Mr. Jose P. Albuquerque
Chief, Satellite Division
International Bureau
Federal Communications Commission
Washington, DC 20554

July 16, 2018

Re: New Spectrum Satellite, Ltd.
IBFS File No. SAT-LOI-20170726-00111 (Call Sign S3019)

Dear Mr. Albuquerque,

New Spectrum Satellite, Ltd. ("NSS") hereby responds to the Commission's letter of June 14, 2018 seeking clarification on several points arising out of NSS's Letter of Intent filed July 26, 2017 ("Application"). Where necessary, NSS will file an amendment to its Application to reflect these clarifications.

1. The Application states operation in the 18.3-18.6 GHz band, whereas Schedule S addresses only 17.8-18.3 GHz. NSS hereby clarifies that Schedule S is correct, and NSS wishes to offer service only in the 17.8-18.3 GHz band. The Virtual Geo system will not use and does not apply for the 18.3-18.6 GHz spectrum.
2. Under Section 25.114(c) NSS did not provide data as to its TT&C facilities and transmission because it intended to support these function from Canada where it has its main application. The Narrative Description erroneously stated that TT&C would be located in the United States, because it anticipated that might be required by the Commission. Consequently, NSS will amend its Application to exclude its requests for consideration of TT&C facilities in the US.
3. With reference to Section 25.114(d)(1), which requires information on the mapping of the uplink and downlink frequencies on board the satellite, NSS states the following. At the time it filed its

application in July 2017, NSS had not yet finally determined the exact mapping of such frequencies, which depend on the size and number of beams deployed. In the intervening time and as it refines the satellite system design to account for advances in technologies, due to the large number of beams on the satellite user links, NSS has concluded its satellites will use on-board switching to direct single frequency channels (FDMA slot by FDMA slot) on a flexible basis from Gateway links to User links. This dynamic switching capability will facilitate optimization of spectrum and power utilization. Consequently, no hard mapping is anticipated and no specific data is required. NSS is moreover investigating the possible use of switching among beams at the packet level in lieu of FDMA channel switching for more efficient use of payload power in serving capacity. NSS will keep the Commission informed as to such steps, and will make any necessary modifications to its license once final design occurs.

4. Concerning the Inter-Satellite Links, (ISL), NSS indicated in its Application an earlier intent rather than a specific commitment to use those. At this time NSS has elected to forego ISL links. Therefore NSS hereby withdraws its ISLs from consideration. Should this situation change, NSS would advise the Commission in advance of such decision and seek its concurrence and input.

5. Same as in 4. Above. NSS will keep the Commission informed of its plans if and when applicable.

6. Coverage and contour diagrams. We are including in Appendix A contour diagrams for a nadir beam while both at the end of an active arc and at apogee within the arc for the Western North America active arc. The illustrations include contours for 2, 4, 6, 8, 10, 15, and 20 dB down from beam peak. We also include diagrams of the beam array for the satellite as filed, for the cases of start-of-arc, mid-arc, and end-of-arc. The beam array diagrams include a contour for those places seeing a 20-degree elevation angle to the satellite. Areas in the United States are always served by beams operating above 20 degrees. In the diagrams however the beams are drawn to terminate at the 10-degree elevation contour. Note that another beam array from the East North America active arc covers the Eastern United States, so that the beam array shown only serves areas West of roughly 90 degrees West Longitude. The two complete beam arrays overlap in coverage. When one array is at the beginning or end of an arc the other arc serving the area will be at apogee. Users will use the best arc in view. Figure 6 in the appendix illustrates this overlap.

7. NSS has committed to comply with all EPDF limits as defined by the Commission and in particular with Article 22 of the ITU Radio regulations through its Canadian licensing process.

