

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC**

Application of Hughes Network Systems, LLC)
for Authority to Launch and Operate a Ka-band)
and Q/V-band Geostationary Fixed-Satellite) File No. SAT- _____
Service Satellite at the Nominal 95° W. L.)
Orbital Location)

APPLICATION

Hughes Network Systems, LLC (“Hughes”) hereby applies for authority to launch and operate a Ka-band and Q/V-band geostationary orbit (“GSO”) satellite to provide non-common carrier Fixed-Satellite Service (“FSS”) in the United States and throughout the Americas from the nominal 95° W.L. orbital location. This new, advanced Hughes broadband satellite is referred to herein as “HNS 95W.”

The state-of-the-art broadband HNS 95W satellite will use 286 user beams operating initially through 18 gateway earth stations¹ to provide broadband at speeds significantly in excess of current FCC-defined broadband speeds,² thus meeting user demand across the United States where HNS 95WL will serve.³ The HNS 95W satellite will expand Hughes’ fleet and greatly increase Hughes’ satellite broadband capacity bringing additional competition to the United States marketplace for broadband connectivity, including the support of next-generation

¹ Hughes expects to increase the number of gateway earth stations by up to approximately 4 to 7.

² See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 2016 Broadband Progress Report, 31 FCC Rcd 699, 707 ¶ 19 (2016) (“2016 Broadband Progress Report”).

³ See Technical Exhibit, Sections A.2 and A.3.

communications services such as 5G, machine-to-machine (“M2M”), and the Internet of Things (“IoT”).⁴

I. GRANT OF THIS APPLICATION SERVES THE PUBLIC INTEREST

Hughes, a U.S. company, is the leading global provider of satellite-based broadband, serving more than a million broadband subscribers, many in the most rural and remote parts of the United States.⁵ Today, through its satellite network, Hughes provides customers across the continental United States, regardless of their location, access to cost-effective, high-speed broadband service that meets their needs.⁶ As part of the design, development and deployment of the satellite network, Hughes has invested billions of dollars in its satellite and associated ground infrastructure technology⁷ and continuously works to improve the throughput and speed of its next-generation of broadband satellites through its research and development process at its

⁴ See Testimony of Jennifer A. Manner, SVP Regulatory Affairs, EchoStar Corp., Before the House Commerce Committee Subcommittee on Communications and Technology: Facilitating the 21st Century Wireless Economy, at 3 (Apr. 5, 2017) (“Hughes Testimony”), <http://docs.house.gov/meetings/IF/IF16/20170405/105841/HHRG-115-IF16-Wstate-MannerJ-20170405.pdf>; see also Hughes Network Systems, LLC, White Paper: Evolution of Hughes Network Systems LLC’s Broadband Satellite Services From Narrowband to Federal Communications Commission-defined Broadband Speeds, at 1 (Apr. 2017) (“Hughes White Paper”).

⁵ See Hughes Satellite Systems Corp., Annual Report Form 10-K, at 23 (Feb. 24, 2017); Hughes White Paper at 1 n.2.

⁶ See, e.g., Comments of EchoStar Satellite Operating Corp. and Hughes Network Systems, LLC, IB Docket No. 16-408, at 2-3 (filed Feb. 27, 2017) (“Hughes NGSO FSS Comments”); *Innovation Delivered: Residential*, Hughes, <https://www.hughes.com/> (last visited June 17, 2017).

⁷ See *2016 Broadband Progress Report*, 31 FCC Rcd at 719 ¶ 45 (acknowledging Hughes as a satellite broadband provider that has “continued to invest substantial resources into their networks, making progress in their home broadband offerings”); see also Reply Comments of EchoStar Satellite Operating Corp., and Hughes Network Systems, LLC, and Alta Wireless, Inc., GN Docket No. 14-177 *et al.*, at 4 (filed Feb. 26, 2016) (“Hughes Spectrum Frontiers Reply Comments”).

United States labs.⁸ In order to both meet the growing demand in the United States and throughout the Americas for broadband services and ensure that such services are provided cost-effectively, Hughes needs access to significantly more bandwidth (as well as continued access to the frequency bands on which it operates today).⁹ Accordingly, HNS 95W is being developed to operate in a range of frequency bands including the Ka, Q and V bands.

HNS 95W will replace Spaceway 3, a Ka-band satellite currently providing broadband services to the United States from the nominal 95°W orbital location.¹⁰ Hughes also operates the EchoStar XVII¹¹ and EchoStar XIX¹² satellites, which provide high-speed broadband services in North America and portions of Central and South America. EchoStar XVII, which was launched in 2012, was the first satellite of its kind to be able to achieve broadband speeds of up to 15/3 Mbps¹³ and provides an aggregate capacity of 120 Gbps.¹⁴

⁸ See generally Hughes Network Systems, LLC, White Paper: Jupiter System Bandwidth Efficiency (Nov. 2015), <http://defense.hughes.com/resources/jupiter-system-bandwidth-efficiency?locale=en>.

⁹ See, e.g., Hughes Spectrum Frontiers Reply Comments at 7; see also *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Notice of Proposed Rulemaking, IB Docket No. 16-408, ¶ 8 (rel. Dec. 15, 2016) (“*NGSO FSS NPRM*”).

