



**Denali 20020, LLC
Vernon Valley NJ
27.5-28.35 GHz**

Introduction

On behalf of Denali 20020, LLC, Comsearch has completed analysis for a GSO earth station transmitting the 27.5-28.35 GHz band at Vernon Valley, NJ. The purpose of the analysis is to consider whether the earth station would satisfy the limitations in FCC rules §25.136(a)(4)(i to iii) to protect Upper Microwave Flexible Use Service (UMFUS) licenses in the area. The earth station parameters used in the analysis are shown on the attached Data Sheet and Coordination Values report. In §25.136(a)(4)(ii) the earth station coverage of PFD -77.6 dBm/m²/MHz at 10 m above ground level must not affect more than a stated population limit. Vernon Valley is in Sussex County, NJ where the population at the 2020 Census was 144,221. For a county of this size the rule limits the affected population to 450 people.

In addition, FCC rules §25.136(a)(4)(i) sets a limit of no more than two other 27.5-28.35 GHz earth stations in the county, and §25.136(a)(4)(iii) prohibits impacting certain roads, routes, and venues.

Coverage Calculations

Comsearch calculated the coverage of the earth station transmitter considering distance loss and clutter loss according to Recommendation ITU-R P.452-16. The area surrounding the earth station potentially affected by PFD above the limit is seen in aerial imagery to be overlaid with deciduous trees. The clutter losses for deciduous trees from P.452 are 18.6 dB using the earth station transmitting antenna centerline height of 5 m, and 7.0 dB using the assumed 10 m receiving antenna height, for a total of 25.6 dB. The earth station transmitter Max Available RF Power density (Pt (dBW/MHz)) and antenna horizon gain (Gt (dBi)) on each azimuth are listed in the Data Sheet and Coordination Values report. On each azimuth the EIRP density is:

$$\text{EIRP (dBm/m}^2\text{/MHz)} = \text{Pt (dBW/MHz)} + 30 + \text{Gt (dBi)}$$

The power flux density at distance d(m) is:

$$\text{PFD (dBm/m}^2\text{/MHz)} = \text{EIRP (dBm/m}^2\text{/MHz)} - 10 \cdot \log_{10}(4 \cdot \pi \cdot d(m)^2) - \text{clutter (dB)}$$

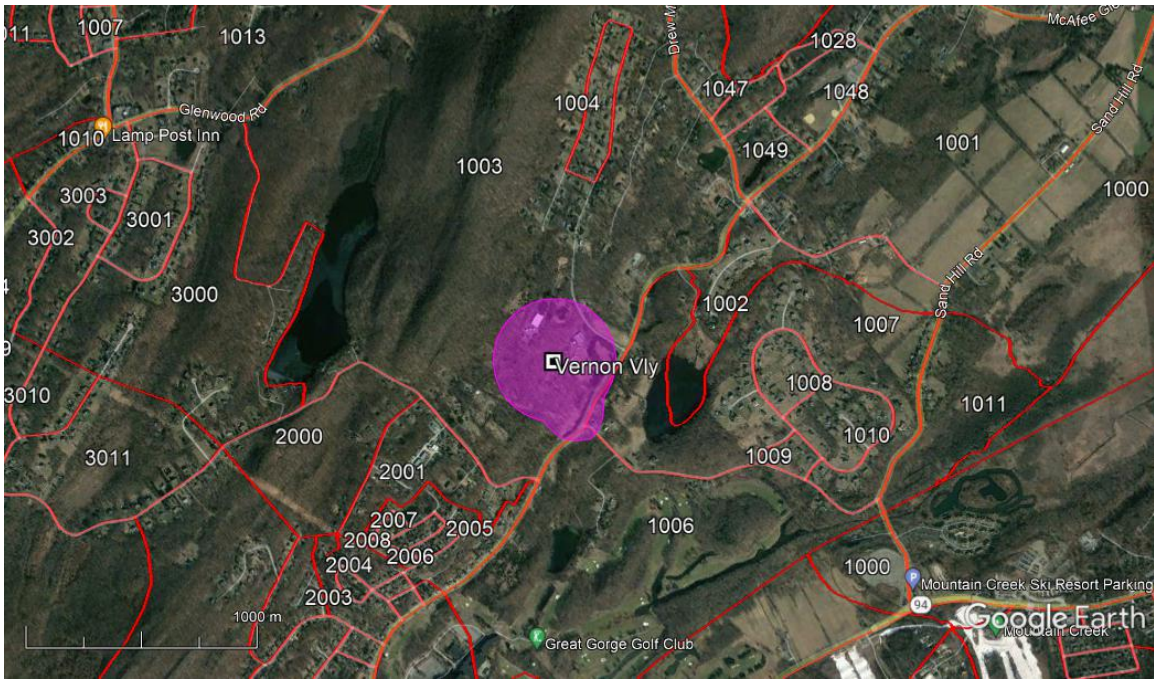


Figure 2: Coverage Area ($-77.6 \text{ dBm/m}^2/\text{MHz}$) with 2020 Census Blocks

Additional Requirements

With respect to the requirements of §25.136(a)(4)(i), there are no other authorized earth stations operating in the 27.5–28.35 GHz band in Sussex County, NJ.

With respect to the requirements of §25.136(a)(4)(iii), the only nearby road with a Federal Highway Administration classification such that the $-77.6 \text{ dBm/m}^2/\text{MHz}$ coverage may not cross is New Jersey Route 23. The classification of Route 23 is Other Principal Arterial, and the coverage does not cross this highway. In addition, the coverage does not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port.

Thus, the results of our analysis are that Vernon Valley meets the requirements of FCC rules §25.136(a)(4)(i) and §25.136(a)(4)(iii).

Conclusion

The proposed Vernon Valley earth station meets the requirements in FCC rules §25.136(a)(4) as follows:

- §25.136(a)(4)(i): There are no other 27.5-28.35 GHz earth stations in Sussex County, NJ
- §25.136(a)(4)(ii): The population affected by the PFD coverage (27) is below the limit (450)
- §25.136(a)(4)(iii): The PFD coverage does not cross any prohibited road nor contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port

If you have any questions or need further assistance, please do not hesitate to contact us.

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