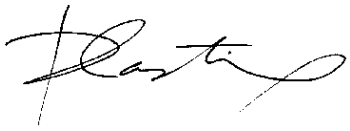
8. When it submitted its Letter of Intent application in July 2017, NSS had optimized its design to accommodate the use of the 17.3-18.3 GHz band in the Earth-to-space direction, before the Commission adopted its rules in September of that same year. To the extent a waiver is required, NSS requests it based on the fact that no interference is expected to and from other licensed systems operating in the Space-to-Earth direction as per the following explanation: NSS will use the 17.8-18.3 GHZ band for feeder links uplinks from Gateways. The Virtual Geo system gateways use large 6 meter antennas at 18 GHz that are highly directive to its satellites, which in turn during operation have very large separation angles from the geostationary arc

(more than 40 degrees). NSS will also as needed, employ sites furnishing adequate separation and terrain shielding from any known or projected sites using this band in a downlink direction or for terrestrial microwave reception. NSS accordingly requests a waiver for this application. Please let us know if you need more data in support of the waiver request.

9. With regard to PFD levels at elevation angles of less than 5 degrees, the present Virtual Geo design can operate to 2 degrees elevation angle by reducing its excess margin by 0.6 dB on that link. In that event the Virtual Geo System meets the requirements of 25.208(o) at all cited elevation angles.
   However NSS does not intend on offering service at this elevation angle, and has designed the system so as to avoid such low elevation angles. In pursuing our intent to offer high quality service we seek to offer high elevation angles. NSS will use the active arc that best serves a given site In North America. This can be seen in the included beam diagrams.
   In general, at 30 degrees North we offer service with minimum elevation angles of 30 degrees or better depending on latitude (60 degrees minimum under the center of an active arc, the lowest figure between the arcs). At 25 degrees North our elevation angles are 35 degrees in Florida and 34 degrees in South Texas or better. The satellites in our constellation fly from around 40 degrees North to 63 degrees North when they are active. Hence North of these areas, elevation angles are better. NSS will normally not excite beams at the edge of the earth including the cited beams since that is in general not necessary. These beams, however, come into use as the satellite descends from apogee and the beams scan inward from the edge of the earth as a consequence of that. But even if illuminating near the edge of the earth should become necessary, NSS will adjust margins slightly as above to ensure it meets the standard in 25.208(o).

10. As specified in the Commission's letter, this response is submitted on this 16th day of July, 2018 . NSS requests that it be given the opportunity to complement this submission, should the Commission determine that any additional information or clarifications are needed.