¹⁰ Hughes Communications, Inc., Stamp Grant, File No. SAT-AMD-20060306-00025 (granted June 29, 2006). Hughes expects to relocate the Spaceway 3 satellite to another orbital location upon successful deployment of HNS 95W.

¹¹ See Hughes Communications, Inc., Stamp Grant, File No. SAT-LOA-20120424-00075 (granted June 12, 2012) (“EchoStar XVII Grant”).

¹² See Hughes Communications, Inc., Stamp Grant, File No. SAT-PPL-20160421-00037 (granted June 9, 2016) (“EchoStar XIX Grant”).

¹³ *Fun Facts About HughesNet’s EchoStar XVII Satellite*, HughesNet Internet, <http://www.hughesnetinternet.net/internet-guide/gen4-echostar-xvii/> (last visited June 17, 2017); see also EchoStar XVII Grant, Exhibit 43 at 3-4.

¹⁴ See *EchoStar XVII*, Hughes, <https://www.hughes.com/technologies/hughes-high-throughput-satellite-constellation/echostar-xvii> (last visited June 17, 2017).

To meet the ever-growing demand for high-speed broadband and other services offered by EchoStar XVII,¹⁵ Hughes launched EchoStar XIX in late 2016.¹⁶ EchoStar XIX provides up to 250 Gbps of capacity to users across the country¹⁷ and powers the “HughesNet Gen5” next-generation Internet service, which provides Internet speeds of 25/3 Mbps and above to customers.¹⁸ In just the first two months of operations, more than 100,000 customers, comprised of consumers and small businesses located throughout the United States, have subscribed to the HughesNet Gen5 Internet service.¹⁹ The growing need of consumers, enterprises, and the government in the United States and throughout the Americas for advanced broadband services, including next-generation services, such as 5G, M2M, and IoT, will ensure that there is an ample market for the advanced broadband service that Hughes plans to provide through the HNS 95W satellite.²⁰ In this manner, HNS 95W will be an important part of the increasingly competitive marketplace for broadband connectivity in the United States, as well as across the Americas.

¹⁵ Hughes saw a 33% increase in its customer base during the first year of EchoStar XVII operation alone. *See* Hughes White Paper at 3.

¹⁶ *See* EchoStar XIX, Hughes, <https://www.hughes.com/technologies/hughes-high-throughput-satellite-constellation/echostar-xix> (last visited June 17, 2017) (“EchoStar XIX Overview”); Hughes White Paper at 4.

¹⁷ *See* EchoStar Corp., *Earnings Call Transcript, CEO Mike Dugan on Q1 2017 Results*, Seeking Alpha (May 10, 2017), <https://seekingalpha.com/article/4071892-echostars-sats-ceo-mike-dugan-q1-2017-results-earnings-call-transcript>; *see also* Hughes White Paper at 5.

¹⁸ *See* Press Release, HughesNet Gen5 Surpasses 100,000 Subscribers in Just Two Months, Hughes (June 5, 2017), <http://www.prnewswire.com/news-releases/hughesnet-gen5-surpasses-100000-subscribers-in-just-two-months-300468274.html>; EchoStar XIX Overview.

¹⁹ *See id.*

²⁰ *See, e.g., 2016 Broadband Progress Report*, 31 FCC Rcd at 701-702 ¶¶ 2-6 (“Americans continue to turn to advanced telecommunications capability for every facet of daily life”); *id.* at 720-721 ¶ 48 (recognizing the importance of satellite systems in helping to meet consumers’ growing demand for broadband); Forecast International, *Insatiable Demand for Data and Connectivity Drive Commercial Satellite Market*, Global Newswire (Sept. 12, 2016), <https://globenewswire.com/news-release/2016/09/12/871248/10165067/en/Forecast->

This is particularly important in areas where terrestrial broadband does not exist. As the Commission has noted, 34 million Americans live in areas that lack terrestrial fixed, high-speed Internet access.²¹ High-speed Internet access is critical to ensuring economic opportunity,²² and 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.²³

For instance, Hughes' satellites are helping rural schools and libraries across the country to bridge the digital divide by delivering high-speed Internet services to areas unserved by terrestrial networks.²⁴ Similarly, Hughes' satellites support critical services, like telehealth and telemedicine, in rural and remote locations.²⁵ Accordingly, Hughes broadband satellite services ensure that there are no unserved areas for broadband services across the continental United States.

International-Insatiable-Demand-for-Data-and-Connectivity-Drive-Commercial-Satellite-Market.html.

²¹ See *2016 Broadband Progress Report*, 31 FCC Rcd at 731-32 ¶ 79 (statistic reflects data as of December 31, 2014).

²² Testimony of FCC Chairman Ajit Pai 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.

²³ See *Getting Broadband*, FCC, <https://www.fcc.gov/consumers/guides/getting-broadband> (last visited June 17, 2017) (“Satellite broadband . . . is useful for serving remote or sparsely populated areas.”); see also Hughes White Paper at 6.

