

## Exhibit 13.1

### Description of Proposed Antenna System

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1. This single tower will house the diplexed non-directional AM signals of WVAB(AM) – 1550 kHz (Facility ID No. 57611) and WBVA(AM) – 1450 kHz (Facility ID No. 84068). The common non-directional antenna system will consist of one (1) vertical guyed, uniform cross-section steel tower mounted on a base pier and insulator. The tower will employ a 43.3 meter (142 ft) electrical radiator mounted above a 0.9 meter (3 ft) base pier and insulator for a height of 44.2 meters Above Ground Level (AGL). Obstruction lighting is not required. Given the site elevation of 5.8 meters AMSL, the overall height for the tower will stand at 50.0 meters AMSL.
2. The single non-directional tower will employ 7.0 meters (23 ft) of top-loading on each of the three wires in the uppermost guy wire set. The outer ends of the top-loaded guy wires will be connected to each other to form a “top-hat”.
3. The proposed ground system will consist of 120 buried copper radials, extending on average 33.5 meters (110 feet) about the base of the tower. The western side of the ground system, radials will consist of radials running no more than 38.0 (125 feet) meters to length or terminating at property boundaries and or an existing structure already located on the property. The eastern side of the ground system will consist of radials running no more than 53 meters (174 feet) or terminating at property boundaries. Interspersed between each radial will be a stub copper radial extending 15.2 meters (50 feet) in length about the base of the tower. The material used for the radials will be #10 AWG, soft drawn copper wire or equivalent.
4. For operation on 1450 kHz, the WBVA(AM) – Bayside, VA radiating element has been calculated to be a  $75.4^\circ$  radiator with  $12.2^\circ$  of additional top-loading. The ground system has been calculated to employ 120 radials,  $58.3^\circ$  on average, or  $0.162 \lambda$  for operation on 1450 kHz. As a ground system of less than  $1/4$  wavelength ( $\lambda$ ) in length is proposed, a correction factor of  $-25.7 \text{ mV/m @ } 1 \text{ km}$  has been applied (for radial lengths averaging between 0.1601 to 0.1700 wavelengths). Given an uncorrected daytime theoretical efficiency of  $307.133 \text{ mV/m/kW at } 1 \text{ km}$ , a corrected operational efficiency of  $281.433 \text{ mV/m/kW at } 1 \text{ km}$  is proposed.
5. For operation on 1550 kHz, the WVAB(AM) – Virginia Beach, radiating element has been calculated to be a  $80.6^\circ$  radiator with  $13.0^\circ$  of additional top-loading. The ground system has been calculated to employ 120 radials,  $62.4^\circ$  on average, or  $0.173 \lambda$  for operation on 1550 kHz. As a ground system of less than  $1/4$  wavelength ( $\lambda$ ) in length is proposed, a correction factor of  $-22.5 \text{ mV/m @ } 1 \text{ km}$  has been applied (for radial lengths averaging between 0.1701 to 0.1800 wavelengths). Given an uncorrected daytime theoretical efficiency of  $309.824 \text{ mV/m/kW at } 1 \text{ km}$ , a corrected operational efficiency of  $287.324 \text{ mV/m/kW at } 1 \text{ km}$  is proposed.
6. No §73.68 approved sampling system is required as non-directional operation is proposed.

# Exhibit 13.2

## Vertical Plan of Antenna System

The site is located at 418 Davis Road,  
the city of Virginia Beach, Virginia.

### Site Location (NAD 27)

NL: 36° 51' 14.4"