Respectfully submitted



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Appendix A

Antenna Pattern Diagrams

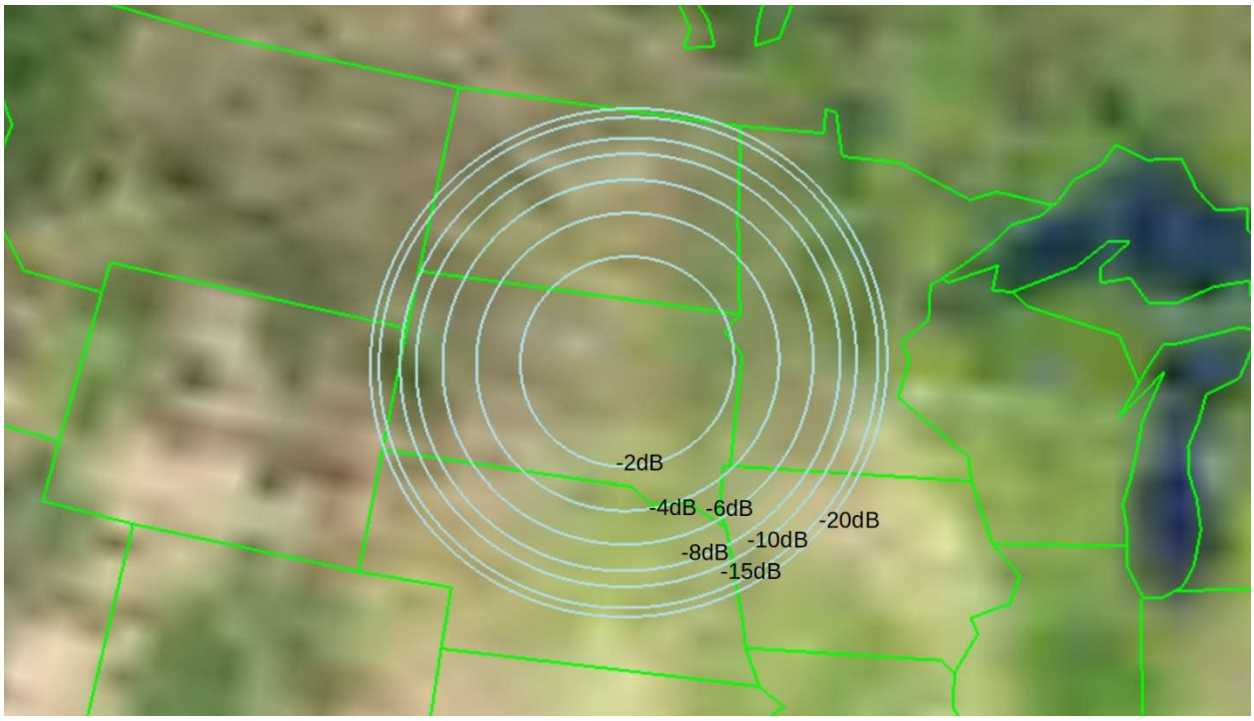

Figure 1 Nadir beam contours for end of West North America active arc, start of arc similar.

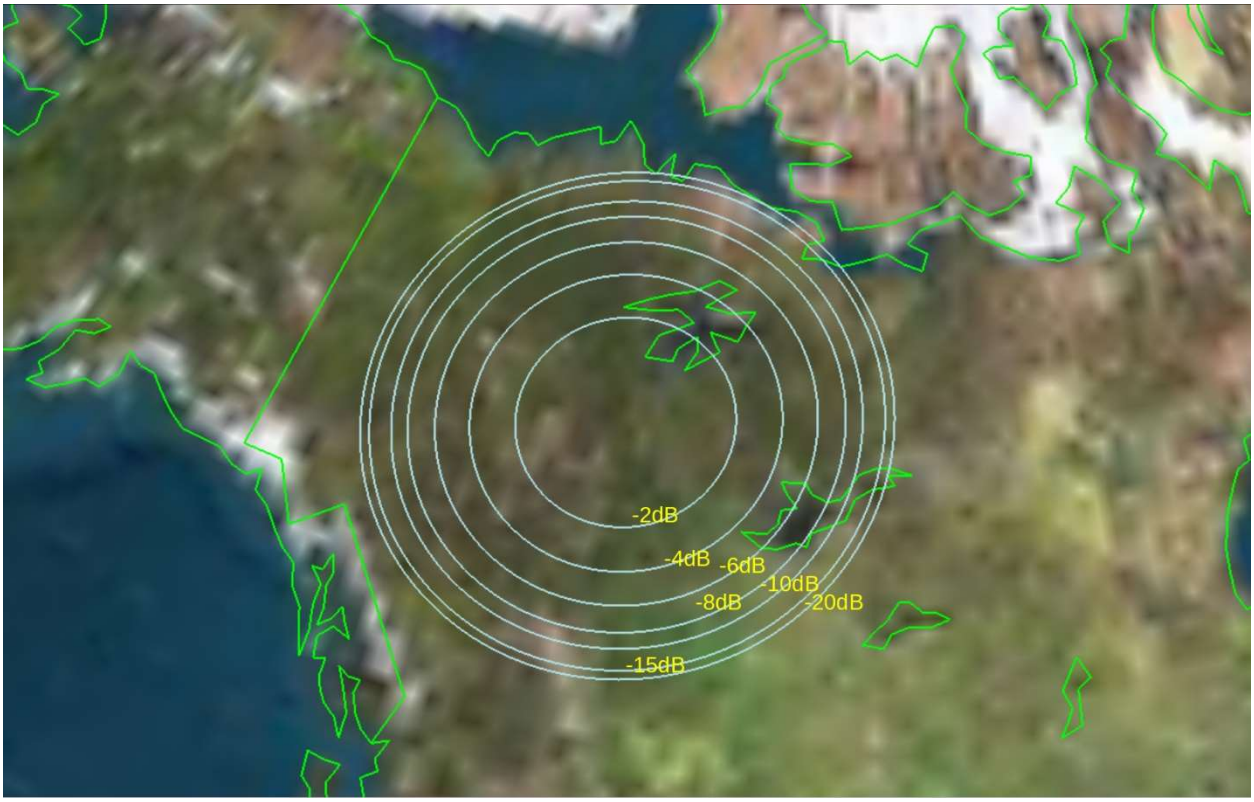

Figure 2, Nadir beam contours when at apogee in the West North America active arc

Figure 3 Satellite beam array at start of West North America active arc. The large circle is the 20 degree elevation angle contour to the satellite. The beams terminate in this illustration at 10 degees elevation angle.