²⁴ See, e.g., *Internet Access*, Hughes, <https://www.hughes.com/what-we-do/by-solution/satellite-solutions/internet-access> (last visited June 17, 2017); Comments of EchoStar Satellite Operating Corp., *et al.*, GN Docket No. 14-177 *et al.*, at 5 (filed Jan. 27, 2016); Hughes Spectrum Frontiers Reply Comments at 3.

²⁵ See Hughes, *Enabling Healthcare Connectivity in the United States Through Satellite Broadband*, White Paper, at 3 (May 23, 2017), <https://prodnet.www.neca.org/publicationsdocs/wwpdf/52417hughes.pdf>.

Through its satellite broadband network, Hughes also provides potentially life-saving communications services to communities during natural disasters and emergencies when terrestrial and wireless networks have failed or are unreliable or unavailable. As an example, during the aftermath of Hurricane Sandy, Hughes provided satellite broadband and VoIP services to 20 disaster recovery centers in the Rockaway, New York area, and to a command center in Breezy Point, New York to support Habitat for Humanity's rebuilding efforts.²⁶ Hughes' satellite connectivity also offers a fail-safe backup to terrestrial networks. By incorporating satellite connectivity into the 911 and Public Safety Answering Point network architecture, network administrators can provide resiliency to handle escalated call volumes and ensure that citizens are able to connect with operators in the face of emergency situations.²⁷

The addition of the HNS 95W satellite to the Hughes fleet of spacecraft will greatly enhance broadband connectivity across the continental United States and the Americas, especially in areas unserved or underserved by terrestrial broadband services.²⁸ With the advanced and flexible design of this satellite, Hughes will be better able to respond to the rapidly growing needs of its customers, particularly in rural and remote areas, and provide a reliable, cost-effective means to support next-generation services, including 5G.²⁹ For these reasons, grant of this application and deployment of the HNS 95W satellite will ensure that satellite

²⁶ Case Study, Superstorm Sandy: Hughes Satellite Technology Provides Critical Communications in the Aftermath of Superstorm Sandy, Hughes (Nov. 2013), https://www.hughes.com/sites/hughes.com/files/2017-04/Superstorm-Sandy_H51425_LR_11-18-13.pdf.

²⁷ See *9-1-1 Backup*, Hughes, <https://government.hughes.com/what-we-do/solutions/emergency-communications/911-backup> (last visited June 17, 2017).

²⁸ See Technical Exhibit, Sections A.2, A.3.

²⁹ See Hughes Testimony at 3; Hughes Spectrum Frontiers Reply Comments at 3-5.

broadband remains an important, competitive platform to deliver advanced broadband services to U.S. customers on a spectrally efficient and cost-effective basis, hence serving an important public interest.

II. LEGAL AND TECHNICAL INFORMATION

A. Legal Qualifications

Hughes, a U.S. company, is 100 percent owned and controlled by EchoStar Corporation (“EchoStar”), which is ultimately controlled by Mr. Charles W. Ergen.³⁰ Hughes’ legal qualifications are set forth in this application and in the corresponding FCC Form 312 and associated exhibits.³¹ In addition, the qualifications of Hughes and EchoStar to hold Commission licenses are a matter of record.³²

B. Technical Qualifications

A complete Technical Exhibit and Schedule S submission for HNS 95W are provided as part of this application.³³

³⁰ See Exhibit 2; Hughes 10-K at 16.

³¹ See 47 C.F.R. § 25.114.

³² See Hughes Communications, Inc., Transferor, and EchoStar Corporation, Transferee, Consolidated Application for Authority to Transfer Control, Stamp Grant, File Nos. SAT-T/C-20110228-00041, SAT-T/C-20110228-00042, SES-T/C-20110228-00221, SES-T/C-20110228-00222, SES-T/C-20110228-00223 and SES-T/C-20110228-00224, Experimental License File Nos. 0001-EX-TC-2011, 0002-EX-TC-2011 and 0003-EX-TC-2011) (granted June 8, 2011); see also *BRH Holdings GP, Ltd., Transferor and EchoStar Corporation, Transferee, Applications for Consent to Transfer Control of Hughes Communications, Inc., Hughes Network Systems, LLC, and HNS License Sub, LLC*, Order, 26 FCC Rcd 7976 (IB 2011).

³³ See 47 C.F.R. § 25.114(d)(14).

C. Performance Bond

Hughes acknowledges that it will be required to post a performance bond because the HNS 95W satellite has not yet been constructed and Hughes seeks frequencies at the nominal 95° W.L. orbital location for which it does not already have an authorization.³⁴

D. Spectrum Access Limit

Hughes is in compliance with the FCC's spectrum access limit.³⁵

E. Compliance with Frequency Band-Specific Rules

The Commission has not adopted Q/V-band-specific service rules.³⁶ Hughes acknowledges that the Commission's default service rules, *inter alia*, require that in the event the Commission adopts Q/V-band specific service rules in the future, Hughes will be required to come into compliance with such band-specific rules within 30 days.³⁷ As explained in the Technical Exhibit, the HNS 95W satellite will meet all applicable default service rules.³⁸

III. WAIVER REQUESTS

The Commission may waive any of its rules if there is "good cause" to do so.³⁹ In general, waiver is appropriate if: (1) special circumstances warrant a deviation from the general

³⁴ 47 C.F.R. § 25.165.

