

**Appendix B**  
**Payload Checklist**

For a payload to be covered under this EA, it must meet specific limiting criteria, which are determined by evaluating a series of questions that serve as a payload checklist (checklist). The checklist should be evaluated following the format below as soon as the proposed payload and spacecraft subsystems are sufficiently defined (i.e., the end of Phase A/beginning of Phase B – during the Formulation Phase).

If responses to all checklist questions are negative (i.e., the condition is not present), the candidate mission would be considered covered by this EA. If answers to any of the checklist questions are positive, further NEPA analysis and documentation or clarification would be required. The nature and scope of the any incremental environmental review process, analysis, and documentation required would be determined in consultation with NASA Headquarters.

1. Would the candidate mission return a sample from an extraterrestrial body? (A1)

*Spacecraft that would return air, soil, or other materials from any extraterrestrial body or from interplanetary space are not covered by this EA. This includes spacecraft that would return a sample to the Earth's surface and spacecraft that would return a sample only to Earth orbit.*

2. Would the candidate spacecraft carry radioactive sources such that launch could not be approved by the NASA Office of Safety and Mission Assurance (OSMA) Nuclear Flight Safety Assurance Manager (NFSAM) per NASA Procedural Requirement (NPR) 8715.3B (NASA Safety Manual)? (B1, B2)

*Spacecraft carrying any radioactive material for power, heat sources, instrument calibration, structural members, or any other purpose must be analyzed and reviewed for launch approval with the level of analysis and approval determined by the quantity of radioactive material. The NASA NFSAM may approve launch for small quantities of radioactive material that have been shown to present no substantial public hazard.*

*Spacecraft that would carry radioactive sources requiring launch approval at the OSMA Associate Administrator level or above are not covered by this EA and would require further NEPA analysis per Table 6.1 of NASA's NPR 8715.3B Chapter 6, the type of radioactive material relates to its activity ( $A_1$  and  $A_2$ )<sup>2</sup> (see Table 1 of Appendix D in NPR 8715.3B), and the amount of radioactive material determines the  $A_1$  and  $A_2$  multipliers. For the radioactive instrument calibration and measurement sources NPR payloads would launch, the sum of all of the  $A_2$  values onboard the spacecraft contributes to a value known as the " $A_2$  mission multiple." For the purposes of this EA, the upper limit of the NFSAM's signature authority is less than 10 times the  $A_2$  mission multiple.*

3. Would the candidate spacecraft be launched on a vehicle and launch site combination other than those listed in this EA? (C1)

*The group of launch vehicles selected for routine payload spacecraft has been approved for launch from the launch sites listed. The environmental impacts of these vehicles have been reported in previous NEPA documentation.*

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<sup>2</sup> The  $A_2$  multiplier for each radioactive source is based on the International Atomic Energy Agency (IAEA), Safety Series Number 6, Regulations for the Safe Transport of Radioactive Material, 1985 edition as amended in 1990, Section III, paragraphs 301 through 306, and summed to determine the  $A_2$  mission multiple.

4. Would the proposed mission launch(es) cause the launch rate (per year) for a particular launch vehicle or total launches to exceed the launch rate previously approved and permitted at the proposed launch site? (C2)

*NEPA documentation for each launch vehicle has been approved assuming a particular number of annual launches from WFF. If adding the launch(es) required by the proposed spacecraft to the existing launch manifest would cause the number of launches to exceed the approved annual number for any year, further NEPA analysis would be required.*

5. Would the candidate mission require the construction of any new facilities or substantial modification of existing facilities beyond the scope of this EA? (D1)

*Payload spacecraft would use only existing launch site facilities including roads, utilities, payload and launch vehicle processing facilities, and launch complexes. Minor modifications to existing facilities required for launch of the proposed spacecraft would be covered by this EA only if the associated activities remain within the scope of permitted operations at all proposed launch sites. Any non-covered modification or new construction would require further NEPA analysis.*

6. Would the candidate spacecraft utilize any hazardous propellants, batteries, ordnance, radio frequency transmitter power, or other subsystem components in quantities or levels exceeding the ES in Table 5 of this EA? (E1)

*The routine payload Envelope Spacecraft defines the upper limits of quantities and levels of commonly used materials and systems that routine payload spacecraft may carry. These values are presented in Table 5 of this EA.*

7. Would the candidate spacecraft utilize any potentially hazardous material as part of a flight system whose type or amount precludes acquisition of the necessary permits prior to its use or is not included within definition of the ES? (E2)

*Routine payload spacecraft may carry small quantities of hazardous materials that are not included as part of the ES description. If so, the required local permit(s) must be identified (if currently in force) or obtained (if new or renewed) before the material is used at the launch site.*

8. Would the candidate spacecraft release material other than propulsion system exhaust or inert gases into the atmosphere? (E3)

*Routine payload spacecraft do not release or vent any material into the atmosphere that could present a hazard or substantial environmental impact either during launch preparations or launch.*

9. Would launch of the candidate spacecraft suggest the potential for any substantial impact on public health and safety not covered by Chapter 4 of this EA? (E4)

*The environmental impact of routine payload spacecraft is bounded by the potential impact of preparation and launch of Envelope Spacecraft as presented in Chapter 4 of this EA. Changes in preparation, launch, or operation from standard practices described in this EA would require review to determine if the changes or associated environmental impacts are substantial enough to require further NEPA review.*

10. Would the candidate spacecraft utilize an Earth-pointing laser system that does not meet the requirements for safe operations according to the analysis techniques in ANSI Z136.1-2000 and ANSI Z136.6-2005? (E5)

*Routine payload spacecraft may carry Earth-pointing laser systems as part of scientific instrumentation. Routine payload laser systems must meet performance criteria that eliminate the potential for the laser energy to present a health hazard for persons on the ground or in aircraft. Laser systems that would operate only in interplanetary space or in orbit around other planets are not required to meet the eye-safe requirement if they have systems that would prevent use when pointing toward the Earth. This EA documents not only the laser safety standards but also the required notifications and permits that must be obtained prior to use of Earth-pointing laser systems.*

11. Would the candidate spacecraft contain pathogenic microorganisms (including bacteria, protozoa, and viruses) that could produce disease or toxins hazardous to human health? (E6)

*Spacecraft that would carry live or inactive disease-causing biological agents as part of an experiment package are not covered by this EA.*

12. Would the candidate spacecraft have the potential for substantial effects on the environment outside the United States or on the global commons? (F1)

*If the launch or operation of the candidate spacecraft in the course of normal or anomalous operations might cause substantial effects outside of the United States, further analysis must be performed in accordance with Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, and NASA regulations (14 U.S.C. § 1216.321).*

13. Would launch and operation of the candidate spacecraft have the potential to create substantial public controversy related to environmental issues? (F2)

*Based on prior NASA experience and associated review, routine payload spacecraft are considered routine in that they would not present any environmental impacts that are new or unusual and would not raise or be likely to create substantial public controversy related to environmental concerns.*