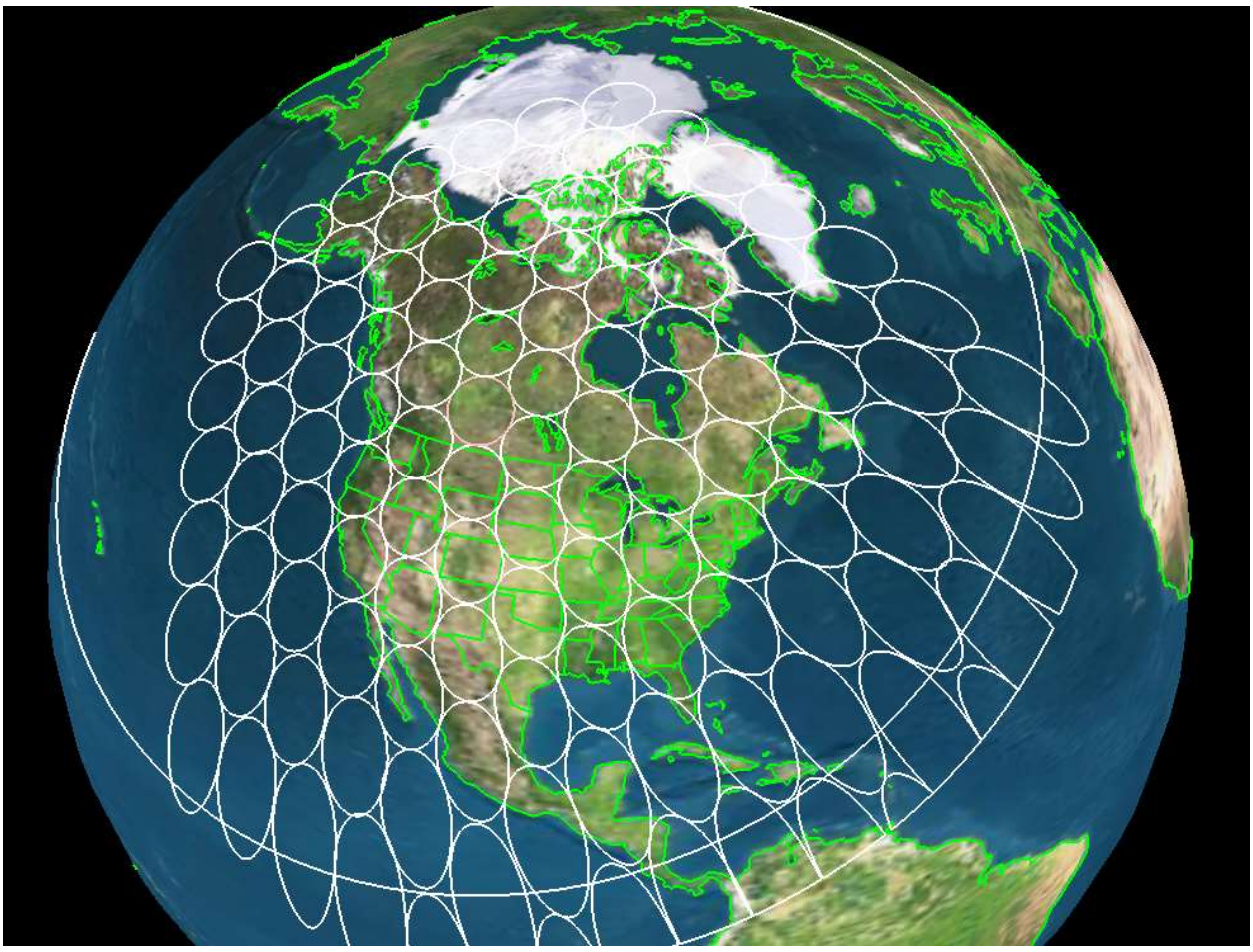

Figure 4 Satellite beam array West North American active arc, showing the 20 degree elevation angle contour and beams extending to 10 degrees elevation angle.

