

### 25.203(l) Analysis for 17/24 GHz BSS Feeder Link Antenna

In this application, DIRECTV Enterprises, LLC (“DIRECTV”) requests operating authority to allow an earth station antenna at DIRECTV’s Northwest Uplink Diverse Facility (NWDF) in Ellensburg, WA to communicate with the 17/24 GHz BSS communications payloads on the T14 and T15 satellites. Under Section 25.203(l) of the Commission’s rules, feeder link facilities operating in the 25.05-25.25 GHz band can only be licensed in Economic Areas (“EA”) where no existing FS licensee is authorized, and feeder link operations must be coordinated with FS licensees in nearby EAs when the PFD of the feeder link transmitted signal is equal to or greater than  $-114 \text{ dBW/m}^2/\text{MHz}$  at the boundary of the FS licensed area.

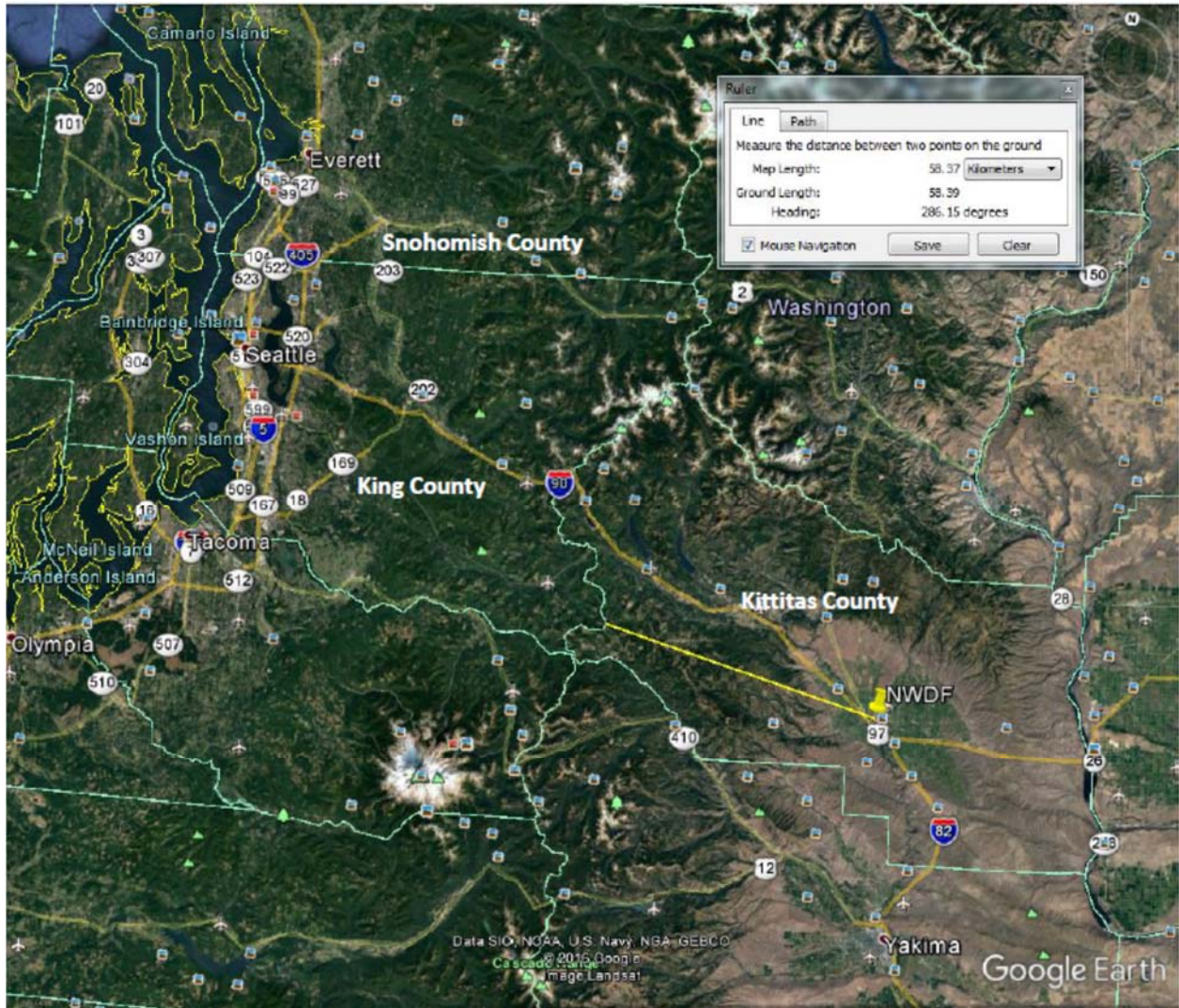
DIRECTV notes that the earth station that is the subject of this application is located in Kittitas County, WA. According to the Commission’s ULS database, there are no FS licensees authorized to operate in the relevant band in the EA that includes Kittitas County. The table on the following page was produced as a result of a search of the ULS database for active authorizations that include the 25.05-25.15 GHz band. As can be seen, the only active license in the relevant frequency band in the state of Washington is call sign WMF854 licensed in the Seattle SMSA, which includes King and Snohomish Counties. King County is adjacent to Kittitas County and Snohomish County is further removed from Kittitas County.

