

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington DC 20554**

In the Matter of)	
)	
Amendment of Section 73.622,)	MB Docket No. 21-148
Digital Television Table of Allotments)	
For WVPT(TV), Staunton, VA)	Rulemaking No. 11910
(Facility 60111))	

To: Office of the Secretary, Federal Communications Commission
Attn: Chief, Media Bureau

AMENDED PETITION FOR RULEMAKING

VPM Media Corporation (“VPM”), licensee of noncommercial educational television station WVPT(TV) (“WVPT” or “the Station”), Staunton, Virginia, hereby submits this amendment to its petition (the “Petition”) for the Commission to institute a rulemaking proceeding for the purpose of amending the DTV Table of Allotments (the “DTV Table”) contained in Section 73.622(i) of the Commission’s rules.¹ On June 15, 2021, in response to VPM’s Petition, the Commission issued a Notice of Proposed Rulemaking² in which it proposed to amend the DTV Table to substitute UHF Channel 15 (reserved educational) for VHF Channel 11 (reserved educational).³ The instant

¹ See 47 C.F.R. §§ 1.401, 1.420, 73.622(i).

² *In the Matter of Amendment of Section 73.622(i), Post-Transition Table of DTV Allotments, Television Broadcast Stations (Staunton, Virginia)*, Notice of Proposed Rulemaking, 36 FCC Rcd. 9828 (rel. June 15, 2021) (the “NPRM”).

³ In the Closing and Channel Reassignment Public Notice, the FCC assigned WVPT to transition from channel 11 to channel 12. *See Incentive Auction Closing and Channel Reassignment Public Notice: The Broadcast Television Incentive Auction Closes; Reverse Auction and Forward Auction Results Announced; Final Television Band Channel Assignments Announced; Post-Auction Deadlines Announced*, Public Notice, 32 FCC Red 2786 (WTB & MB 2017). VPM has a pending construction permit to relocate WVPT to channel 12, on which it is operating pursuant to special temporary authorization, but the Station is still licensed to operate on channel 11. *See* File Nos.

amendment proposes new technical parameters, set forth in the attached Engineering Statement, as a result of VPM's discussions with the National Radio Astronomy Observatory ("NRAO").⁴ As set forth herein, modification of the DTV Table of Allotments based on the revised technical parameters will continue to create a preferential arrangement of allotments by expanding the availability of free over-the-air television service in this market.

The FCC has described the goal of the DTV Table as ensuring the provision of digital television service "to the American people in an expeditious and efficient manner."⁵ In considering channel substitution requests, the Commission considers the petitioner's public interest justification and whether the proposal would comply with the principal community coverage requirements of Section 73.625(a).⁶

This channel substitution serves the public interest in at least two ways.

0000028448 (construction permit); 0000129932 (tolling); BLEDT-20130214ACP (license).

⁴ A Letter of Concurrence from the NRAO confirming that neither the NRAO site located at Green Bank nor the Sugar Grove Research Station object to this frequency assignment, subject to continued coordination with NRAO, is attached hereto.

⁵ See, e.g., *In the Matter of Amendment of Section 73.622(B), Table of Allotments, Digital Television Broadcast Stations (Nampa, Idaho)*, Report and Order, 19 FCC Rcd. 4491, 4493 (2004); *In the Matter of Amendment of Section 73.622(B), Table of Allotments, Digital Television Broadcast Stations (In the Matter of Amendment of Section 73.622(B), Table of Allotments, Digital Television Broadcast Stations (Albany, New York)*, 19 FCC Rcd. 4279, 4331 (2004); see also *In the Matter of Advanced Television Systems & Their Impact Upon the Existing Television Broadcast Service*, 12 FCC Rcd. 14588 ¶ 76 (1997).

