



NATIONAL RADIO ASTRONOMY OBSERVATORY

POST OFFICE BOX 2
GREEN BANK, WV 24944-0002
NRQZ OFFICE TELEPHONE (304) 456-2107
HTTP://WWW.GB.NRAO.EDU/

FAX (304) 456-2276
NRQZ@NRAO.EDU

October 24, 2019

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NRQZ ID: 12021-01 29MAR2019

Gray Television Licensee, LLC
c/o Joseph M. Davis, P.E.
Chesapeake RF Consultants LLC
207 Old Dominion Road
Yorktown, VA 23692

| | |
|--------------------------------|----------------------------------|
| Application Reason/Purpose | Prior coordination notification |
| File Number | Shall be provided by applicant |
| Applicant Name | Addressee |
| Call Sign | WSVF-CD |
| Site Name or Loc | Massanutten – Channel 36 |
| Nearest City/State | Harrisonburg, VA |
| N Latitude | 38 23 34.8 |
| W Longitude | 78 46 11.9 |
| Ground Elevation (m) / AGL (m) | 890.6 / 22.6 |
| Freq. Band (MHz) | 602 – 608 |
| Emission Designator | DTV |
| System Configuration | See attached "Final Engineering" |
| Previous NRAO Coordination No. | NRQZ ID 10737 REV1_13MAR2017 |
| Current NRAO Coordination No. | NRQZ ID 12021-01_29MAR2019 |

Dear Applicant:

The National Radio Quiet Zone (NRQZ) has evaluated these facilities to determine the interference impact on our highly sensitive radio astronomy operations.

Special Condition:

The National Radio Astronomy Observatory (NRAO), Green Bank, WV, objects unless the Applicant's license is restricted to an Effective Radiated Power (ERP) of 4.4 Watts at Azimuth 273.1 degrees True North.

To meet this Special Condition, the Applicant shall:

1. Use the final engineering submitted by Joseph Davis, Chesapeake RF Consultants, indicating that all facilities meet the ERP restriction.
2. Arrange for the requested site inspection to verify the implementation of this Special Condition.
3. Post a copy of this document and associated attachments at the Transmit facility.
4. Provide a Construction Notification as defined by the FCC for your specific radio service.

Reference Copy - Special Condition Statement



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Regulatory

The NRQZ Office requests that:

1. The FCC places the Special Condition on the Station License.
2. This Letter of Concurrence be attached to the FCC application.
3. The applicant provides the NRQZ Office with notice of its official filing with the FCC per section 47CFR1.924 (a) (2).

The National Radio Astronomy Observatory (NRAO) site located at Green Bank, Pocahontas County, WV, has no objection to this frequency assignment provided the special conditions are met.

The Sugar Grove Research Station, the former Naval Radio Research Observatory (NRRO), located at Sugar Grove, Pendleton County, WV has no objections to this frequency assignment.

This letter constitutes coordination of assignment in the National Radio Quiet Zone as required by the FCC Rules and Regulations 47CFR1.924.

If I may be of assistance, please feel free to contact me.

Sincerest regards,

Paulette W. Woody
NRQZ Office Administrator
PWW:pww

file: 12021-01 WSVF-CD Massanutten Channel 36.docx

Attachments: Final Engineering Worksheet

This concurrence remains valid provided the data contained within is consistent with the applicant's filing at the Commission. Any discrepancy in system parameters, such as geographical coordinates (Latitude, Longitude, AMSL), antenna height above ground level (AGL), antenna gains or directivity (orientation), channel (operating frequency or frequency bands), emission type, and power requires re-coordination. If the Commission has questions regarding the validity of this or any concurrence, please direct inquiries to nrqz@nrao.edu or 304-456-2107.

Reference Copy - Special Condition Statement

6/7/2019 DATE

NRQZ# 12021-01 / 10737 Massanutten
<http://www.ngdc.noaa.gov/geomag-web/#declination>

Magnetic Declination Correction 9.7 ° West
(Value only)

Location: WSVF-CD Massanutten (shared antenna with WHSV-TV DRT1 Ch-34) Latitude: 38 23 34.8 (ddmmss.s)
Longitude: 78 46 11.9 (ddmmss.s)
Ground Elev.: 890.6 Meters 2921.9 Ft
Antenna Ht.: 22.6 Meters 74.1 Ft
Frequency: 602 - 608 MHz TV Channel 36

NRAO AERP (watts) 4.4 watts at 273.1 ° True (Φd)
Scatter watts at 273.1 ° True
watts at 273.1 ° True

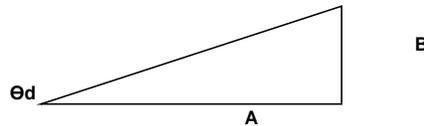
Reference Copy - Special Condition Statement

Table with 3 columns: Sector Name or Indicator, 1 - Hpol, 2 - Vpol. Rows include Antenna Type, Maximum Antenna Gain, Antenna Azimuth, Az to GBT on Antenna Pattern, Antenna Gain to GBT, Mechanical Downtilt, Loss to GBT Due to Mechanical Downtilt, Transmitter Output Power, System Losses, Lightning Arrestor, Main Line, RF Filter, Misc. connectors, etc., System Loss, Power to Antenna, Main Beam Power, ERPd to GBT.

Antenna azimuth pattern supplied is already rotated to the desired orientation. Pattern is centered at 93°T

Total ERPd Hpol plus Vpol at 273°T. 1.91 Watts Total to GBT

Power at output of duplexer 1380.28 1380.28



Enter 1st Obstacle Information provided by NRQZ office

42.21 km to 1st Obstacle A = Distance to 1st Obstacle in Feet 138484
2996.06 TX AMSL (ft) B = Ant Ht AMSL minus Ht of 1st Obs -1051.077008
4047.14 AMSL 1st Obstacle Theta_d = arctan(B/A) = -0.43 °

A -Theta_d value indicates that the first obstacle is above the horizon
A +Theta_d value indicates that the first obstacle is below the horizon

Effective mechanical downtilt adjustment:

Effective Elevation = Theta_d - Theta_bt cos(Phi_d - Phi_bt) = 0.0 0.0 0.0
Effective Elevation Adjustment = 0.0 ° 0.0 ° 0.0 °

Definitions:

- Phi_d = Azimuth to GBT
- Phi_bt = Azimuth of mechanical beam tilt (verticle)
- Theta_d = Elevation to 1st obstacle (negative above horizon)
- Theta_bt = Elevation of antenna mechanical beam tilt (neg. above horizon)

Note: No adjustments for electrical beam tilt are required because the pattern data already accounts for this

Effective azimuth on horizontal pattern = Phi_d - Antenna Azimuth (True) {If AZ<0, then add 360}
Effective elevation on vertical pattern = Theta_d - Theta_bt cos(Phi_d - Phi_bt) {If ELEV<0, then add 360}

Antenna Gain = HPAT(Eff AZ) + VPAT(Eff ELEV) + Max Gain