APPLICATION FOR LICENSE MODIFICATION

Introduction:

Pursuant to 47 C.F.R. § 25.117, HNS License Sub, LLC ("Hughes") seeks authority to modify its blanket earth station authorization, call sign E110149, to (i) add new antenna models; (ii) add the transmit frequency band 27.85-28.35 GHz for the new antenna models; and (iii) add the planned Jupiter 97W satellite (call sign S2834) as point of communication for all antenna models.

On July 27, 2012, the FCC authorized Hughes to access the U.S. market using Jupiter 97W, a satellite that will operate in the Ka-band and provide broadband services to U.S. consumers across the country.[1] On December 10, 2014, Hughes filed an application (which remains pending) to modify its authorization, including adding the frequencies 27.85-28.35 GHz (gateway uplink) and updating the FCC licensing information associated with the satellite to reflect that it will be operated by Hughes under the International Telecommunications Union ("ITU") network RAGGIANA-5 registered at the ITU by Papua New Guinea.[2]

Grant of this application is in the public interest as it will allow Hughes to deploy the gateway earth stations necessary for the Jupiter 97W satellite, which is scheduled to be launched in 2016 and will provide advanced broadband services to U.S. consumers. Specifically, Jupiter 2 will offer significant additional capacity to the Hughes fleet to meet the broadband needs of business and residential users in North America, delivering such high demand services as HD

[1] *See* Hughes, Letter of Intent, IBFS File No. SAT-LOI-20110809-00148 (granted Jul. 27, 2012). The application was placed on Public Notice on Mar. 20, 2015.

[2] *See* IBFS File No. SAT-MOD-20141210-00127 (filed Dec. 10, 2014).

video programming, on-demand entertainment, digital music, interactive television, video conferencing and high capacity two-way communications.

Additional Antennas:

In the modification application, Hughes seeks authority to add the following gateway earth station antennas seven 8.1 meter earth station antennas, seven 5.6 meter earth station antennas, two 9.2 meter antennas, and one 13.2 meter earth station antenna. The technical data for these antennas is provided in the accompanying Form 312, Schedule B.

The proposed additional antennas will meet the antenna performance mask provided in § 25.209(a) of the Commission's Rules. The off-axis EIRP density levels in § 25.138(a) are met with the antenna types that Hughes is proposing to add under this authorization.

In order to make review of this application more efficient, Hughes provides in Table 1 the location of sites for which an earth station will be deployed under the current modification in the 2015-2016 timeframe.

Table 1: Earth Station Sites

		Site Contact Information	Antenna Diameter	Longitude			Lattitude		
	Sites		**(meters)**	**Degree**	**Minutes**	**Seconds**	**Degree**	**Minutes**	**Seconds**
1	Albuquerque	725 6th Street, N.W. Albuquerque, NM 87102	8.1	106	39	10.8	35	5	32.28
2	Amarillo	512 SE 8th Ave, Amarillo,TX 79101	8.1	101	49	55.2	35	12	16.56
3	Billings	1030 Central Avenue, Billings, MT 59102	5.6	108	32	27.6	45	46	6.96
4	Bismark	4202 Coleman Street - Bismarck, ND 58501	8.1	100	46	48.72	46	51	5.76
5	Boise	10215 W. Emerald Street, Boise ID 83704	5.6	116	18	36	43	36	27.72
6	Cheyenne	530 Echostar Drive Cheyenne, WY 82007	9.2	104	44	9.6	41	7	55.2
7	Missoula	8404 El Way, Suite 1 Missoula, MT 599808	5.6	114	7	1.2	46	56	9.96
8	North Las Vegas	1 Aerojet way North Las Vegas, NV.	5.6	115	7	2.64	36	14	11.04
9	North Platte	1003 East State Farm Road, North Platte, NE 69103	8.1	100	45	10.8	41	5	26.88
10	Omaha	9394 West Dodge Road #100 Omaha NE 68114	13.2	96	3	32.76	41	15	51.48
11	San Jose	2050 Martin Avenue Santa Clara, CA 95050	5.6	121	57	39.6	37	21	54.72
12	Salt Lake City, UT	333 S 520 W, Lindon, UT 84042, USA	5.6	111	43	40.8	40	19	57
13	Gilbert	801 North Dish Drive, Gilbert, AZ	9.2	111	48	50.4	33	21	55.8
14	Seattle	12101 Tukwila International Blvd, Tukwila, WA 98168, USA	8.1	122	17	42	47	29	33
15	Roseburg, OR	455 SE Spruce St., Roseburg, Oregon 97470	8.1	123	20	49.56	43	12	40.32
16	San Diego, CA	12270 World Trade Drive #100 San Diego, CA	5.6	117	4	24.6	32	59	19.68
17	Duluth, MN	3401 Technology Drive, Duluth, MN, 55811	8.1	92	7	49.8	46	49	33.6

