



Future Areas of Planetary Protection Sterilization Research

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The decision to implement Mars Sample Return will not be finalized until NASA's completion of the National Environmental Policy Act (NEPA) process. This document is being made available for information purposes only. Pre-decisional. For planning and discussion purposes only.

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Backwards Planetary Protection Research Roadmap



Backwards PP
Technology RDT&E Map

Invest & Implement

- R&D of established and new microbial reduction (sterilization techniques)
- Molecular Biology Techniques & Equipment
- Experimental Testing of Microorganisms
- R&D of Engineering compatible with BPP

Immediate (6mo – 1yr)
PP Decisions Technology
Updates & Research

- Clear Language on Sterilization Requirements
- Decision for Heat Sterilization based on existing data
 - Temperature (High vs. Low)
 - Time
- Do we need dual modalities?
- Relevant stakeholders we aren't talking to?

Near term (1–3 yrs)
PP Technology
Updates & Research

- Microbial Reduction (Sterilization) Experiments
 - Established Modalities
 - Novel Modalities
 - Dual Modalities
- Testing Protocols
- Characterizing Microbial Analogs
 - BI Standards
- Data Collection
- BTC Engineering Prototyping (TRL6)

Long term (3–5 yrs)
PP Technology
Updates & Research

- Data Storage
- Modeling and Analysis
- Sterilization and Engineering Integration