Exhibit A

Description of Application

ViaSat, Inc. ("ViaSat") seeks authority to operate a 4.1 meter, Model VA-41-KA gateway-type earth station in the Ka band to communicate with the ViaSat-2 satellite, which is expected to be launched by the first quarter of 2017, and enter into commercial service during the summer of 2017. To enable satisfaction of the one-year construction deadline for earth station facilities in Section 25.133(a)(1), this application is being filed approximately 15 months before the expected in-service date of ViaSat-2. ViaSat has filed a series of thirty-six other applications for earth stations that will also serve as the critical broadband aggregation and interconnection facilities for the ViaSat-2 network, and one additional application is being filed concurrently with this application. Two additional such applications are expected to be filed shortly.

The earth station will operate in the 17.7-19.3 GHz and 19.7-20.2 GHz downlink frequencies and the 27.5-29.1 GHz and 29.5-30.0 GHz uplink frequencies. ViaSat-2, which will operate under the authority of the United Kingdom, has been approved to serve the United States in the 18.3-19.3 GHz, 19.7-20.2 GHz, 28.1-29.1 GHz and 29.5-30.0 GHz band segments.[1] The ViaSat-2 Authorization allows the spacecraft to operate (i) in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.5-30.0 GHz frequencies on a primary basis, (ii) in the 28.1-28.35 GHz on a secondary basis to LMDS and in the 28.6-29.1 GHz frequencies on a secondary basis to NGSO systems, and (iii) in the 18.8-19.3 GHz frequencies on a non-conforming basis pursuant to a grant of a waiver of Section 2.106 of the Commission's rules, and specifically footnote NG165 thereto. ViaSat has pending an application to modify its authority for ViaSat-2 to include operations in the 27.5-28.1 GHz band segment on a secondary basis to LMDS and the 17.7-18.3 GHz band segment on a non-conforming basis pursuant to a waiver request.[2]

To the extent necessary, ViaSat requests a waiver of the U.S. Table of Frequency Allocations to allow the earth station to receive communications from ViaSat-2 in the 17.7-18.3 GHz and 18.8-19.3 GHz frequencies on a non-conforming basis.[3] Granting waivers to allow the operation of the earth station in these bands is in the public interest because it will allow ViaSat to deploy the earth station facilities that will serve as the aggregation and interconnection points for the ViaSat-2 network. ViaSat-2 incorporates ViaSat's next-generation satellite technology, which will utilize this spectrum to provide greater capacity and throughput for a range of communications services to businesses, consumers and governmental users. Moreover, as discussed in more detail below, these operations will occur without causing harmful interference into the services that are designated as primary within the United States.

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[1] *See* IBFS File Nos. SAT-LOI-20130319-00040 (granted Dec. 12, 2013); SAT-MOD-20141105-00121 & SAT-AMD-20150105-00002 (granted Apr. 15, 2015); Call Sign: 2902 ("ViaSat-2 Authorization").

[2] IBFS File No. SAT-MOD-20160527-00053 (filed May 27, 2016) ("ViaSat-2 Modification Application").

[3] 47 C.F.R. § 2.106, n.NG165, US271.

I. CONSISTENCY WITH CO-FREQUENCY OPERATIONS

The proposed operations are compatible with the operations of adjacent GSO systems, as well as co-frequency NGSO systems, primary terrestrial users, and BSS feeder link Earth-to-space transmissions.

A. GSO Operations

Section 25.132(a)(2) provides that earth stations operating in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz and 29.5-30.0 GHz band segments must demonstrate compliance with Section 25.138.[4] The antenna meets the performance requirements in Section 25.138(a) in the direction of the GSO arc, as well as in all other directions, as illustrated by the off-axis EIRP spectral density plots attached as Exhibit B. ViaSat includes all patterns in digitized format for all angles up to +/-180 degrees, including the off-axis EIRP density envelope superimposed on the plots, consistent with the requirements of Section 25.138(d).[5] Further, as established in the Commission's authorization for the ViaSat-2 satellite, the power flux-density at the earth's surface produced by emissions from ViaSat-2 are within the -118 dBW/m2/MHz limit set forth in Section 25.138(a)(6).

