

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTICE (95-)

National Environmental Policy Act; Near Earth Asteroid Rendezvous Mission

AGENCY: National Aeronautics and Space Administration (NASA).

ACTION: Finding of no significant impact.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321, et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA policy and procedures (14 CFR Part 1216 Subpart 1216.3), NASA has made a finding of no significant impact (FONSI) with respect to the proposed Near Earth Asteroid Rendezvous (NEAR) mission, which would involve a flight to and orbit about the near Earth asteroid (433) Eros. The baseline mission calls for the NEAR spacecraft to be launched aboard a Delta II 7925 from Cape Canaveral Air Station (CCAS), Florida, in February 1996.

DATE: Comments on the FONSI must be provided in writing to NASA on or before (insert date 30 days from date of publication in the Federal Register).

ADDRESSES: Written comments should be addressed to Ms. Elizabeth Beyer, NASA Headquarters, Code SLP, 300 E Street SW, Washington, DC 20546. The Environmental Assessment (EA) prepared for the NEAR mission which supports this FONSI may be reviewed at the following locations:

(a) NASA Headquarters, Library, Room 1J20, 300 E Street, SW, Washington, DC 20546.

(b) Spaceport USA, Room 2001, John F. Kennedy Space Center, Florida, 32899. Please call Lisa Fowler beforehand at 407-867-2468 so that arrangements can be made.

(c) Jet Propulsion Laboratory, Visitors Lobby, Building 249, 4800 Oak Grove Drive, Pasadena, CA 91109 (818-354-5179).

The EA may also be examined at the following NASA locations by contacting the pertinent Freedom of Information Act Office:

(d) NASA, Ames Research Center, Moffett Field, CA 94035 (415-604-4190).

(e) NASA, Dryden Flight Research Center, Edwards, CA 93523 (805-258-3448).

(f) NASA, Goddard Space Flight Center, Greenbelt, MD 20771 (301-286-0730).

(g) NASA, Johnson Space Center, Houston, TX 77058 (713-483-8612).

(h) NASA, Langley Research Center, Hampton, VA 23665 (804-864-6125).

(i) NASA, Lewis Research Center, 21000 Brookpark Road, Cleveland, OH 44135 (216-433-2313).

(j) NASA, Marshall Space Flight Center, Huntsville, AL 35812 (205-544-5252).

(k) NASA, Stennis Space Center, MS 39529 (601-688-2164).

A limited number of copies of the EA are available by contacting Ms. Elizabeth Beyer at the address or telephone

number indicated herein.

FOR FURTHER INFORMATION CONTACT: Elizabeth Beyer, 202-358-0314.

SUPPLEMENTARY INFORMATION: NASA has reviewed the EA prepared for the NEAR mission and has determined that it represents an accurate and adequate analysis of the scope and level of associated environmental impacts. The EA is incorporated by reference in this FONSI.

NASA is proposing to launch the NEAR mission, which would deliver a single orbiting spacecraft to Eros in 1999. Following launch and injection into a heliocentric transfer orbit in February 1996, there would be an Earth swingby in January 1998 which will change the heliocentric orbital inclination by about 10 degrees to intercept the orbit of Eros. The initial flyby of Eros would be at a closest approach distance of 500 kilometers (km) (310 miles (mi.)) and would allow an initial reconnaissance of Eros by several instruments and an initial determination of mass and rotational state. Orbital insertion about Eros would occur a few days later in a circular 1000 km (621 mi.) orbit, followed a few weeks later by insertion into a circular 200 km (124 mi.) orbit face-on to the direction of Earth. The orbit would then be lowered in stages, as the asteroid shape and gravity models are refined, until the nominal rendezvous orbit radius of 35 km (22 mi.) is attained. The spacecraft carries no radioactive material, except for a minor calibration source which consists of 30 microcuries of Fe⁵⁵ (iron-55). The proposed

action calls for using a Delta II 7925 launch vehicle with a Payload Assist Module-Delta (PAM-D) upper stage to inject the NEAR spacecraft into its heliocentric transfer orbit.

The science objective for the NEAR mission is to investigate the properties of a single asteroid, the rendezvous target, 433 Eros. Near earth asteroids are of fundamental scientific importance because they may preserve clues to early solar system processes and to conditions during the formation and early evolution of the planets. Measurements from five instruments would provide the data which should accomplish the science objectives. These objectives include detailed studies of surface processes such as the formation of soil from rocks and surface characteristics of these very low gravity bodies. The study of Eros is expected to provide data to characterize asteroid physical and geological properties and indicate elemental and mineralogical composition. Data collected by NEAR could also provide important information on the search for intrinsic magnetization of the asteroid.

Alternatives that were evaluated include (1) No-Action (i.e., no NEAR mission); and (2) launch vehicles options, including the Space Shuttle, Titan, and Atlas configurations, foreign launch vehicles, as well as other Delta configurations. Failure to undertake the NEAR mission would disrupt the execution of NASA's Solar System Exploration Program, as defined by the Agency's Solar System Exploration Committee. Cancellation of the NEAR mission would delay or eliminate the gathering of potentially

important data needed to study the origin and evolution of our solar system. Of the launch vehicles evaluated, the Delta II 7925/PAM-D most closely matches the NEAR mission requirements, has superior reliability, minimizes adverse environmental impacts, and is also the lowest in cost.

Expected impacts to the human environment associated with the mission arise almost entirely from the normal launch of the Delta II 7925. Air emissions from the exhaust produced by the solid propellant graphite epoxy motors and liquid first stage primarily include carbon monoxide, hydrochloric acid, aluminum oxide in soluble and insoluble forms, carbon dioxide, and deluge water mixed with propellant by-products. Air impacts will be short-term and not substantial. Short-term water quality and noise impacts, as well as short-term effects on wetlands, plants, and animals, would occur in the vicinity of the launch complex. These short-term impacts are of a nature to be self-correcting, and none of these effects would be substantial. There would be no impact on threatened or endangered species or critical habitat, cultural resources, or floodplains. Accident scenarios have also been addressed.

The second stage would be ignited at an altitude of 122 km (76 mi.), which is in the ionosphere. Although the second stage would achieve orbit, its orbital decay time would fall below the limit NASA has set for orbital debris consideration. After burning its propellant to depletion, the second stage would

remain in low Earth orbit until its orbit eventually decayed. The NEAR Project has followed the NASA guidelines regarding orbital debris and minimizing the risk of human casualty for uncontrolled reentry into the Earth's atmosphere. No other impacts of environmental concern have been identified.

The level and scope of environmental impacts associated with the launch of the Delta II 7925 vehicle are well within the envelope of impacts that have been addressed in previous FONSI's concerning other launch vehicles and spacecraft. No significant new circumstances or information relevant to environmental concerns associated with the launch vehicle have been identified which would affect the earlier findings.

On the basis of the NEAR EA, NASA has determined that the environmental impacts associated with the mission would not individually or cumulatively have a significant impact on the quality of the human environment. NASA will take no final action prior to the expiration of the 30-day comment period.

A handwritten signature in black ink, reading "Wesley T. Huntress, Jr." The signature is written in a cursive, flowing style with a large, prominent 'W' and 'H'.

Wesley T. Huntress, Jr.

Associate Administrator for
Space Science