³⁵ 47 C.F.R. § 25.159(d).

³⁶ *See Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands, et al.*, Third Notice of Proposed Rulemaking, 25 FCC Rcd 15563 (2010) ("V-band NPRM"); The Boeing Company, *Allocation and Designation of Spectrum for Fixed-Satellite Services in the 50.4-51.4 GHz and 51.4-52.4 GHz Bands*, Petition for Rulemaking, CG RM-11773 (June 22, 2016) ("Boeing V-band Petition").

³⁷ 47 C.F.R. § 25.217(e).

³⁸ *See* Technical Exhibit, Section A.19.

³⁹ *See* 47 C.F.R. § 1.3; *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

rule; and (2) such deviation will better serve the public interest than will strict adherence to the general rule.⁴⁰ Generally, the Commission will grant a waiver of its rules in a particular case if the relief requested will not undermine the policy objective of the rule in question and will otherwise serve the public interest.⁴¹ With respect to waivers of the U.S. Table of Frequency Allocations, the Commission has granted waivers for non-conforming spectrum uses where a demonstration is made that the non-conforming operations are not likely to cause harmful interference into the allocated services and where the non-conforming operator accepts any interference from allocated services.⁴²

Hughes submits that good cause exists to waive the rules identified below. Grant of the requested waivers will allow Hughes to deploy an innovative state-of-the-art satellite system capable of delivering advanced broadband services at high data rates, well in excess of current FCC-defined broadband speeds. Grant of the requested waivers will also allow Hughes to make efficient use of the spectrum resource, including frequency bands that are currently underutilized. Moreover, to ensure the provision of a cost-effective and spectrally-efficient satellite broadband service that meets the growing demands of U.S. consumers for broadband connectivity anywhere, the HNS 95W satellite must have use of the full range of requested Ka-band and Q/V-band frequencies, which are allocated to the FSS on an international basis.

⁴⁰ See *Northeast Cellular*, 897 F.2d at 1166.

⁴¹ See *WAIT Radio*, 418 F.2d at 1157.

⁴² See, e.g., *Hughes Network Systems, LLC*, Declaratory Ruling, 26 FCC Rcd 8521 (IB 2011); *Inmarsat Mobile Networks, Inc.*, Application to Operate a Fixed-Satellite Service Gateway Earth Station Facility in Lino Lakes, Minnesota with the Inmarsat-5 F2 Space Station, Order and Authorization and Declaratory Ruling, 30 FCC Rcd 2770, 2778-79 ¶ 25 (IB/OET 2015) (“*Inmarsat Order*”).

Further, grant of the requested waivers will not undermine the FCC's domestic frequency allocations. As explained below, Hughes will protect from harmful interference allocated services operating in the United States in the relevant bands and will accept harmful interference caused by such allocated services where it is required to do so by FCC rules.

A. Frequency Bands

Hughes requests authority to operate on the frequencies identified in Tables 2-1 and 2-3 in the Technical Exhibit.⁴³ As explained below, the following frequency bands are not allocated for use by non-Federal GSO FSS satellites and, accordingly, Hughes requests waiver of the Commission's rules for the proposed operations in those frequency bands.⁴⁴ With respect to each of these bands, Hughes will accept a waiver conditioned on the outcome of any related rulemaking proceeding regarding the applicable frequency band.⁴⁵

1. 18.8-19.3 GHz Band

In the United States, the 18.8-19.3 GHz band is allocated for Federal GSO and NGSO FSS (space-to-Earth) and non-Federal NGSO FSS (space-to-Earth) on a co-primary basis.⁴⁶ In the *NGSO FSS NPRM*, the Commission recently invited comments on adding a non-Federal GSO

⁴³ See Technical Exhibit, Section A.2

⁴⁴ See, e.g., 47 C.F.R. §§ 2.102(a), 2.106, and 25.202.

⁴⁵ See, e.g., generally *NGSO FSS NPRM*; *V-band NPRM*; Boeing V-band Petition.

⁴⁶ 47 C.F.R. § 2.106 NG165; see also *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 and Fourth Notice of Proposed Rulemaking, 11 FCC Rcd 19005, 19036 ¶ 77 (1996); *Redesignation of 17.7-19.7 GHz Frequency Band*, Report and Order, 15 FCC Rcd 13430, 13456-59 ¶¶ 55-58 (2000).

FSS allocation to this band on either a co-primary or secondary basis.⁴⁷ Internationally, the 18.8-19.3 GHz band is allocated for both GSO and NGSO FSS in all ITU regions on a co-primary basis.⁴⁸ Because of the restrictions in the United States, Hughes has no plans to operate in the 18.8-19.3 GHz band in the United States.⁴⁹

Rather, Hughes proposes to use on a co-primary basis the 18.8-19.3 GHz band (space-to-Earth) for GSO FSS service links to user terminals operating outside of the United States but within the satellite coverage area (*e.g.*, Central and South America and the Caribbean) and, accordingly, requests waiver of the Commission's rules to allow such operation outside of the United States.⁵⁰ As discussed in the Technical Exhibit, Hughes' operations in the 18.8-19.3 GHz band will protect authorized operations in this band in the United States from harmful interference and comply with international requirements.⁵¹ Hughes acknowledges that it must coordinate its operations in the 18.8-19.3 GHz band with Federal FSS systems, including federal operations to earth stations in foreign countries, and accepts that completion of such coordination may be a condition of its license.⁵²

Grant of the waiver will serve the public interest because it will increase service link capacity (space-to-Earth) for user terminals outside of the United States, facilitate efficient use of spectrum, and enhance the operational flexibility of the satellite. Moreover, grant of the waiver

⁴⁷ See *NGSO FSS NPRM* ¶¶ 11-12.