Out of an abundance of caution, ViaSat provides the gain patterns for receiver performance in Exhibit C, even though the Commission has deleted the requirement in Section 25.138(e) to provide antenna performance plots for the receive bands.[6] When plotted against the current Section 25.209(a) and (b) mask as revised by the *Part 25 Second Report and Order*, the receive performance complies with the modified mask.[7] Therefore, the earth station would be entitled to protection in the 18.3-18.8 GHz and 18.7-20.2 GHz band segments at levels established in Section 25.209 that is expected to be in effect at the time the requested earth station authorization is issued.

B. NGSO Operations

Under the ViaSat-2 Authorization, that GSO FSS system may operate in the 28.6-29.1 GHz band segment on a secondary basis with respect to NGSO FSS systems, and in the 18.8-

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4 47 C.F.R. § 25.132(a)(2).

5 The Commission has adopted modifications to the Part 25 rules to consolidate and streamline certain requirements, including the requirement to provide off-axis EIRP density plots. *See Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Second Report and Order, 30 FCC Rcd 14713 ¶ 215 (2015) ("*Part 25 Second Report and Order*"). Out of an abundance of caution, ViaSat provides plots in accordance with the current Section 25.138(d) requirement, which provides more information than in required in the new rules that are not yet in effect.

6 *See id.* ¶ 322.

7 As plotted against the current Section 25.209(a) and (b) mask, which was revised in the *Part 25 Second Report and Order*, the receive patterns show minor incursions.

19.3 GHz band segment on a non-conforming basis.[8] NGSO systems are designated as primary in the U.S. in these frequencies. ViaSat's proposed earth station operations would not cause harmful interference into NGSO systems as a result of the conditions in the ViaSat-2 Authorization designed to protect NGSO systems in the 18.8-19.3 GHz downlink band segment and the associated 28.6-29.1 GHz uplink band segment, and as discussed in the ViaSat-2 Modification Application.[9]

C. Terrestrial Operations

ViaSat will operate in the 27.5-28.35 GHz band segment in a manner that will protect Local Multipoint Distribution Service ("LMDS") operations, which are designated in the U.S. as the primary use of the band, from harmful interference.[10] Consistent with the GSO FSS designation in the United States in this band as secondary with respect to LMDS, as well as the conditions in the ViaSat-2 Authorization for operations in the 28.1-28.35 GHz band segment and the commitments that ViaSat has made in the ViaSat-2 Modification Application, ViaSat's use of the 27.5-28.35 GHz frequency band for gateway-type earth stations will be on a non-harmful interference basis relative to LMDS.[11] As demonstrated in the attached Technical Analysis, the proposed earth station is capable of operating on a non-interference basis with existing or future LMDS stations.[12]

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8 To the extent necessary, and for the same reasons specified in the ViaSat-2 Authorization, ViaSat requests a waiver of NG165 to allow GSO FSS operations in the 18.8-19.3 GHz band on a non-conforming basis.

9 *See* IBFS File No. SAT-LOI-20130319-00040, Call Sign S2902, at Attach. ¶ 4 (granted Dec. 12, 2013); ViaSat-2 Modification Application, Supplemental Technical Annex at A.11.

10 *See Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, First Report and Order, FCC 96-311, ¶¶ 42, 44 (1996) ("*28 GHz First Report and Order*") (designating the FSS as secondary to LMDS but having "licensing priority vis-a-vis any third service allocated domestically or internationally in the band").

11 ViaSat-2 Authorization, Attachment ¶ 12 (authorizing ViaSat-2 in the 27.1-28.35 GHz band on a secondary basis with respect to LMDS); *see also*, *28 GHz First Report and Order* ¶ 45 ("At 27.5-28.35 GHz we designate 850 MHz for LMDS on a primary basis. GSO/FSS . . . will be permitted on a non-interference basis to the LMDS systems in the 850 MHz band segment, for the purpose of providing limited gateway-type services.").

