

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of	)	
	)	
Space Sciences & Engineering LLC, d/b/a	)	File No. _____
PlanetiQ	)	
	)	
Application for Authority to Launch and	)	
Operate a Non-Geostationary Satellite Orbit	)	
System to Provide Radio Occultation Services	)	

APPLICATION

Tony Lin
Emma Marion
DLA Piper LLP (US)
500 Eighth Street, N.W.
Washington, DC 20004
+1-202-799-4450

Counsel for PlanetiQ

Daniel P. Smith
Vice President of Operations
Space Sciences & Engineering LLC,
d/b/a PlanetiQ
15000 West 6th Avenue, Suite 202
Golden, CO 80401
+1-702-427-9711

Dated: September 21, 2022

TABLE OF CONTENTS

	Page
I. BACKGROUND AND SYSTEM DESCRIPTION.....	1
A. Space Segment.....	3
B. Ground Segment	4
II. FREQUENCY USE AND SPECTRUM SHARING	4
A. S-band/X-band Frequencies.....	4
B. GNSS Signals.....	7
III. APPLICATION OF STREAMLINED RULES	8
IV. WAIVER REQUESTS	12
A. U.S. Table of Frequency Allocations.....	12
1. 2025-2110 MHz (Earth-to-Space) TT&C and Data Uplink	12
2. 8025-8400 MHz (Space-to-Earth) Data Downlink.....	13
3. Radio Occultation of GNSS Signals.....	13
V. ITU COMPLIANCE	14
VII. CONCLUSION.....	15

Exhibit A – Orbital Debris Assessment Report

Exhibit B – ITU Cost Recovery Letter

Exhibit C – Technical Annex

Exhibit D – Ownership Information

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of	)	
	)	
Space Sciences & Engineering, LLC, d/b/a	)	File No. _____
PlanetiQ	)	
	)	
Application for Authority to Launch and	)	
Operate a Non-Geostationary Satellite Orbit	)	
System to Provide Radio Occultation Services	)	

APPLICATION

Space Sciences & Engineering, LLC, a subsidiary of Global Weather & Climate Solutions, Inc., d/b/a PlanetiQ (“PlanetiQ”) requests authority to launch and operate the GNOMES-4 non-geostationary orbit (“NGSO”) satellite in low-Earth orbit (“LEO”), to conduct Radio Occultation (“RO”) for purposes of weather forecasting and space weather forecasts and analyses. This application is submitted under the Commission’s Part 25 streamlined licensing procedures governing small satellites.¹ A completed Form 312, Schedule S, Technical Annex, orbital debris assessment report (“ODAR”), International Telecommunication Union (“ITU”) cost-recovery letter, and ownership information exhibit are included with this application. Contemporaneously, ITU documentation for GNOMES-4 will be provided to the Commission under separate cover.

I. BACKGROUND AND SYSTEM DESCRIPTION

PlanetiQ is a Colorado-based company. PlanetiQ plans to sell data products collected from its spacecraft through its RO activity to government customers and commercial parties.

¹ 47 CFR § 25.122; *see also Streamlining Licensing Procedures for Small Satellites*, IB Docket No. 18-86, *Report and Order*, 34 FCC Rcd 13077 (2019) (“*Streamlined Processing Order*”).

Although this application covers only a single satellite, GNOMES-4, PlanetiQ intends to operate in the future a constellation of GNSS Navigation and Occultation Measurement Satellites (“GNOMES”). Two initial, experimental GNOMES have been successfully launched and are currently on-orbit generating RO data.² GNOMES-4 is scheduled to launch no earlier than October 2023.

Through the GNOMES constellation, PlanetiQ aims to significantly improve weather forecasting, numerical weather prediction (“NWP”) models, and space weather forecasts and analyses. To achieve this vision, PlanetiQ has designed a GNSS-RO instrument, Pyxis, which delivers the highest level of performance in a microsatellite spacecraft form factor. This approach enables satellites carrying state of the art instrumentation to be placed into and operate in LEO, dramatically increasing the combined quality and quantity of GNSS occultations assimilated in each NWP and space weather update cycle.

