



November 17, 2008

TO: Jack Burns, Chair Science Committee
Ken Ford, Chair NAC
Greg Williams, NAC Executive Secretary
Cassie Conley, NASA HQ
Members of the PPS

FROM: Ronald Atlas, Chair PPS

REGARDING: Planetary Protection Subcommittee meeting, November 2008

Below please find the recommendations from the Nov. 6-7, 2008, meeting of the Planetary Protection Subcommittee which was held at NASA Headquarters in Washington DC.

Sincerely,

A handwritten signature in black ink that reads "Ronald M. Atlas". The signature is written in a cursive, flowing style.

Ronald M. Atlas
Chair

Recommendation 1

The Planetary Protection Subcommittee (PPS) endorses the consensus of the international scientific community, through COSPAR, to protect the Moon at the level of Planetary Protection Category II. This requirement mandates documentation of mission activities and an inventory of organic chemicals above 1 kg, but imposes no operational constraints. The reason for supporting this requirement is that the cold traps present in permanently shadowed regions near the poles of the Moon may contain a record of volatile materials deposited during the evolution of the Solar System, and their potential contamination by human activities should be documented.

Recommendation 2

The Planetary Protection Subcommittee recommends that NASA pursue the appropriate external avenues for ensuring that sites on the Moon containing evidence of past human activity be protected from damage by future exploration efforts. With the advent of the Google X-Prize and plans for increased exploration of the Moon, it has become critical to ensure the safety of these sites-- whether explored by governmental or commercial entities.

Recommendation 3

The Planetary Protection Subcommittee recommends that studies during human exploration of the Moon include:

- (a) monitoring the survival of microbes in space environments, emphasizing those that may be released by human activities and infrastructure, particularly during extravehicular activities;
- (b) understanding the nature and effects of contamination on sample collection and curation; and
- (c) evaluating new and emerging technologies for planetary protection.

The basis for this recommendation is that lunar exploration provides a unique opportunity to perform a range of planetary protection based investigations that recognize the relevance of the lunar environment as a Mars analogue.

This specific recommendation to include three areas of investigation in the lunar exploration program builds upon previous recommendations made by the PPS at the NASA Advisory Council Workshop on Science associated with the Lunar Exploration Architecture, held in Tempe, AZ, Feb. 22-28, 2007:

- (a) perform in situ investigations of a variety of locations on the Moon by highly sensitive instruments designed to search for biologically derived organic compounds to assess the contamination of the Moon by lunar spacecraft and astronauts;
- (b) perform chemical and microbiological studies on the effects of terrestrial contamination and microbial survival, both during upcoming lunar robotic and human missions (dedicated experiments and "natural" experiments in a variety of lunar environments/depths, etc.) and during the Apollo missions (study Apollo sites);

(c) develop technologies for effective containment of samples collected by humans to feed forward into designs that will help prevent forward and backward contamination during Mars missions; and

(d) use the lunar surface as a Mars Analog site, to test, in a sterile environment, proposed life detection systems that are designed to go to Mars.

The detailed recommendations made during the Nov. 08 meeting are intended to supplement and not to replace the previous recommendations.

Recommendation 4

The PPS recommends that the reporting structure for recommendations on planetary protection permit direct input to the NASA Advisory Council and the NASA Administrator. Reporting through the Science Committee to the NAC creates the potential for conflict of interest with science and exploration programs that could undermine public trust.

– The regulatory nature of Planetary Protection and the charter of the PPS are distinct and separate from the purely scientific focus of the NAC Science Committee.

– The National Research Council's Space Studies Board has repeatedly advised NASA that it must ensure the integrity of the Planetary Protection Office and advisory bodies as separate from the science side of the Agency (NRC 1992, 1997, 2002). There are valid reasons to position the Planetary Protection Officer within the Science Mission Directorate, but there are none to justify subordinating the planetary protection advisory body and potentially filtering its advice.

NRC 1992. Biological Contamination of Mars: Issues and Recommendations, National Academy Press

NRC 1997. Mars Sample Return: Issues and Recommendations, National Academy Press

NRC. 2002. The Quarantine and Certification of Martian Samples, National Academy Press

Recommendation 5

The Planetary Protection Subcommittee recommends that NASA expeditiously take steps to convert the assignment of the current Planetary Protection Officer to a full-time Headquarters position and to provide for direct access to the Associate Administrator when making that assignment. The PPS notes that the authorities and responsibilities of the Planetary Protection Officer under NPD 8020.7 are critical to NASA's ongoing efforts in solar system exploration, and that both continuity in that position and an unfettered reporting relationship to the Associate Administrator for the Science Mission Directorate are essential for the effective and robust performance of the job.

Recommendation 6

The Planetary Protection Subcommittee requests that the chair of the NAC attend the next meeting of the PPS, and provide an update on the status of recommendations made during the past 3 years. In the future, the PPS requests that reports be provided by the Science Committee after each meeting on the disposition of recommendations from the PPS.