

## EXHIBIT 1

### DESCRIPTION OF AMENDMENT (Response to Question 43, FCC Form 312)

Pursuant to 47 C.F.R. § 25.116, HNS License Sub, LLC (“Hughes”) submits this amendment to its pending applications (“Applications”) for authority to operate twenty (20) gateway earth stations<sup>1</sup> (listed in Table 1 below) that will communicate with EchoStar XXIV (also known as “HNS 95W” or “Jupiter 3”), a Ka- and Q/V-band geostationary satellite orbit (“GSO”) space station licensed to provide fixed-satellite service (“FSS”).<sup>2</sup> Specifically, Hughes seeks to amend its Applications to permit the following changes to its proposed gateway operations: (i) adding frequencies at 28.6-29.1 GHz (Earth-to-space) for FSS uplinks;<sup>3</sup> (ii) changing the coordinates of the proposed gateway locations to the sites specified in Table 1 below; (iii) increasing the equivalent isotropically radiated power (“EIRP”) and EIRP density; and (iv) increasing the antenna size of 10 proposed gateways from 9.2 meters to 10 meters in diameter, as specified in Table 1 below. These changes are further reflected in the accompanying Schedule B, FCC Form 312, for each proposed gateway. All other information previously provided in the pending Applications, including requested waivers, remains materially unchanged.

Hughes plans to launch and place EchoStar XXIV into operation in 2021. Accordingly, the Commission should grant the Applications as soon as possible to provide the regulatory

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<sup>1</sup> See Hughes, Applications, IBFS File Nos. SES-LIC-20170807-00876 *et seq.* (Aug. 3, 2017).

<sup>2</sup> See Hughes, Stamp Grant, IBFS File No. SAT-LOA-20170621-00092 (Mar. 20, 2018).

<sup>3</sup> Hughes has filed an application for modification of its EchoStar XXIV satellite license to add the same Ka-band spectrum for FSS uplinks, along with the 18.8-19.3 GHz band for FSS downlinks to user terminals. See Hughes, Application for Modification, IBFS File No. SAT-MOD-20190212-00011 (Feb. 12, 2019) (“Satellite Modification Application”).

certainty required to ensure a successful launch of new broadband services, offering substantial public interest benefits for consumers throughout the country and abroad.

***Proposed Additional Ka-band Spectrum.*** Hughes seeks to operate its proposed gateways on additional Ka-band frequencies at 28.6-29.1 GHz (Earth-to-space) in order to provide additional FSS capacity for broadband services to consumers. The proposed gateways will meet the antenna performance masks and off-axis EIRP density limits specified in Sections 25.209(a) and 25.138(a), respectively, of the Commission’s rules for the 28.6-29.1 GHz band (as well as for other frequency bands).<sup>4</sup>

Moreover, consistent with the Commission’s rules and domestic Ka-band plan,<sup>5</sup> the proposed gateway uplink operations at 28.6-29.1 GHz will be on a secondary (*i.e.*, unprotected, non-harmful interference) basis with respect to non-GSO (“NGSO”) FSS systems. Hughes will implement coordination mechanisms to avoid causing harmful interference to authorized NGSO FSS operations at 28.6-29.1 GHz.<sup>6</sup> As previously demonstrated, mutually agreed coordination agreements will enable shared use of the 28.6-29.1 GHz band, while allowing NGSO systems to operate free of harmful interference from GSO operations.<sup>7</sup>

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<sup>4</sup> Hughes’ request set forth in its pending Applications, for a limited waiver of Section 25.132(b)(1)’s requirement for submission of antenna measurement data remains applicable to the proposed gateways, as modified hereunder. *See* Hughes, Applications, Exhibit C, at 2-3 (Waiver Requests). As previously stated, Hughes will accept a license condition requiring submission of the required antenna measurement data within 30 days after filing its post-grant certification of completion of construction. *See id.*

<sup>5</sup> *See* 47 C.F.R. § 2.106 n.NG165; *see also Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809, ¶ 14 (2017).

<sup>6</sup> *See* Response of Jennifer A. Manner, Senior Vice President, Regulatory Affairs, Hughes Network Systems, LLC to letter from Jose P. Albuquerque, Chief, Satellite Division, FCC, IBFS File No. SAT-LOA-20170621-00092 (Sep. 8, 2017).

