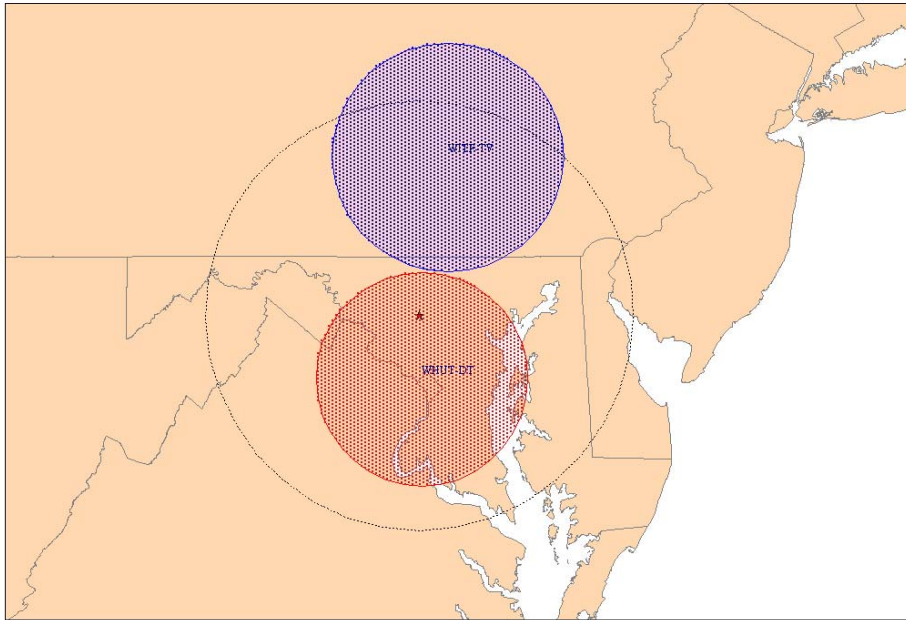


Figure 73. Channel 33 (WHUT-DT) Service Contour Relative to Test Site 3.

Channel 34 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

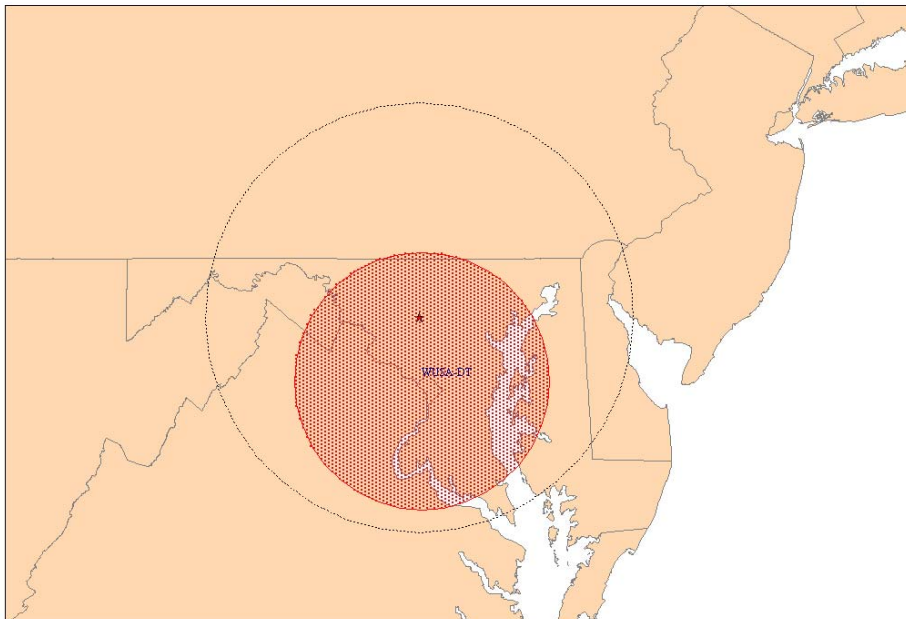


Figure 74. Channel 34 (WUSA-DT) Service Contour Relative to Test Site 3.

Channel 35 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

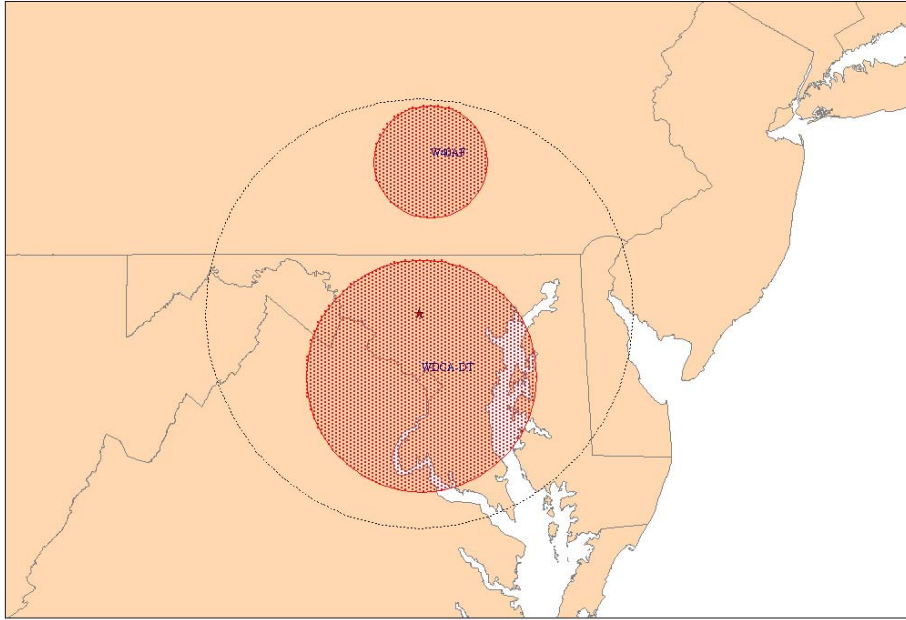


Figure 75. Channel 35 (WDCA-DT) Service Contour Relative to Test Site 3.

Channel 36 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

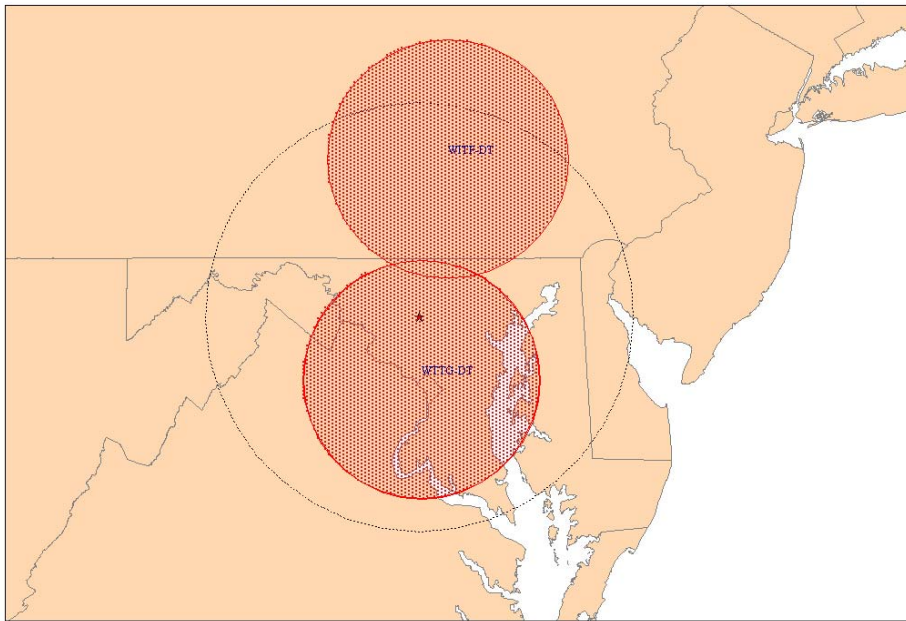


Figure 76. Channel 36 (WTTG-DT) Service Contour Relative to Test Site 3.

Channel 38 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

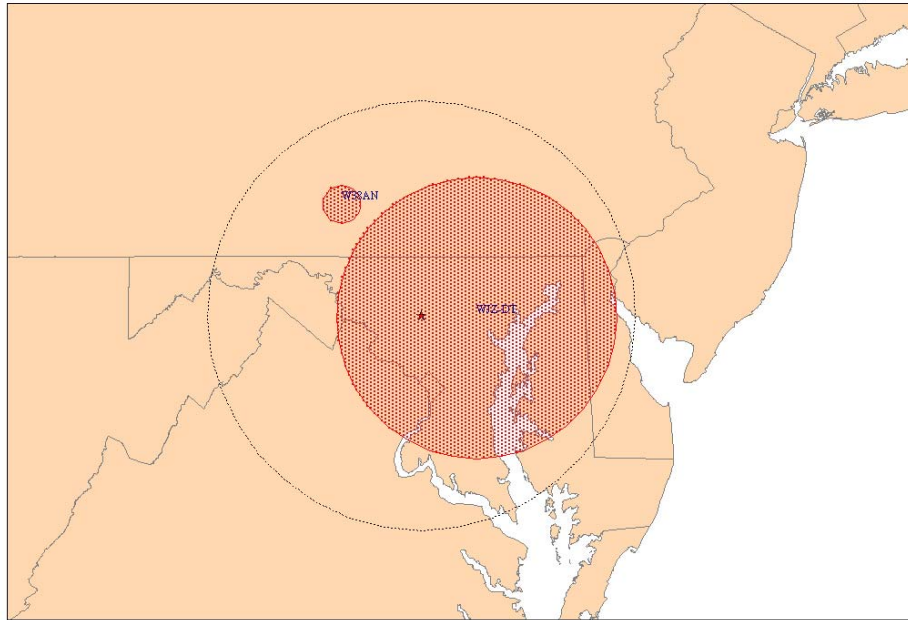


Figure 77. Channel 38 (WJZ-DT) Service Contour Relative to Test Site 3.

Channel 39 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

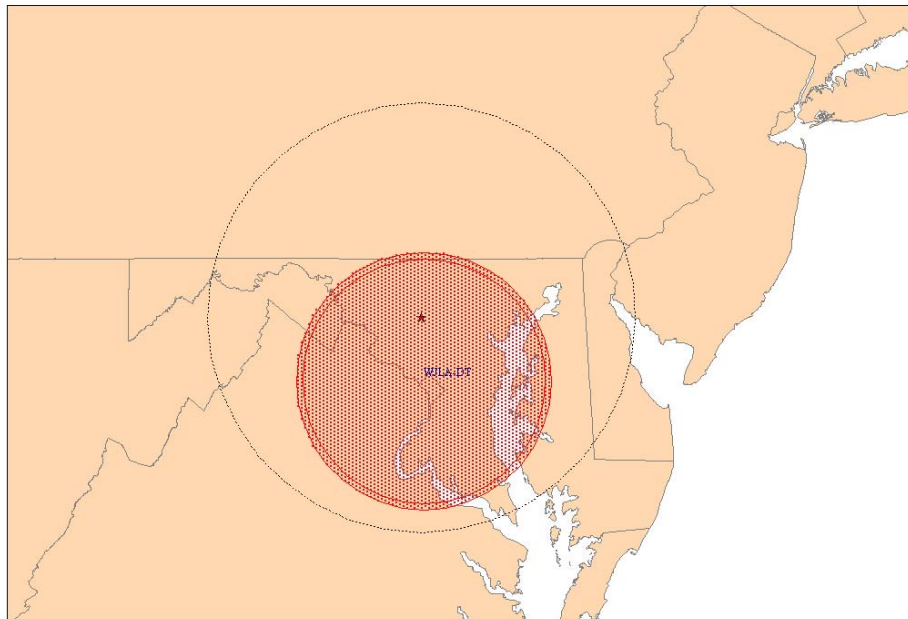


Figure 78. Channel 39 (WJLA-DT) Service Contour Relative to Test Site 3.

