

NASA Interim Directive (NID)

Effective Date: July 9, 2020
Expiration Date: December 7, 2021

Planetary Protection Categorization for Robotic and Crewed Missions to the Earth's Moon

Responsible Office: Office of Safety and Mission Assurance

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PREFACE

P.1 Purpose

a. This directive sets forth NASA requirements applicable to robotic and crewed missions travelling to the Earth's Moon. These requirements define NASA's implementation of obligations to avoid harmful contamination under the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (UN, 1967), Article IX for such missions.

b. This directive specifically addresses the control of terrestrial biological contamination associated with space vehicles intended to land, orbit, flyby, or otherwise encounter Earth's Moon.

Note: Return of samples from Earth's Moon to Earth has been unrestricted since the Interagency Committee on Back Contamination opinion following the end of Apollo 14 in 1971.

P.2 Applicability

a. This NID is applicable to NASA Headquarters and NASA Centers, including Component Facilities and Technical and Service Support Centers. This language applies to the Jet Propulsion Laboratory (JPL) (a Federally-Funded Research and Development Center), other contractors, grant recipients, or parties to agreements to the extent specified or referenced in the appropriate contracts, grants, or agreements.

b. The requirements of this directive apply to all NASA missions that may encounter Earth's Moon. The provisions of this NID cover robotic and crewed spaceflight missions with NASA involvement, which may intentionally or unintentionally carry Earth organisms and organic constituents to the Moon. Specifically, this includes NASA-controlled missions, commercial missions sponsored by NASA, joint missions in which NASA participates, and NASA support of non-NASA missions to the extent specified or referenced in the applicable contracts, grants, or agreements.

c. This directive is specifically not applicable to Terrestrial (Earth-orbital) missions.

d. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The term "may" denotes a discretionary privilege or permission, "can" denotes statements of possibility or capability, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.

e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 Authority

The National Aeronautics and Space Act, 51 U.S.C. § 20113(a).

P.4 Applicable Documents

- a. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (UN, 1967), Article IX.
- b. NPR 7120.5, NASA Spaceflight Program and Project Management Requirements.
- c. NID 8020.109A, Planetary Protection Provisions for Robotic Extraterrestrial Missions.

P.5 Measurement/Verification

- a. To ensure compliance with this NID, the Planetary Protection Officer (PPO) monitors the planetary protection related activities and development of required documentation by individual NASA missions.
- b. Program and project compliance with requirements described in this NID are subject to verification by the PPO as part of the Safety and Mission Assurance Technical Authority.

P.6 Cancellation

None.

Chapter 1. Roles and Responsibilities

1.1 Planetary Protection Categorization of Earth's Moon

1.1.1 The Office of Planetary Protection (OPP), as delegated by the Office of Safety and Mission Assurance, evaluates all robotic and crewed missions to Earth's Moon. Based on the evaluation, the PPO recommends approval or non-concur to the Chief Safety and Mission Assurance for the final gate products identified in this directive at Key Decision Points (KDPs), by review of milestone products and control plans due at life-cycle reviews. Signed and approved documents are to be completed in association with KDPs as described in this directive and in accordance with NPR 7120.5

1.1.2 The Mission Directorate Associate Administrator shall assign, with OPP concurrence, all missions to the Moon a NASA Mission Planetary Protection Category I-L (Table 1), except for missions to the following sensitive locations:

a. Permanently Shadowed Regions (PSRs) that have scientific value in the study of the history of the solar system and of significant interest relative to the process of chemical evolution, as well as potential value for In-Situ Resource Utilization (ISRU), and

b. Apollo landing and other lunar historic sites, which have both historical and scientific value, specifically protecting studies of the biological materials left by the Apollo astronauts. For additional information, see NASA Recommendations to Space-Faring Entities: How to Protect and Preserve the Historic and Scientific Value of U.S. Government Lunar Artifacts, (Technical Guidelines) published in 2011.

1.1.3 The Mission Directorate Associate Administrator shall assign, with OPP concurrence, missions to these two exceptions a NASA Mission Planetary Protection Category II-L (Table 1). For the purposes of complying with this NID, the PSRs include areas of the Moon south of 79°S latitude and areas north of 86°N latitude, based on Lunar Reconnaissance Orbiter mapping.

1.1.4 The Mission Directorate shall implement the planning and documentation requirements for Category II-L missions in accordance with Category II in the NID 8020.109A, with the change in requirement for organic inventory in Category II replaced by the following for Category II-L:

a. Provide an inventory of biological materials (living and dead) included in spacecraft hardware and payloads.

b. For crewed missions only, provide a listing of amount and disposition of biological materials, including waste, to remain in the lunar environment.

1.1.5 Because there is incomplete knowledge of transport mechanisms on the lunar surface, this NID is subject to change if new information about lunar environments indicate a different planetary protection categorization should be used for such missions.

Table 1. NASA Mission Planetary Protection

Lunar Target Sensitivity	Mission PP Category
Not of direct interest for understanding the process of chemical evolution or where exploration will not be jeopardized by terrestrial contamination. No protection of such regions is warranted.	I-L
Of significant interest relative to the process of chemical evolution but only a remote chance that biological contamination by spacecraft could compromise future investigations. Reporting of biological materials is warranted.	II-L

Appendix A. References

A.1 NASA-HDBK-6022, NASA Standard Procedures for the Microbial Examination of Space Hardware.

A.2 NASA Recommendations to Space-Faring Entities: How to Protect and Preserve the Historic and Scientific Value of U.S. Government Lunar Artifacts, (Technical Guidelines) published in 2011.