⁶ See, e.g., *In Re Amendment of Section 73.622(i), Post-Transition Table of DTV Allotments, Television Broadcast Stations (Mesa, Arizona)*, Notice of Proposed Rulemaking, MB Docket No. 20-331, RM-11863, DA-20-1192 (rel. Oct. 13, 2020) ("Mesa NPRM"); *In Re Amendment of Section 73.622(b), Table of Allotments, Digital Television Broad. Stations, Ontario, CA*, Notice of Proposed Rulemaking, 16 FCC Rcd. 2276 (2001); *In Re Amendment of Section 73.606(b), Table of Allotments, Television Broad. Stations, Moscow, Idaho*, Notice of Proposed Rulemaking, 17 FCC Rcd. 19447 (2002).

First, it will resolve significant over-the-air (“OTA”) reception problems in WVPT’s existing service area.⁷ With viewers increasingly reliant on OTA signals to receive the most valued video content,⁸ providing a strong broadcast signal is more important than it has been in decades. Yet, the challenges with digital reception of VHF signals are well-documented. Ten years ago, the Commission recognized the deleterious effects manmade noise has on the reception of VHF signals, finding that “the propagation characteristics of these channels allow undesired signals and noise to be receivable at relatively farther distances, nearby electrical devices tends to emit noise in this band that can cause interference, and reception of VHF signals requires physically larger antennas ... relative to UHF channels.”⁹ The Commission also observed the “large variability in the performance (especially intrinsic gain) of indoor antennas available to consumers,

⁷ See *Mesa NPRM* ¶ 6 (recognizing effect of “VHF propagation challenges”); *In Re Amendment of Section 73.622(b), Table of Allotments, Digital Television Broadcast Stations, Missoula, Mt*, Notice of Proposed Rulemaking, 16 FCC Rcd. 2227 (2001) (finding that proposal to substitute channels to improve signal coverage and eliminate interference “warrants consideration”).

⁸ See, e.g., Parks Associates, *TV Antenna Usage in US Broadband Households Jumped to 25% in 2019 and Is Expected to Grow More as COVID-19 Keeps Consumers at Home* (Mar. 26, 2020), <http://www.parksassociates.com/blog/article/pr-02762020> (finding that OTA viewing increased from 15% in 2018 to 25% in 2019); Phil Kurz, *New Research Reveals Resurgence in OTA Antenna Viewing*, TVTechnology (Apr. 29, 2019), available at <https://www.tvtechnology.com/news/new-research-reveals-resurgence-in-ota-antenna-viewing> (finding that viewers consume 19% of viewing time over the air); *The Evolving Over-the-Air Home*, Nielsen Local Watch Report (Jan. 14, 2019), available at <https://www.nielsen.com/wp-content/uploads/sites/3/2019/04/q2-2018-local-watch-report.pdf> (finding that more than 14% of TV households lack cable or satellite service).

⁹ See *Matter of Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, Notice of Proposed Rulemaking, 25 FCC Rcd. 16498 ¶ 42 (2010) (recognizing that “VHF channels have certain characteristics that have posed challenges for their use in providing digital television service.”).

with most antennas receiving fairly well at UHF and the substantial majority not so well to very poor at high-VHF.”¹⁰

These observations are consistent with WVPT’s real-world experience. WVPT routinely receives calls from viewers with two different reception issues based on WVPT’s VHF channel. In the first instance, viewers located within WVPT’s predicted coverage area are unable to receive an OTA signal due to a deficient antenna system that can receive the UHF channels in the market, but not WVPT. The consumer confusion is magnified because WVPT’s virtual (PSIP) channel suggests that it should be a UHF station, not a VHF station. In the second instance, viewers who previously received WVPT’s OTA signal either intermittently or permanently lose the signal due to interference from sources including LED lighting, CF lighting, electric motors, electric dryers, solar panels, kitchen appliances, a bird bath heater, Christmas lights, phone chargers, pool pumps, a wood stove blower, and electric utility pole insulator failure. Although some of these cases can be resolved, other times the sources of interference are outside the viewer’s control. Furthermore, when there is lightning activity in the area, the VHF signal can be virtually unwatchable for hours at a time. Moving WVPT from channel 11/12 to channel 15 will solve the problems associated with VHF reception that make it difficult for viewers to receive WVPT’s noncommercial educational programming without a subscription service.