Channel 40 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

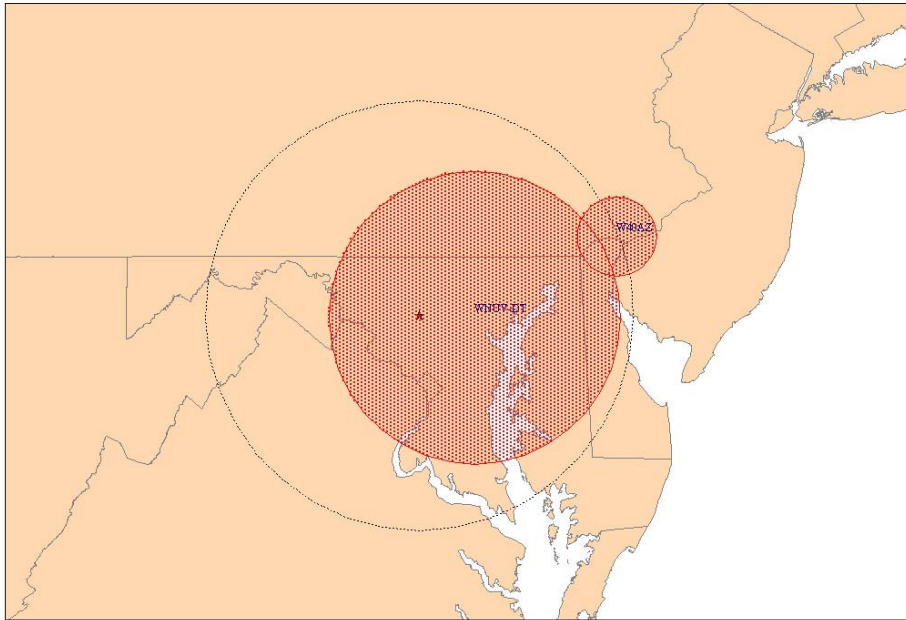


Figure 79. Channel 40 (WNUV-DT) Service Contour Relative to Test Site 3.

Channel 41 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

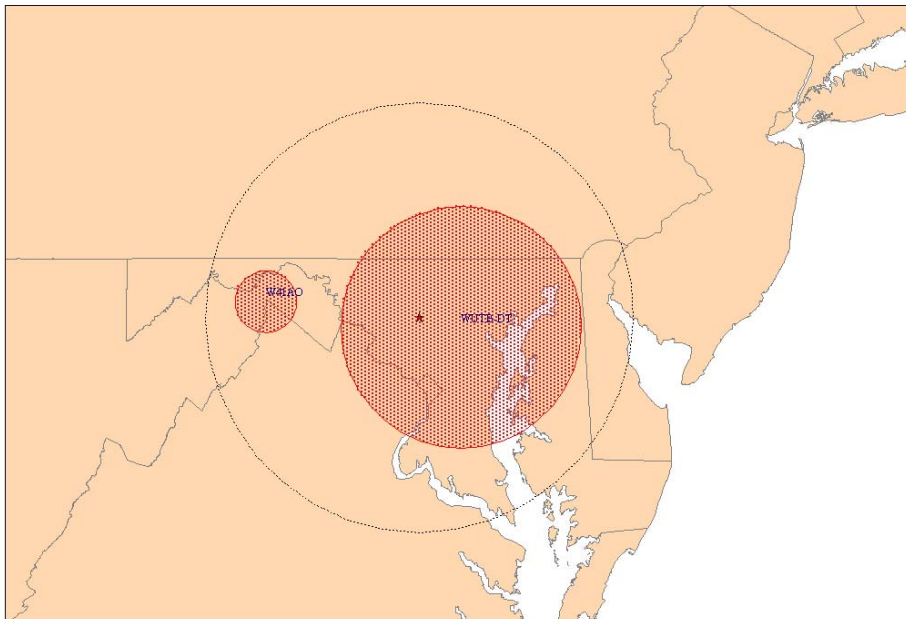


Figure 80. Channel 41 (WUTB-DT) Service Contour Relative to Test Site 3.

Channel 42 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

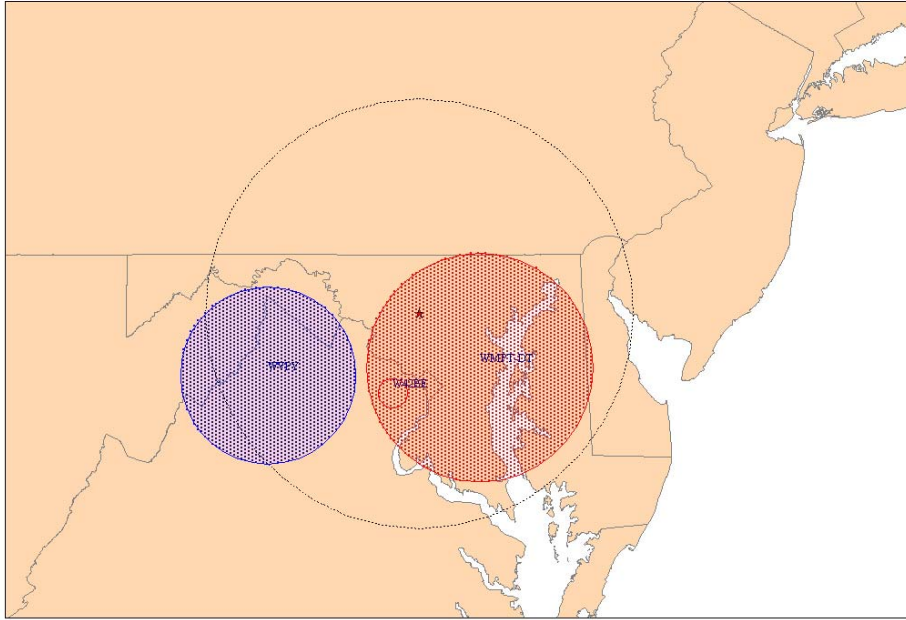


Figure 81. Channel 42 (WMPT-DT) Service Contour Relative to Test Site 3.

Channel 43 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

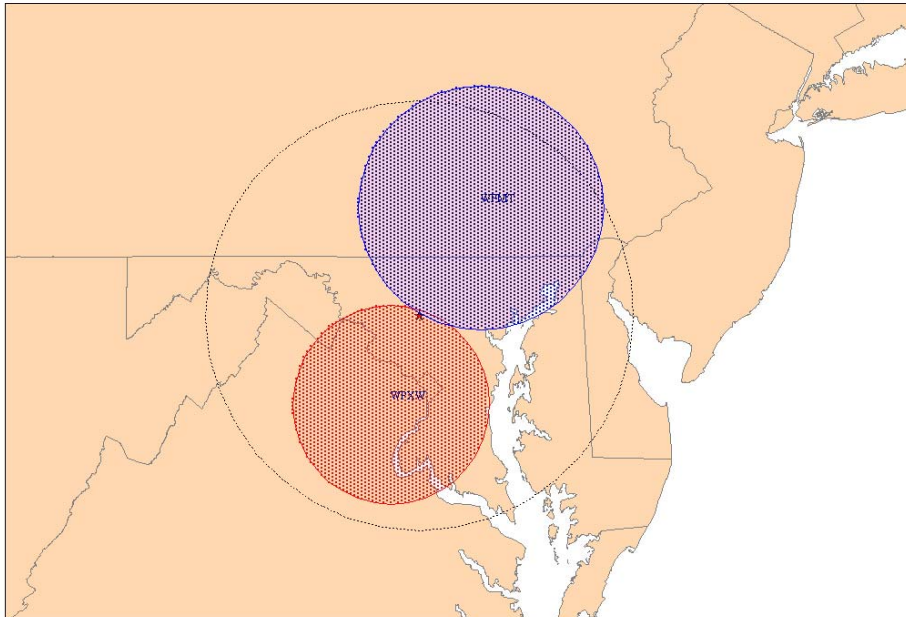


Figure 82. Channel 43 (WPXW-DT) Service Contour Relative to Test Site 3.

Channel 44 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

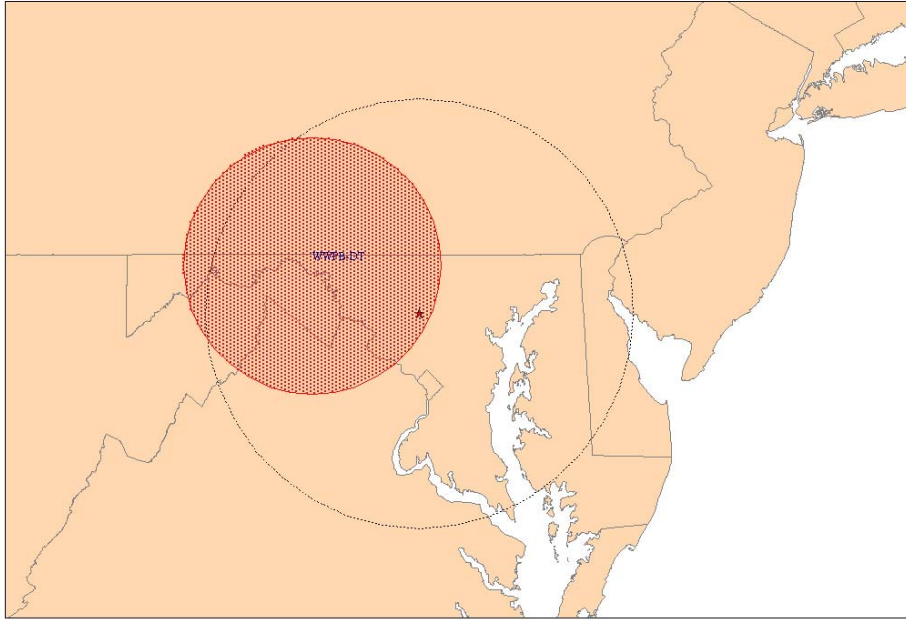


Figure 83. Channel 44 Service Contours Relative to Test Site 3.

Channel 45 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

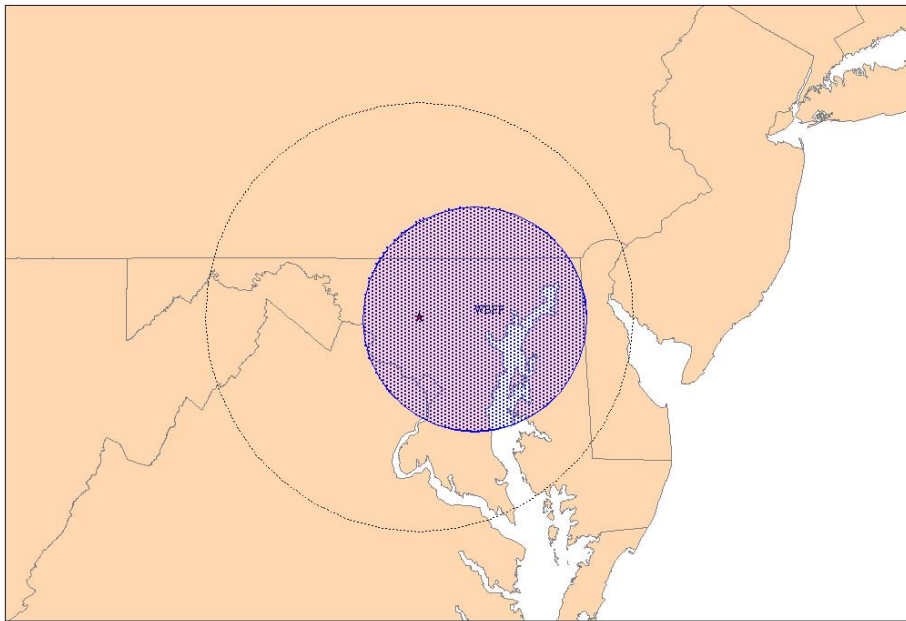


Figure 84. Channel 45 (WBFF-TV) Service Contour Relative to Test Site 3.