12 ViaSat acknowledges the pendency of the Spectrum Frontiers Notice of Proposed Rulemaking, which proposes to make this band segment available for terrestrial mobile services. *See Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, GN Docket No. 14-177, Notice of Proposed Rulemaking, FCC 15-138 (rel. Oct. 23, 2015). ViaSat would accept a grant conditioned upon the outcome of that proceeding.

In addition, and as demonstrated in the ViaSat-2 Modification Application, which seeks to add the 17.7-18.3 GHz frequencies, downlinks from ViaSat-2 in this band segment would not cause harmful interference into fixed service ("FS") operations that are designated in the U.S. as primary in this band.[13] In that application, ViaSat requested a waiver of the allocations in the U.S. Table of Frequency Allocations in Section 2.106 of the Commission's rules. ViaSat requests a waiver to the extent necessary to allow the proposed earth station antenna to receive transmissions from ViaSat-2 in this band on a non-protected basis. Downlinks from ViaSat-2 in this band will meet the power flux density limits prescribed by the ITU, which have been established to protect terrestrial services in this band. As a non-conforming user, ViaSat would accept interference from FS operations in this band.

D. BSS Feeder Links

The 17.7-17.8 GHz is allocated to the FSS on a co-primary basis, and footnote US271 limits the allocation to broadcasting-satellite service ("BSS") feeder links in the Earth-to-space direction. Therefore, in the ViaSat-2 Modification Application, ViaSat requested a waiver of Section 2.106 and footnote US271 to allow ViaSat-2 to operate downlinks in this band on a non-conforming, non-interference basis. In that application, ViaSat demonstrated that ViaSat-2 downlinks in this band would not cause harmful interference into receivers on adjacent BSS spacecraft.[14] Correspondingly, ViaSat requests a waiver in this application to the extent necessary to permit the proposed earth station to receive transmissions from ViaSat-2 in the 17.7-17.8 GHz band segment. As a non-conforming user, ViaSat would accept interference from BSS Earth-to-space transmissions into the proposed earth station in this band segment.

II. RADIATION HAZARD ANALYSIS

A radiation hazard analysis for the proposed antenna is attached hereto as Exhibit D. As demonstrated by the results of the analysis, harmful levels will not be present in areas occupied by the general population, and the antenna does not present a risk to trained personnel in the controlled area in the immediate vicinity of the antenna.

III. FAA NOTIFICATION

The proposed 4.1 meter antenna is exempt from notification to the FAA under Section 17.7(e)(3) of the Commission's rules because the height of the antenna is less than 6.1 meters above ground level.

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[13] *See* ViaSat-2 Modification Application, Supplemental Technical Annex at A.9.

[14] *See id*. at A.10.

Technical Analysis

The Commission's rules permit GSO FSS use of the 27.5-28.35 GHz band segment on a secondary basis for gateway-type earth stations on a secondary basis to LMDS facilities. ViaSat submits the following showing to demonstrate that the proposed gateway-type earth stations to be located in Atlanta and Memphis are capable of operating on a non-interference basis with existing or future LMDS stations. The analysis for these two earth stations is the same as that filed for each of the 4.1 meter gateway-type earth stations proposed for locations identified in Table 3 below that will serve as broadband traffic aggregation and interconnection points for the ViaSat-2 network (the "ViaSat-2 Gateways"). All of the ViaSat-2 Gateways will be 4.1 meter antennas that are identical to that described in this application, except for two sites that will utilize a 9.1 meter antenna, and are subject to a separate technical analysis submitted with those applications.

