

Experimental License Application Justification

New Jersey American Water (NJAW) is the largest water service provider in the state of New Jersey, serving approximately 2.7 million people in 191 communities. NJAW is a subsidiary of American Water, the largest and most geographically-diverse publicly traded water and wastewater utility company with a national reach. Due to America's aging infrastructure, up to 20% of all treated water is lost to leaks. In addition to investing approximately \$1.4 billion annually to renew our supply and treatment systems, NJAW is pioneering innovative solutions to spot leaks before they become visible above ground.

BACKGROUND

NJAW is expanding use of internet of things (IOT) sensors deployed across its water infrastructure systems in order to improve its ability to detect and minimize issues such as leaks before they become catastrophic. American Water wants to utilize and apply technology to its mission-critical use cases such as leak detection. Given the potential for large scale expansion of networked devices, NJAW is exploring options to gain more control over its networked communications. Specifically, NJAW seeks to explore the value of additional reliability and security through Private LTE solutions and will work with pdvWireless to enable the communication backhaul of IOT devices for this pilot.

EchoShore-DX is an IOT technology for leak monitoring. NJAW has almost 5,000 EchoShore-DX sensor endpoints deployed in American Water's water pipe network, with further expansion planned. Echologics is a business affiliate of Mueller Water Products (NYSE: MWA), a leading manufacturer and marketer of products used for the management of water networks. Echologics pioneered the development of advanced acoustic technologies, products and services that enable non-invasive diagnostics of water utility pipeline infrastructure, including leak detection, pipe condition assessment and water loss management. NJAW requested that Mueller / Echologics run a pilot test to demonstrate that the EchoShore-DX technology can use the pdvWireless network for reliable communications backhaul.

PdvWireless, Inc. ("PDV") and the Enterprise Wireless Alliance ("EWA") submitted a Petition for Rulemaking to create a 3X3 MHz allocation to facilitate broadband deployment for business enterprise entities, including those classified as Critical Infrastructure Industry (RM-11738) within the 900MHz band. The FCC released a Notice of Proposed Rulemaking ("NPRM") on March 22, 2019 that would realign the 900 MHz band. NJAW intends to use PDV 900 MHz channels as proposed in the experimental license in a broadband configuration. Currently, the 900 MHz licenses are configured in 20 blocks of 10 contiguous 12.5 kHz channels (125 kHz) that cover entire Metropolitan Trading Areas ("MTAs"), each block is separated by 10-channel allocations of site-specific Business/Industrial/Land Transportation ("B/ILT") frequencies. Since the minimum channel size for a LTE carrier is currently 200KHz, the existing 900 MHz band configuration prevents the deployment of these services.

REQUEST FOR CONVENTIONAL EXPERIMENTAL RADIO LICENSE

NJAW requests a conventional experimental radio license which will be instrumental for testing the Private LTE system on 900 MHz spectrum. The purpose of the testing is technical radio research: it is intended

to confirm that up to 3 MHz broadband service can be deployed on 900 MHz spectrum using LTE-certified Band Class 8 leak detection sensors to provide the necessary capacity and latency for the above listed use cases without causing interference to systems operating on spectrum adjacent to the proposed 900 MHz allocations in the license. NJAW will evaluate LTE NB-IoT using 200 kHz paired channels as well as conventional LTE-Advanced using a paired 1.4 MHz channel. All testing will comply with CFR 47 Section 5.84 and will not cause harmful interference to any station, either co-channel or adjacent channel, operating in accordance of the current 900 MHz band plans. It will be conducted on MTA channels and on interleaved B/ILT channels held by PDV – recently scanned in the test area and determined to have little if any incumbent radio traffic. NJAW specifically requests that due to the minimal size of the testing area, notification to incumbent licensees of the tests should be limited to those having sites within 40 kilometers of the station location. Consent should not be required of any licensee.

The testing will involve wireless connectivity to fixed locations within the listed radius of the transmitter site. Detail on the transmitting equipment is provided in the technical section of this application. It should be noted that this is experimental equipment only to the extent that it has not yet been certified for use on Part 90 spectrum in the United States; the models NJAW plans to test are certified LTE Band Class 8 equipment that have been deployed worldwide at 900 MHz. NJAW plans to deploy Laird TRA6927M3PBN-001 omni-directional antennas at each site, the details of which also are provided in the technical section of this application.

As with standard field area network systems, the testing of the fixed wireless LTE equipment will be automated to transmit/receive intermittent information between the transmitters and the end-point (acoustical leak detection sensor) locations. While most of the monitored testing would take place during normal business hours (9AM-5PM), NJAW anticipates that some data transmissions will occur throughout the 24-hour day. Consistent with the requirements of Rule Section 5.107, system management and monitoring will be handled remotely from Woodland Park, New Jersey except for setup and any equipment adjustments that will be conducted by qualified personnel on site.

NJAW requests a 24-month term for the experimental license for a valid product development trial and to make adjustments to the testing as needed. At the conclusion of the experiment, NJAW expects to be able to confidently state whether a network built using LTE-Advanced equipment in the proposed 3 x 3 MHz PEBB allocation can support NJAW's unique, mission critical communications needs and whether such a network will be able to operate side-by-side with a narrowband network with no harmful interference to either system.