Channel 46 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

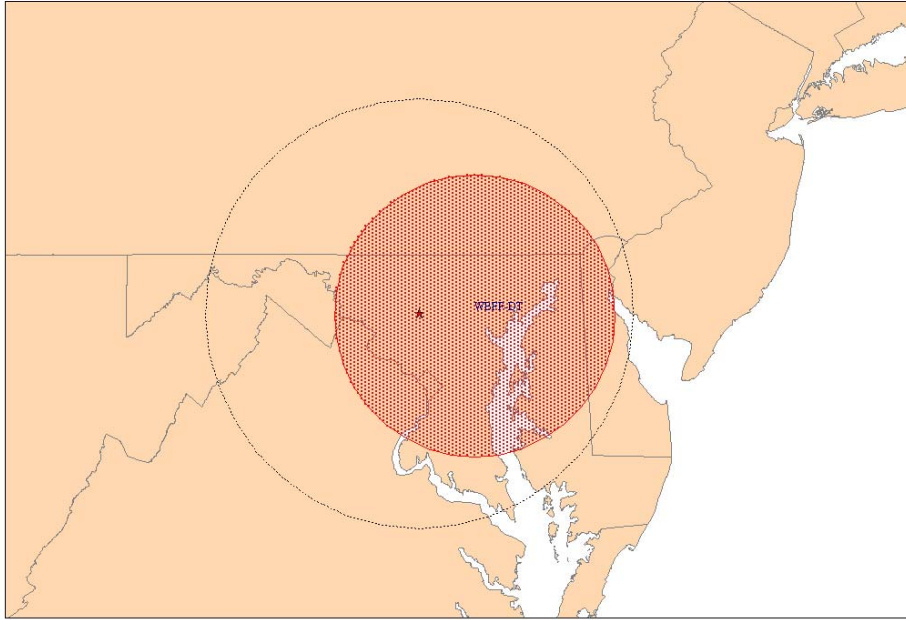


Figure 85. Channel 46 (WBFF-DT) Service Contour Relative to Test Site 3.

Channel 47 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

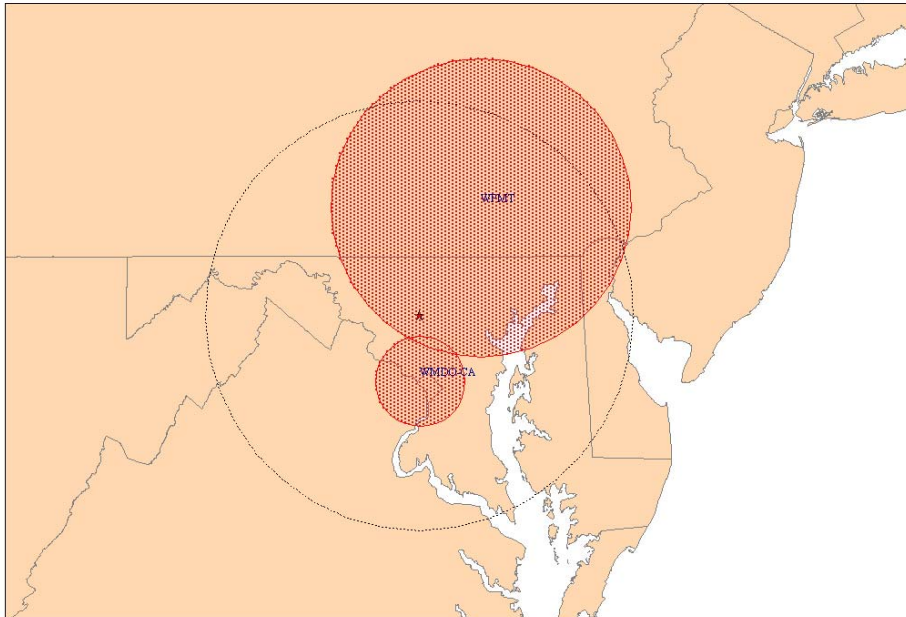


Figure 86. Channel 47 (WPMT-DT) Service Contour Relative to Test Site 3.

Channel 48 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

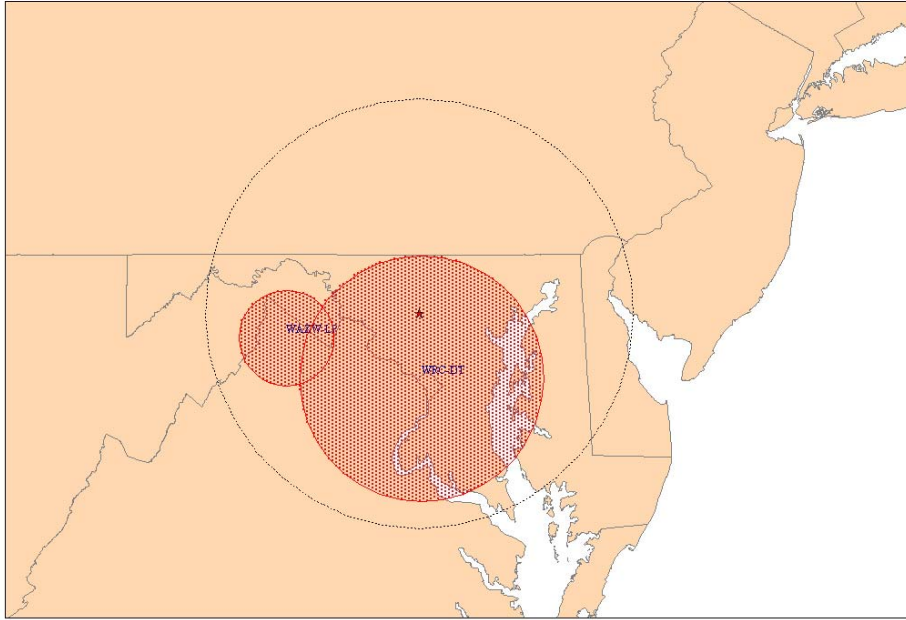


Figure 87. Channel 48 (WRC-DT) Service Contour Relative to Test Site 3.

Channel 49 - 39 degrees 20 minutes North, 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

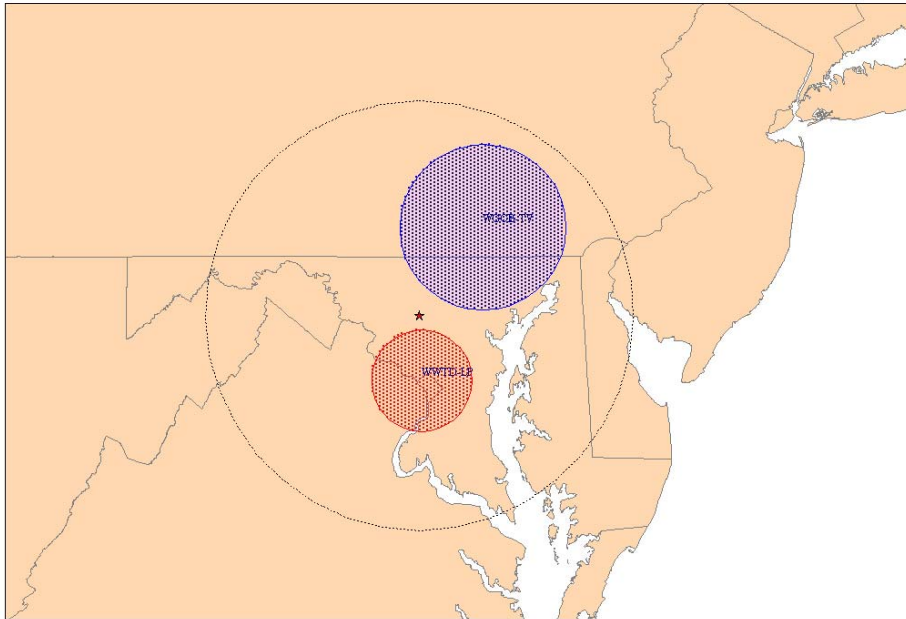


Figure 88. Channel 49 Service Contours Relative to Test Site 3.

Channel 50 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

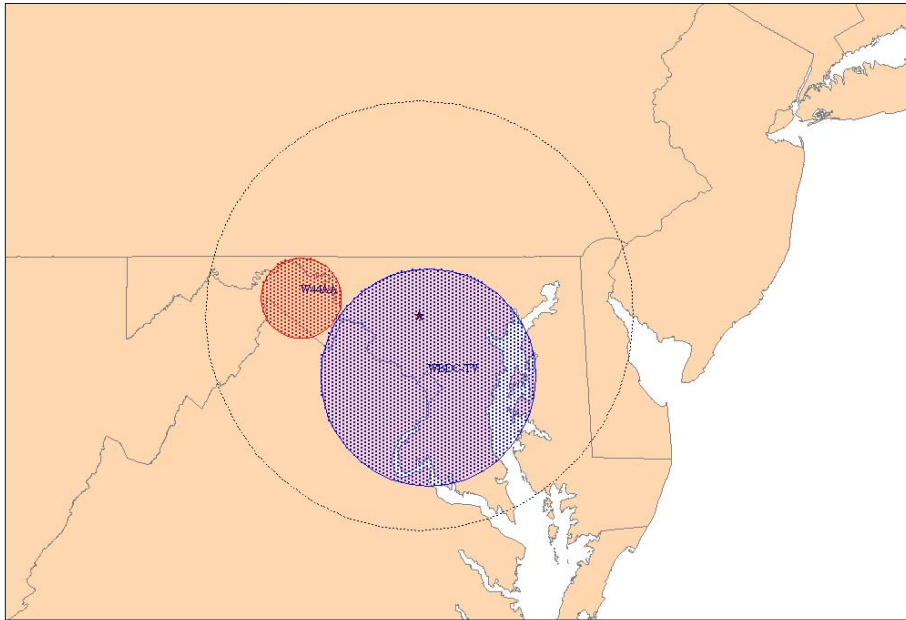


Figure 89. Channel 50 (WDCW-TV) Service Contour Relative to Test Site 3.

Channel 51 - 39 degrees 20 minutes North; 077 degrees 05 minutes West

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

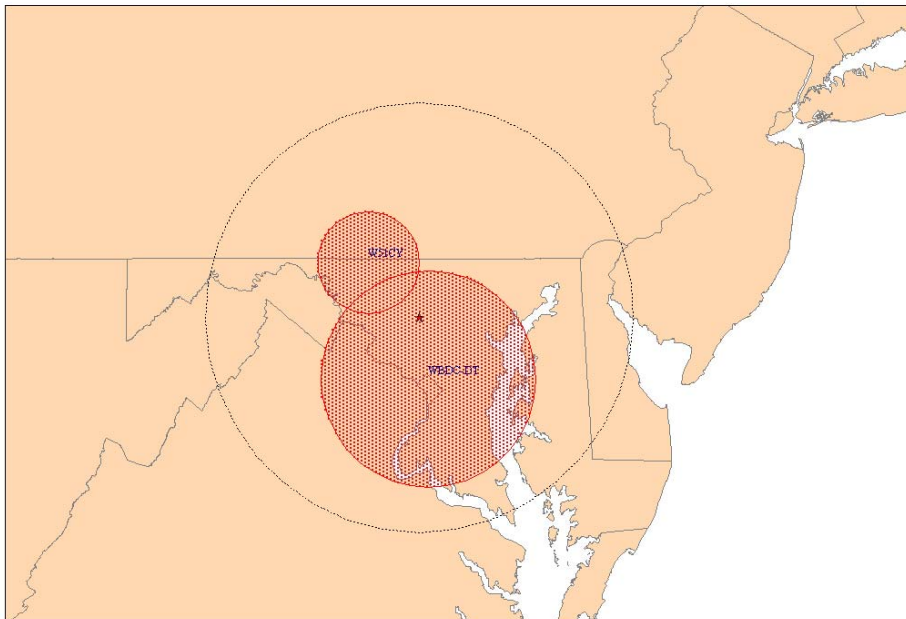


Figure 90. Channel 51 (WDCW-DT) Service Contour Relative to Test Site 3.