<sup>7</sup> *See id.* In fact, Hughes already has coordination agreements with a number of authorized NGSO FSS operators, and expects to reach similar coordination arrangements with additional NGSO FSS systems to provide appropriate technical mechanisms for achieving technical compatibility with those systems.

***Proposed Changes in Gateway Locations, EIRP/EIRP Density, and Antenna Size.***

Hughes further seeks to change its proposed gateways to the sites specified in Table 1 below.

Additionally, Hughes seeks to increase the antenna size of ten (10) of its proposed gateways from 9.2 meters to 10 meters in diameter, as specified in Table 1 below. Hughes also seeks to increase the EIRP and EIRP density, as specified in the accompanying Schedule B for each proposed gateway.

Revised technical data, including increased EIRP and EIRP density, for each proposed gateway is provided in the accompanying Schedule B. As shown in the accompanying Schedule B, each proposed gateway will meet all applicable antenna performance masks and off-axis EIRP density limits specified in Sections 25.209(a) and 25.138(a), respectively, of the Commission's rules.

**Table 1: Gateway Earth Station Sites**

	Site and Call Sign	Site Contact Information	Antenna Diameter (meters)	Latitude			Longitude		
				Degree	Minutes	Seconds	Degree	Minutes	Seconds
1.	Flagstaff, AZ E170156	1677 E. Butler Ave., Flagstaff, AZ 86001 301-428-7205	9.2	35	11	25.9	111	37	55.8
2.	Boise, ID E170155	10215 W. Emerald Street, Boise, ID 83704 301-428-7205	9.2	43	36	27.5	116	18	33.8
3.	Bend, OR E170151	20845 NE Sockeye Place, Bend, OR 97701 301-428-7205	10.0	44	5	10.6	121	17	2.0
4.	North Las Vegas, NV E170154	1 Aerojet Way, North Las Vegas, NV 89030 301-428-7205	9.2	36	14	11.8	115	7	5.5
5.	Rapid City, SD E170157	3850 Tower Road, Rapid City, SD 57701 301-428-7205	10.0	44	2	53.1	103	14	38.2
6.	Billings, MT E170158	1030 Central Avenue, Billings, MT 59102 301-428-7205	10.0	45	46	7.3	108	32	29.0
7.	Missoula, MT E170168	8404 El Way, Suite 1, Missoula, MT 59808 301-428-7205	9.2	46	56	10.3	114	6	53.9
8.	Bismarck, ND E170169	4202 Coleman Street, Bismarck, ND 58503 301-428-7205	10.0	46	51	7.2	100	46	56.7
9.	North Platte, NE E170170	1003 East State Farm Road, North Platte, NE 69103 301-428-7205	10.0	41	5	26.8	100	45	10.4
10.	Tucson, AZ E170162	1135 East Pennsylvania St, Tucson, AZ 85714 301-428-7205	10.0	32	10	20.4	110	57	17.5
11.	Cheyenne, WY E170164	530 EchoStar Drive, Cheyenne, WY 82007 301-428-7205	10.0	41	7	54.5	104	44	15.2
12.	Simi Valley, CA E170163	4514 Ish Drive, Simi Valley, CA 93063 301-428-7205	9.2	34	16	9.8	118	42	12.8

		<b>Site Contact Information</b>	<b>Antenna Diameter</b>	<b>Latitude</b>			<b>Longitude</b>		
13.	Quincy, WA E170153	2200 M Street NE, Quincy, WA 98848 301-428-7205	10.0	47	14	43.4	119	48	58.7
14.	Rifle, CO E170166	235 E 21st Street, Rifle, CO 81650 301-428-7205	9.2	39	32	54.2	107	46	53.9
15.	Lindon, UT E170165	333 S 520 W, Lindon, UT 84042 301-428-7205	9.2	40	19	58.1	111	43	50.2
16.	Santa Clara, CA E170152	2050 Martin Avenue, Santa Clara, CA 95050 301-428-7205	10.0	37	21	54.3	121	57	41.2
17.	Yuma, AZ E170167	575 South Madison Ave, Yuma, AZ 85634 301-428-7205	9.2	32	43	0.0	114	37	8.0
18.	Reno, NV E170160	1 Superloop Circle, Suite 3, McCarren, NV 89434 301-428-7205	9.2	39	30	53.0	119	28	46.0
19.	Taos, NM E170159	201 Camino de la Merced, Taos, NM 87571 301-428-7205	10.0	36	23	16.0	105	35	16.5
20.	Driggs, ID E170161	1670 N Hwy 33, Driggs, ID 83422 301-428-7205	9.2	43	44	53.7	111	6	51.2

