MODELING PUBLIC PRIVATE PARTNERSHIP ECONOMIC BENEFITS FOR LUNAR ISRU. B. Blair[1], [1]NewSpace Analytics, Canterbury, New Hampshire, planetminer@gmail.com.

Introduction: The NASA Emerging Space Office (ESO) recently selected a proposal entitled "PPP framework for multi-commodity lunar ISRU" for award under NRA Solicitation NNA15ZBP0001N-B1. The current status of this lunar economic ISRU modeling effort will be presented. Elements of the Public Private Partnership modeling layer will be emphasized, with solicitation of input by the LEAG community.

Relevance to NASA: A robust, private sector, commercial lunar ecosystem will prove invaluable to NASA, provisioning propellant, life support consumables and other materials to NASA as one customer among many. This would increase the robustness of NASA‟s human space exploration missions by providing sustainable, affordable, complementary options that reduce NASA‟s science and spaceflight costs. A commercial-off-the-shelf approach could also lower the risk of NASA program failure and/or requirements creep that typically accompanies cyclical regime change – which is especially troubling for long duration programs (indeed, a lack of fully considering economic factors may be the leading cause of agency regime change).

Public Private Partnerships: A rich set of potential public-private partnership (PPP) tools are available to government. A new tool is needed for selecting the PPP strategy that could maximize the rate of lunar commercialization by attracting private capital into the development of critical infrastructure and robust capability. A successful lunar industrial development program would be good for the country, offering a path to revitalize the US economy by opening up whole new worlds of resources while increasing national employment in aerospace and other high technology sectors.

Project Objectives: The primary objective of this work will be quantitative evaluation of PPP scenarios. This will be done by combining previously developed technical and economic model elements that have been used to simulate various aspects of lunar resource development. Multi commodity ISRU supply (i.e., an aggregate production function) is envisioned that will be combined with a previously developed multi-year Earth-Mars demand forecast as a framework for PPP comparison and scenario analysis.

Modeling Lunar Commercialization: The proposed work would estimate the effect of both supply and demand side stimulation through PPP scenarios, providing a quantitative estimate of the degree of acceleration and/or risk reduction in the emergence of commercial lunar enterprise. This work will also draw upon comparisons to terrestrial mining activities, where byproducts often generate more operating profit than the primary commodity produced. A secondary objective of the proposed work will examine lunar resource byproduct scenarios that may be synergetic or of low incremental cost to obtain high economic benefit. This secondary activity could also create a tool that could facilitate steering near-term prospecting and ISRU technology demonstration missions toward commercially useful results.

References:

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