Channel 21 - 39 degrees 20 minutes North, 077 degrees 05 minutes West
 Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

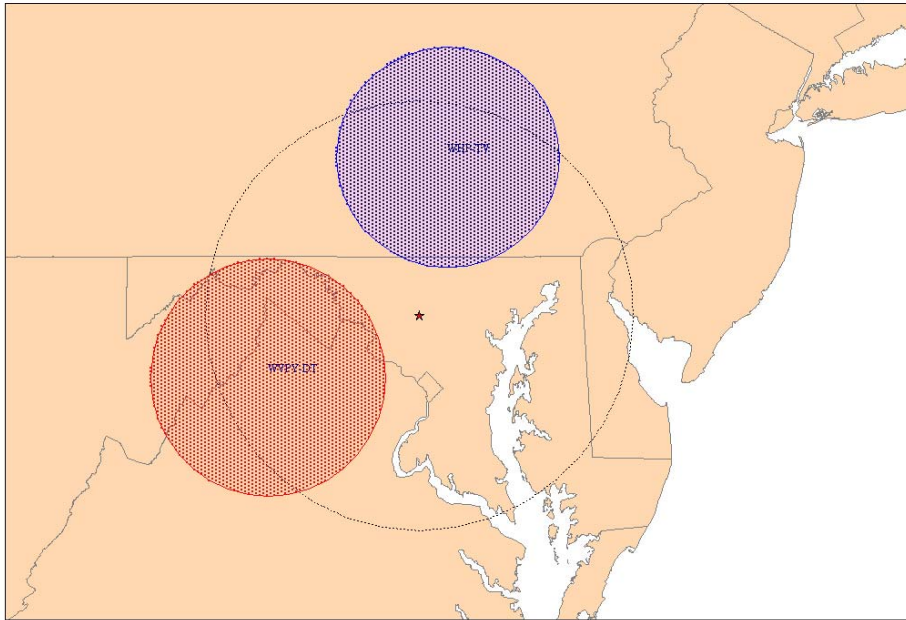


Figure 91. Channel 21 Service Contours Relative to Test Site 4.

Channel 22 - 38.17' N; 077.17' W
 Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

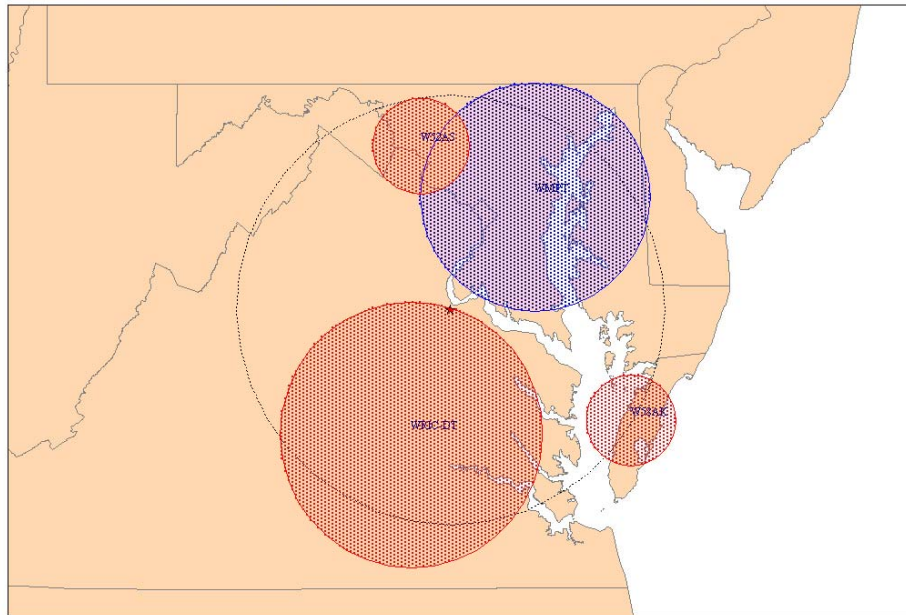


Figure 92. Channel 22 (WRIC-DT) Service Contour Relative to Test Site 4.

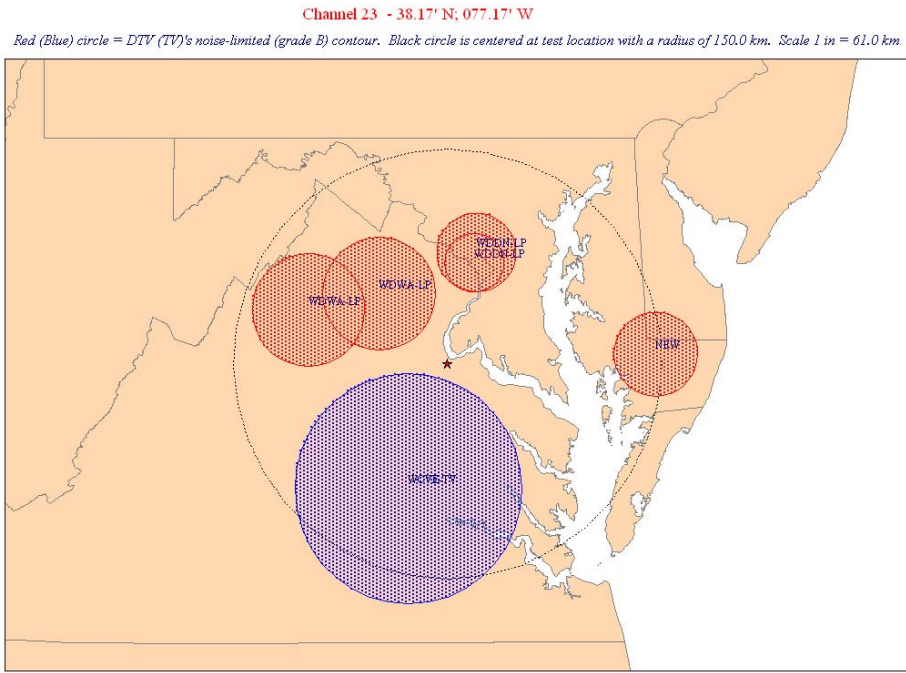


Figure 93. Channel 23 Service Contours Relative to Test Site 4.

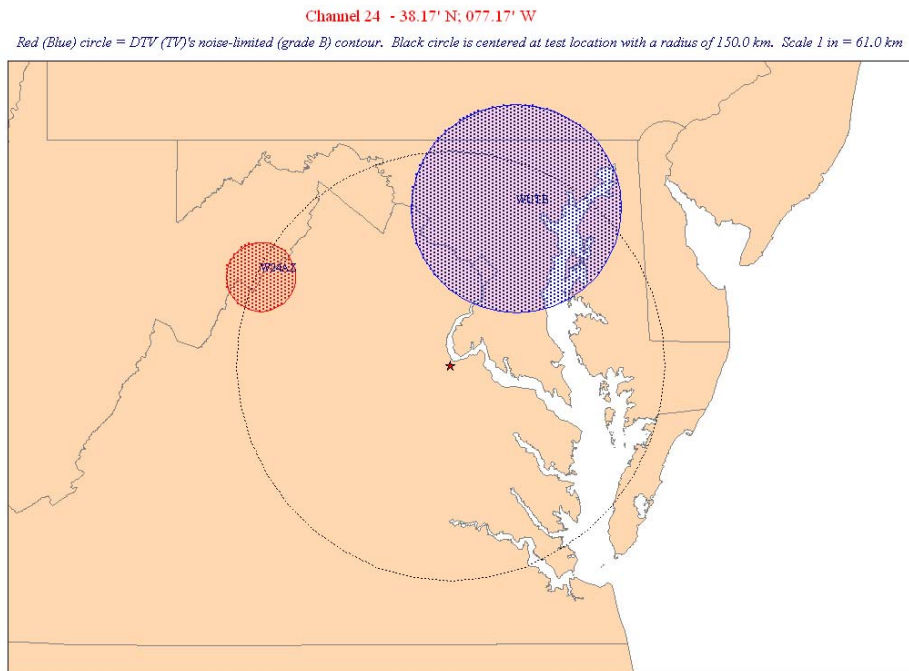


Figure 94. Channel 24 Service Contours Relative to Test Site 4.

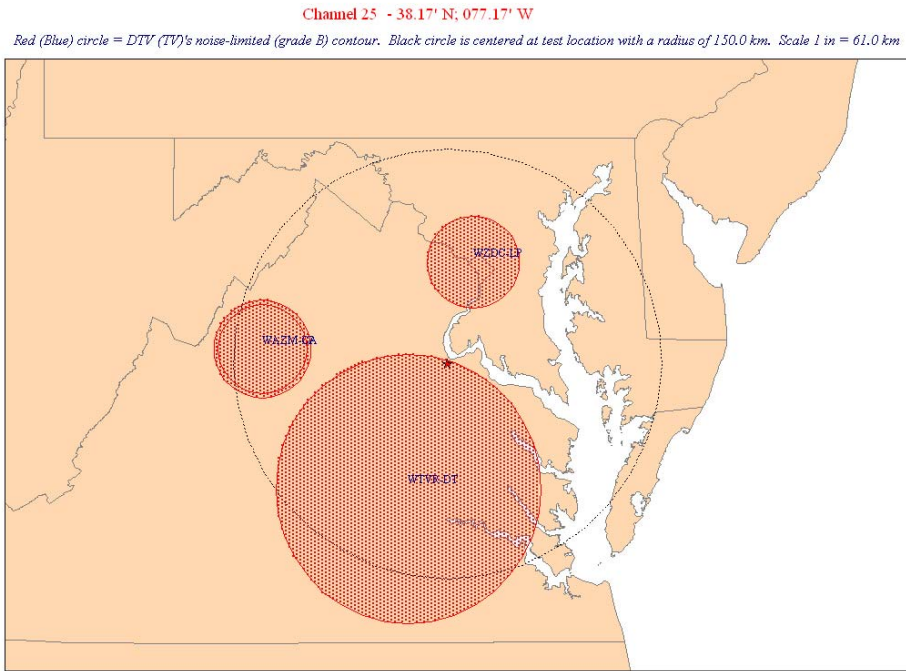


Figure 95. Channel 25 (WTVR-DT) Service Contour Relative to Test Site 4.

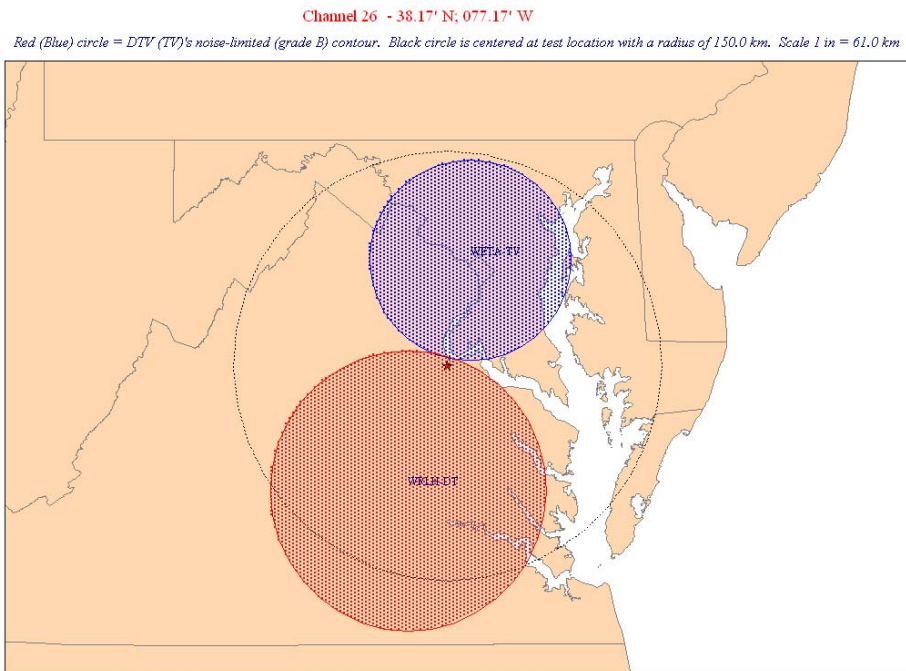


Figure 96. Channel 26 (WRLH-DT) Service Contour Relative to Test Site 4.

