

Martian soil may contain detrimental substance

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This undated image provided by NASA shows the Phoenix spacecraft's inverted scoop preparing to take soil samples on Mars. NASA's Phoenix spacecraft has detected the presence of a chemically reactive salt in the Martian soil, a finding that if confirmed could make it less friendly to potential life than once believed, according to a report Monday Aug. 4, 2008. (AP Photo/NASA)

Scientists are analyzing results from soil samples delivered several weeks ago to science instruments on NASA's Phoenix Mars Lander to understand the landing site's soil chemistry and mineralogy.

Within the last month, two samples have been analyzed by the Wet Chemistry Lab of the spacecraft's Microscopy, Electrochemistry, and

Conductivity Analyzer, or MECA, suggesting one of the soil constituents may be perchlorate, a highly oxidizing substance. The Phoenix team has been waiting for complementary results from the Thermal and Evolved-Gas Analyzer, or TEGA, which also is capable of detecting perchlorate. TEGA is a series of ovens and analyzers that "sniff" vapors released from substances in a sample.

NASA will hold a media teleconference on Tuesday, Aug. 5, to discuss these recent science activities.

Confirmation of the presence of perchlorate and supporting data is important prior to scientific peer review and subsequent public announcements. The results from Sunday's TEGA experiment, which analyzed a sample taken directly above the ice layer, found no evidence of this compound.

"This is surprising since an earlier TEGA measurement of surface materials was consistent with but not conclusive of the presence of perchlorate," said Peter Smith, Phoenix's principal investigator at the University of Arizona, Tucson.

Scientists at the Phoenix Science Operations Center at the University of Arizona are specifically looking at the data from these instruments to provide information on the composition of Martian soil.

"We are committed to following a rigorous scientific process. While we have not completed our process on these soil samples, we have very interesting intermediate results," said Smith, "Initial MECA analyses suggested Earth-like soil. Further analysis has revealed un-Earthlike aspects of the soil chemistry."

The team also is working to totally exonerate any possibility of the perchlorate readings being influenced by terrestrial sources which may

have migrated from the spacecraft, either into samples or into the instrumentation.

"When surprising results are found, we want to review and assure our extensive pre-launch contamination control processes covered this potential," said Barry Goldstein, Phoenix project manager at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

Since landing on May 25, Phoenix has been studying Martian soil with MECA's wet chemistry lab, two microscopes and a conductivity probe, TEGA's ovens and two cameras.

MECA's robotic wet chemistry lab studies soluble chemicals in the soil by mixing a soil sample with a water-based solution with several reagents brought from Earth. The inner surface of each cell's beaker has 26 sensors that give information about the acidity or alkalinity and concentrations of elements such as chloride or perchlorate. The beaker also can detect concentrations of magnesium, calcium and potassium, which form salts that are soluble in water.

With continuing results and the spacecraft in good condition, the mission has been extended through Sept. 30. The original prime mission of three months ends in late August. The mission extension adds five weeks to the 90 days of the prime mission.

Provided by NASA

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