Second, the proposed channel substitution will allow for a more efficient construction of WVPT’s post-incentive auction facilities. VPM initially planned to retune WVPT’s existing distributed transmission system (“DTS”) transmitters from channel 11 to channel 12. After VPM placed its orders, however, the transmitter manufacturer

¹⁰ *Id.* ¶ 44.

declared bankruptcy and neither the transmitter manufacturer nor the antenna manufacturer were able to support the planned retuning effort. Meanwhile, in February 2020, the manufacturer of the existing tower, Valmont, performed a structural analysis which revealed that the existing tower at Elliott Knob cannot support a replacement antenna on channel 12.¹¹ Not only is UHF equipment more readily available, but UHF antennas are lighter than VHF antennas. As a result, transitioning to channel 15 should obviate the need for VPM to construct a new tower for WVPT—saving both time and money.

Attached to the instant application is an Engineering Statement of Doug Vernier Telecommunications Consultants, which sets forth in detail the proposed WVPT Channel 15 DTV Table specifications. This proposal is in compliance with all relevant technical requirements for amendment of the post-transition DTV Table, including the interference protection requirements of 47 C.F.R. §73.616 and the 0.5% de minimis interference standard with respect to all allotments and assignments, existing and proposed. The proposed Channel 15 facilities will provide full principal community coverage to Staunton, Virginia.

As further demonstrated by the attached Engineering Statement, the proposed Channel 15 facilities will cover 1,102,100 people, a net gain of 139,248 people when compared to WVPT's existing service. Although there is a small loss area that covers 1,160 persons due to the deep null protection that is required for WVPT-1, channel 15, by the Green Bank Observatory and the Sugar Grove Naval Station, VPM will continue to

¹¹ For a more detailed description of VPM's efforts, see VPM's Request for Tolling Waiver, File No. 0000129932.

serve these areas by operating on channel 11 (current licensed channel) or 12 (current temporary channel) as a translator, resulting in no actual loss of service.

For the foregoing reasons, VPM respectfully requests that the Commission adopt a Report and Order to change the digital allotment for WVPT from Channel 11 to Channel 15 as proposed herein.

Respectfully submitted,

VPM MEDIA CORPORATION

By: /s/ Ari Meltzer
Ari Meltzer
Wiley Rein LLP
2050 M Street NW
Washington DC 20036
202.719.7467
ameltzer@wiley.law

Dated: August 29, 2022

Attachment 1



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

August 11, 2022
Page 1 of 2
NRQZ ID: 13157

WVPT
298 PORT REPUBLIC ROAD
HARRISONBURG, VA 22801

Application Reason/Purpose	Prior coordination notification
File Number	13157
Applicant Name	WVPT
Call Sign	
Site Name or Loc	['WVPT1', 'WVPT4']
Previous NRAO Coordination No.	
Current NRAO Coordination No.	13157-01, 13157-04

Dear Applicant:

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

NRAO Special Condition Statement:

The National Radio Astronomy Observatory (NRAO), Green Bank, Pocahontas County, WV, objects unless the Applicant's license is restricted to an Effective Radiated Power (ERP) of Watts per MHz unit bandwidth at Azimuth degrees True North in the Site-Specific Data Below.

Sugar Grove Research Station Special Condition Statement:

The Sugar Grove Research Station, formerly Naval Radio Research Observatory (NRRO) located at Sugar Grove Pendleton County, WV, objects unless the Applicant's license is restricted to an Effective Radiated Power (ERP) of Watts per MHz unit bandwidth at Azimuth degrees True North in the Site-Specific Data Below.

NRQZ Office Special Condition Statement

The NRQZ Office objects unless the activation of WVPT 1, 2, and 4 is coordinated with NRAO and SGRS to ensure proper installation and antenna manufacturer specifications meet the proposed thresholds under active transmission. Order of activation, under coordination, to be WVPT 1, 4, and lastly, 2.