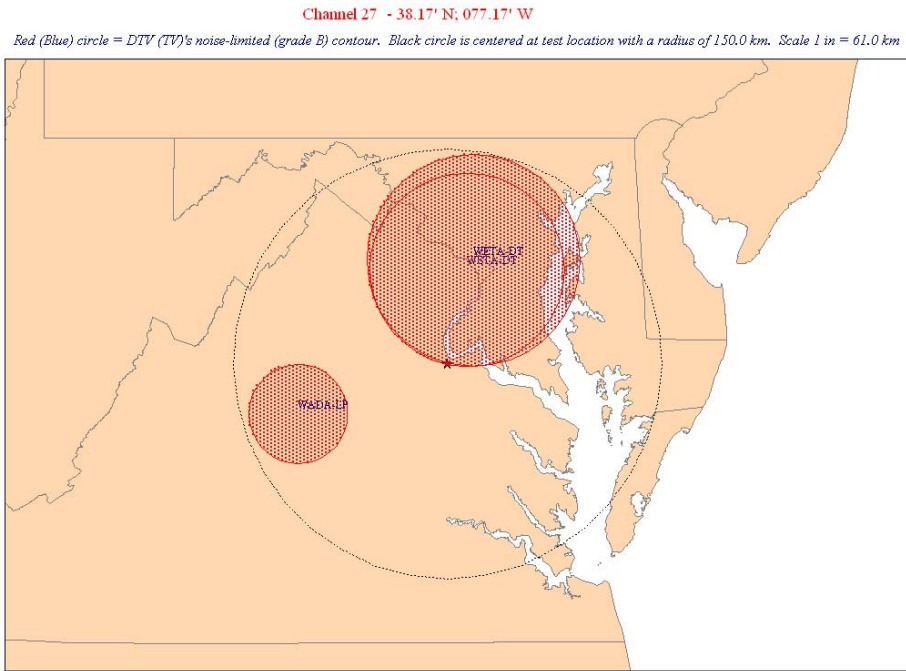


Figure 97. Channel 27 (WETA-DT) Service Contour Relative to Test Site 4.

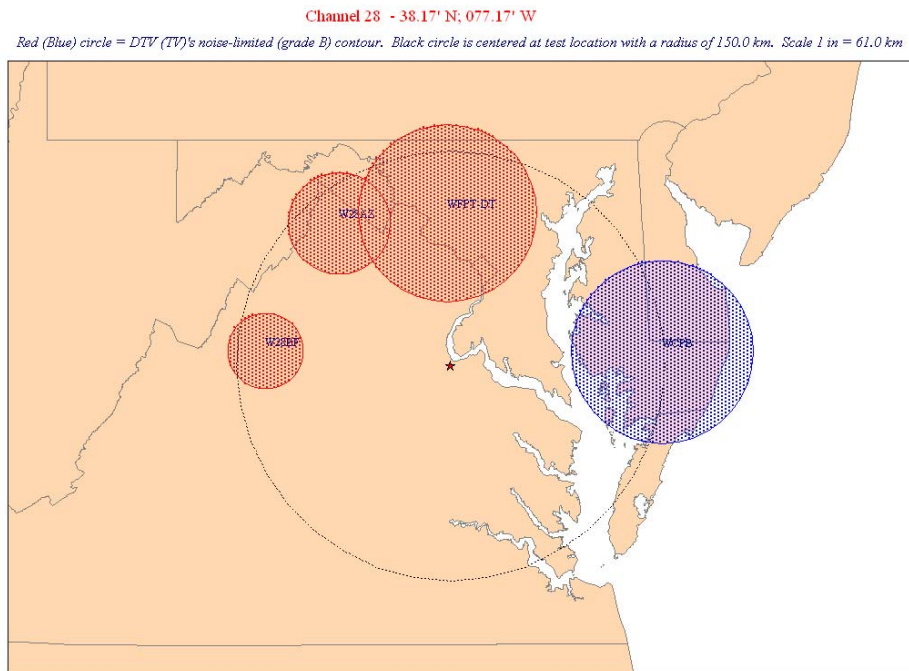


Figure 98. Channel 28 Service Contours Relative to Test Site 4.

Channel 29 - 38.17° N; 077.17° W
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

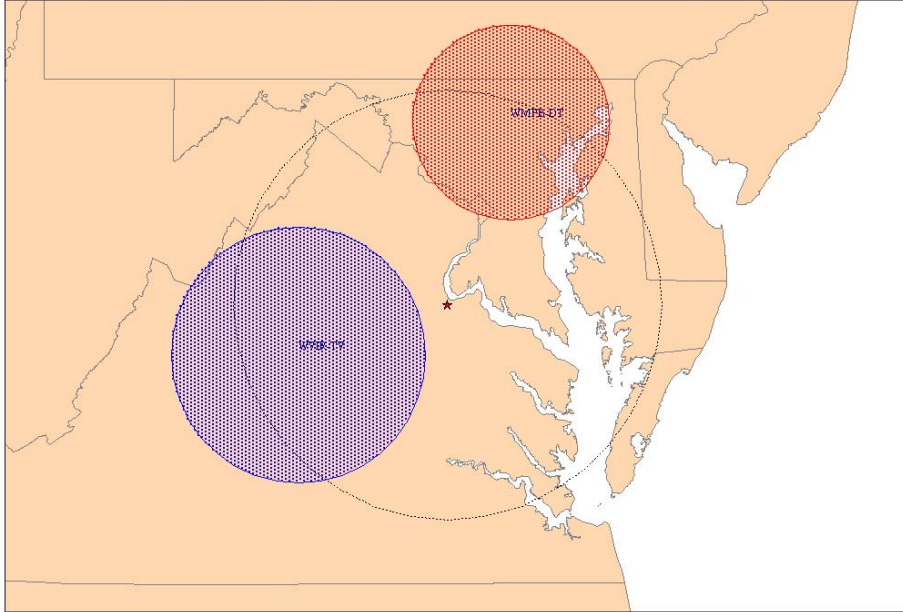


Figure 99. Channel 29 Service Contours Relative to Test Site 4.

Channel 30 - 38.17° N; 077.17° W
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

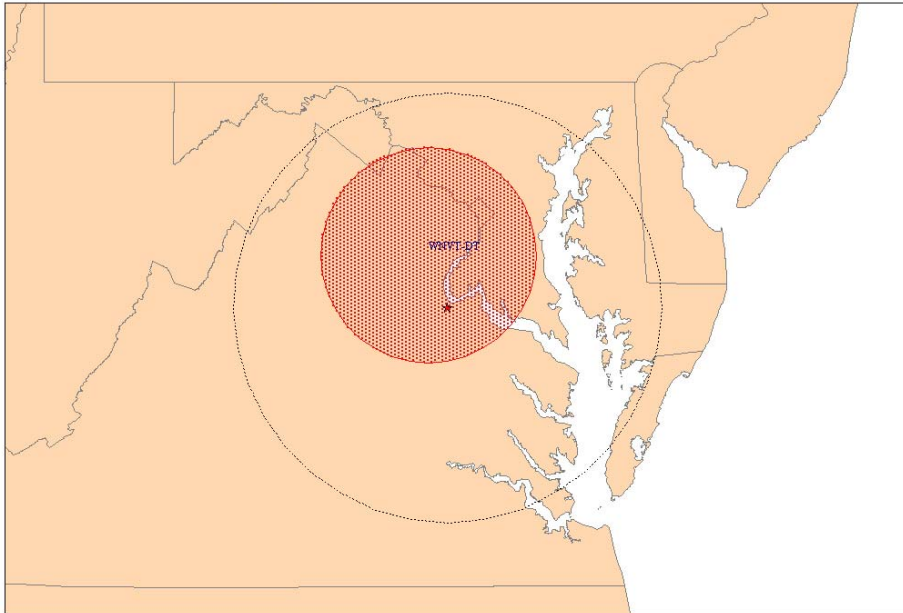


Figure 100. Channel 30 (WNVT-DT) Service Contour Relative to Test Site 4.

Channel 31 - 38.17' N; 077.17' W
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

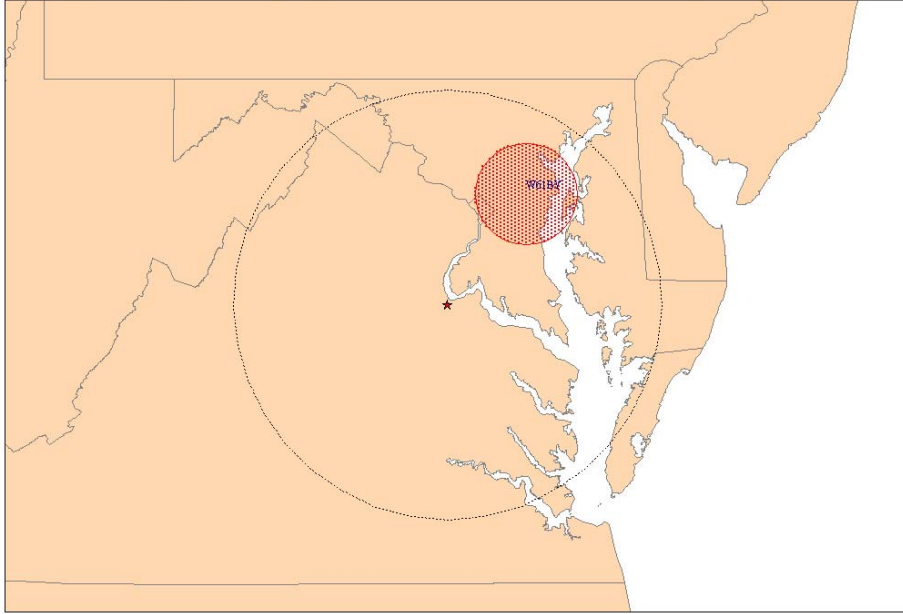


Figure 101. Channel 31 Service Contour Relative to Test Site 4.

Channel 32 - 38.17' N; 077.17' W
Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

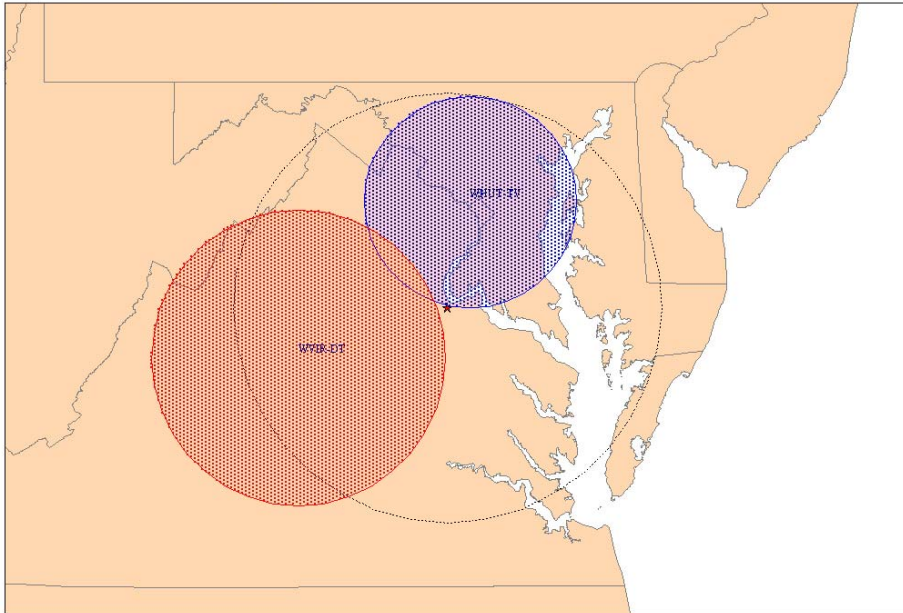


Figure 102. Channel 32 Service Contours Relative to Test Site 4.