ViaSat has implemented measures to ensure that each of the ViaSat-2 Gateways will operate in a manner that will protect LMDS stations from harmful interference. LMDS deployment is unlikely in the future. However, prior to commencement of the proposed operations, ViaSat will notify any LMDS licensees in the vicinity and provide them with a point of contact with respect to the operation of this earth station so that they can notify ViaSat should they plan to deploy an LMDS facility in the vicinity of this earth station in the future. Such notice would allow ViaSat to protect those LMDS stations by erecting shielding around the earth station.

ViaSat conducted a technical analysis to determine a "worst case" potential required separation distance from an LMDS terminal, assuming no shielding were employed at the earth station and no additional blockage from terrain. The operating elevation angles for the ViaSat-2 Gateways range between 16.8 degrees and 52.7 degrees, but from the antenna EIRP density plots in Exhibit B it can be seen that the EIRP density ranges from -46 dBW/40 kHz to -55 dBW/40 kHz. Accordingly, two analysis results tables are presented that capture the range of min/max EIRP density toward the LMDS stations. The operating elevation angle for the Atlanta earth station is 48.0 degrees, and for the Memphis earth station is 44.2 degrees, and thus both are in the range of this analysis.

Because no sharing criteria have been expressly adopted, ViaSat relied on research available in technical papers discussing LMDS systems and link budgets,[15] and also obtained LMDS equipment specifications from a major LMDS equipment manufacturer.[16] Based on the available research, ViaSat selected a ΔT/T of 6% as the basis for calculating the potential separation distance with no shielding at the earth station. This threshold results in an I/N ratio of -12.2 dB and yields an effective increase to the LMDS receiver's noise floor of 0.27 dB. These levels are not assumed to be, and should not be construed as, the basis for assessing what would constitute "harmful interference" into the LMDS facility. The ΔT/T of 6% threshold was

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15 Robert Duhamel, "Local Multipoint Distribution Service (LMDS) Cell Sizing and Availability," IEEE P802.16 Broadband Wireless Access Working Group (June 9, 1999), *available at* http://wirelessman.org/sysreq/contributions/80216sc-99_17.pdf.

16 DragonWave Packet Microwave Systems, Product Link: http://www.dragonwaveinc.com/products-wireless-ethernet.asp.

used in ViaSat's analysis demonstrating compatibility of the 17 ViaSat-1 earth stations that operate in the in the 28.1-28.35 GHz band, which were granted based on that analysis.

The analysis considers both hub-type and user-type LMDS terminals. However, the higher antenna gain and the better receiving performance of the user-type LMDS terminals make these terminals more sensitive than the hub-type terminals, and thus, more susceptible to interference. Therefore, only the results of the analysis from the LMDS user terminals are presented here.

The analysis assumes the LMDS terminal has an antenna gain of 31 dBi and a receiver noise figure of 6 dB, which are included in the technical specifications provided for sample LMDS equipment. Based on these assumptions, ViaSat calculated the required separation distance between the earth station and the LMDS terminal under a worst-case alignment scenario. This calculation assumes that the LMDS user terminal is located along a line on the same bearing as the satellite and pointed directly at the earth station, i.e., maximal coupling between the two antennas.

Parameters	**ViaSat**	**LMDS**	
Frequency (GHz)	28.3	28.3	GHz
On-axis EIRP Density	32.99		dBW/MHz
On-axis Transmit Antenna Gain	59.6		dBi
Off-axis Angle	16.64	0.0	deg
Off-axis Transmit Antenna Gain	-5.4		dBi
Off-Axis EIRP density	-32.0		dBW/MHz
Circular to Linear Polarization Reduction		3.0	dB
Distance between sites		17.19	km
Path Loss		146.2	dB
On-axis Receive Antenna Gain		31.0	dBi
Off-axis Receive Antenna Gain Reduction		0.0	dB
System Noise Figure		6.0	dB
Thermal Noise Density		-138.0	dBW/MHz
Interference Noise Density		-150.2	dBW/MHz
I/N		-12.2	dB
Noise Floor Degradation		0.2531	dB
ΔT/T		6.0000	%
Received Carrier Level		-117.0	dBW/MHz
Received Noise Plus Interference		-137.7	dBW/MHz
C/(N+I)		20.71	dB
Reduction due to Interference Noise		0.25	dB

Table 1 System Parameters and Results for 16.6 Degree Elevation Angle

The results in Table 1 indicate that the required separation distance between an LMDS terminal and the earth station for the worst case alignment and lowest elevation installation is 17.19 km.

