MITIGATING ADVERSE EFFECTS OF A HUMAN MISSION ON POSSIBLE MARTIAN INDIGENOUS ECOSYSTEMS.

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Introduction: Although human beings are, by most standards, the most capable agents to search for and detect extraterrestrial life, we are also potentially the most harmful. While there has been substantial work regarding forward contamination with respect to robotic missions, the issue of potential adverse effects on possible indigenous Martian ecosystems, such as biological contamination, due to a human mission has remained relatively unexplored and may require our attention now as this presentation will try to demonstrate by exploring some of the relevant scientific questions, mission planning challenges, and policy issues. An informal, high-level mission planning decision tree will be discussed and is included as the next page of this abstract [1].

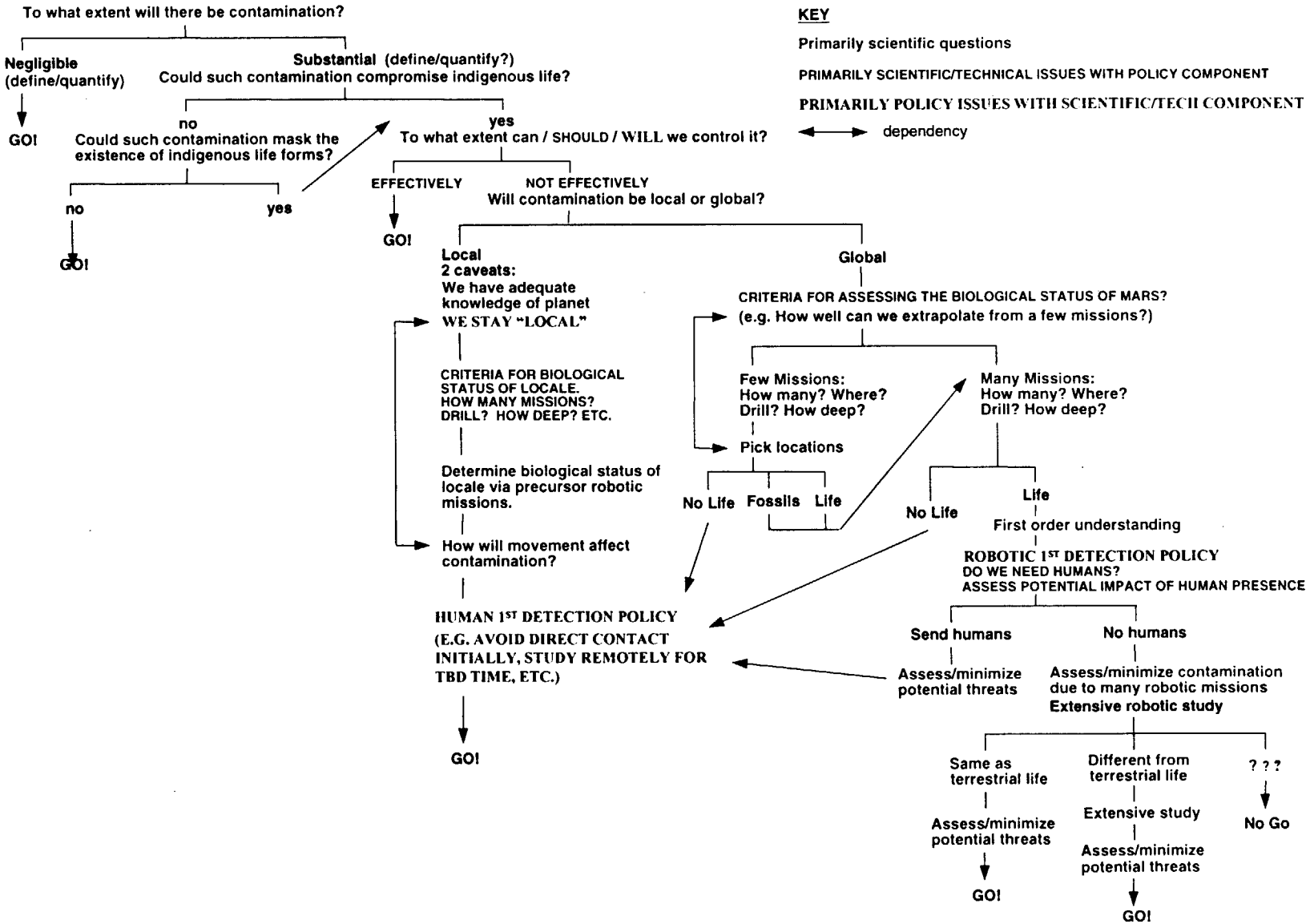
Some of the questions to be considered are: To what extent could contamination due to a human presence compromise possible indigenous life forms? To what extent can we control contamination? For example, will it be local or global? What are the criteria for assessing the biological status of Mars, both regionally and globally? For example, can we adequately extrapolate from a few strategic missions such as sample return missions? What should our policies be regarding our mission planning and possible interaction with what are likely to be microbial forms of extraterrestrial life?

Central to the science and mission planning issues is the role and applicability of terrestrial analogs, such as Lake Vostok for assessing drilling issues [2], and modeling techniques. Central to many of the policy aspects are scientific value, international law, public concern, and ethics. Exploring this overall issue responsibly requires an examination of all these aspects and how they interrelate [3, 4, 5].

References:

[1] Taken from Lupisella M. L. (1999) Ensuring the Integrity of Possible Martian Life, *International Astronautical Federation Congress*, Amsterdam. [2] Lupisella M. L. (1998) A Terrestrial Analog, Presentation/Abstract in *Lake Vostok Workshop Final Report*, National Science Foundation, Washington, D.C. [3] Lupisella M. L. (2000), Humans and Martians, *Earth Space Review*, 9, 1. [4] Lupisella M. L. (1999) The Criticality of Biology's Second Data Point, *NASA Astrobiology Institute Societal Implications Workshop*, NASA Ames Research Center, Mountain View. [5] Lupisella M. L and Logsdon J. (1997) Do We Need a Cosmocentric Ethic? *International Astronautical Federation Congress*, Turin.

Mission Planning Decision Tree for Mitigating Adverse Effects to Possible Indigenous Martian Ecosystems due to a Human Mission



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