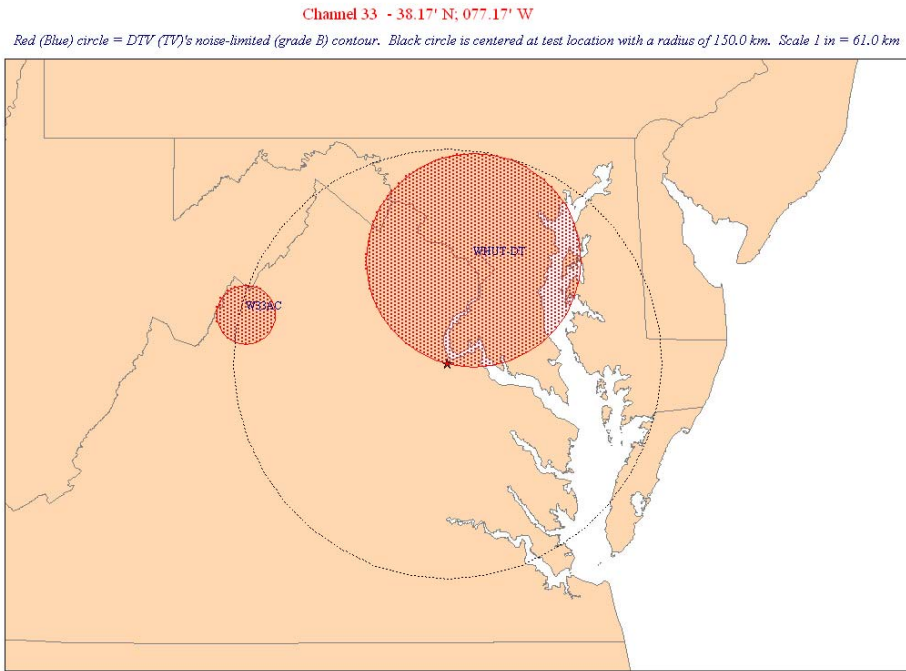


Figure 103. Channel 33 (WHUT-DT) Service Contour Relative to Test Site 4.

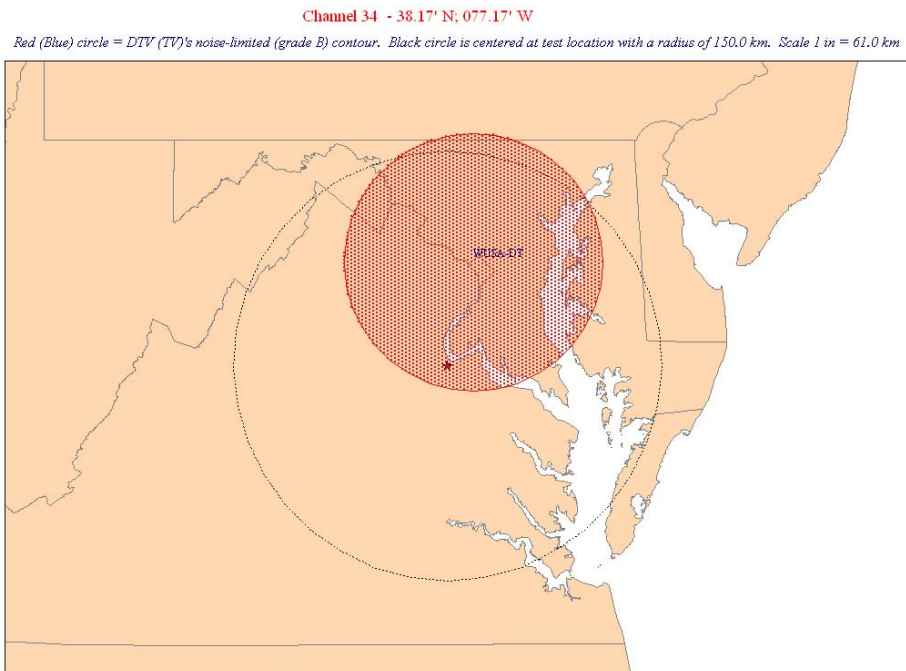


Figure 104. Channel 34 (WUSA-DT) Service Contour Relative to Test Site 4.

Channel 35 - 38.17' N; 077.17' W

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

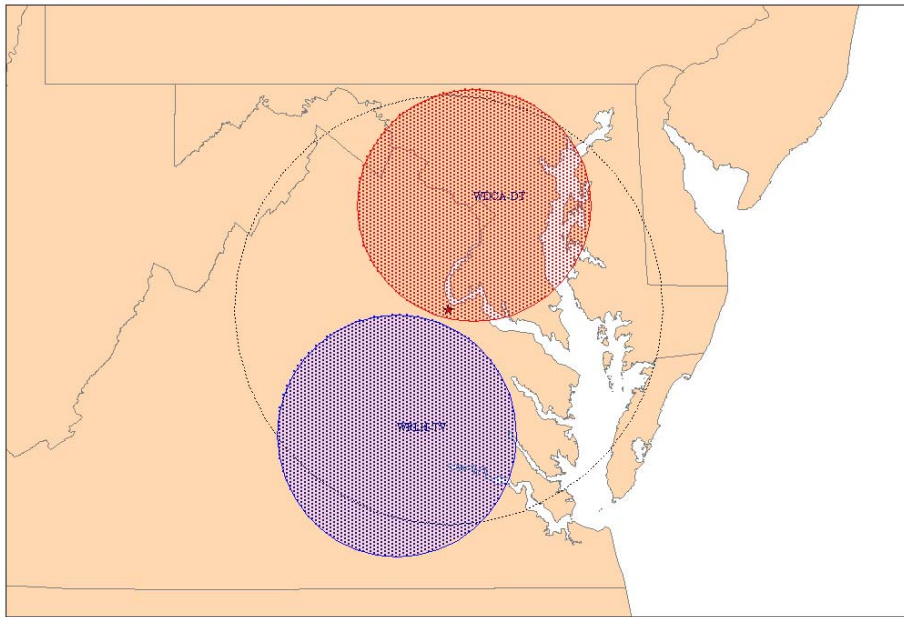


Figure 105. Channel 35 (WDCA-DT) Service Contour Relative to Test Site 4.

Channel 36 - 38.17' N; 077.17' W

Red (Blue) circle = DTV (TV)'s noise-limited (grade B) contour. Black circle is centered at test location with a radius of 150.0 km. Scale 1 in = 61.0 km

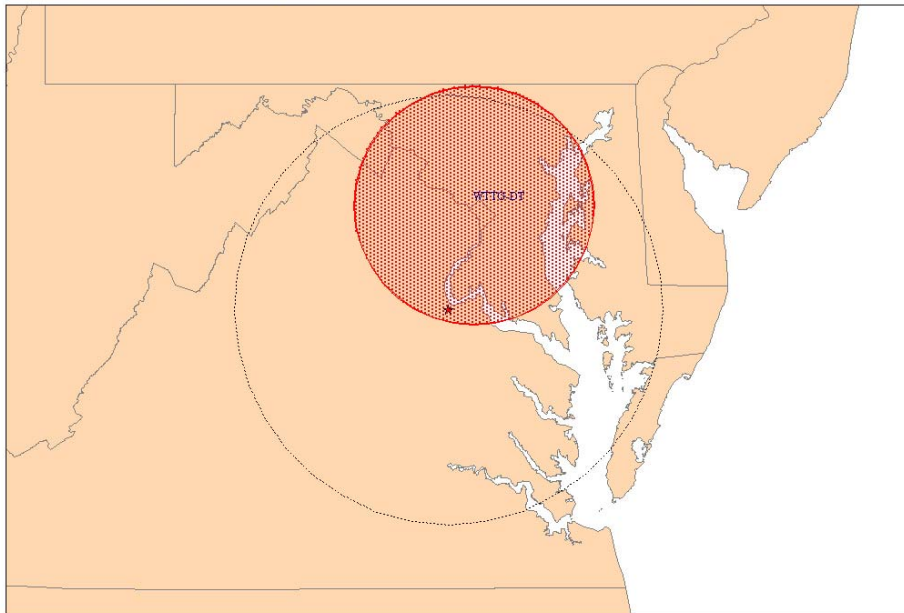


Figure 106. Channel 36 (WTTG-DT) Service Contour Relative to Test Site 4.

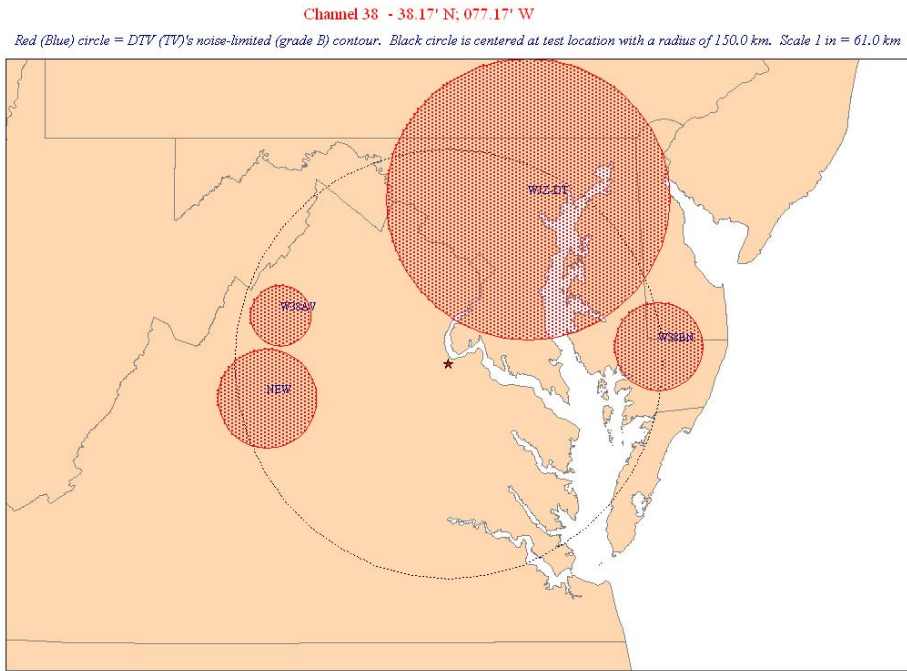


Figure 107. Channel 38 Service Contours Relative to Test Site 4.

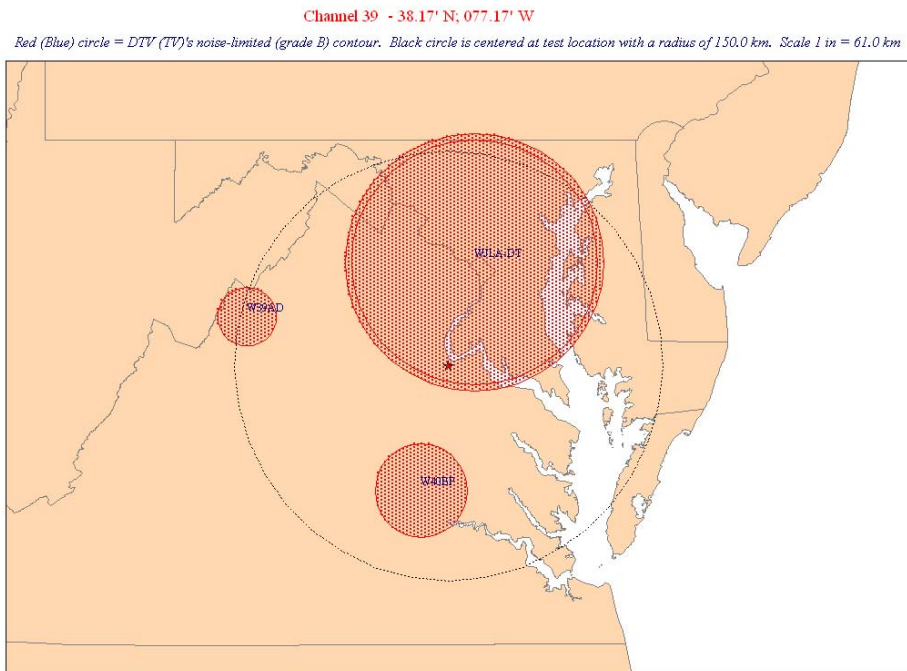


Figure 108. Channel 39 (WJLA-DT) Service Contour Relative to Test Site 4.