To meet this Special Condition, the Applicant shall:

1. Use the final engineering submitted by the applicant or their designated technical representative indicating that all facilities meet the ERP restriction.
2. Arrange for the requested site inspection to verify the implementation of this Special Condition.
3. Coordinate activation of WVPT 1, 2, and 4 as addressed in the NRQZ Office Special Condition.
4. Post a copy of this document and associated attachments at the Transmit facility.
5. Provide a Construction Notification as defined by the FCC for your specific radio service.



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The NRQZ Office requests that:

1. This Letter of Concurrence be attached to the FCC application.
2. The FCC application should indicate to the FCC that the assignment should be modified to include the current NRQZ ID in the supplementary details line (e.g. "SUP: NRQZ COORD COMPLETE 2022 AUG 11/NRQZ ID 13157").
3. The applicant provides the NRQZ Office (nrqz@nrao.edu) with notice of its official filing with the FCC per section 47CFR1.924 (a) (2).
4. The FCC should email the NSF Electromagnetic Spectrum Management Unit (esm@nsf.gov) when the supplemental details have been modified to include the NRQZ ID as this will facilitate faster approval of the application.

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 provided the special conditions are met.

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,

Sheldon Wasik
NRQZ Program Administrator

cc: nrqz@nrao.edu, esm@nsf.gov, Sugar Grove Research Station Spectrum Management Group

Attachments:

Site-Specific Data

SGRS ERP Limits

Recognition of WVPT2 and WVPT3

Site Inspection Worksheet(s)

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.

NRQZ ID	Site Name	Lat N NAD83	Lon W NAD83	MSL (m)	Max TX Pwr (W)	# TX per Sector	# TX per Facility	Freq Low (MHz)	Freq High (MHz)	Bandwidth (MHz)	Max Gain (dBi)	Antenna Model	AGL (m)	Az ° True	Mechanical-DT	Electrical-DT	Max eRPd of facility (W)	NRAO ERPd Limit (W)
13157-04	WVPT 4	38 36 3.900	-78 37 56.800	901.834	250.0	1	1	476.0	482.0	5.38	2.15	Die-TUL-C2SP-15 COS 66_33	60.2	260.335	0	0	250.0	4.4e-01
13157-01	WVPT 1	38 09 54.400	-79 18 50.100	1323.0	263000.0	1	1	476.0	482.0	5.38	2.15	Dielectric TUL-BP2 6/12M 1	10.0	303.05	0	2	263000.0	3.8e+00

Site ID	Bearing of Antenna (DEG)	Mechanical + Electrical Down Tilt (DEG)	Bearing to SG (DEG)	Elevation to 1st Obstacle (DEG)	Off-axis Angle Azimuth (DEG)	Off-Axis Angles Elevation (DEG)	Main Beam Gain (dBi)	Antenna Gain towards Sugar Grove (dBm)	Maximum Allowed ERP(dBd) towards Sugar Grove (WATTS)	Distance to 1 st Obstacle (km)	Height of 1 st obstacle (m)
13157-01	152	2	4	12	-148	12	2.1	-42.4	7.4	.1	1355



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- The NRQZ Office recognizes that:
- NRQZ ID 13157-02 (Site WVPT2) is located outside of the NRQZ. The Site-Specific data below is a representation of the conditions that could be set if the site were to be located in the NRQZ. The NRAO and SGRS would appreciate any voluntary coordination for NRQZ ID 13157-02.

NRQZ ID	Site Name	Lat N NAD83	Lon W NAD83	MSL (m)	Max TX Pwr (W)	# TX per Sector	# TX per Facility	Freq Low (MHz)	Freq High (MHz)	Bandwidth (MHz)	Max Gain (dBi)	Antenna Model	AGL (m)	Az ° True	Mechanical-DT	Electrical-DT	Max eRPd of facility (W)	NRAO ERPd Limit (W)
13157-02	WVPT2	37 59 00.00	-78 29 1.00	42 7.1	1000.0	1	1	476.0	482.0	5.38	2.15	Dielectric TUL-BP2-1/2M-1-K	68.0	293.215	0	0	1000.0	9.6e-01