This is the minimum distance along this worst case path between an LMDS terminal and the earth station that satisfies the above 6% ΔT/T protection criteria without requiring ViaSat to take measures to mitigate interference into that LMDS terminal. The actual required separation distance may be smaller depending on the characteristics of the surrounding terrain and variations in the LMDS system from the assumptions used in this analysis. The required separation distance decreases dramatically when the LMDS station's antenna is not pointed toward the earth station.

Parameters	ViaSat	LMDS	
Frequency (GHz)	28.3	28.3	GHz
On-axis EIRP Density	33.0		dBW/MHz
On-axis Transmit Antenna Gain	59.6		dBi
Off-axis Angle	52.70	0.0	deg
Off-axis Transmit Antenna Gain	-14.4		dBi
Off-Axis EIRP density	-41.0		dBW/MHz
Circular to Linear Polarization Reduction		3.0	dB
Distance between sites		6.10	km
Path Loss		137.2	dB
On-axis Receive Antenna Gain		31.0	dBi
Off-axis Receive Antenna Gain Reduction		0.0	dB
System Noise Figure		6.0	dB
Thermal Noise Density		-138.0	dBW/MHz
Interference Noise Density		-150.2	dBW/MHz
I/N		-12.2	dB
Noise Floor Degradation		0.2531	dB
ΔT/T		6.0000	%
Received Carrier Level		-117.0	dBW/MHz
Received Noise Plus Interference		-137.7	dBW/MHz
C/(N+I)		20.71	dB
Reduction due to Interference Noise		-14.71	dB

Table 2 System Parameters and Results for 52.7 Degree Elevation Angle

Table 2 shows the required separation distance given the same worst case alignment as above, but when the operating elevation angle of the earth station is higher. At angles greater than 35 degrees, the off-axis gain toward the horizon is reduced by at least 74 dB from the on-axis value. In this case, the elevation angle of the earth station is 52.7 degrees and the distance required to meet the 6% ΔT/T criteria drops to 6.1 km.

Table 3 lists each of the ViaSat-2 Gateway locations and the respective elevation angles to ViaSat-2. From the table it can be seen that the average elevation angle is 37.3 degrees. ViaSat conducted further analyses using Visualyse software to perform an area analysis that demonstrates the impact to the area surrounding the earth station when operating at a 35 degree elevation angle, which is representative of the majority of the sites for the ViaSat-2 Gateways. The Visualyse simulation determines the level of interference into an LMDS user terminal at all locations surrounding the earth station for a variety of LMDS hub locations. In this area analysis, the LMDS hub terminal is moved in small steps around a square centered over the earth station such that the LMDS hub station is located about 2.5 km from the earth station as it moves around the periphery of the square. Each time the LMDS hub station is moved, the LMDS user terminal is then moved in small steps to each location within the area and the I/N results are recorded. The analysis continues in successive iterations until all of the results for the various locations are recorded. Using these recorded results, Visualyse generated the figure shown below to illustrate the worst case contour boundary where the interference level from the earth station into the LMDS user terminal exceeds the assumed 6% ΔT/T threshold. This boundary is indicated by the green contour line. The orange and red contour lines indicate an I/N of -6 dB (25.1% ΔT/T) and 0 dB (100% ΔT/T) respectively. The LMDS user station in the figure is shown 8.4 km away from the earth station.

Figure 1 depicts the Visualyse results for the scenario described above. Under this scenario, the results show that the worst case required separation distance is 8.4 km. The grids in the figure are spaced at 1 km intervals. In this scenario, shielding could be employed as needed to reduce the required separation distance toward any higher priority co-frequency terrestrial deployment.

