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IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

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SUSTAINABILITY, SUSTAINABLY: BUILDING BLOCKS TOWARDS LUNAR ENVIRONMENTAL IMPACT ASSESSMENTS

Abstract

In the near future, a burgeoning number of space actors intend to land and remain on the lunar surface, rapidly exceeding all previously seen activity on the Moon. The Artemis Accords signatories, Russia and China, and private entities such as SpaceX have imminent plans for interaction and habitation on the lunar surface. In light of these imminent changes to the lunar ecosystem, it's imperative for the global space community to assess the environmental impact of sustained lunar activities through the domains of permanent stations, spaceports on the lunar surface, and occupied orbital slots. This will support the goal of sustainability not only for humanity's permanent presence on the Moon but in maintaining the usability of its surface and orbital environment for future generations.

This study conducts a review of publicly-announced plans to establish a permanent presence on the Moon, analyzes key components of those plans in the form of Environmental Impact Statements (EIS), and discusses the current state-of-the-art (SOA) for impact mitigation. These analyses will examine the significance of impacts due to the continued human and robotic presence on and around the Moon.

The goal of this research, in providing a comprehensive review of the key international players' definitive lunar plans along with their respective environmental impact analyses, is to update the global body of knowledge on sustained lunar operations. That update will help serve as a foundation for future space technical and/or policy recommendations towards lunar codes of conduct.

Please note that this abstract is submitted by the Technical Unit Research for a Thriving Lunar Ecosystem (TURTLE) of the Space Generation Advocacy Policy Platform (SGAPP) within the Space Generation Advisory Council (SGAC).