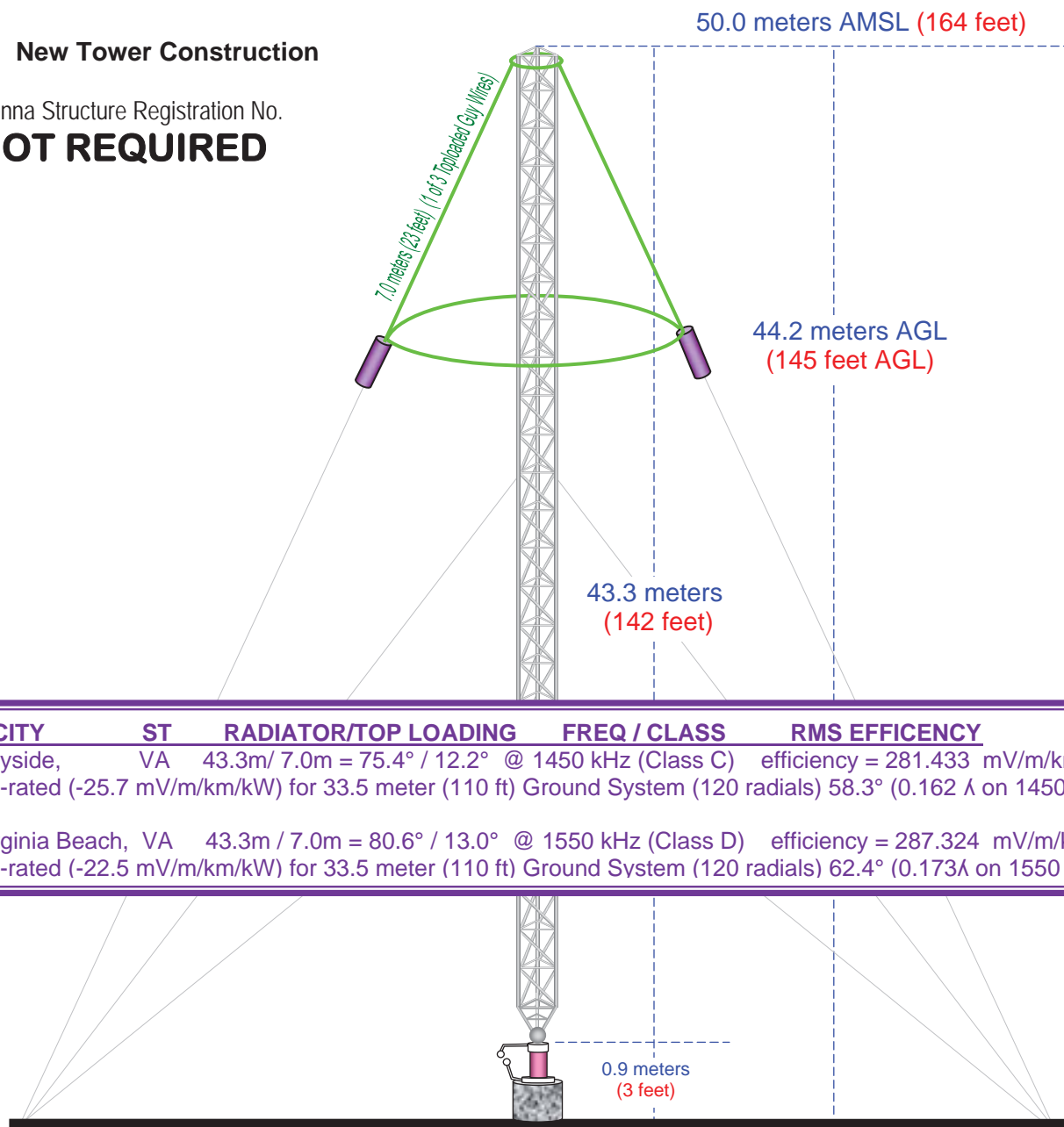
WL: 76° 10' 12.8"

(36-51-14.93 N; 76-10-11.57 W NAD '83)

### NOTE: New Tower Construction

Antenna Structure Registration No.

**NOT REQUIRED**



| CALL   | CITY            | ST | RADIATOR/TOP LOADING                              | FREQ / CLASS                      | RMS EFFICIENCY |
|--|-----------------|----|---|-----------------------------------|----------------|
| WBVA(AM)   | Bayside,        | VA | 43.3m/ 7.0m = 75.4° / 12.2° @ 1450 kHz (Class C)  | efficiency = 281.433 mV/m/km/kW*  |                |
| *Efficiency de-rated (-25.7 mV/m/km/kW) for 33.5 meter (110 ft) Ground System (120 radials) 58.3° (0.162 λ on 1450 kHz). |                 |    |   |                                   |                |
| WVAB(AM)   | Virginia Beach, | VA | 43.3m / 7.0m = 80.6° / 13.0° @ 1550 kHz (Class D) | efficiency = 287.324 mV/m/km/kW** |                |
| *Efficiency de-rated (-22.5 mV/m/km/kW) for 33.5 meter (110 ft) Ground System (120 radials) 62.4° (0.173λ on 1550 kHz).  |                 |    |   |                                   |                |