Site ID	Bearing of Antenna (DEG)	Mechanical + Electrical Down Tilt (DEG)	Bearing to SG (DEG)	Elevation to 1st Obstacle (DEG)	Off-axis Angle Azimuth (DEG)	Off-Axis Angles Elevation (DEG)	Main Beam Gain (dBi)	Antenna Gain towards Sugar Grove (dBm)	Maximum Allowed ERP(dBd) towards Sugar Grove (WATTS)	Distance to 1st Obstacle (km)	Height of 1st obstacle (m)
13157-02	289	0	310	1	22	1	2.1	-4.1	1.6	34	884

- NRQZ ID 13157-03 (Site WVPT3) will remain on the previously coordinated channel 12, thus is being dropped from this application in a change to channel 15. The NRQZ office requests any status updates in the FCC filing process of these conditions, and requires coordination for any future alterations.

REV

2/11/2021

3/25/2022 DATE of submission

NRQZ# 13157-01

Magnetic Declination Correction 9.88333333 ° West
(Value only)

Go to this URL and calculate declination

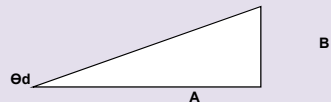
<https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination>

Site Name WVPT1 Latitude (N): 38 09 54.4 (dd mm ss.s)
 Location Elliott Knob Longitude (W): 79 18 50.1 (dd mm ss.s)
 City/State AMSL: 1323 Meters 4340.50 Ft
 HAGL (centerline) 10 Meters 32.81 Ft
 Frequency: 476 MHz 4373.31 Ft

NRAO AERP (watts) 3.8 watts at 303.1 ° True (Φd)
 Bandwidth in MHz 5.38 watts at 303.1 ° True
 Dominant Path Defraction watts at 303.1 ° True

Sector Name or Indicator	1	2	3
a. Antenna Type (Model/Tilt)	Dielectric TUL-BP2 6/12M 1		
Electrical Tilt or Tilt Range	2		
b. Maximum Antenna Gain	2.2 dBd	dBd	dBd
c. Antenna Azimuth (° True or "omni")	152 °T	°T	°T
Antenna Azimuth (° Mag)	161.9 °Mag	9.9 °Mag	9.9 °Mag
d. Az to GBT on Antenna Pattern	151.1 °	303.1 °	303.1 °
e. Antenna Gain to GBT (b - f)	-53.80 dB	0.00 dB	0.00 dB
f. Antenna Gain to GBT Below Maximum	-56.00 dB	dB	dB
g. Mechanical Downtilt (Φbt)	0 °	°	0 °
h. Loss to GBT Due to Mechanical Downtilt	0 dB	dB	dB
i. Transmitter Output Power	263000 watts	watts	watts
j. System Losses: Combiner/Duplexer	0 dB	dB	dB
Lightning Arrestor	0 dB	dB	dB
Main Line	0 dB	dB	dB
RF Filter	0 dB	dB	dB
Misc. connectors, etc.	0 dB	dB	dB
j. System Loss	0.00 dB	0.00 dB	0.00 dB
k. Power to Antenna (ix j)	263000.00 watts	0.00 watts	0.00 watts
l. Main Beam Power (k x b)	436471.36 watts	0.00 watts	0.00 watts
m. ERPd to GBT (l x (f + h)) or (l x (e - (h + j)))	1.10 watts	0.00 watts	0.00 watts

Power at output of duplexer 263000.00 #NUM!
 263000.00 #NUM!



Enter 1st Obstacle Information provided by NRQZ office

0.1 Distance to 1st Obstacle (km) 328
 4373.36 TX AMSL (ft) B = Ant Ht AMSL minus Ht of 1st Obs -35.51041996
 4408.87 AMSL of 1st Obstacle (Ft) Φd = arctan(B/A) = -6.18 °

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

Effective mechanical downtilt adjustment:

Effective Elevation = Φd - Φbt cos(Φd - Φbt) = 0.0 ° 0.0 ° 0.0 °
 Effective Elevation Adjustment = 0.0 ° 0.0 ° 0.0 °

Definitions:

Φd = Azimuth to GBT
 Φbt = Azimuth of mechanical beam tilt (verticle)
 Φd = Elevation to 1st obstacle (negative above horizon)
 Φbt = 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 = Φd - Antenna Azimuth (True) {If AZ<0, then add 360}
 Effective elevation on vertical pattern = Φd - Φbt cos(Φd - Φbt) {If ELEV<0, then add 360}

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

(03) Go to the URL indicated here to have NGDC calculate the the magnetic declination associated with these coordiantes.
 (04) Value only of the magnetic declination as provided by going the URL provided in (3)

(06 and (07) Please provide either a 1A/2C survey or Google Earth KML file to verify the site location.

Note format for LAT/LONG - No special characters, numerals only

(08) AMSL or height above mean sea level

(09) HAGL or antenna height above ground level (Not sea level) to centerline

(12) AZ bearing toward the GBT from your fixed facility

(13) Specify the bandwidth allowance associated with this submission

(14) If dominant path is Diffraction limited, then you can use additional attenuation due to Mechanical Down Tilt

(17) This is the model number of your antenna and its associated ET. Please attach antenna datum (H/V) to verify your values.

(18) Maximum antenna gain associated with specified antenna model number

(19) Indicate the AZ bearing of each sector in degrees True North

(20) Equals your AZ + ~ 8° or 9° degrees more due to magnetic declination

(21) A calculated value of the Horizontal offset AZ bearing from your facility to GBT

(23) Antenna gain at offset Horizontal AZ bearing. If value in Row (19) indicates an AZ bearing between two values, provide the lesser attenuation.

(24) Provide values only if using Mechanical Tilt AND site is not SCATTER diffraction limited!

(25) Antenna gain at offset Vertical AZ bearing (within +/- Row 24 values)

(26) Watts per transmitter. If you are utilizing multiple transmitters (RRH's) per sector, you need to download Site Inspection Worksheet #2 or #3.

(27) Values for system losses are to be indicated as a negative value

Note: If site is troposcatter, use only the Vertical ET antenna attenuation value at 0 degrees

1.10 Congratulations. Meets NRAO Power Density Limits!

(51) Distance to first obstacle as provided by the NRQZ office.

(53) Height of first obstacle as provided by the NRQZ office.

(57) Calculated AZ bearing on the vertical pattern based upon offset AZ bearing to GBT

(58) Check the antenna pattern at this offset AZ bearing. If AZ bearing is between two values, provide the lesser attenuation.

REV

2/11/2021

3/25/2022 DATE of submission

NRQZ# 13157-04

Magnetic Declination Correction 9.13333333 ° West

(Value only)

(03) Go to the URL indicated here to have NGDC calculate the the magnetic declination associated with these coordiantes.

(04) Value only of the magnetic declination as provided by going the URL provided in (3)

Go to this URL and calculate declination

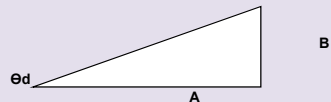
<https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination>

Site Name WVPT4 Latitude (N): 38 36 03.9 (dd mm ss.s)
 Location Big Mountain Longitude (W): 78 37 56.8 (dd mm ss.s)
 City/State AMSL: 901.834 Meters 2958.74 Ft
 HAGL (centerline) 60.2 Meters 197.50 Ft
 Frequency: 476 MHz 3156.24 Ft

NRAO AERP (watts) 0.4 watts at 0.4 ° True (Φd)
 Bandwidth in MHz 5.38 watts at 0.4 ° True
 Dominant Path Diffraction watts at 0.4 ° True

