Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC  20554

In the Matter of

Higher Ground LLC File No. SES-LIC-20150616-00357
Application for a Blanket License to Call Sign E150095
Operate C-band Mobile Earth Terminals

OPPOSITION OF HIGHER GROUND LLC TO MOTION FOR STAY

The Commission should deny the Fixed Wireless Communications Coalition’s (“FWCC”) Motion for Stay1 of the order by the International Bureau, Wireless Telecommunications Bureau, and Office of Engineering and Technology (collectively, the “Bureaus”) granting Higher Ground LLC (“Higher Ground”) a blanket license to operate a limited number of earth stations (i.e., “SatPaq” user terminals) to communicate with certain U.S.-licensed fixed satellite service (“FSS”) satellites.2

The spectrum involved here, C-band frequencies at 5925-6425 MHz, comprises a 500 megahertz swath that includes unoccupied frequencies across virtually the entire country. Higher Ground has developed a way to realize more intensive, non-interfering use of those frequencies to provide consumer messaging and IoT services via a satellite transceiver embedded in a protective case attached to a smartphone. Higher Ground will operate at very low power levels in 4- or 8-megahertz channels that do not interfere with Fixed Service (“FS”) microwave point-to-point receivers and satellite links operating in the band. As the Bureaus concluded, Higher Ground’s “use of a single database that authorizes and manages the devices within a

1 See FWCC Motion for Stay (filed Feb. 10, 2017) (“Motion”).
single network is relatively simple,” and “Higher Ground has demonstrated that its proposed system should prevent or minimize the risk of harmful interference to FS operators in the 5925-6425 MHz frequency band.”

The Motion does not present any new facts or law in support of FWCC’s position or refute the underlying facts of Higher Ground’s proposed operations. As such, FWCC will not succeed on the merits of its concurrently filed Application for Review. Further, FWCC fails to show any irreparable injury or otherwise satisfy the prerequisites for issuance of a stay, and the balance of equities strongly favors denying the request for stay.

I. FWCC CANNOT SATISFY THE REQUIREMENTS FOR A STAY.

In determining whether to stay the effectiveness of one of its orders, the Commission applies the traditional four-factor test employed by the D.C. Circuit. The moving party bears the heavy burden of demonstrating that: (1) it is likely to succeed on the merits; (2) it will imminently suffer irreparable harm; (3) a stay will not cause substantial harm; and (4) a stay would serve the public interest. FWCC satisfies none of these requirements.

A. FWCC Will Not Prevail On The Merits.

FWCC’s claim that it will prevail on the merits hinges on the unsupported and untenable assertion that Higher Ground “has failed to show” that it will not cause harmful interference to terrestrial FS operations. Its arguments are specious; they disregard the record, completely

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3 Id. ¶¶ 29, 19.
4 See FWCC Application for Review (filed Feb. 10, 2017)
6 Motion at 2, 4-5.
overlook the interference protection regime that Higher Ground has developed, and ignore the Bureaus’ findings made in the *Higher Ground Order*.

To begin, FWCC willfully disregards the record evidence. Higher Ground submitted a rigorous technical appendix and a declaration from Virginia Tech Professor Jeffrey H. Reed concluding that Higher Ground operations are highly unlikely to cause harmful interference to FS stations.\(^7\) Higher Ground submitted further technical data in the record and engaged in multiple demonstrations of its Channel Master software to FCC staff and third parties, showing how it identifies available, unoccupied C-band frequencies in virtually all locations across the United States, providing ample options to transmit on non-interfering frequencies.\(^8\) Higher Ground’s ongoing experimental test operations, moreover, belie FWCC’s assertion that there has been no testing to support the non-harmful interference evidence in the record.\(^9\)

FWCC utterly ignores Higher Ground’s interference protection regime. As the Bureaus recognized, however, “Higher Ground will use its Channel Master software to identify non-interfering frequencies for SatPaq terminal operation, taking into account all relevant ULS-derived data for individual C-band point-to-point receivers as well as the SatPaq terminal’s location and orientation, and the use of frequency diversity and satellite choice.”\(^10\) The Channel Master software will incorporate daily ULS updates for “new” C-band point-to-point receiver

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\(^7\) *See* Higher Ground, Application, Technical Appendix & Declaration at 3 (June 16, 2015).

\(^8\) *See* Higher Ground, Consolidated Opposition, at 6-14 (Sept. 23, 2015); Letter from Adam D. Krinsky, Counsel to Higher Ground, to Marlene H. Dortch, FCC, at 5 (Apr. 20, 2016); Letter from Adam D. Krinsky, Counsel to Higher Ground, to Marlene H. Dortch, FCC, at 1 (Apr. 25, 2016); Letter from Adam D. Krinsky, Counsel to Higher Ground, to Marlene H. Dortch, FCC, at 1 (May 23, 2016); Letter from Adam D. Krinsky, Counsel to Higher Ground, to Marlene H. Dortch, FCC, at 1 (Dec. 19, 2016).