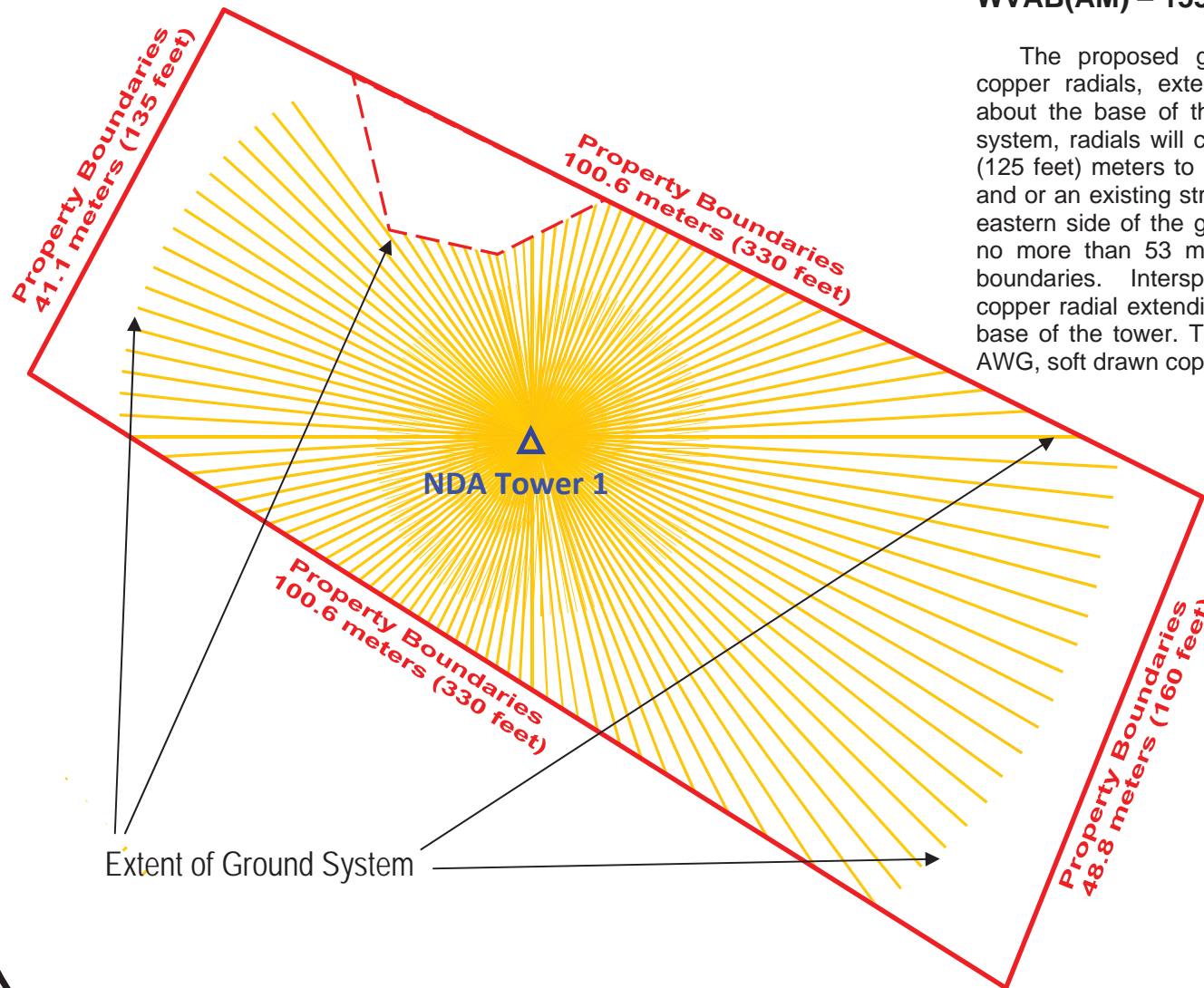
Ground Elevation = 5.8 m AMSL (19 feet)  
Drawing is not to Scale

# Exhibit 13.3

## Horizontal Plat of Antenna Array

WBVA(AM) – 1450 kHz – Bayside, VA  
WVAB(AM) – 1550 kHz – Virginia Beach, VA

The proposed ground system will consist of 120 buried copper radials, extending on average 33.5 meters (110 feet) about the base of the tower. The western side of the ground system, radials will consist of radials running no more than 38.0 (125 feet) meters to length or terminating at property boundaries and or an existing structure already located on the property. The eastern side of the ground system will consist of radials running no more than 53 meters (174 feet) or terminating at property boundaries. Interspersed between each radial will be a stub copper radial extending 15.2 meters (50 feet) in length about the base of the tower. The material used for the radials will be #10 AWG, soft drawn copper wire or equivalent.