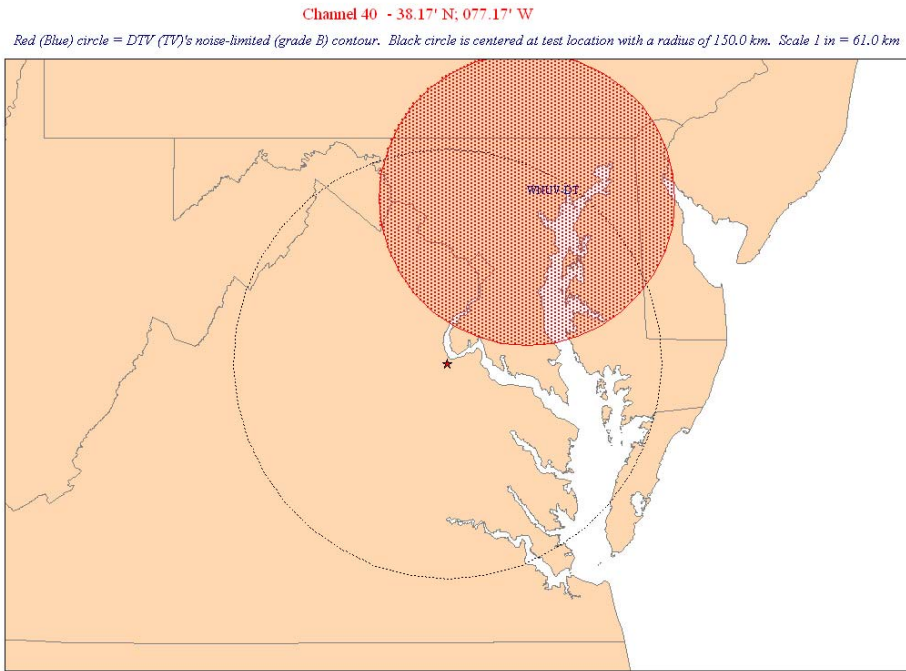


Figure 109. Channel 40 Service Contour Relative to Test Site 4.

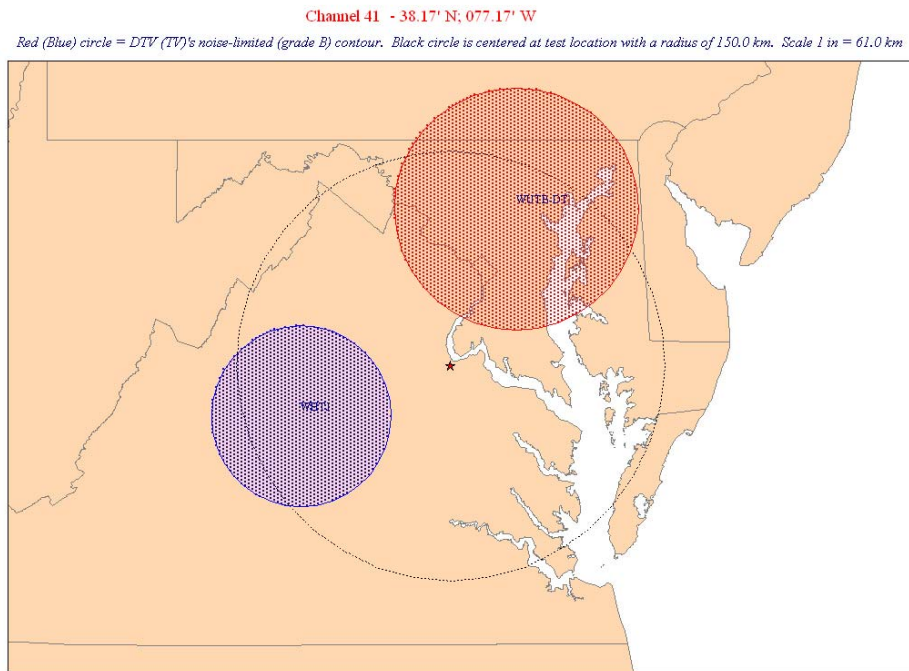


Figure 110. Channel 41 Service Contours Relative to Test Site 4.

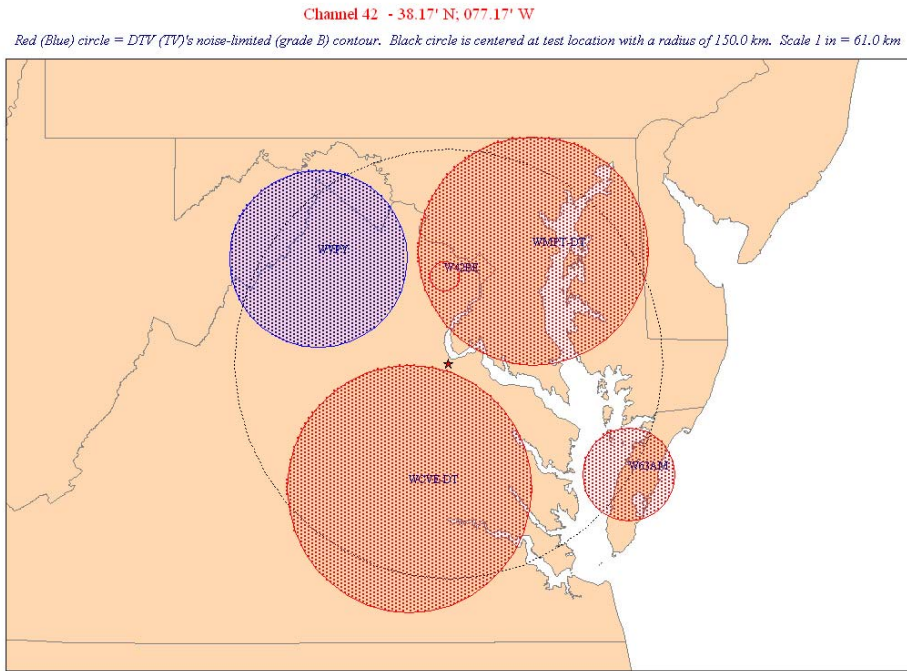


Figure 111. Channel 42 Service Contours Relative to Test Site 4.

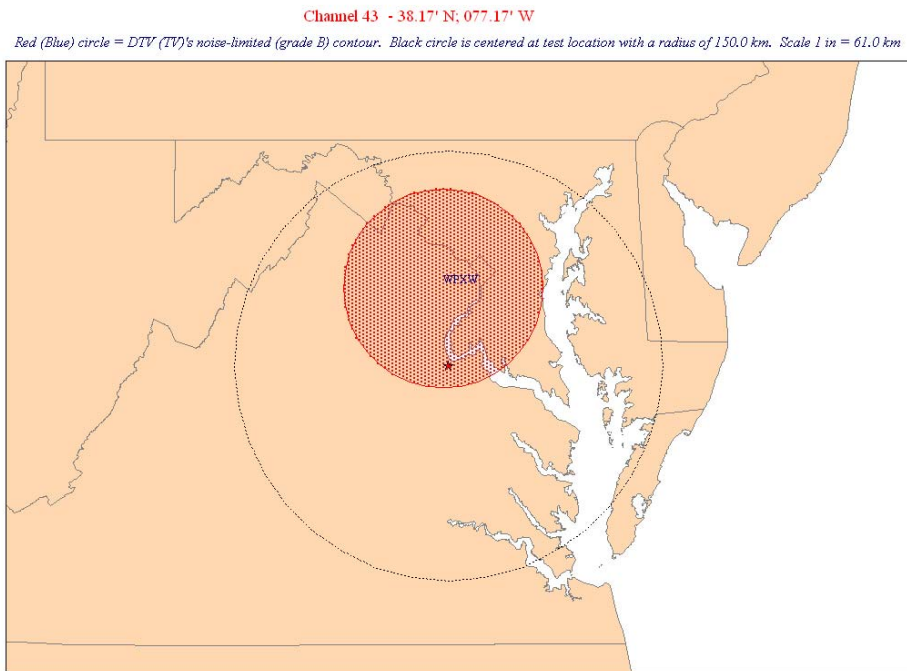


Figure 112. Channel 43 (WPXW-DT) Service Contour Relative to Test Site 4.

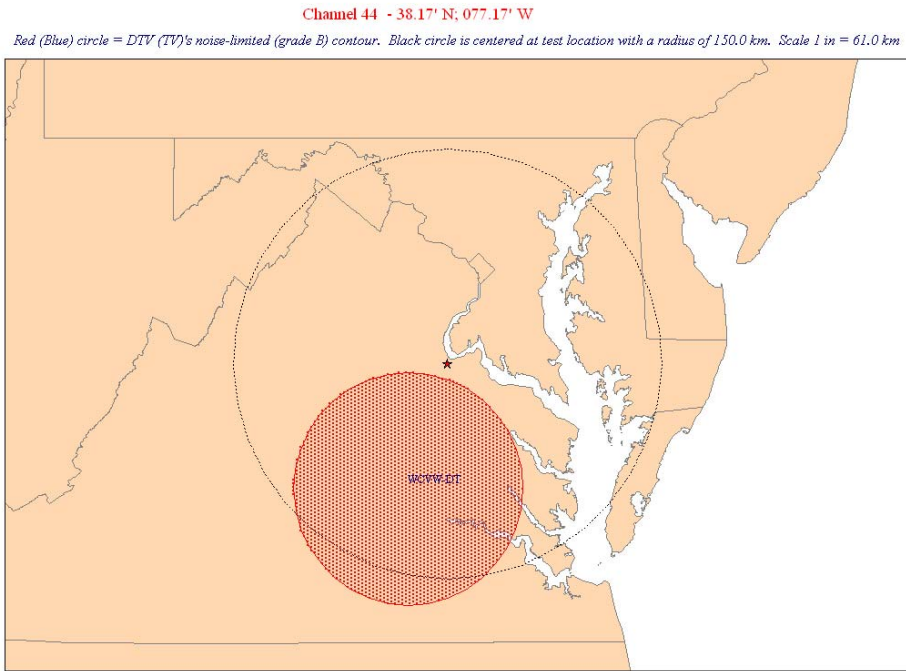


Figure 113. Channel 44 Service Contour Relative to Test Site 4.

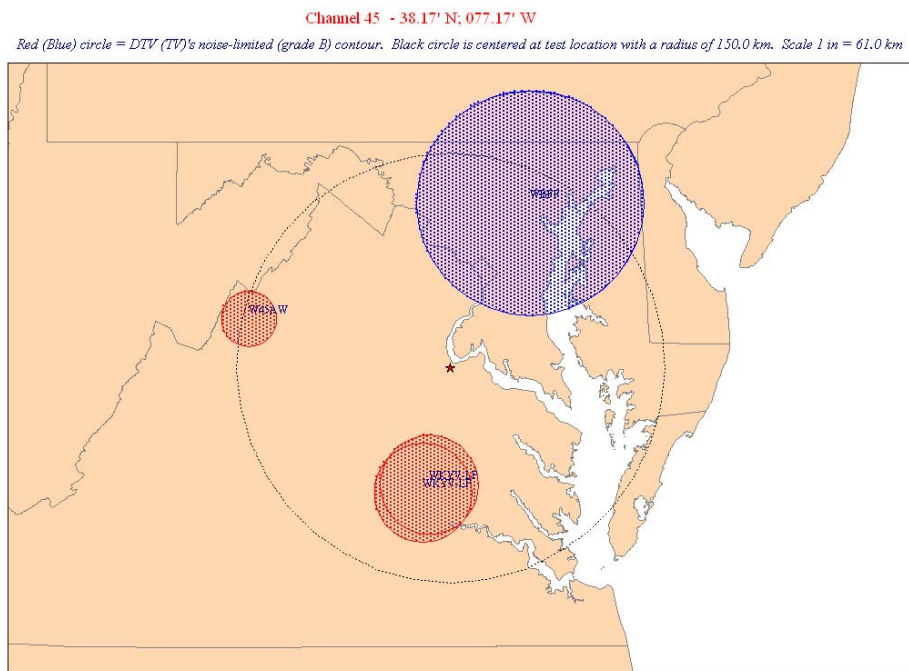


Figure 114. Channel 45 Service Contours Relative to Test Site 4.

