To: Magalie Roman Salas
Office of the Secretary, Federal Communications Commission

From: P. Patrick Leahy
Chief Geologist, U.S. Geological Survey

Subject: Comment regarding the Federal Communications Commission Notice of Inquiry titled: Revision of the Rules Regarding Ultra-Wideband Transmission Systems, 47 CFR Part 15 [ET Docket No. 98-153; FCC 98-208]

Date: December 7, 1998

We appreciate the opportunity to comment on the useful and reasonable regulation of airborne radio wave transmissions. As you may be aware, the use of electromagnetic radiation is widespread and well established in the earth sciences. The Geologic Division of the U.S. Geological Survey has used electromagnetic geophysical devices operating in the VLF to UHF bands of the electromagnetic spectrum for over 40 years in applications ranging from earthquake, volcano and landslide hazards to ecosystem preservation. We use ground-penetrating radar, transient electromagnetic and continuous wave devices in these non-invasive studies of the earth's subsurface. With regard to UWB systems in particular, our scientists are actively using, developing, and enhancing a variety of tools for subsurface investigations ranging in depth scale from millimeters to kilometers. The frequency ranges of the UWB systems vary from 10s of Kilohertz to a few Gigahertz. It is most important to note that all of these vital tools are designed to send energy into the ground, and not into the air.

Airborne transmission from electromagnetic geophysical survey equipment is minimal. A few of the systems even operate with air-coupled antennas for logistical reasons (locating buried landmines). However, the low average power output in the milliwatt range, and the low duty cycles of less than 0.1% over time effectively limit existing geophysical tools as a source of airborne radio transmissions. Also, geophysical surveys are costly and relatively rare in occurrence (compared with cell phone usage, for example).

With the advent of new micropower impulse radar transceivers, our scientists using established electromagnetic geophysical tools for subsurface investigations appreciate and share your timely concern for a potential increase in background noise levels. While our subsurface-directed systems pose little danger of creating noticeable interference, we do suffer from the increasing noise levels caused by the increased use of radiowave transmission devices.

When considering the regulation of UWB devices, we strongly urge you to avoid restrictions that run counter to the continued use of established geophysical tools. Furthermore, we encourage you to help preserve our continued use of these tools for critical non-invasive, subsurface investigations. UWB devices designed to put energy into the ground should be separated from those that transmit into the air.