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To: Doug Young

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Subject: Request for Info - File # 0305-EX-CN-2017

Message:

Response to Correspondence 39470

The earth stations will be fixed in location and at 3m above ground level at the coordinates provided in the application.

The 15 dB of additional over-the-horizon losses estimated for the Swarm transmitter sites is a conservative measure for a VHF transmitter with a low antenna centerline (3m) propagating over land over large distances, >150km. The transmitters are located inland and using a standard loss model such as the Irregular Terrain Model (ITM or Longley-Rice)* discussed in the NTIA report 82-100 published in 1982. Figure 1 from the report shows reference attenuation values versus distance for the ITM. The "scatter" region alone in Figure 1 provides 15 dB loss when the line is extrapolated from 0 to 180 km (15 dB slope from 0 to 180 km), and is a very conservative value not including the effects of diffraction over a spherical Earth which could mean over 60 dB of loss depending on the variability of the actual terrain in the path. This model is valid for frequencies between 20 MHz and 20 GHz. In addition, the ITU-R P.526-13** (diffraction) recommendation will also show sufficient attenuation (~65 dB using the nomogram in Figure 3).