***Commission Policy and Public Interest Benefits.*** The proposed gateway amendments reflect corresponding changes in the EchoStar XXIV satellite design and are integral components of the overall satellite network, as described in the space station modification application.<sup>8</sup> Commission approval of such technical changes is consistent with the Commission’s established policy of leaving satellite design decisions to system operators in order “[t]o promote competition, flexibility, and technical innovation.”<sup>9</sup> Accordingly, the Commission consistently has approved satellite system modifications “when a proposed modification presents no significant interference problem and conforms to the Commission’s rules and policies.”<sup>10</sup>

The EchoStar XXIV satellite system is designed to utilize approximately 20 gateway earth stations at sites distributed throughout the United States. These sites were selected after careful examination as they will have sufficient electrical facilities, reliable fiber-delivered broadband capacity, and ease of access for personnel to provide operational support for the operation of EchoStar XXIV, which will bring high-speed broadband services throughout the continental United States and the Americas. The distribution of the gateway earth stations over a wide area facilitates spectrum efficiency by permitting Hughes to use the same set of frequencies in the respective uplink beam and downlink beam for each gateway earth station simultaneously, without causing interference to other gateways. Geographically separated earth stations also enhance reliability by allowing Hughes to shift traffic among the different gateways in the event of a transient service interruption at a particular site.

The changes proposed herein will serve the public interest by adding significant broadband capacity to the Hughes satellite fleet. EchoStar XXIV, by virtue of its capacity and

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<sup>8</sup> See Satellite Modification Application, Exh. 1 (Description) at 2-3.

<sup>9</sup> See *New ICO Services G.P.*, Memorandum Opinion and Order, 21 FCC Rcd 14603, ¶ 5 (IB 2006).

<sup>10</sup> *Id.*

speed capabilities, will join the Hughes satellite fleet to offer a true competitive broadband alternative across the country. The EchoStar XXIV satellite system will provide additional capacity to further enable Hughes to provide advanced broadband services at approximate download speeds of 100 Mbps to enterprises, the government, small businesses, and residential customers across the United States. EchoStar XXIV also will support a variety of applications, including broadband access, aeronautical services for in-flight connectivity, residential and business VOIP, and next generation communications services, including 5G. Hughes plans to launch and place EchoStar XXIV into operation in 2021.

***Coordination and Compatibility with Terrestrial Operations.*** As demonstrated in the attached Comsearch Report (Attachment A), frequency coordination has been successfully completed for all proposed Ka-band gateway operations, as amended herein. Specifically, prior notification letters were sent to incumbent terrestrial Ka-band licensees, and all proposed sites have cleared the coordination process with no objections or concerns raised.<sup>11</sup>

Additionally, as demonstrated in the attached UMFUS Compatibility Showing (Attachment B), the proposed gateways comply with the Section 25.136's requirements for compatibility with UMFUS operations in the 27.5-28.35 GHz ("28 GHz") and 47.2-48.2 GHz ("47 GHz") bands,<sup>12</sup> except to the extent that a limited waiver is requested to permit any *de minimis* non-conformance with respect to four proposed gateways.

***FAA Notification.*** For all proposed gateway earth station antennas, the Commission's TOWAIR application was used to verify compliance with the limits specified in 47 C.F.R. §

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<sup>11</sup> Section 25.136(d)(4)(iv)'s coordination requirement is inapplicable to Hughes' proposed Q/V-band gateway operations because there are currently no terrestrial Upper Microwave Flexible Use Service ("UMFUS") licensees in the Q/V-band. See 47 C.F.R. § 25.136(d)(4)(iv).