PlantiQ has a contract with the National Oceanic and Atmospheric Administration (“NOAA”) for the provision of RO data.³ PlanetiQ also recently submitted a proposal for another contract, as part of NOAA’s Commercial Weather Data Program Radio Occultation Data Buy II.⁴ These contracts are in furtherance of legislative mandates from the Weather Research

² See Grant, File No. 0734-EX-CN-2021 (granted March 2, 2022); Grant, File No. 0504-EX-CN-2020 (granted November 6, 2020).

³ The federal contract ID number is 1332KP22PNEEP0020 and information regarding that contract is available online. See <https://www.fpds.gov/ezsearch/search.do?q=1332KP22PNEEP0020+PIID%3A%221332KP22PNEEP0020%22&s=FPDS.GOV&templateName=1.5.2&indexName=awardfull> (last visited September 8, 2022).

⁴ See Request for Proposal: NOAA Commercial Weather Data Program Radio Occultation Buy II (RODB)-2, Notice ID: 1332KP22RNEEP0003 (July 20, 2022), available at <https://sam.gov/opp/542f8cf3b9e84c06837bb40169592f9f/view> (last visited September 8, 2022).

and Forecasting Innovation Act of 2017 to improve U.S. weather forecasting capabilities and assess the viability of using commercial RO data to support NOAA’s weather forecasting mission.⁵ For these reasons, PlanetiQ submits that grant of this application is in the public interest and requests FCC action in time to allow PlanetiQ to launch GNOMES-4 by October 2023.

A. Space Segment

As discussed in the Technical Annex,⁶ GNOMES-4 will use S-band frequencies (2025-2110 MHz) for primary data and TT&C uplinks and X-band frequencies (8025-8400 MHz) for primary data and TT&C downlinks.

GNOMES-4 is expected to be launched into and operate in the following orbits:

LTAN / LTDN: To be defined by SpaceX Transporter-9

Nominal insertion orbital altitude: 505 to 545 km circular

Nominal insertion inclination: 97-98 degrees

Nominal operating orbital altitude: 430-545 km circular

Nominal operating inclination: Sun-synchronous inclination, 97.6 degrees (+/- 0.5 degrees)

The nominal orbit configuration is a sun-synchronous orbit (“SSO”) at 525 km altitude, which will provide pole-to-pole Earth coverage. PlanetiQ plans to perform system commissioning and RO data collection at the injection altitude. The commissioning period is expected to be less than 1 month. The on-board propulsion system will be used to maintain the nominal circular orbit from the launch injection altitude, and to perform orbit maintenance to maintain a target 5-year mission. Under normal operating conditions, the propulsion would not be used to maintain orbit altitude until it has decayed to approximately 430 km x 430 km. Then

⁵ See *Weather Research and Forecasting Innovation Act of 2017*, P.L. 115-25 (April 18, 2017) (directing NOAA to obtain commercial weather data from private sector providers).

⁶ See Exhibit C.

the propulsion would keep the satellite at 430 km x 430 km until the end of operational life. The satellite contains sufficient propulsion for orbit change, inclination adjustments, station keeping, collision avoidance, and deorbit operations.⁷

B. Ground Segment

The atmospheric soundings measured by GNOMES-4 will be downlinked via commercial ground station networks. At present, PlanetiQ has contracts with Kongsberg Satellite Services (KSAT) and ATLAS Space Operations for use of the ground station networks specified in the Technical Annex.

The company may expand its future ground station network to include stations inside and/or outside the United States for the purposes of increasing opportunities for data transmissions. The company will coordinate all such ground stations, including non-U.S. ground stations, with Federal operators in the relevant bands prior to operating any such stations and requests authority for such communications subject to coordination with relevant Federal operators.⁸

II. FREQUENCY USE AND SPECTRUM SHARING

A. S-band/X-band Frequencies

As discussed further in the Technical Annex, GNOMES-4 will operate its communications links with the frequency parameters specified below in Table 1. PlanetiQ

⁷ See Exhibit A, Orbital Debris Assessment Report.