⁴⁸ 47 C.F.R. § 2.106 n. 5.523A.

⁴⁹ Although Hughes does not plan on operating in the 18.8-19.3 GHz band in the United States, it will accept the imposition of a condition that any such operations will be on an unprotected, non-harmful interference basis. See *infra* note 53.

⁵⁰ See Technical Exhibit, Section A.2; 47 C.F.R. § 25.102.

⁵¹ See Technical Exhibit, Section A.14.

⁵² See 47 C.F.R. § 2.106 US334; see also *Inmarsat Order*, 30 FCC Rcd at 2785 ¶ 46.

request will be analogous to waivers the Bureau has granted in the past for FSS operations in the 18.8-19.3 GHz band⁵³ and is otherwise consistent with the FCC's rules and ITU allocation in this band.⁵⁴

2. 50.4-51.4 GHz Band

In the United States, the 50.4-51.4 GHz band is allocated for Federal and non-Federal FSS (Earth-to-space) in the U.S. Table of Frequency Allocations,⁵⁵ but the band is not identified in Section 25.202(a)(1) or the Commission's *V-band Plan* as available for non-Federal FSS.⁵⁶ However, the Commission recently sought comment on the satellite allocation in this band in its *Spectrum Frontiers Order and FNPRM*.⁵⁷ Internationally, the 50.4-51.4 GHz band is allocated for the FSS (Earth-to-space), fixed service, and mobile service in all ITU regions on a co-primary basis.⁵⁸

As explained in the Technical Exhibit, the frequency band is largely fallow. Accordingly, Hughes' limited use of these frequencies for a small number of gateway stations in areas that

⁵³ See e.g., *Inmarsat Order*, 30 FCC Rcd at 2777-78 ¶ 22 (granting waiver of the Section 2.106 to permit non-Federal GSO FSS operations in the 18.8-19.3 GHz band on an unprotected, non-harmful interference basis); *Hughes Networks Systems, LLC*, Declaratory Ruling, 26 FCC Rcd 8521, 8525 ¶¶12-13 (IB 2011) (same); *Northrop Grumman Space & Mission Systems Corporation*, Order and Authorization, 24 FCC Rcd 2330, 2332 ¶ 1 (IB 2009) (same); *ViaSat, Inc.*, Stamp Grant, IBFS File No. SAT-LOI-20080107-00006, Condition 4 (granted Aug. 18, 2009) (same).

⁵⁴ See Technical Exhibit, Sections A.9, A.12; see also 47 C.F.R. § 2.106.

⁵⁵ 47 C.F.R. § 2.106.

⁵⁶ See 47 C.F.R. § 25.202(a)(1); *Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands*, Report and Order, 13 FCC Rcd 24649 (1998) ("*V-band Plan*").

⁵⁷ See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Servs.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8158 ¶ 421 (2016).

⁵⁸ 47 C.F.R. § 2.106 n. 5.338A.

meet the FCC's rules in the *Spectrum Frontiers Order and FNPRM* for Ka-band earth stations will create very little risk of interference with any existing or future terrestrial operations in this band.⁵⁹

To the extent necessary, Hughes requests waiver of Section 25.202(a)(1) to permit use of the 50.4-51.4 GHz band (Earth-to-space) for FSS gateway uplinks. Grant of this request will serve the public interest because it will increase gateway uplink capacity, facilitate efficient use of spectrum, and enhance the operational flexibility of the satellite.

B. Band Sharing

The Commission's rules provide that applicants seeking to use spectrum for which the Commission has not developed sharing criteria between GSO and NGSO applicants will share such spectrum based on the proportion of qualified GSO and NGSO applicants.⁶⁰ Sharing between NGSO and GSO systems can be accomplished by interference mitigation and operational techniques and through coordination as discussed in more detail in the Technical Exhibit.⁶¹ For example, one such technique is for NGSO satellites to avoid co-channel

⁵⁹ See Technical Exhibit, Section A.17.

⁶⁰ 47 C.F.R. § 25.156(d)(5); see also *id.* § 25.157(e)(1).