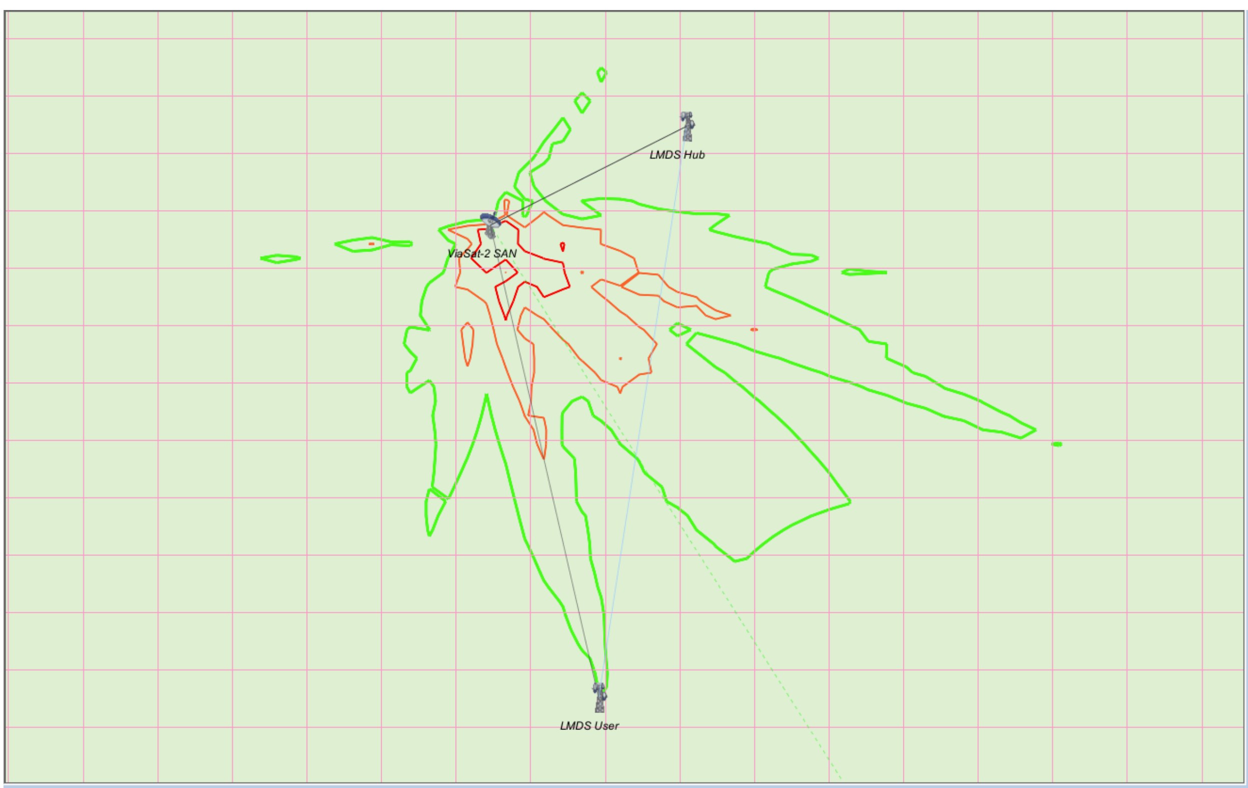

Figure 1 Visualyse Results for Variable Hub Location

Figure 2 shows the same Visualyse simulation for an example static LMDS hub location approximately 1 km northeast of the earth station site. In this case the LMDS user terminal is again moved to all locations within the area analysis, but because the worst case antenna alignment never occurs, the distance to meet the 6% ΔT/T criteria drops to about 3 km along two very narrow regions and the remainder of the analysis area is unaffected.

