UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM INCORPORATED,
Petitioner,

v.

UNM RAINFOREST INNOVATIONS,
Patent Owner.

PTAB Case No. IPR2021-00375
Patent No. 8,265,096 B2

DECLARATION OF BRANIMIR VOJCIC, D.SC., IN SUPPORT OF UNM RAINFOREST INNOVATIONS' PRELIMINARY RESPONSE

I, Dr. Branimir Vojcic, under the penalty of perjury under the laws of the United States, declare that the following is true and correct based on the best of my ability.

Date: 21 April 2021 Signed: _____
Branimir Vojcic, Ph.D.

1. I have been retained by DiMuro Ginsberg, P.C., as an independent technical expert in the Inter Partes Review between UNM Rainforest Innovations ("UNM"), and Qualcomm Incorporated ("Qualcomm"), PTAB Case No. IPR2021-00375 involving U.S. Patent No. 8,265,096 ("the '096 patent").

2. I am being compensated for my work as a technical expert at my customary rate of $675 per hour. My compensation does not in any way depend on the outcome of this review, and I have no personal interest in the outcome of this review.

I. QUALIFICATIONS

3. I am an expert in wireless technology and other telecommunications areas. I am an Emeritus Professor of Engineering and Applied Science at The George Washington University, where I have been a member of the faculty since September 1991. In addition, I have served as a consultant for a number of companies in the wireless communications industry in various technology areas. I have also served on numerous committees and as a reviewer and editor for several journals, conferences, and organizations.

4. I received my Diploma of Engineering, Master of Science, and Doctor of Science degrees in Electrical Engineering from the University of Belgrade in Yugoslavia in 1981, 1986, and 1989, respectively. The primary focus of my Doctor of Science studies was on Code Division Multiple Access (CDMA) and spread spectrum communications technologies.

5. In 1991, I joined The George Washington University as an Assistant Professor and was promoted to Associate Professor and Professor in 1997 and 2000, respectively. From 2001 to 2004, I served as Chairman of the Electrical and Computer Engineering Department at The George Washington University and retired in 2015. During my tenure at The George Washington University, I have taught many different courses on communications theory and networks, wireless communications, CDMA, and I have been a course director for a number of courses in communications. I have supervised students mostly in the areas of wireless communications and CDMA (including IS-95, CDMA2000, WCDMA/HSDPA/HSUPA) and OFDM/LTE and have been a thesis director for a number of Doctor of Science candidates, who now have successful careers in academia, industry, and government.

6. My research in the areas I just mentioned has been supported by the communications industry and various government agencies, such as the Advanced Research Project Agency (ARPA), the National Science Foundation (NSF), and the National Security Agency (NSA). Much of this research concerns communications theory, performance evaluation, modeling of wireless networks, multi-user detection, adaptive antenna arrays, and ad-hoc networks.

7. I have authored and co-authored a number of journal and conference papers, contributed to various books, and co-authored a textbook on CDMA, entitled

The CDMA2000 System for Mobile Communications, Prentice Hall, 2004. I have also served as a co-editor of a book on wireless communications, entitled *Multiaccess, Mobility, and Teletraffic in Wireless Communications*, Volume III, Kluwer Academic Publishers, Norwell, Massachusetts, 1998. My CV includes a detailed listing of my publications. *See* Attachment A.

8. I have also received awards for my work. For example, in 1995, I received the prestigious National Science Foundation Faculty Early CAREER Development Award. The award is given annually by the NSF to a select number of young professors nationwide to promote excellence in teaching and research.

9. I have served as a consultant for numerous companies in the wireless communications industry in technology areas, including the areas of 2G/3G/4G mobile technologies, Wireless LANs, new generation broadcast systems, advanced mobile satellite systems and other aspects of modern communication systems. I have also taught academic courses as well as short courses for the industry and government on various aspects of communications in the areas of 2G, 2.5G, 3G, and 4G cellular standards, such as CDMA2000 1xRTT, CDMA2000 Evolution Data Optimized (EVDO), Wideband Code Division Multiple Access (WCDMA), and LTE.

10. I am a Senior Member of the IEEE and was an Associate Editor for IEEE Communications Letters and the Journal on Communications and Networks. I have

served as a member of technical program committees, as a session organizer for many technical conferences and workshops, and as a reviewer of technical papers for many journals and conferences.

11. I am a co-inventor on about 20 patents; some representative examples include: U.S. Patent No. 6,523,147, entitled "*Method and Apparatus for Forward Error Correction Coding for an AM In-Band On-Channel Digital Audio Broadcasting System*," U.S. Patent No. 8,595,590 B1, entitled "*Systems and Methods for Encoding and Decoding Check-Irregular Non-Systematic IRA Codes*," and applications including "*Joint Source-Channel Decoding with Source Sequence Augmentation*," U.S. 20140153654 A1, June 5, 2014, "*Systems and Methods for Advanced Iterative Decoding and Channel Estimation of Concatenated Coding Systems*," U.S. 20140153625 A1, June 5, 2014, "*Advanced Decoding of High/Medium/Low Density Parity Check Codes*," PCT/US13/72883, and International Application Number PCT/CA01/01488, entitled "*Multi-User Detector For Direct Sequence - Code Division Multiple Access (DS/CDMA) Channels*."

12. Over the last several years, I have evaluated many, on the order of hundreds, of patents that are essential or potentially essential to wireless standards for various clients. These evaluations typically include, for example, analyzing whether the patent claims read on the relevant standard, considering the importance of the technological inventions claimed, analyzing how such claimed inventions

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