⁶¹ See Technical Exhibit, Section A.14; see also *NGSO FSS NPRM* ¶¶ 1-3 (proposing new allocations for shared use of Ka-band frequencies between NGSO and GSO systems to reflect innovations in satellite technology); Comments of OneWeb, IB Docket No. 16-408, at 2 (filed Feb. 27, 2017) ("OneWeb Comments") ("[M]odern technologies allow NGSO operations to coexist with GSO operations on a noninterference basis."); Comments of The Boeing Company, IB Docket No. 16-408, at 4 (filed Feb. 27, 2017) ("Boeing Comments") ("NGSO FSS systems can use GSO arc avoidance to comply with ITU limits and protect GSO FSS systems."); see also Boeing V-band Petition at 5, 10 (explaining Boeing's proposed NGSO FSS system will operate in the V-band serving "a constantly growing national need [for broadband], without increasing the risk of interference to other spectrum users").

transmissions when there can be in-line interference with GSO satellites.⁶² Accordingly, Hughes requests waiver of the Commission’s band-segmentation rule to permit use of the full range of the requested Q/V-band frequencies on a shared, coordinated basis with NGSO licensees. Grant of the waiver request will serve the public interest because it will increase satellite broadband capacity, support efficient use of spectrum, and enhance operational flexibility for the satellite.

C. NGSO Cut-off Deadline

The International Bureau previously placed a Q/V-band NGSO satellite application on public notice and established a cut-off date for competing NGSO satellite applications.⁶³ On its face, the public notice did not apply to GSO satellite applicants, and accordingly, the instant application is timely filed.⁶⁴ In any event, to the extent necessary, Hughes requests waiver of any

⁶² See Boeing Comments at 4 (“This [GSO arc avoidance] constraint is typically implemented by inhibiting transmissions from all NGSO system satellites within a ‘GSO protection zone’ that is centered on the equator relative to the sub-satellite orbital path.”); see also *id.* at 14 (“[T]hrough the use of the in-line avoidance approach and other sharing measures, modern NGSO FSS systems can operate on a co-frequency basis with other NGSO FSS systems and thereby avoid the need for highly inefficient and counterproductive spectrum segmentation.”); Comments of Space Exploration Holdings, LLC, IB Docket No. 16-408, at 18 (filed Feb. 27, 2017) (the in-line interference regime “offers the best methodology for intra-service spectrum sharing, and is much preferable to a simple spectrum splitting approach such as that in Section 25.157”); WorldVu Satellites Limited d/b/a OneWeb, Petition for Declaratory Ruling, File No. SAT-LOI-20160428-00041, at 18 (filed Apr. 28, 2016) (proposing that NGSO FSS licensees can share Ku-band spectrum subject to coordination agreements where multiple operating NGSO systems experience in-line interference).

⁶³ See Public Notice, Cut-off Established for Additional NGSO-like Satellite Applications or Petitions for Operations in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz, DA 16-1244, at 2 (Nov. 1, 2016) (“We invite additional applications and petitions for declaratory ruling for NGSO-like satellite applications”) (emphasis added).

⁶⁴ See *Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS Systems co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range et al.*, Memorandum Opinion and Order and Second Report and Order, 17 FCC Rcd 9614, 9697 ¶¶ 213-14 (2002) (public notice establishing cut-off deadline for NGSO satellite applications did not also establish cut-off for terrestrial applications using the same frequencies), *recon. denied*, *Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS*

applicable cut-off deadline. As demonstrated in the Technical Exhibit, shared use of FSS spectrum between NGSO and GSO operators is possible.⁶⁵ Moreover, the public notice provided no reasonable notice of any deadline for GSO applicants. Accordingly, grant of a waiver request, to the extent necessary, is warranted.

D. Processing Rules

There is no prior filed GSO applicant or licensee at this location, other than Hughes, using or seeking to use any of the frequencies requested in this application. Accordingly, the HNS 95W satellite is first in the queue at the nominal 95°W orbital location with respect to all the requested frequency bands and can be considered as a single application for processing.

Nonetheless, to the extent necessary, Hughes requests waiver of the Commission's processing rules to allow for consideration of this application as a single application rather than as separate applications for different frequency bands.⁶⁶ The use of the Ka-band and Q/V-band frequencies for the HNS 95W satellite are mutually interdependent.⁶⁷ The Q/V-band component cannot reasonably be implemented without the Ka-band component, and the Ka-band component must proceed on a timetable that allows the Q/V-band payload to be integrated with the Ka-band payload.⁶⁸ For these reasons, grant of the waiver request is warranted.

Systems co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range et al., Fourth Memorandum Opinion and Order, 18 FCC Rcd 8428 (2003), *aff'd*, *Northpoint Technology, Ltd. v. FCC*, 414 F.3d 61, 67 (D.C. Cir. 2005).

⁶⁵ See *supra* Section III.B; see also Technical Exhibit, Section A.14.

⁶⁶ See 47 C.F.R. § 25.156(d)(3) (systems employing two or more service bands will be treated like separate applications for each band); 47 C.F.R. § 25.156(d)(4) (applications for feeder-link authority will be treated like an application separate from its associated service band).

⁶⁷ See Technical Exhibit, Section A.5.

⁶⁸ See *id.*

E. Schedule S

Section 25.114(c)(4)(vii) of the FCC's rules provides that GSO FSS applicants "with large numbers of identical fixed spot beams [may] provide the predicted antenna gain contours for one transmit and receive antenna beam, together with ... [a] map of the isolines formed by combining all of the spot beams into one or more composite beams."⁶⁹ Given the complexity of the HNS 95W satellite, consisting of a total of 286 user beams and initially 18 gateway beams, certain simplifications have been made in the preparation of the Schedule S pursuant to this rule. Rather than providing individual information for each individual beam, typical gain contours are provided for gateway beams as well as for the three types of user beams together with a single isoline gain contour for user beams and a single isoline gain contour for gateway beams, representing the combination of all the corresponding beams, which depicts the coverage areas of the HNS 95W satellite.