Additional Frequencies:

The proposed additional earth stations will be operated as gateways in conjunction with the Jupiter 97W satellite network. All proposed earth stations will operate in the following frequency bands:

Table 2 - Gateway Beams		
Frequency Band (GHz)	**Function**	**US Allocation**
27.85-28.35	Gateway Uplink	LMDS Primary
28.35-28.6	Gateway Uplink	FSS GSO Primary
28.6-29.1	Gateway Uplink	NGSO FSS Primary
29.25-30.0	Gateway Uplink	FSS GSO Primary
18.3-18.8	Gateway Downlink	FSS GSO Primary
18.8-19.3	Gateway Downlink	NGSO FSS Primary
19.7-20.2	Gateway Downlink	FSS GSO Primary

Hughes is seeking authority to add the 27.85-28.35 GHz frequency band to its authorized frequencies for the additional earth stations only.[3] The 27.5-28.35 GHz uplink band is allocated to the local multipoint distribution service ("LMDS") on a primary basis and to Fixed Satellite Service on a secondary basis.

The attached Comsearch coordination report (Exhibit A) shows that the additional gateway earth stations which will be deployed in 2015-2016 will be capable of operating in the

[3] *See* IBFS File No. SAT-MOD-20141210-00127 (filed Dec. 10, 2014) (seeking authority to add 27.85-28.35 GHz band to authorization for Jupiter 97W.

27.85-28.35 GHz band on a non-harmful interference basis with existing and future LMDS systems. On December 5, 2014, Comsearch completed frequency coordination notice for 16 of the proposed locations in Table 1.[4] Prior-notification letters were sent to incumbent 28 GHz licensees, and no objections were received. Therefore, there are no interference concerns regarding the addition of the 27.85-28.35 GHz frequency band to this authorization.

As to those stations requested under this authorization but which will be deployed later, Hughes commits not to make use of the band 27.85-28.35 until a prior coordination notice has been issued and no concerns have been filed.

Additional Point of Communication:

Hughes seeks to add the Jupiter 97W satellite at 97.1° W.L. as a point of communication to all antennas included under this authorization.[5] As mentioned previously, only those antennas where coordination with the LMDS has been successfully completed will make use of the frequency band 27.85-28.35 GHz.

Waiver Request:

As detailed in the attached Exhibit B (Waiver Requests), Hughes requests a partial waiver of the data submission requirements of 47 C.F.R. § 25.115(e), 25.138(d) and (e) in order to allow for submission of measured data for each of the proposed antenna types. Hughes also requests a

[4] The frequency coordination for the 9.2m antennas in Gilbert, AZ and Cheyenne, WY is underway, and Hughes will supplement this application when coordination has been completed.

[5] The FCC added the Jupiter 97W satellite to the Ka-band Permitted List at the 97.1 W.L. orbital location for the 28.35-28.6 GHz and 29.25-30.0 GHz frequency bands (Earth-to-space), and the 18.3-18.8 GHz and 19.7-20.2 GHz frequency bands (space-to-Earth). *See* Stamp Grant, SAT-LOI-20110809-00148 ¶ 10 (granted Jul. 27, 2012). However, E110149 does not have the ALSAT designation so it is not authorized to communicate with all satellites on the Permitted Space Station List.

waiver of Section 25.130(g) regarding the licensing of multiple antenna locations under a single Call Sign.

FAA Notification:

The 5.6 meter antennas proposed in this application are exempt from notification to the FAA under 47 C.F.R. §17.7(e)(3) as they are less than 6.1 meters in height above ground level.[6]

For those locations where the gateway antenna has a diameter of 8.1 meters or greater, the FCC TOWAIR software application was used to verify compliance with the limits in 47 C.F.R. § 17.7(b). All gateway stations, except the one in Seattle, passed this verification.[7]

The Seattle gateway will be located approximately 4000 meters from the Boeing factory airfield and will exceed the slope requirement in 47 CFR § 17.7(b). This antenna will consist of an 8.1 meter parabolic antenna that will have a maximum height of no more than 8.3 meters above ground level. However, the Seattle gateway antenna will be located on the side of a hill, with a building located immediately beside the antenna. This building has a maximum height of 25 meters and is between the antenna and active runway. Given the shielding of the antenna by a larger, permanent structure, FAA notification of the Seattle gateway location is not required.[8] Photo 1 provided below shows both the antenna location (red) and the end of the active runway (yellow). Photo 2 provides additional resolution at the antenna location, showing a hill on the left and a building taller than the antenna on the right.