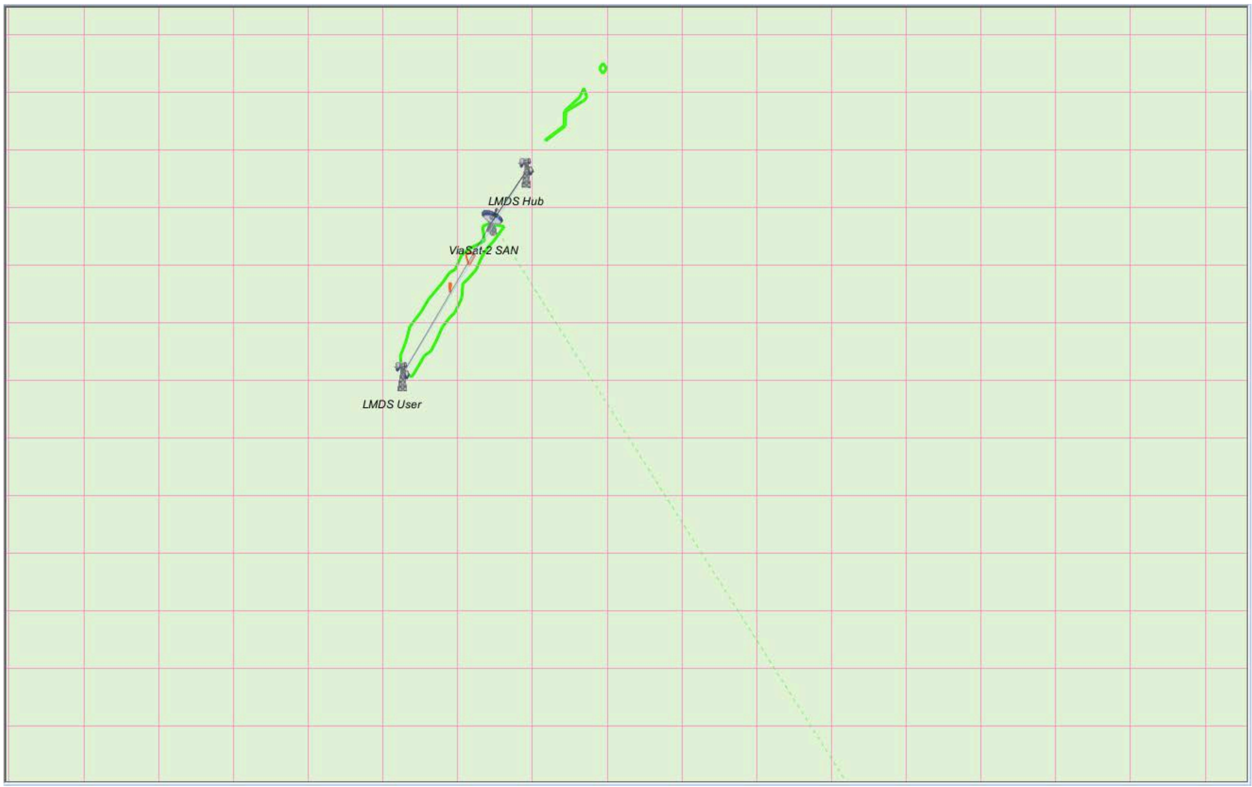

Figure 2 Visualyse Results for Static Hub Location

City	Lattitude	Longitude	Decimial Lattitude	Decimal Longitude	Azimuth Angle	Elevation Angle
Albuquerque	35 05 37.5N	106 38 45.2W	35.093750	-106.645889	127.597	33.764
Columbus	39 53 20.9N	082 55 58.7W	39.889139	-82.932972	160.153	41.933
Portland	44 57 17.4N	123 00 57.6W	44.954833	-123.016000	117.932	16.833
Denver	39 32 57.3N	104 51 52.4W	39.549250	-104.864556	132.320	31.827
Des Moines	41 34 46.0N	093 35 43.3W	41.579444	-93.595361	146.524	36.246
Carlsbad	33 07 41.2N	117 15 54.9W	33.128111	-117.265250	116.710	26.821
Ft. Hancock	31 26 29.0N	106 05 01.2W	31.441389	-106.083667	125.494	36.562
Chiefland	29 28 19.4N	082 51 34.6W	29.472056	-82.859611	154.933	52.809
Hammonton	39 37 01.3N	074 49 20.6W	39.617028	-74.822389	172.308	43.887
Houston	29 46 15.4N	095 20 45.6W	29.770944	-95.346000	136.220	45.547
Raleigh	35 49 48.5N	078 36 34.9W	35.830139	-78.609694	165.335	47.405
Tucson	32 12 57.5N	110 57 42.0W	32.215972	-110.961667	121.464	32.313
Charlotte	35 38 56.1N	080 40 04.9W	35.648917	-80.668028	161.928	47.071
Oklahoma City	35 24 21.5N	096 55 23.9W	35.405972	-96.923306	138.641	39.915
Atlanta	33 35 35.4N	084 13 14.6W	33.593167	-84.220722	155.232	48.024
Omaha	41 56 27.8N	096 27 52.0W	41.941056	-96.464444	143.201	34.571
Rapid City	44 04 20.7N	103 09 38.2W	44.072417	-103.160611	136.681	29.371
Nashville	36 06 11.2N	086 45 18.7W	36.103111	-86.755194	152.789	44.467
Bozeman	45 40 33.4N	111 08 33.8W	45.675944	-111.142722	129.213	23.758
Indianapolis	39 44 29.2N	086 09 07.1W	39.741444	-86.151972	155.489	41.047
Las Vegas	36 08 33.7N	115 04 38.1W	36.142694	-115.077250	120.377	26.973