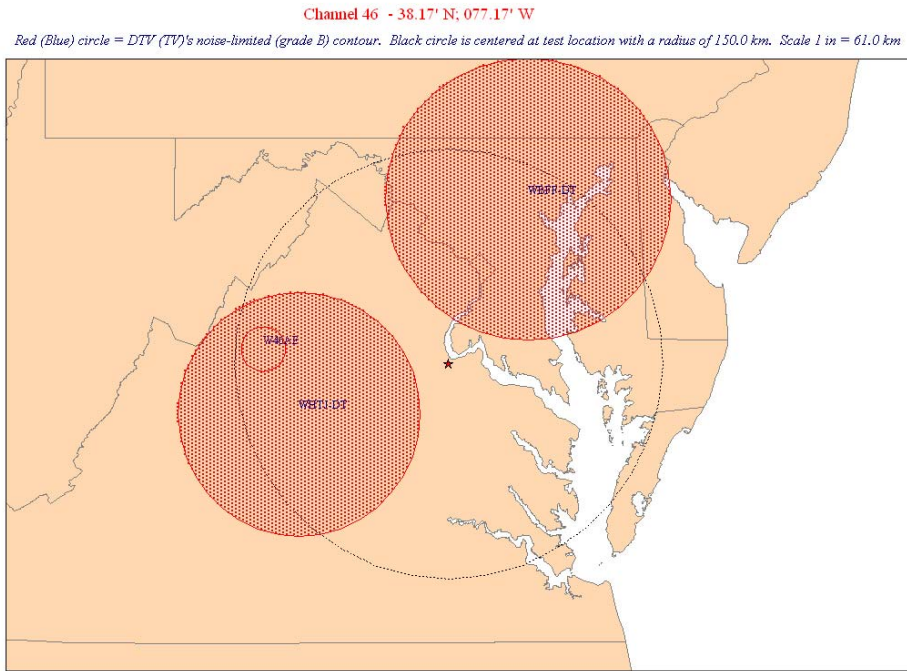


Figure 115. Channel 46 Service Contours Relative to Test Site 4.

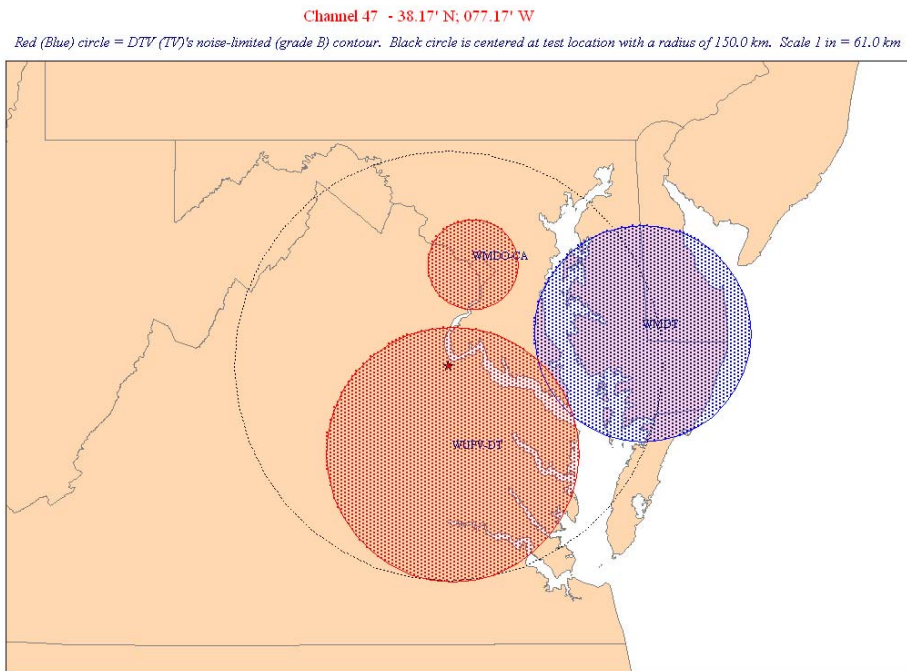


Figure 116. Channel 47 (WUPV-DT) Service Contour Relative to Test Site 4.

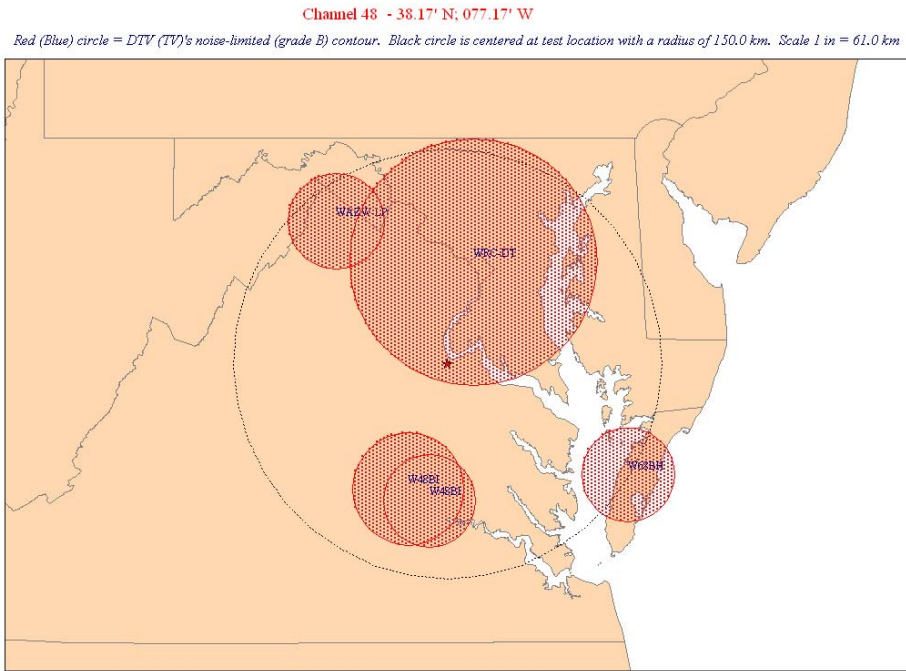


Figure 117. Channel 48 (WRC-DT) Service Contour Relative to Test Site 4.

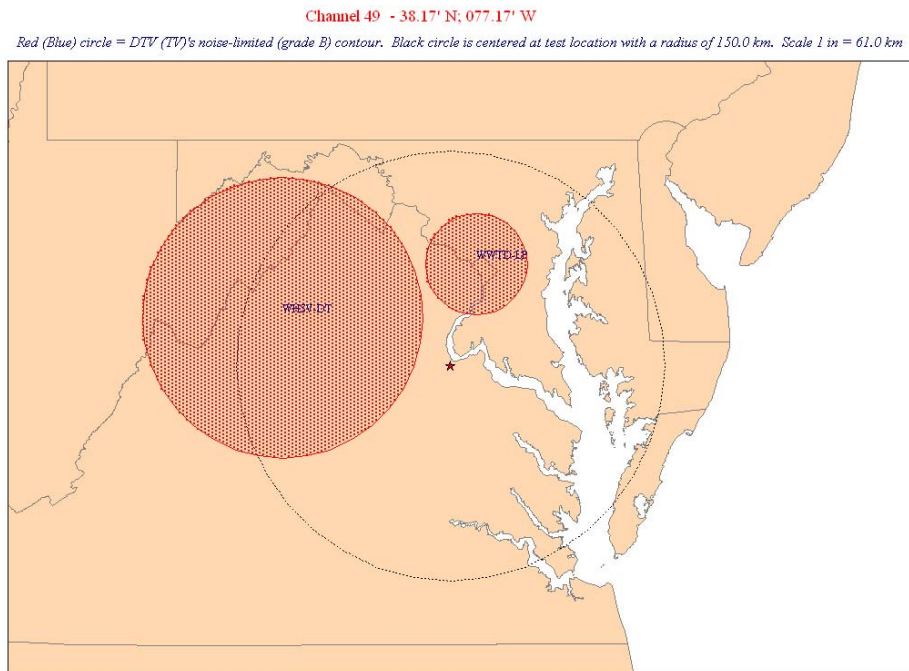


Figure 118. Channel 49 Service Contours Relative to Test Site 4.

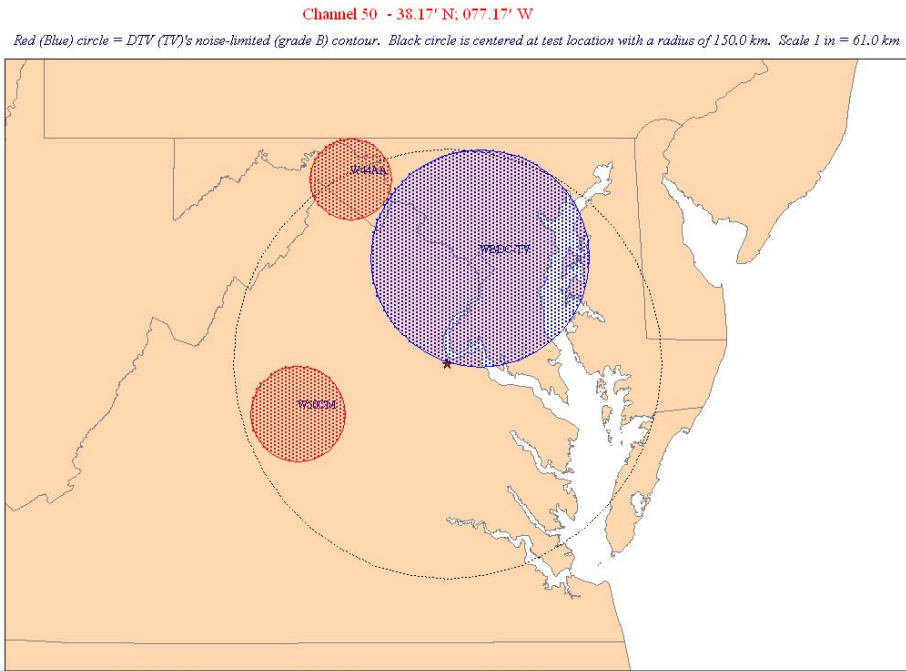


Figure 119. Channel 50 Service Contours Relative to Test Site 4.

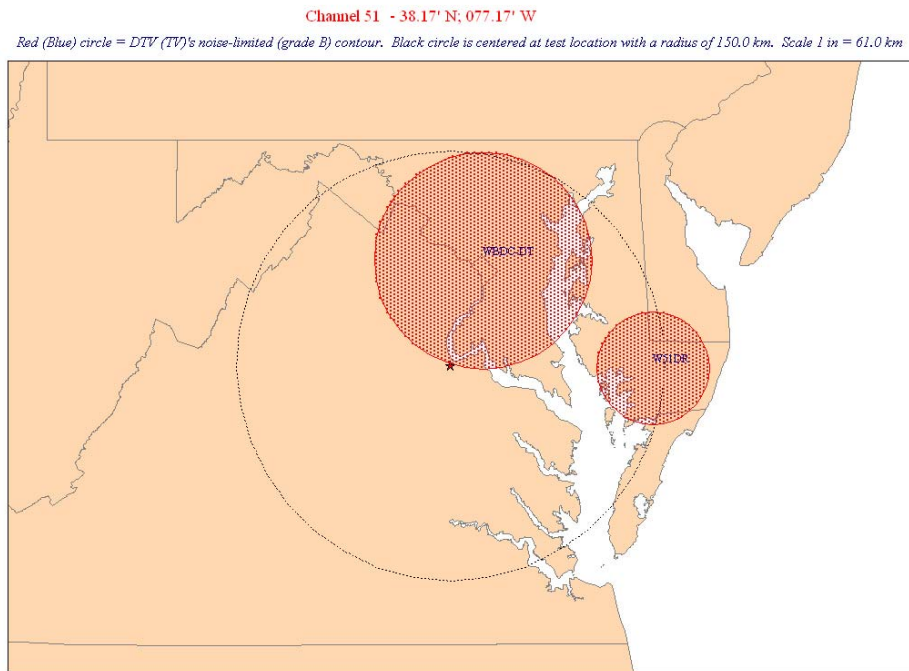


Figure 120. Channel 51 (WDCW-DT) Service Contour Relative to Test Site 4.