⁸ See, e.g., Stamp Grant, Loft Orbital Solutions, Inc., IBFS File No. SAT-LOA-20200907-00105, at Condition 14 (granted May 28, 2021) (“[Licensee] shall provide the FCC with an updated list of coordinated earth stations within ten business days following any changes to the list.”); Stamp Grant, Planet Labs Inc., IBFS No. SAT-MOD-20170713-00103, at Condition 7 (granted Jul. 19, 2018) (“Transmissions of ... data in the 8025-8400 MHz frequency band may only be made to earth stations coordinated with National Aeronautics and Space Administration (NASA). [Licensee] shall provide the FCC the list of coordinated earth stations.”).

previously coordinated these parameters with federal operators for GNOMES-2 and GNOMES-3.⁹ PlanetiQ has the ability to use any center frequency within the 2025-2110 MHz and 8025-8400 MHz bands and may change that selection as a result of pre-coordination with Federal operators. PlanetiQ has already commenced pre-coordination activities with federal spectrum managers regarding the S-band/X-band spectrum use for GNOMES-4.

	Frequency Band	Center Frequency	Maximum Bandwidth	Data Rate
Uplink	S-band	2081 MHz	200 kHz	100 kbps
Downlink	X-band	8260 MHz	20 MHz	10 Mbps

Table 1. Proposed Frequency Parameters

The S-band (2025-2110 MHz) and X-band (8025-8400 MHz) frequency bands each have allocations for Earth Exploration-Satellite Service (“EESS”) use. Specifically, the 2025-2110 MHz (Earth-to-space) band is allocated internationally and in the U.S. for non-Federal EESS use, subject to conditions as may be applied on a case-by-case basis and the limitation that any use may not cause harmful interference to authorized Federal and non-Federal operations.¹⁰ The 8025-8400 MHz (space-to-Earth) band is allocated internationally and in the U.S. for non-Federal EESS use on a primary basis.¹¹

Radio occultation is a remote sensing technique used for measuring the physical properties of the atmosphere.¹² Specifically, it relies on the detection of a change in a radio

⁹ See, e.g., Grant, ELS File No. 0504-EX-CN-2020 (granted November 6, 2020); Grant, ELS File No. 0734-EX-CN-2021 (granted March 2, 2022).

¹⁰ See 47 C.F.R. § 2.106 n.US347. The 2025-2110 MHz (Earth-to-space) band is also allocated to space operations internationally. *Id.* § 2.106.

¹¹ The 8025-8400 MHz band is also subject to an electromagnetic compatibility analysis as may be applied on a case-by-case basis. *Id.* § 2.106 n.US258.

¹² See, e.g., *Radio Occultation*, Wikipedia, https://en.wikipedia.org/wiki/Radio_occultation (last visited September 12, 2022).

signal as it passes through a planet's atmosphere, *i.e.*, as it is occulted by the atmosphere. Accordingly, the RO service proposed by GNOMES-4 meets the definition of EESS because the satellite will observe and analyze data derived from signals passing through the Earth's atmosphere.¹³ Further, this data will be used for weather forecasting, NWP modeling, and space weather forecasts and analyses, all of which is consistent with EESS activities. Accordingly, use of these frequency bands is consistent with the international and domestic EESS frequency allocations.¹⁴

Spectrum sharing in the proposed EESS frequencies will be possible because GNOMES-4 and satellites in other similar systems transmit/receive only in short periods of time while visible to a receiving/transmitting earth station. For harmful interference to occur, satellites belonging to the different systems would have to be visible to the Earth station and transmitting or receiving using the same frequencies at the exact same time. In such an unlikely event, the resulting inline interference could be avoided by coordinating the satellite transmissions so that they do not occur simultaneously. Accordingly, there is no mutual exclusivity between GNOMES-4 and other EESS (or similar) systems using the same frequency bands. PlanetiQ will also comply with technical requirements in Part 2 of the Commission's rules and applicable ITU rules and complete coordination with the Federal operators as required.¹⁵

¹³ See 47 C.F.R. § 2.1 (defining EESS as a "radiocommunication service ... in which "information relating to the characteristics of the Earth and its natural phenomena ... is obtained from active sensors or passive sensors on Earth satellites").