Sector Name or Indicator	1	2	3
a. Antenna Type (Model/Tilt)	Die-TUL-C2SP-15 COS 66 33		
Electrical Tilt or Tilt Range	0		
b. Maximum Antenna Gain	2.2 dBd	dBd	dBd
c. Antenna Azimuth (° True or "omni")	80 °T	°T	°T
Antenna Azimuth (° Mag)	89.1 °Mag	9.1 °Mag	9.1 °Mag
d. Az to GBT on Antenna Pattern	280.4 °	0.4 °	0.4 °
e. Antenna Gain to GBT (b - f)	-32.02 dB	0.00 dB	0.00 dB
f. Antenna Gain to GBT Below Maximum	-34.22 dB	dB	dB
g. Mechanical Downtilt (Φbt)	0 °	°	0 °
h. Loss to GBT Due to Mechanical Downtilt	0 dB	dB	dB
i. Transmitter Output Power	250.00 watts	watts	watts
j. System Losses: Combiner/Duplexer	0 dB	dB	dB
Lightning Arrestor	0 dB	dB	dB
Main Line	0 dB	dB	dB
RF Filter	0 dB	dB	dB
Misc. connectors, etc.	0 dB	dB	dB
j. System Loss	0.00 dB	0.00 dB	0.00 dB
k. Power to Antenna (ix j)	250.00 watts	0.00 watts	0.00 watts
l. Main Beam Power (k x b)	414.90 watts	0.00 watts	0.00 watts
m. ERPd to GBT (l x (f + h)) or (l x (e - (h + j)))	0.16 watts	0.00 watts	0.00 watts

Power at output of duplexer 250.00 #NUM! #NUM!
 250.00 #NUM! #NUM!



Enter 1st Obstacle Information provided by NRQZ office

Φd = Angle to 1st Obstacle
 A = Distance to 1st Obstacle in Feet 145997
 B = Ant Ht AMSL minus Ht of 1st Obs -833.6304725
 Φd = arctan(B/A) = -0.33 °

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

Effective mechanical downtilt adjustment:

Effective Elevation = Φd - Φbt cos(Φd - Φbt) = 0.0 0.0 0.0
 Effective Elevation Adjustment = 0.0 ° 0.0 ° 0.0 °

Definitions:

Φd = Azimuth to GBT
 Φbt = Azimuth of mechanical beam tilt (verticle)
 Φd = Elevation to 1st obstacle (negative above horizon)
 Φbt = 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 = Φd - Antenna Azimuth (True) {If AZ<0, then add 360}

Effective elevation on vertical pattern = Φd - Φbt cos(Φd - Φbt) {If ELEV<0, then add 360}

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

(06 and (07) Please provide either a 1A/2C survey or Google Earth KML file to verify the site location.

Note format for LAT/LONG - No special characters, numerals only

(08) AMSL or height above mean sea level

(09) HAGL or antenna height above ground level (Not sea level) to centerline

(12) AZ bearing toward the GBT from your fixed facility

(13) Specify the bandwidth allowance associated with this submission

(14) If dominant path is Diffraction limited, then you can use additional attenuation due to Mechanical Down Tilt

(17) This is the model number of your antenna and its associated ET. Please attach antenna datum (H/V) to verify your values.

(18) Maximum antenna gain associated with specified antenna model number

(19) Indicate the AZ bearing of each sector in degrees True North

(20) Equals your AZ + ~ 8° or 9° degrees more due to magnetic declination

(21) A calculated value of the Horizontal offset AZ bearing from your facility to GBT

(23) Antenna gain at offset Horizontal AZ bearing. If value in Row (19) indicates an AZ bearing between two values, provide the lesser attenuation.

(24) Provide values only if using Mechanical Tilt AND site is not SCATTER diffraction limited!

(25) Antenna gain at offset Vertical AZ bearing (within +/- Row 24 values)

(26) Watts per transmitter. If you are utilizing multiple transmitters (RRH's) per sector, you need to download Site Inspection Worksheet #2 or #3.

(27) Values for system losses are to be indicated as a negative value

Note: If site is troposcatter, use only the Vertical ET antenna attenuation value at 0 degrees

0.16 Congratulations. Meets NRAO Power Density Limits!

(51) Distance to first obstacle as provided by the NRQZ office.

(53) Height of first obstacle as provided by the NRQZ office.

(57) Calculated AZ bearing on the vertical pattern based upon offset AZ bearing to GBT

(58) Check the antenna pattern at this offset AZ bearing. If AZ bearing is between two values, provide the lesser attenuation.