\(^10\) *Higher Ground Order* ¶ 15.
information, and a SatPaq will not transmit unless either it is assigned a non-interfering frequency from the SatPaq Network Controller or it has the updated C-band information, or it is operating on a non-interfering “hailing frequency.”\textsuperscript{11}

The Bureaus also recognized that several other aspects of Higher Ground’s system will “prevent or minimize the risk of harmful interference.”\textsuperscript{12} For example, the SatPaq terminals will operate 6 dB (or more) below receiver thermal noise levels, or $I/N = -6$ dB.\textsuperscript{13} This protection criteria will keep the SatPaq emissions 6 dB below the noise level of FS receivers. This fact alone will render any potential interference effects of Higher Ground operations on FS stations to be negligible, as FWCC has previously acknowledged.\textsuperscript{14}

FWCC ignores this protection regime in its entirety, arguing instead that other conditions intended to hold Higher Ground accountable in the event of interference complaints do not prevent interference. That is not their purpose, and FWCC’s reasoning ignores that Higher Ground has developed (as the Bureaus recognized) a robust interference protection regime that will prevent SatPaq operations from transmitting on an interfering signal and avoids harmful interference in to FS operations. The Bureaus concluded:

\begin{quote}
We find that Higher Ground’s automated coordination process, while unconventional and proprietary, provides necessary safeguards against harmful interference to users in the band, . . . Higher Ground has provided sufficient technical and operational
\end{quote}

\textsuperscript{11} \textit{Id.}

\textsuperscript{12} \textit{Id.}

\textsuperscript{13} \textit{Id.} \S 16.

\textsuperscript{14} Letter from Cheng-yi Liu \textit{et al.,} Counsel to FWCC, to Marlene H. Dortch, Secretary, at 6 (June 8, 2016) (“Higher Ground’s stated aim is to limit interference caused by its transmitters to 6 dB below the thermal noise power level of affected fixed service receivers. If Higher Ground’s coordination methods are successful in achieving this goal, we agree the interference effects should be negligible.”).
parameters for its automated coordination system to support its application.\textsuperscript{15}

While FWCC also raises adjacent channel interference concerns, it does not even attempt to address the Bureaus’ conclusions that the risk of such interference is minimal “given the low signal strength at which the SatPaq terminals transmit and the small likelihood of having a SatPaq close to an FS station operating in the adjacent channel.”\textsuperscript{16} Indeed, FWCC’s argument on this point contains no technical support whatsoever and does not even reference the SatPaq transmit power levels, which are orders of magnitude lower than FS stations that operate in the band. FWCC likewise ignores the fact that FS antennas’ narrow beamwidth make any interference highly unlikely.

FWCC also disregards that the Bureaus adopted a “cautious approach” to safeguard against unintended consequences if Higher Ground’s system, for any reason, does not perform as designed.\textsuperscript{17} These conditions include a requirement that Higher Ground limit roll out of SatPaq terminals on a phased basis, up to 5,000 new terminals each quarter in the first year, up to a maximum total of 50,000 terminals thereafter.\textsuperscript{18}

Ultimately, Higher Ground is subject to the condition that it may not cause harmful interference to any current or future authorized station operating under an existing allocation and must immediately cease operations upon notification of harmful interference.\textsuperscript{19} And, the SatPaq Network Controller is required to maintain supervisory control at all times, with the ability to

\textsuperscript{15} Higher Ground Order ¶ 25.  
\textsuperscript{16} Id. ¶ 22.  
\textsuperscript{17} Id. ¶ 36.  
\textsuperscript{18} Id. ¶¶ 36, 40.  
\textsuperscript{19} Id. ¶¶ 20, 40.
override a frequency selection or shut off SatPaq terminal operation. Further, the Commission may suspend or terminate deployment and operational authority at any time if it finds that the Higher Ground system causes unresolved harmful interference to protected users of the band.

In sum, FWCC simply wishes away the Bureaus’ cautious approach and the inconvenient fact that Higher Ground’s interference protection regime “should prevent or minimize the risk of harmful interference” to microwave operations, and FWCC’s assertion of success on the merits lacks any merit.

B. FWCC Does Not Demonstrate Irreparable Injury.

To substantiate a showing of irreparable injury, the movant must demonstrate that the injury is “both certain and great; it must be actual and not theoretical.” The movant must also “substantiate the claim that the irreparable injury is ‘likely’ to occur. . . . Bare allegations of what is likely to occur are of no value. . . .” FWCC utterly fails to satisfy these rigorous standards.