The map on the following page was produced using Google Earth and it shows that the shortest distance from the proposed new earth station at NWDF to King County is approximately 58 km. The analysis below demonstrates that an antenna that just meets the FCC specified §25.209 off-axis performance would exceed the  $-114 \text{ dBW/m}^2/\text{MHz}$  level at the closest boundary of the Seattle SMSA by 1.2 dB. The estimated off-axis performance of the applied-for antenna is shown on a following page, and it is clear that the applied-for antenna will have off-axis performance several dB better than §25.209. Therefore, rather than a 1.2 dB shortfall in protection, it is fully expected that the applied-for antenna will meet the FS protection criteria with several dB of margin.

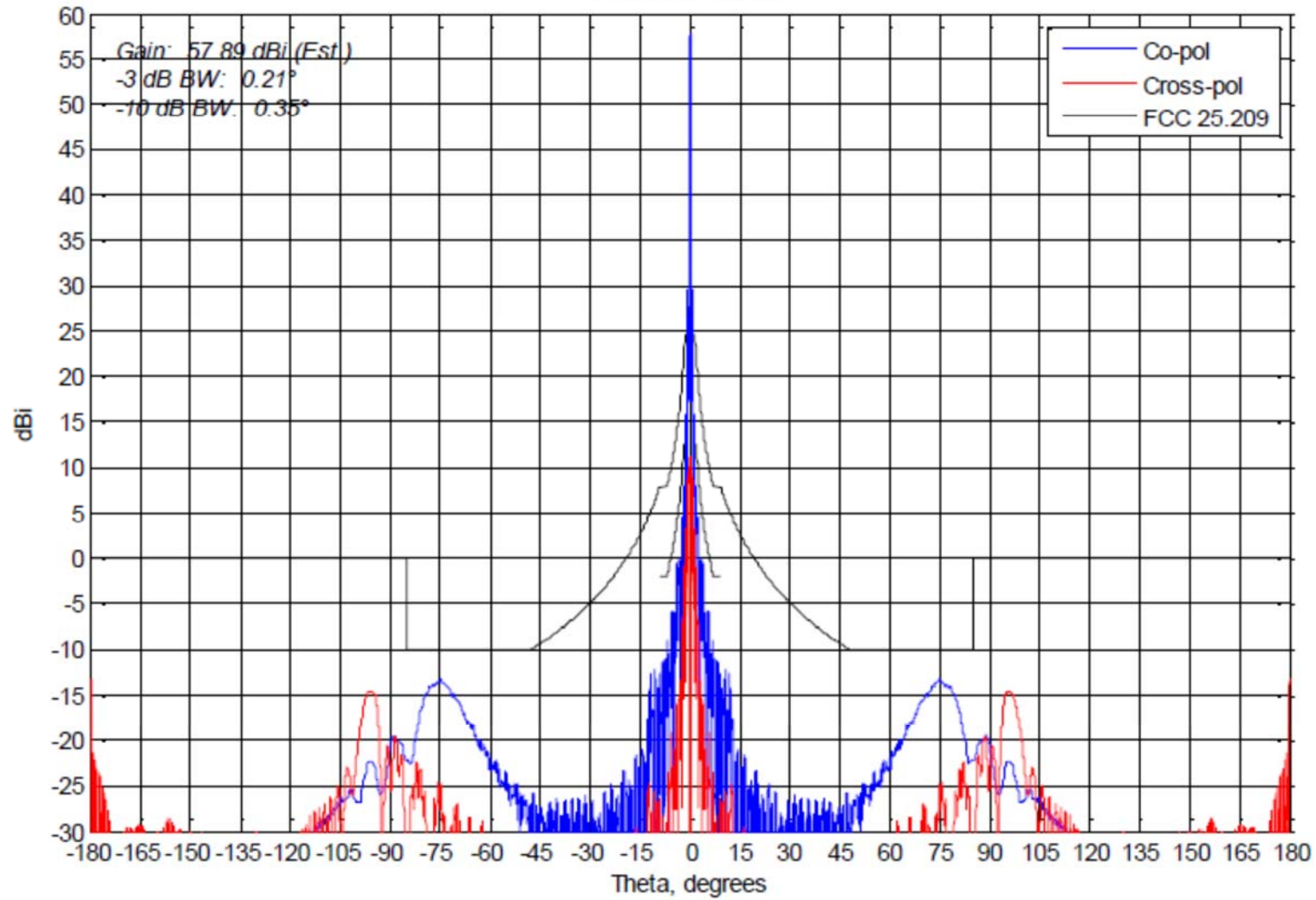
#### 3.5m uplink

24 GHz BSS Feeder Link Antenna Parameters	King County
Max EIRP/carrier (dBW)	75.7
Antenna size (m)	3.5
Antenna on-axis gain (dBi)	56.7
Max power into antenna (dBW)	19.0
Bandwidth normalizing factor for 36 MHz carrier (dB)	15.6
Max power density into antenna (dBW/MHz)	3.4
Max gain towards King County (dBi) (§25.209)	-10.0
Max eirp density towards King County (dBW/MHz)	-6.6
Min distance to EA border (km)	58.0
Spreading loss over min distance to EA border (dB-m <sup>2</sup> )	106.3
Max PFD at EA border (dBW/m <sup>2</sup> /MHz)	-112.8
Margin in DEMS protection (dB)	-1.2

<b>ULS Search Results for Licensees in 25.05-25.15 GHz</b>			
<b>Call Sign</b>	<b>Licensee Name</b>	<b>Market/Area</b>	<b>Status</b>
WMF846	FiberTower Spectrum Holdings LLC	St. Louis, MO	Active
WMF848	FiberTower Spectrum Holdings LLC	Kansas City, MO	Active
WMF850	FiberTower Spectrum Holdings LLC	Baltimore SMSA	Active
WMF852	FiberTower Spectrum Holdings LLC	Pittsburg, PA	Active