¹⁴ The Commercial Remote Sensing Regulatory Affairs office of NOAA has previously determined that PlanetiQ's RO satellites do not require NOAA remote sensing licenses because they do not collect data that can be processed into imagery of the surface features of the Earth.

¹⁵ See *Space Imaging, LLC*, Declaratory Order and Order and Authorization, 20 FCC Rcd 11964 ¶¶ 26-31 (2005); *DigitalGlobe, Inc.*, Order and Authorization, 20 FCC Rcd 15696 ¶¶ 1, 15 (2005); see also Stamp Grant, Planet Labs Inc., IBFS File No. SAT-MOD-20170713-00103

B. GNSS Signals

As discussed in more detail in the Technical Annex,¹⁶ the Pyxis-RO instruments on GNOMES-4 is designed to collect data, *i.e.*, an RO sounding, from publicly available GNSS signals from the GPS (L1 at 1575.42 MHz and L2 at 1227.6 MHz), Galileo (E1 at 1575.42 and E5 at 1207.14 MHz), GLONASS (FDMA signals centered at L1 at 1602 MHz and L2 at 1246 MHz), and BeiDou (B1 at 1575.42 MHz and B2 at 1207.14 MHz) constellations. For science data products, obtaining RO soundings from all four GNSS constellations is critical because it greatly increases the number of RO observations per satellite, enhancing weather prediction accuracy and capabilities for GNOMES-4 and the future GNOMES constellation. Additionally, allowing the GNOMES satellite to maximize RO collections reduces the number of total satellites that PlanetiQ would need to optimally operate the future GNOMES constellation, which would not only mitigate system costs but would also support space sustainability. In terms of sharing, conducting RO sounding cannot cause harmful interference or otherwise exclude other users from using those same signals.¹⁷

Moreover, there is no national security or other similar concerns regarding the RO observations obtained from GLONASS or BeiDou satellites. Because of the necessary post-processing of the RO observations, which involves the use of *a priori* information about the

(granted Jul. 18, 2019); Stamp Grant, Skybox Imaging, Inc., IBFS File No. SAT-LOA-20120322-00058 (granted Sept. 20, 2012); Stamp Grant, Spire Global Inc., IBFS File No. SAT-LOA-20151123-00078 (granted in part Mar. 18, 2016).

¹⁶ See Technical Annex § 2.1.

¹⁷ In analogous situations, the FCC has concluded that the reception of signals cannot cause harmful interference. See, *e.g.*, *Iridium Constellation LLC*, Order and Authorization, 31 FCC Rcd 8675 ¶ 21 (2016); Stamp Grant, Spire Global, Inc., IBFS File No. SAT-AMD-20161114-00107 (granted in part Apr. 7, 2017) (authorizing satellite reception of AIS 1, AIS 2, AIS 3, AIS 4, ASM 1, ASM 2, and ADS-B signals).

various GNSS systems,¹⁸ PlanetiQ would be able to detect any deliberate falsification or spoofing of the foreign GNSS signals and would not release weather data products derived from any such signals. Indeed, the NOAA commercial data buy program allows and encourages use of all available RO signals, including specifically those from the GLONASS and BeiDou constellations.¹⁹

GNOMES-4 satellite navigation would not be conducted based on any GLONASS or BeiDou signals. Rather, conventional orbit determination for GNOMES-4 and on-board scheduling will be performed using GPS data (and Galileo, as needed).