The beam information in the Schedule S reflects the maximum EIRP for the identical typical transmit beams, and the maximum G/T and minimum saturation flux density for the identical typical receive beams. This information, coupled with the single isoline diagrams, provides the data necessary to analyze compatibility with adjacent satellites while minimizing Schedule S filing burdens, which is consistent with the streamlined approach adopted in the Commission's recent orders.⁷⁰ Accordingly, to the extent required, Hughes respectfully requests a waiver of the general requirements to provide a map of the isolines formed by combining all of the spot beams into one or more composite beams as provided in Section 25.114(c)(4)(vii), and

⁶⁹ 47 C.F.R. § 25.114(c)(4)(vii)(C).

⁷⁰ *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Report and Order, 28 FCC Rcd 12403 (2013); *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Second Report and Order, 30 FCC Rcd 14713 (2015).

instead allow submission of single isoline maps representing the combination of all spot beams, together with typical gain contours for gateway and user beams in Schedule S.

IV. CONCLUSION

For the reasons stated above, Hughes requests that the Commission grant this application.

Respectfully submitted,

HUGHES NETWORK SYSTEMS, LLC

By: /s/ Jennifer A. Manner
Jennifer A. Manner
Senior Vice President, Regulatory Affairs

June 21, 2017

Technical Certification

I, Fernando Carrillo, hereby certify, under penalty of perjury, that I am the technically qualified person responsible for the engineering information contained in the foregoing application and the related exhibits, that I am familiar with Part 25 of the Commission's rules, and that the engineering information is complete and accurate to the best of my knowledge and belief.

/s/ Fernando Carrillo
Fernando Carrillo
Senior Principal Engineer-Regulatory
Affairs
Hughes Network Systems, LLC

Dated: June 21, 2017

EXHIBIT 1

Other Licenses and Applications Response to FCC Form 312, Question 36

On July 26, 2011, the FCC declared null and void an authorization of EchoStar Corporation, the parent company of Hughes Network Systems, LLC (together with their affiliates, “EchoStar”), to construct, launch, and operate a new Direct Broadcast Satellite at 86.5° W.L. for failure to meet the critical design review milestone, and rejected EchoStar’s request to modify its 86.5° W.L. authorization to allow the in-orbit EchoStar 8 satellite to provide service from that orbital location.¹

The FCC also has denied a few of EchoStar’s applications for initial license or modification.²

The FCC has dismissed, but not denied on the merits, a few of EchoStar’s license applications without prejudice to refileing.³

¹ See *EchoStar Corp.*, Memorandum Opinion and Order, 26 FCC Rcd 10442 (IB 2011).

² See *Satellite Communications Services Information Re: Actions Taken*, Public Notice, Rpt. No. SES-00847 at 27 (IB rel. Aug. 16, 2006) (denying request for extension of construction milestones regarding File Nos. SES-MOD-20060404-00560 and SES-MOD-20060404-00561); *EchoStar Satellite LLC*, Memorandum Opinion and Order, 19 FCC Rcd 7846 (IB Sat. Div. 2004) (denying applications to launch and operate four geostationary satellites because of interference concerns); *EchoStar Satellite LLC*, Order, 20 FCC Rcd 12027 (IB Sat. Div. 2005); *EchoStar Satellite Corp.*, Memorandum Opinion and Order, 17 FCC Rcd 8831 (IB Sat. Div. 2002) (denying request to extend construction milestone dates); *EchoStar Satellite Corp.*, Memorandum Opinion and Order, 16 FCC Rcd 14300 (IB 2001).

³ See, e.g., Letter from Robert G. Nelson, Chief, Satellite Division, to Pantelis Michalopoulos, Counsel for EchoStar Corporation, 24 FCC7132 (IB Sat. Div. 2009); EchoStar Corporation, Application to Operate a C-Band Geostationary Satellite Orbit Satellite in the Fixed-Satellite Service at the 84.9° W.L. Orbital Location, *Memorandum Opinion and Order*, 25 FCC Rcd 10193 (IB 2010); Letter from Paul E. Blais, Chief, Systems Analysis Branch, Satellite Division, to Alison Minea, Corporate Counsel, EchoStar Broadcasting Corporation, 28 FCC Rcd 10214 (IB Sat. Div. 2013); Letter from Paul E. Blais, Chief, Systems Analysis Branch, Satellite Division, to Alison Minea, Corporate Counsel, EchoStar Broadcasting Corporation, 28 FCC Rcd 10216 (IB Sat. Div. 2013).