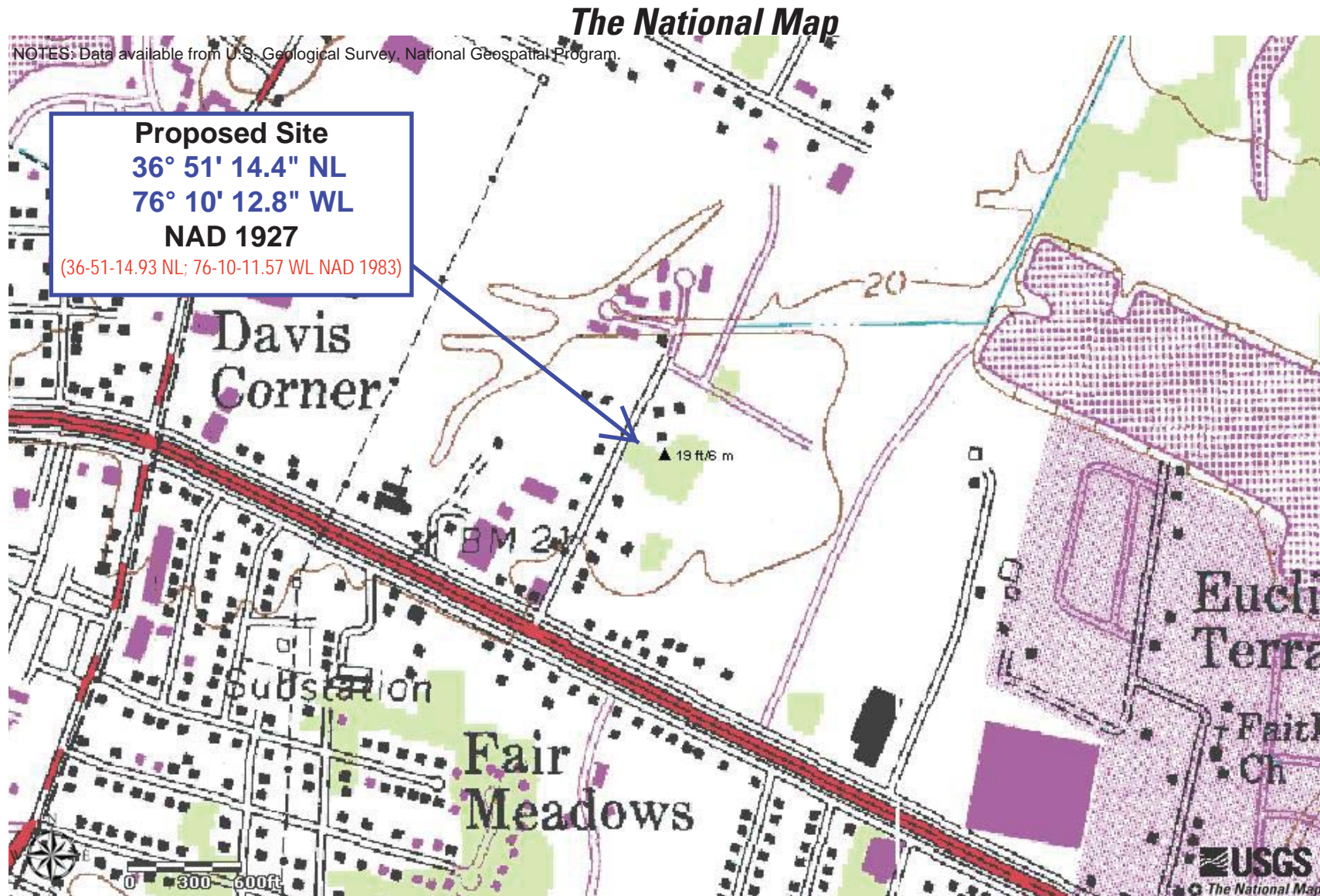
Scale (in meters)





# Exhibit 13.4

## USGS Topographic Map of Proposed Site





# Exhibit 13.5

## USGS Aerial Photograph of Proposed Site

*The National Map*

NOTES: Data available from U.S. Geological Survey, National Geospatial Program.