III. APPLICATION OF STREAMLINED RULES

Section 25.122 of the Commission’s rules states that applicants filing under the streamlined rules must certify that they meet certain criteria.²⁰ The following table identifies the streamlined rules criteria and confirms that GNOMES-4 meets the criteria.

47 C.F.R. § 25.122(c) Criteria	PlanetiQ Compliance
(1) The space station(s) will operate only in non-geostationary orbit.	GNOMES-4 will be deployed into a sun-synchronous circular orbit at a target altitude of 525 km. ²¹
(2) The total in-orbit lifetime for any individual space station will be six years or less.	GNOMES-4 is expected to have a total in-orbit lifetime of less than six years at the target insertion altitude. ²²
(3) The space station(s): (i) Will be deployed at an orbital altitude of 600 kilometers or below; or (ii) Will	GNOMES-4 will be deployed to a target altitude 525 km, and no higher

¹⁸ See Technical Annex § 2.1.

¹⁹ See Commercial Weather Data Program Radio Occultation Data Buy II (RODB) – 2, Request for Proposal Amendment 0002, RFP 1332KP22RNEEP0003 (August 16, 2022), at p. 9 (stating expressly that parties may obtain RO soundings from any of the four GNSS constellations).

²⁰ See 47 C.F.R. § 25.122; see also *Mitigation of Orbital Debris in the New Space Age*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 4156 (2020) (Appendix A); 85 Fed. Reg. 52422 (Aug. 25, 2020).

²¹ See Exhibit A, Orbital Debris Assessment Report.

²² See *id.* § 1.

47 C.F.R. § 25.122(c) Criteria	PlanetiQ Compliance
maintain a propulsion system and have the ability to make collision avoidance and deorbit maneuvers using propulsion.	than 545 km. ²³ The GNOMES will also maintain a propulsion system with the ability to make collision avoidance and deorbit maneuvers, although such maneuvers are not necessary to ensure compliance with the six-year orbit lifetime.
(4) Each space station will be identifiable by a unique signal-based telemetry marker distinguishing it from other space stations or space objects.	GNOMES-4 will use a telemetry downlink with a unique spacecraft identifier to ensure that it will be identifiable during commissioning and in-orbit activities. ²⁴
(5) The space station(s) will release no operational debris.	GNOMES-4 will not release any operational debris. ²⁵
(6) The space station operator has assessed and limited the probability of accidental explosions, including those resulting from the conversion of energy sources on board the space station(s) into energy that fragments the spacecraft.	PlanetiQ has assessed and limited the probability of accidental explosions, including those resulting from the conversion of energy sources on board GNOMES-4 into energy that fragments the spacecraft. ²⁶
(7) The probability of a collision between each space station and any other large object (10 centimeters or larger) during the orbital lifetime of the space station is 0.001 or less as calculated using current NASA software or other higher fidelity model.	The probability of collision between GNOMES-4 and other large objects is 6.4976E-06, as calculated by the NASA Debris Assessment Software (“DAS”). ²⁷
(8) The space station(s) will be disposed of post-mission through atmospheric re-entry. The probability of human casualty from portions of the spacecraft surviving re-entry and reaching the surface of the Earth is zero as calculated using current NASA software or higher fidelity models.	GNOMES-4 will be disposed of through atmospheric re-entry. The probability of human casualty from portions of the spacecraft surviving re-entry and reaching the surface of the Earth is zero as calculated using current NASA DAS. ²⁸
(9) Operation of the space station(s) will be compatible with existing operations in the authorized	Operation of GNOMES-4 will be compatible with existing and future

²³ See *id.*

²⁴ See Technical Annex § 2.2.3.

²⁵ See ODAR § 3.

²⁶ See *id.* § 4.

²⁷ See *id.* § 5.

²⁸ See *id.* § 7.