<sup>12</sup> 47 C.F.R. § 25.136(a), (d).

17.7(b). As shown in Attachment C (TOWAIR Verification), all gateway earth stations passed this verification.

***Radiation Hazard Analyses.*** For the proposed antenna types, radiation hazard analyses were conducted using the predictive methodology identified in OET Bulletin 65. The results are provided in Attachment D (RADHAZ Calculations). The analyses were based on the maximum RF power at the antenna flange of 200 watts for the 9.2-meter and 10-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.

Attachment D shows that the average exposure levels for the protection of the general public are met in the near field, transition field, far field, and 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. However, 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 secure the transmitter before performing any maintenance work.

***Waiver Requests.*** Hughes renews its requests in the Applications for waivers of the following requirements to the extent necessary:

- Section 25.132(b)(1)'s requirements with respect to certain measured antenna information required to be submitted with FSS earth station applications; and



- the twelve-month earth station construction and bring-into-use requirement of Section 25.133(a)(1).<sup>13</sup>

Further, as detailed in the attached UMFUS Compatibility Showing (Attachment B), Hughes requests a limited waiver of Section 25.136's UMFUS compatibility requirements in order to permit any *de minimis* nonconformance with respect to four proposed gateways.

The requested waivers are necessary to permit efficient design, construction, and operation of the EchoStar XXIV satellite system. With launch and operation of EchoStar XXIV scheduled for 2021, Hughes is reaching a crucial time period to begin construction of its proposed gateway earth stations, including extending fiber to many of these gateway sites. Accordingly, expeditious action on these Applications, including grant of the requested waivers of Section 25.133(a)(1)'s construction requirements and other Commission rules, is critical to a successful launch of new broadband services. Further, grant of the requested waivers will enable development of an innovative, advanced broadband delivery system potentially reaching millions of consumers across the United States, providing high-capacity broadband at estimated download speeds of approximately 100 Mbps, and offering other substantial public interest benefits described in the initial Applications.

### ***Conclusion***

As the Commission has noted, 24 million Americans lived in areas that lack terrestrial fixed, high-speed Internet access at the end of 2016.<sup>14</sup> High-speed Internet access is critical to ensuring economic opportunity and bridging the digital divide,<sup>15</sup> and satellites, including

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<sup>13</sup> See Hughes, Applications, Exh. C (Waiver Requests).

<sup>14</sup> See *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018 Broadband Deployment Report, 33 FCC Rcd 1660 ¶ 50 (2018).

<sup>15</sup> Ajit Pai, Chairman, FCC, Testimony Before the Senate Commerce, Science, and Transportation Committee: *Oversight of the Federal Communications Commission*, at 1 (Mar. 8, 2017), [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-343814A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-343814A1.pdf).

Hughes’s fleet of broadband-capable satellites, play a crucial role in expanding such opportunities to the millions of American customers who live in areas that lack access to terrestrial high-speed broadband.<sup>16</sup> For these reasons, the Commission should promptly grant the applications, as amended, to operate the proposed gateway earth stations. As demonstrated in the record, the proposed gateway operations will serve the public interest by advancing the Commission’s<sup>17</sup> and the Administration’s<sup>18</sup> goals for solving the digital divide and expanding the commercial use of space. Timely grant of these Applications, as amended, will permit Hughes to launch new broadband service as early as 2021, offering substantial public interest benefits for consumers in the United States and abroad.

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<sup>16</sup> See *Getting Broadband*, FCC, <https://www.fcc.gov/consumers/guides/getting-broadband> (last visited Feb. 20, 2019) (“Satellite broadband . . . is useful for serving remote or sparsely populated areas.”).

<sup>17</sup> See, e.g., Bridging the Digital Divide for All Americans (statement of current FCC Broadband Policy), <https://www.fcc.gov/about-fcc/fcc-initiatives/bridging-digital-divide-all-americans> (last visited Feb. 20, 2019).

<sup>18</sup> See, e.g., Presidential Memorandum, *Space Policy Directive-2 of May 24, 2018: Streamlining Regulations on Commercial Use of Space*, 83 Fed. Reg. 24901 (May 30, 2018).