Geographic Coordinate System (WGS84)

# Exhibit 13.6 Present vs. Proposed Daytime Service Contours

**WBVA.Lmc**  
BAYSIDE, VA  
BL-20010122ANP  
Facility ID: 84068  
Freq: 1450 kHz  
Class: C  
Latitude: 36-51-29 N  
Longitude: 076-09-28 W  
Power: 1 kW  
RMS: 301.7 mV/m @1km  
# Towers: 1

**5.0 mV/m Contour**  
Total Population: 630,992  
Coverage Area: 1,757 sq. km

**2.0 mV/m Contour**  
Total Population: 1,143,795  
Coverage Area: 7,936 sq. km

**0.5 mV/m Contour**  
Total Population: 1,539,122  
Coverage Area: 54,422 sq. km

**WBVA.Pmc**  
BAYSIDE, VA  
Proposed Operation  
Facility ID: 84068  
Freq: 1450 kHz  
Class: C  
Latitude: 36-51-14 N  
Longitude: 076-10-13 W  
Power: 1 kW  
RMS: 281.433 mV/m @1km  
# Towers: 1

**5.0 mV/m Contour**  
Total Population: 631,558  
Coverage Area: 1,394 sq. km

**2.0 mV/m Contour**  
Total Population: 1,108,852  
Coverage Area: 6,336 sq. km

**0.5 mV/m Contour**  
Total Population: 1,527,197  
Coverage Area: 45,903 sq. km

Map M3 Conductivity Data  
U.S. Census 2010 PL Data

Scale 1:1,250,000

0 15 30 45 km

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The community boundaries of Bayside, VA no longer exist as this city has been incorporated into the larger community of Virginia Beach, VA. However, the city of Virginia Beach has retained the existing Bayside High School. Therefore the Voting District Boundaries for the Bayside High School have been employed as the Bayside Community Boundaries here-in.

**Bayside School District  
Voting Boundaries**  
Total Population: 4,683  
Total Area: 5.36 km<sup>2</sup>

**Licensed 26.3 mV/m N.I.F.  
Coverage of Bayside, VA**  
Total Population: 2,596  
Total Area: 3.77 km<sup>2</sup> (70.34%)

**Proposed 26.3 mV/m N.I.F.  
Coverage of Bayside, VA**  
Total Population: 1,539  
Total Area: 2.95 km<sup>2</sup> (55.04%)

## Exhibit 13.7 Present vs. Proposed Nighttime Interference Free Service Contours

**WBVA.Lmc  
BAYSIDE, VA**  
BL-20010122ANP  
Facility ID: 84068  
Freq: 1450 kHz  
Class: C  
Latitude: 36-51-29 N  
Longitude: 076-09-28 W  
Power: 1 kW  
RMS: 301.7 mV/m @1km  
# Towers: 1

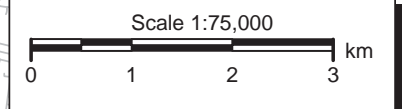
**26.3 mV/m N.I.F. Contour**  
Total Population: 100,213  
Coverage Area: 80 sq. km

**WBVA.Pmc  
BAYSIDE, VA**  
Proposed Operation  
Facility ID: 84068  
Freq: 1450 kHz  
Class: C  
Latitude: 36-51-14 N  
Longitude: 076-10-13 W  
Power: 1 kW  
RMS: 281.433 mV/m @1km  
# Towers: 1

**26.3 mV/m N.I.F. Contour**  
Total Population: 95,072  
Coverage Area: 73 sq. km



Map M3 Conductivity Data  
U.S. Census 2010 PL Data



"+" Represents U.S. Census 2010 PL Centroid Datum

## Exhibit 13.8 Present & Proposed 1.0 V/m "Blanket" Contours

*Licensed 1.0 V/m "Blanket" Contour*

WBVA.Lmc

*Proposed 1.0 V/m "Blanket" Contour*

WBVA.Pmc

**WBVA.Lmc**  
BAYSIDE, VA  
BL-20010122ANP  
Facility ID: 84068  
Freq: 1450 kHz  
Class: C  
Latitude: 36-51-29 N  
Longitude: 076-09-28 W  
Power: 1 kW  
RMS: 301.7 mV/m @1km  
# Towers: 1

1.0 V/m "Blanket" Contour  
Total Population: 552 (0.52%)

25 mV/m Contour  
Total Population: 105,433

**WBVA.Pmc**  
BAYSIDE, VA  
Proposed Operation  
Facility ID: 84068  
Freq: 1450 kHz  
Class: C  
Latitude: 36-51-14 N  
Longitude: 076-10-13 W  
Power: 1 kW  
RMS: 281.433 mV/m @1km  
# Towers: 1

1.0 V/m "Blanket" Contour  
Total Population: none



Map M3 Conductivity Data  
U.S. Census 2010 PL Data

Scale 1:10,000