San Antonio	29 26 18.32N	098 30 25.32W	29.438422	-98.507033	132.025	43.597
Dallas	32 22 01.36N	096 38 15.28W	32.367044	-96.637578	136.740	42.591
Salt Lake City	41 14 17.82N	111 59 28.47W	41.238283	-111.991242	126.121	26.137
Minneapolis	44 51 03.77N	093 35 53.87W	44.851047	-93.598297	148.103	33.230
Milwaukee	43 00 52.28N	088 27 58.70W	43.014522	-88.466306	153.786	36.955
Memphis	34 57 46.83N	089 49 52.26W	34.963008	-89.831183	147.675	44.183
Birmingham	33 29 58.56N	086 49 13.43W	33.499600	-86.820397	151.137	47.017
Reno	39 22 55.17N	120 04 54.56W	39.381992	-120.081822	117.878	21.605
San Jose	37 43 16.58N	121 30 38.33W	37.721272	-121.510647	115.861	21.344
Kansas City	38 44 35.79N	093 52 42.81W	38.743275	-93.878558	144.598	38.689
St Louis	38 15 53.50N	090 24 45.13W	38.264861	-90.412536	148.863	40.780
Little Rock	34 45 44.56N	092 15 36.14W	34.762378	-92.260039	144.191	43.122
Detroit	42 19 30.09N	083 04 11.71W	42.325025	-83.069919	160.837	39.347
Virginia Beach	36 50 17.55N	076 20 00.66W	36.838208	-76.333517	169.349	46.751
Augusta	33 28 28.61N	081 58 21.88W	33.474614	-81.972744	158.805	48.972
Pittsburgh	40 25 30.18N	079 58 11.06W	40.425050	-79.969739	164.685	42.126
Scranton	41 18 59.30N	075 42 54.04W	41.316472	-75.715011	171.231	41.903

Table 3 – 4.1 m Site Locations

Note: an additional two 4.1 m antenna site locations for McAllen, Texas, and Boston, Massachusetts, are still being finalized, and the associated earth station applications will be filed shortly.

In addition to the above 4.1 m sites, applications have been filed for two sites (Albuquerque and Des Moines) where a 9.1 m antenna will be installed. A separate analysis has been provided for each of those sites in the applications for those earth stations.