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Via Electronic Filing

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

Notice of *Ex Parte* Communication

RE: A National Broadband Plan for our Future: **GN Docket No. 09-51**

Dear Ms. Dortch:

In response to an inquiry from Arnab Das, a member of the FCC's Omnibus Broadband Initiative, Clearwire provided the attached information to Mr. Das on October 29, 2009. The attachment is a summary of the technical specifications of WiMAX R2.0/802.16m.

Pursuant to Section 1.1206(b)(2) of the Commission's Rules, notice of this *ex parte* communication is being filed electronically. If you have any questions regarding this matter, please do not hesitate to contact the undersigned at 202-351-5033.

Sincerely,


Cathleen A. Massey

cc: Arnab Das

WiMAX R2.0/802.16m RAN Tech Summary

Technology Area Description

Radio technology OFDMA

Spectrum allocation 5, 10, 20, 40 MHz channels

Spectrum reuse 1:1 or higher. Support for frequency sub bands for partitioning a single frequency channel block to support reuse.

Spectral efficiency 2.6 bps/Hz (0.09 bps/Hz cell edge) downlink. 1.3 bps/Hz (0.05 bps/Hz cell edge) uplink

MIMO 4x4 DL, 2x4 UL MIMO Multi-BS advanced MIMO - inter-cell interference nulling, Closed-Loop Macro Diversity (CL-MD) and Collaborative MIMO (Co-MIMO)

Adaptive antenna Supported

Beam forming Supported

Interference mitigation Advanced inter-cell interference control - mobile stations can be requested to measure their local view of interference and report to base station which then can coordinate between base stations to adjust power levels to lower overall interference levels.

Throughput Up to 1000 Mbps in ideal stationary/portable scenarios. (goal) Up to 100 Mbps in ideal mobility scenarios. (goal) Peak (4x4 DL) >15 bps/Hz, (2x4 UL) >6.75 bps/Hz Sustained >2.6 bps/Hz DL, >1.3 bps/Hz UL

Table 1: Normalized peak data rate

Requirement Type	Link direction	MIMO Configuration	Normalized peak rate (bps/Hz)
Baseline	Downlink	2x2	8.0
	Uplink	1x2	2.8
Target	Downlink	4x4	15.0
	Uplink	2x4	6.75

Mobility speed Up to 350 km/hr (up to 500 km/hr in special cases)

Mobility HO latency <27.5 ms (same frequency) <40 ms (within a spectrum band) <60 ms (between spectrum bands)

Mobility type Mobile assisted seamless HO including backwards compatibility with 16e legacy base stations.

Channel duplex TDD or FDD. Channel frames are divided into hierarchical time slots with 20ms super-frames, 5ms frames, 0.617ms sub-frames. TDD transmission direction can be changed once within a 5ms frame on sub-frame boundaries. Each sub-frame has 5, 6, or 7 symbols.

Channel latency <10 ms one-way IP user-plane

QoS Realtime and non-realtime QoS. Support for application traffic types: Constant bit rate Real-time variable bit rate Non-real-time variable bit rate Best effort

Privacy / security Airlink secured via EAP / PKM with AES-CCM encryption, CMAC authentication mode, X.509 certificates, mutual authentication of base and mobile stations

VoIP capacity >60 concurrent calls per MHz spectrum on a channel (assumes 12.2 kbps vocoder and 40% Voice Activity Factor (VAF))

Backwards compatibility Base station and mobile station equipment can operate in either 16m or legacy 16e mode using the same frequency spectrum.

Relay Integrated multi-hop relay support.

MBS Integrated support for Enhanced Multicast and Broadcast Services.

Multiple access Point-to-multipoint downlink (ASN controlled). Shared uplink (ASN controlled).

Power saving Sleep and idle mobile station modes of operation supported with paging and full mobility support.

Self Organizing Network (SON) Capabilities Support for self-configuration, self-optimization of base stations.

Special features Location based services accuracy 150m (handset method), 300m (network method), 95% CDF MBS

Emergency Services Multi-hop Relay Multi-carriers Femto base stations