WMF854	FiberTower Spectrum Holdings LLC	Seattle, WA	Active
WMT304	FiberTower Spectrum Holdings LLC	New York, NY	Active
WMT307	FiberTower Spectrum Holdings LLC	New York, NY	Active
WMT312	FiberTower Spectrum Holdings LLC	Washington DC SMSA	Active
WMT315	FiberTower Spectrum Holdings LLC	New York, NY	Active
WMT318	FiberTower Spectrum Holdings LLC	Chicago, IL	Active
WMT325	FiberTower Spectrum Holdings LLC	Kansas City, KS	Active
WMT328	FiberTower Spectrum Holdings LLC	Boston, MA	Active
WMT331	FiberTower Spectrum Holdings LLC	Dallas, TX	Active
WMT332	FiberTower Spectrum Holdings LLC	Chicago, IL	Active
WMT333	FiberTower Spectrum Holdings LLC	Boston, MA	Active
WMT334	FiberTower Spectrum Holdings LLC	Miami, FL	Active
WMT335	FiberTower Spectrum Holdings LLC	Atlanta, GA	Active
WMT338	FiberTower Spectrum Holdings LLC	Washington DC SMSA	Active
WMT340	FiberTower Spectrum Holdings LLC	Dallas, TX	Active
WPJD304	FiberTower Spectrum Holdings LLC	Detroit, MI	Active
WPNH286	FiberTower Spectrum Holdings LLC	Richmond, VA	Active
WPNH287	FiberTower Spectrum Holdings LLC	Allentown, PA	Active
WPNH294	FiberTower Spectrum Holdings LLC	Stockton, CA (San Joaquin Co.) BEA163	Active
WPNH298	FiberTower Spectrum Holdings LLC	Jacksonville, FL	Active
WPNH299	FiberTower Spectrum Holdings LLC	Orlando, FL	Active
WPNH306	FiberTower Spectrum Holdings LLC	Greensboro, NC	Active
WPNH315	FiberTower Spectrum Holdings LLC	Buffalo, NY	Active
WPNH323	FiberTower Spectrum Holdings LLC	Memphis, TN	Active
WPNH324	FiberTower Spectrum Holdings LLC	Austin, TX	Active
WPNH325	FiberTower Spectrum Holdings LLC	Nashville, TN	Active
WQCJ304	FiberTower Spectrum Holdings LLC	Denver-Boulder-Greeley BEA141	Active



ASC Signal 3.5m Ka Band Reflector  
Pattern at 25 GHz



Simulated performance of 3.5m Ka-band Reflector at 25 GHz