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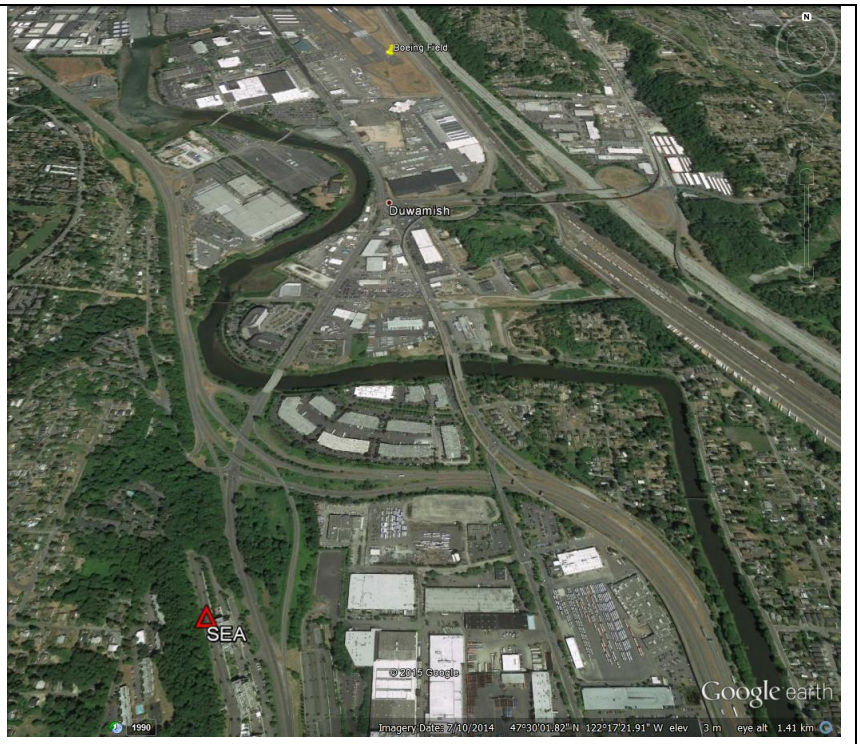
[6] *See also* 47 C.F.R. § 25.113(c) (exemption from FAA notification when antenna height is less than 6.1 meters above ground).

[7] *See* Exhibit C

[8] See 47 CFR § 17.7(e)(1)

Photo 1 (altitude 1400 meters)	
Photo 2 (altitude 145 meters)	

Radiation Hazard Analysis:

Radiation hazard analyses were conducted in regard to the four antenna types proposed in this application. The analyses were carried out using the predictive methodology identified in OET Bulletin 65 and the results are provided in Exhibits D1 to D4.

The analyses were based on the maximum RF power at the antenna flange of 125 Watts for the 5.6 meter antenna and 200Watts for the 8.1, 9.2 and 13.2 meter antennas. This is the maximum uplink power control power, which will only be used for very short periods of time during rain. During clear-sky operations, RF levels will be significantly lower.

Exhibits D1 to D4 show that the average exposure levels for the protection of the general public are met in the near field, transition field, far field as well as between the reflector and ground. As is typically the case with parabolic antennas, the average exposure level for the protection of the general public is exceeded between the feed horn and the reflector.

Since these large antennas will be mounted on a pedestal, the volume of space between the feed horn and reflector where the limit is exceeded will always be above the head of anyone standing in front of the antenna. To further ensure the protection of the general public, the antenna will be located either behind a fence or on private commercial property with limited access. Technicians responsible for operating these antennas are trained to shut down and lock out the transmitter before performing any maintenance work.

NGSO Feederlink Coordination:

The frequency band 29.25-29.50 GHz which will be used by the new antennas is shared on a co-primary basis with the feeder link stations of MSS NGSO systems under 47 C.F.R. §25.258. Hughes has previously concluded a coordination agreement with Iridium, the only

NGSO licensee in this band. By complying with the coordination agreement, Hughes will ensure the protection of Iridium's operations in the band.

Conclusion:

For the reasons stated herein, Hughes requests that the Commission grant this modification application to operate additional earth station antennas, allow access to the 27.8-28.35 GHz band (in addition to the Ka-band frequencies authorized under the existing license) by these antennas, and allow the addition of Jupiter 97W as a point of communication. As demonstrated herein, grant of this application is in the public interest, and the proposed operations will not cause any harmful interference.

Respectfully Submitted,

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Exhibit A to Attachment 1- LMDS Coordination Report

Exhibit B to Attachment 1– Waiver Request

Exhibit C to Attachment 1 – TOWAIR Verification

Exhibit D1 to D4 to Attachment 1 – RADHAZ calculation