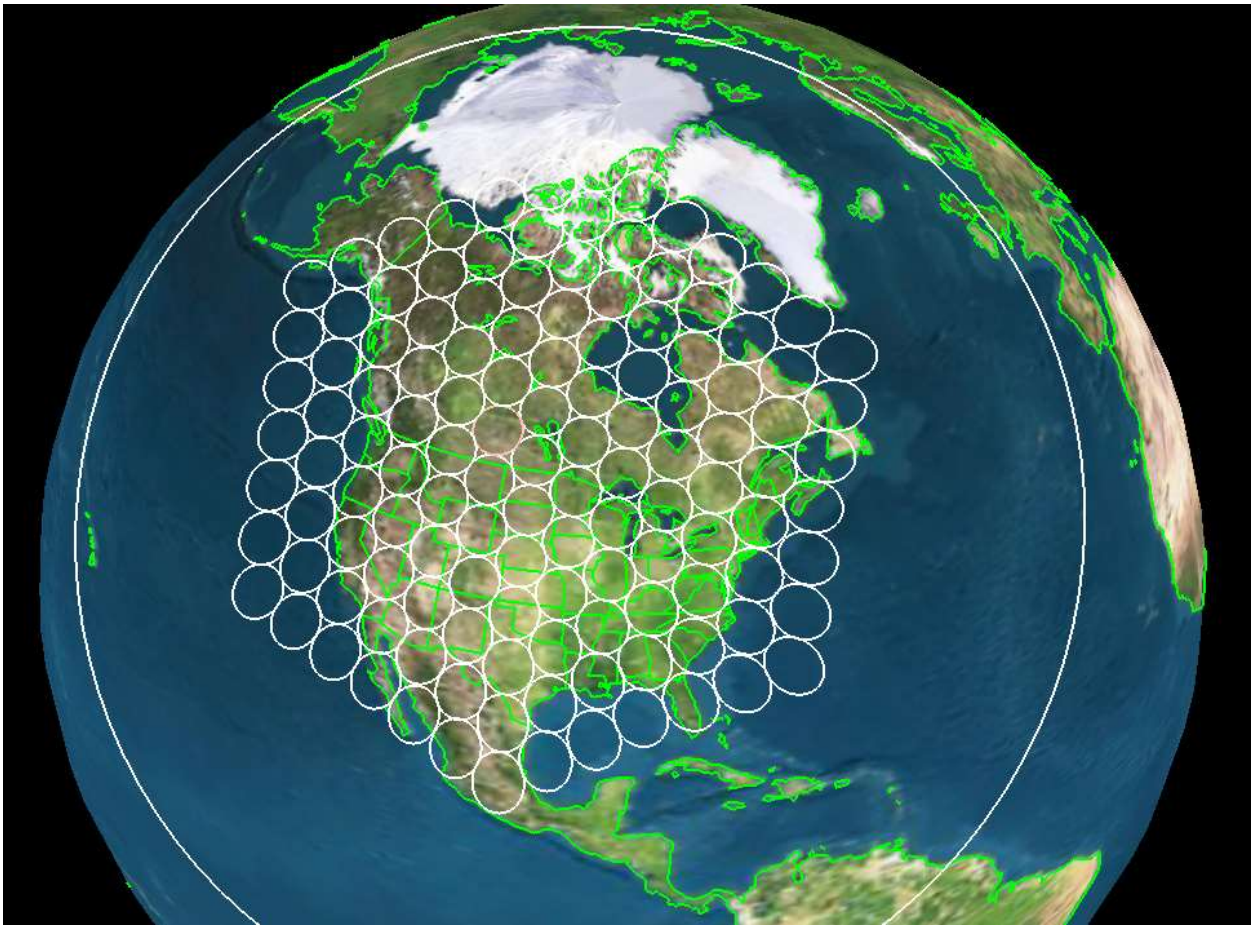

Figure 5 Satellite beam array at the end of the West North American active arc, also showing the 20 degree elevation angle contour to the satellite.