EXHIBIT 2

Ownership and Corporate Officers and Directors Response to FCC Form 312, Question 40

Hughes Network Systems, LLC (“HNS”) is a wholly owned subsidiary of Hughes Communications, Inc. (“HCI”), a Delaware corporation. HCI, in turn, is a wholly owned subsidiary of Hughes Satellite Systems Corporation (“HSSC”), a Colorado corporation. HSSC is a wholly owned subsidiary of EchoStar Corporation (“EchoStar”), a publicly-traded Nevada corporation. The stockholders owning of record and/or voting 10 percent or more of the voting stock of EchoStar as of May 30, 2017, unless otherwise indicated below, include the following:

Ownership Interest	Citizenship	Approx. Equity Interest ¹	Approx. Voting Interest
Charles W. Ergen Chairman EchoStar Corporation 100 Inverness Terrace East Englewood, CO 80112	USA	39.2%	68.6%
Ergen Three-Year 2015 SATS GRAT ² William R. Gouger, as Trustee 5701 S. Santa Fe Drive Littleton, Colorado 80123	USA	7.3%	13.3%

¹ See EchoStar Corp., Amendment No. 15 to General Statement of Acquisition of Beneficial Ownership (Schedule 13D/A) (filed May 31, 2017) (the “Ergen 13D”). According to the Ergen 13D, outstanding equity interests include Class A Common Stock, including any Class A Common Stock to be issued after giving effect to the exercise of options and vesting of restricted stock units held by such person that are either currently exercisable or vested or may become exercisable or may vest within 60 days of May 30, 2017, entitled to one vote per share, and Class B Common Stock, entitled to ten votes per share. The calculation assumes the conversion of all Class B Common Stock outstanding as of May 26, 2017 to Class A Common Stock.

² See EchoStar Corp., Amendment No. 12 to General Statement of Acquisition of Beneficial Ownership (Schedule 13D/A) (filed May 31, 2017) (“the Gouger 13D”). According to the Gouger 13D, the trustee for certain trusts established by Mr. Ergen for the benefit of his family, including the Ergen Three-Year 2015 SATS GRAT, is Mr. William R. Gouger, a U.S. citizen and manager of SC Management, LLC, whose principal business is management services, including estate planning. In his capacity as trustee for all of the aforementioned trusts, subject to certain restrictions, Mr. Gouger, is deemed to beneficially own, and has the ability to exercise

Ownership Interest	Citizenship	Approx. Equity Interest¹	Approx. Voting Interest
Ergen Three-Year 2017 SATS GRAT ³ Cantey M. Ergen, as Trustee 9601 S. Meridian Blvd., Englewood, Colorado 80112	USA	8.0%	14.5%
Putnam Investments LLC One Post Office Square Boston, MA 02102 ⁴	Canada	13.9%	2.6%

CORPORATE OFFICERS AND DIRECTORS

EchoStar Corporation⁵	
Executive Officers	
Charles W. Ergen	Chairman
Michael T. Dugan	Chief Executive Officer and President
David J. Rayner	Executive Vice President, Chief Financial Officer, Chief Operating Officer and Treasurer
Anders N. Johnson	Chief Strategy Officer and President, EchoStar Satellite Services L.L.C.
Pradman P. Kaul	President, Hughes Communications, Inc.

voting power over, shares representing 12.4% of the equity interests and 22.5% of the voting interests in EchoStar (assuming no conversion of Class B Common Stock).

³ See Ergen 13D. According to the Ergen 13D, the trustee for the Ergen Three-Year 2017 SATS GRAT, established by Mr. Ergen for the benefit of his family, is Mr. Ergen's spouse, Ms. Cantey M. Ergen, a U.S. citizen and a Senior Advisor and member of the Board of Directors of DISH Network Corporation. In her capacity as trustee for all of the aforementioned trust, subject to certain restrictions, Mrs. Ergen, is deemed to beneficially own, and has the ability to exercise voting power over, shares representing 38.3% of the equity interests and 68.5% of the voting interests in EchoStar (assuming no conversion of Class B Common Stock).

⁴ See EchoStar Corp., Amendment No. 4 to Statement of Acquisition of Beneficial Ownership by Individuals (Schedule 13G/A) (filed Feb. 14, 2017).

⁵ The address for all officers and directors of EchoStar Corporation is 100 Inverness Terrace E., Englewood, CO 80112.

Dean A. Manson	Executive Vice President, General Counsel and Secretary
Kranti K. Kilaru	Executive Vice President, Business Systems
Board of Directors	
Charles W. Ergen	Chairman of the Board
Michael T. Dugan	Chief Executive Officer, President and Director
R. Stanton Dodge	Director
Anthony M. Federico	Director
Pradman P. Kaul	President, Hughes Communications, Inc. and Director
Tom A. Ortolf	Director
C. Michael Schroeder	Director
William D. Wade	Director

Hughes Network Systems, LLC⁶	
Officers	
Pradman P. Kaul	President
Grant A. Barber	Exec. Vice President and Chief Financial Officer
T. Paul Gaske	Exec. Vice President, North American Division
Adrian Morris	Exec. Vice President, Engineering
Deepak V. Dutt	Vice President, Treasurer
Dean A. Manson	Exec. Vice President, General Counsel & Secretary
Joseph Turitz	Vice President, Asst. General Counsel & Asst. Secretary
Board of Managers:⁷	
Pradman P. Kaul	Sole Manager

⁶ The address for all officers and directors of HNS is 11717 Exploration Lane, Germantown, Maryland 20876.

⁷ Managers of an LLC perform functions equivalent to corporate directors.