FWCC provides no evidence that, absent a stay, its members will suffer irreparable harm. Rather, FWCC assumes, without support, that Higher Ground’s operations will not work as conditioned by the Higher Ground Order and will cause harmful interference. Without any supporting evidence of actual harm, FWCC’s assertions are mere “predictions” that are “at best, remote and speculative” and do not merit a finding of irreparable harm as a matter of law.

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20 Id.
21 Id. ¶ 36.
22 Id. ¶ 19.
23 Wisconsin Gas Co. v. FERC, 758 F.2d 669, 674 (D.C. Cir. 1985).
24 Id.
25 See Econ/Innovation Opportunities, 31 FCC Rcd at 1933 (citing Power Mobility Coal. v. Leavitt, 404 F.Supp. 2d 190, 205 (D.D.C. 2005)).
First, and as discussed above, given the stringent interference protection regime built into Higher Ground’s operations and the conditions imposed in the *Higher Ground Order*, there is no basis to conclude that there will be harmful interference into FS operations. Experience to date reinforces this view. Since 2014, Higher Ground has conducted experimental test operations of the SatPaq technology throughout various areas of the United States, subject to prior notification of operations and 24/7 emergency contact information to potentially affected FS operations, and it has not received a single interference complaint to date.\textsuperscript{26} Second, there are numerous conditions to safeguard microwave operations from any unintended consequences resulting from Higher Ground’s operations. Third, FWCC makes no substantive showing to explain how and to what degree it believes that any of the alleged deficiencies in Higher Ground’s system will actually harm FS operations.

C. **Grant of the Stay Request Will Cause Substantial Harm.**

It is beyond dispute that grant of the stay would cause substantial harm. Grant of a stay would deprive U.S. consumers of the benefits of new services not otherwise available commercially, and would block development of an innovative technology designed to facilitate more efficient and intensive spectrum use and sharing between satellite and terrestrial operations. Further, grant of the stay will directly harm Higher Ground, which has invested substantial resources to develop new equipment and services using a state-of-the-art, database-driven technology that will ensure robust interference protection to FS operations. Higher Ground has worked through the regulatory process for nearly two years to secure the needed regulatory approvals to offer its service, and a stay will substantially harm the prospects for this start-up company.

\textsuperscript{26} *See supra* note 9.
D. The Balance of Equities Clearly Counsel Against a Stay.

Contrary to FWCC’s claims, the balance of equities counsels against a stay.27 As discussed above, FWCC’s claim that a stay is needed is based only on the unsubstantiated assertion that despite the conditions imposed in its grant, Higher Ground will cause harmful interference to FS operations. This speculative prediction, however, is not adequate to overcome the certainty of the significant public interest benefits that will accrue from Higher Ground’s services if the stay request is denied.

Higher Ground’s service will offer substantial consumer and industry benefits, filling a market void for affordable, truly ubiquitous consumer messaging service and data communications for IoT applications, particularly in areas that are outside cellular service coverage. As Intelsat observed, Higher Ground’s proposed service “will help satisfy consumer demand for affordable, ubiquitous messaging services offering universal connectivity across the United States.”28 The Bureaus have concurred, finding that Higher Ground’s operations “would provide public interest benefits by making available to consumers a unique service in areas that may lack coverage.”29

Higher Ground is also developing SatPaq solutions for use in IoT applications, allowing applications to communicate information from farmland that is not served by cellular networks, for example. Applications may include crop management (e.g., detecting prevalence of pests and monitoring temperature and soil moisture to optimize crop yields) and climate control in greenhouses (e.g., monitoring and controlling temperature, humidity, light intensity, and soil moisture), to name a few. Similarly, SatPaqs may be used to provide the connectivity required

27 Motion at 6.
29 Higher Ground Order ¶ 11.
by new smart grid architectures designed to increase the efficiency of high-voltage power transmission lines. Such use would be well-suited particularly for many power transmission towers that are beyond cellular network coverage.

Finally, Higher Ground’s Channel Master software, a customized automated frequency coordination analysis system, will permit a new use of C-band spectrum while mitigating the risk of harmful interference to point-to-point microwave receivers. As such, Higher Ground’s system and operations will further the public interest in ensuring the highest public benefit is derived from this finite spectrum resource.\(^{30}\) The balance of equities clearly weighs in favor of introduction of the SatPaq and against the motion for stay.

II. CONCLUSION

For these reasons, the Commission should deny FWCC’s Motion for Stay.

Respectfully submitted,

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\(^{30}\) \textit{Id.}
CERTIFICATE OF SERVICE

I, Karla Huffstickler, an employee at Wilkinson Barker Knauer, LLP, hereby state that true copies of the foregoing Opposition of Higher Ground LLC to Motion for Stay were sent by first class mail, postage prepaid, February 17, 2017, to the attached Service List.

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