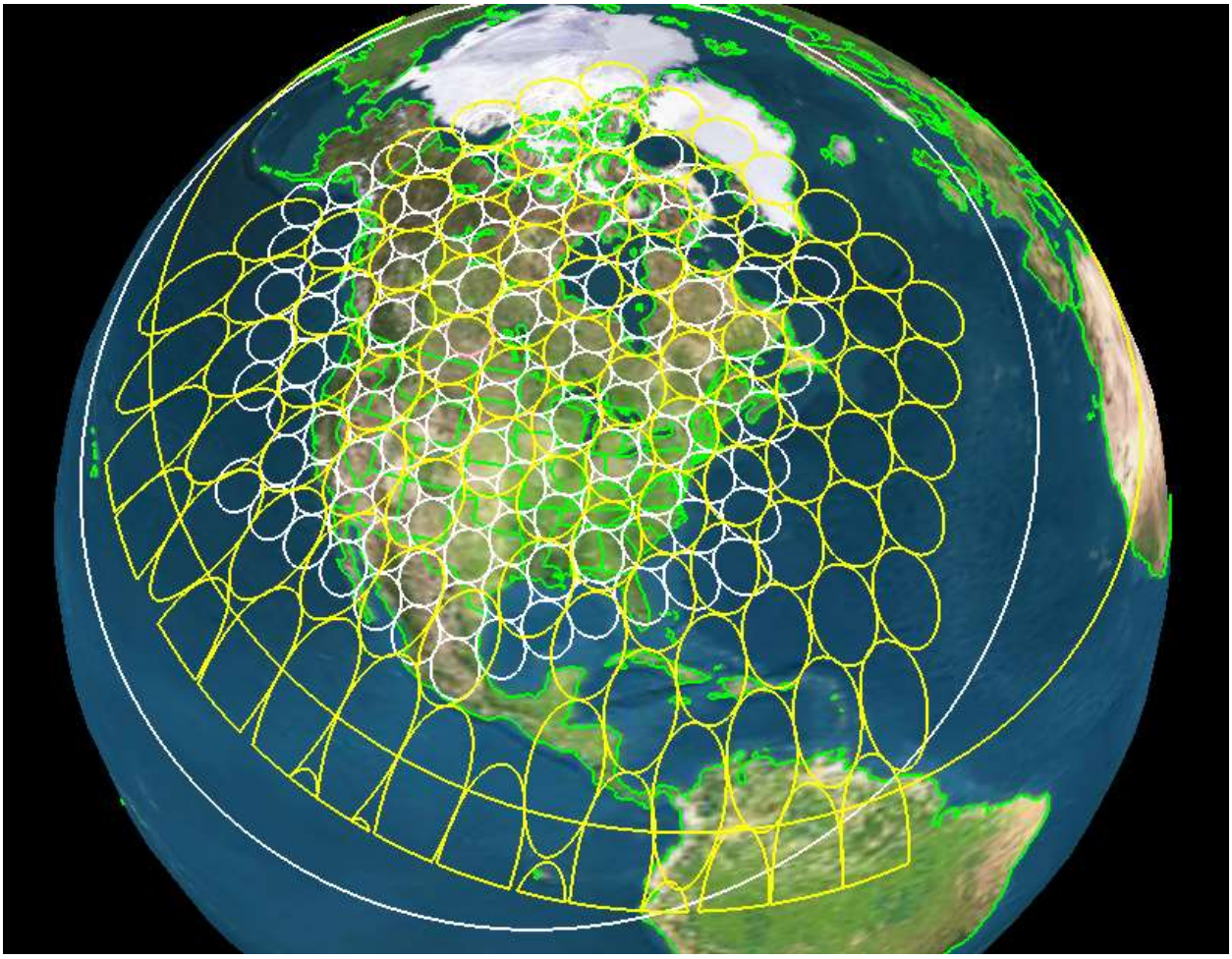

Figure 6 Satellite exiting West North America active arc (small white footprints) while another satelite is at apogee in the East North America active arc (yellow footprints).