47 C.F.R. § 25.122(c) Criteria	PlanetiQ Compliance
frequency band(s). Operations will not materially constrain future space station entrants from using the authorized frequency band(s).	operators in the authorized frequency bands, as discussed below.
(10) The space station(s) can be commanded by command originating from the ground to immediately cease transmissions and the licensee will have the capability to eliminate harmful interference when required under the terms of the license or other applicable regulations.	GNOMES-4 can be commanded by the mission operation center at any time to immediately cease transmissions and to eliminate harmful interference. ²⁹
(11) Each space station is 10 cm or larger in its smallest dimension.	The smallest dimension of GNOMES-4 is approximately 50 cm. ³⁰
(12) Each space station will have a mass of 180 kg or less, including any propellant.	The mass of GNOMES-4 is approximately 41.7 kg. ³¹
(13) The probability that any individual space station will become a source of debris by collision with small debris or meteoroids that would cause loss of control and prevent disposal is 0.01 (1 in 100) or less.	GNOMES-4 does not have any subsystems <u>required</u> for a post-mission disposal maneuver in order to meet de-orbit requirements. However, PlanetiQ does intend to conduct a post-mission disposal maneuver at the end of operational life if possible, to further expedite de-orbit times. ³²
(14) Upon receipt of a space situational awareness conjunction warning, the licensee or operator will review and take all possible steps to assess the collision risk, and will mitigate the collision risk if necessary. As appropriate, steps to assess and mitigate the collision risk should include, but are not limited to: contacting the operator of any active spacecraft involved in such a warning; sharing ephemeris data and other appropriate operational information with any such operator; and modifying space station attitude and/or operations.	PlanetiQ will review conjunction warnings, coordinate physical operations of GNOMES-4 with any operator using similar orbits, and, if necessary, mitigate collision risks to minimize operational impacts. ³³

²⁹ See Technical Annex § 2.3.7.

³⁰ See ODAR § 2.

³¹ See *id.*

³² See *id.* § 5.

³³ See *id.*

The Commission has categorically exempted systems operating under the streamlined rules from the Part 25 processing round and default service requirements. Excluding these systems is sensible because small satellite systems eligible for streamlined processing are “designed to serve [their] purpose within a limited, relatively short period of time [and] have more limited frequency use characteristics than more traditional operations licensed under part 25.”³⁴ In lieu of the processing round rules, the Commission requires applicants to “(a) certify that operations of its satellites will not interfere with those of existing operators, (b) certify that it will not materially constrain future operators from using the assigned frequency band(s), and (c) provide a brief narrative description illustrating the methods by which both current and future operators will not be materially constrained.”³⁵ PlanetiQ certifies that the operations of its satellites will not interfere with those of existing operators and that it will not materially constrain future operators from using the requested frequency bands.

In the *Streamlined Processing Order*, the Commission provided examples of applications that would satisfy the specified requirement. Potentially acceptable scenarios include EESS operations³⁶ and those where the satellite operator possesses “a limited number of earth stations and downlinks during relatively short periods of time, with the ability to effectively schedule transmissions such that future satellite entrants can be accommodated.”³⁷ As detailed above, GNOMES-4 is an EESS satellite, and in any event, the proposed GNOMES-4 activities will not

³⁴ *Streamlined Processing Order*, at ¶ 80 (2019).

³⁵ *Id.* ¶ 81.

³⁶ *Id.* ¶ 81 n. 223.

³⁷ *Id.* ¶ 81.

materially constrain current and future co-frequency systems.³⁸ Accordingly, the proposed frequency use is consistent with the FCC’s streamlined processing rules.

IV. 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 rule; and (2) such deviation would better serve the public interest than would strict adherence to the rule.⁴⁰ Generally, the Commission will grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.⁴¹ PlanetiQ submits that good cause exists to waive the following rules.

A. U.S. Table of Frequency Allocations

1. 2025-2110 MHz (Earth-to-Space) TT&C and Data Uplink

This band is allocated to EESS subject to conditions as may be applied on a case-by-case basis and the limitation that any use may not cause harmful interference to authorized Federal and non-Federal operations.⁴² As discussed above, PlanetiQ’s proposed services meet the definition of EESS, and use of this band will be coordinated ensuring that operations will not cause harmful interference. Accordingly, GNOMES-4 may use this frequency band consistent with the U.S. Table of Frequency Allocations. Nonetheless, to the extent necessary, PlanetiQ

³⁸ See *supra* § II.

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).

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

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

⁴² See 47 C.F.R. § 2.106 n.US347.

requests a waiver of the U.S. Table of Frequency Allocations in the event the Commission concludes that GNOMES-4 is not an EESS system.

2. 8025-8400 MHz (Space-to-Earth) Data Downlink

This band is allocated to EESS on a primary basis on a case-by-case basis.⁴³ As discussed above, PlanetiQ's proposed services meet the definition of EESS, and use of this band can and will be coordinated ensuring that operations will not cause harmful interference. Accordingly, GNOMES-4 may use this frequency band consistent with the U.S. Table of Frequency Allocations. Nonetheless, to the extent necessary, PlanetiQ requests a waiver of the U.S. Table of Frequency Allocations in the event the Commission concludes that the GNOMES-4 is not an EESS system.

3. Radio Occultation of GNSS Signals

To the extent necessary, PlanetiQ requests waiver of any FCC requirement necessary to conduct RO soundings of any GNSS signals. Similarly, the company requests waiver of any FCC requirement to provide information about the GLONASS and BeiDou systems or request U.S. market access for those systems.⁴⁴ Fundamentally, PlanetiQ is not seeking access to the two systems for the reception of the specific transmitted GNSS data or the provision of or use of the systems for GNSS. Rather, PlanetiQ is conducting RO soundings based on the presence of

⁴³ See *id.* § 2.106 n.US258.

⁴⁴ The GPS and Galileo systems are permitted to provide GNSS service to the United States. See, e.g., *Waiver of Part 25 Licensing Requirements for Receive-Only Earth Stations Operating with the Galileo Radionavigation-Satellite Service, Order*, 33 FCC Rcd 11322 (November 16, 2018).

the GNSS signals to measure the amount of diffraction of the signals in the atmosphere for weather analysis purposes, as discussed above.⁴⁵

Moreover, PlanetiQ has no information about the GLONASS and BeiDou systems that is not publicly available. The company has no relationship with the operators of those systems and would be unable to obtain any additional information.⁴⁶

V. ITU COMPLIANCE

PlanetiQ has prepared the ITU Advance Publication Information submission for its proposed system and is contemporaneously providing this information to the Commission under separate cover. Attached to this application is PlanetiQ's signed ITU cost recovery letter.⁴⁷

⁴⁵ See also Technical Annex at § 2.1 (providing additional explanation regarding RO analysis). This use is analogous to the sensing of radiofrequency signals. See, e.g., Stamp Grant, HawkEye 360 Inc., IBFS File No. SAT-LOA-20190102-00001 (granted in part Dec. 10, 2019) (authorizing the sensing of radio frequency signals).

⁴⁶ Also, with respect to prior GNOMES spacecraft, the FCC has not required PlanetiQ to provide any such information or seek U.S. market access for the GLONASS and BeiDou systems. See, e.g., Grant, ELS File No. 0504-EX-CN-2020 (granted November 6, 2020); Grant, ELS File No. 0734-EX-CN-2021 (granted March 2, 2022).

⁴⁷ See Exhibit B, ITU Cost Recovery Letter.

VII. CONCLUSION

For the reasons stated above, PlanetiQ submits that the public interest would be served by expeditious grant of the application.

Respectfully submitted,

/s/ Daniel P. Smith

Tony Lin
Emma Marion
DLA Piper LLP (US)
500 Eighth Street, N.W.
Washington, DC 20004
+1-202-799-4450

Counsel for PlanetiQ

Daniel P. Smith
Vice President of Operations
Space Sciences & Engineering LLC,
d/b/a PlanetiQ
15000 West 6th Avenue, Suite 202
Golden, CO 80401
+1-702-427-9711

Dated: September 21, 2022