UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

ENTERED

June 11, 2003

OFFICE OF
AIR AND RADIATION

Dr. Inés Triay, Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Dear Dr. Triay:

I am writing in response to your letter dated May 20, 2003, regarding certain changes to the previously approved Majorana Experiment located in the Waste Isolation Pilot Plant (WIPP) underground. You initially requested Environmental Protection Agency's (EPA) acceptance of these changes in a letter received by EPA in December 2002. These changes include:

- a name change,
- the addition of two counting stations,
- the occupation of more of the existing physical space in the underground, and
- an increase in liquid nitrogen consumption.

Based on the additional information submitted in the most recent letter, which supplements and explains information in your letter from December 2002, we have determined that these changes are within the scope of the original Majorana approval and are therefore approved to be implemented.

As discussed in our January 29, 2002 (Docket Number II-B3-21) response to your December 2002 letter, EPA's original approval encompassed the implementation of Phase 1 and Phase 2 of the Majorana Experiment. Enclosure 1, page 1, of your submission for the original Majorana approval notes that:

> Phase 1. The experimental apparatus for Phase 1 of the Majorana Project will consist of a single germanium detector operated within a modest lead shield.
>
> Phase 2. The experimental apparatus for the second phase will consist of a single detector array containing 14 germanium detector crystals.

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In the December 2002 letter, Department of Energy (DOE) proposed a number of changes to the already approved Majorana Experiment. First, DOE proposes to change the Majorana experiment name to SEGA (Segmented Enriched Germanium Assembly) and MEGA (Multiple Element Germanium Array) to signify the changing nature of the experiments. Second, you propose the addition of several counting stations, stating that "the SEGA and MEGA experiment will have five counting stations, an increase of two from the three stations in the original Majorana configuration." The letter assigns the detectors as follows:

- SEGA – a single germanium detector inside a lead shield,
- MEGA – an array of eighteen germanium detector crystals in an annular cryostat, with zero to two individual detectors in the inner space of the annulus, similar to those used in SEGA, and
- Triangle Universities Nuclear Laboratory-Institute for Theoretical and Experimental Physics (TUNL-ITEP) apparatus – an unspecified combination of germanium and sodium iodide detectors.

Finally, the additional counting stations (detectors) will require approximately three times as much physical space and about 67 percent more liquid nitrogen daily than is currently required.

In response to the December 2002 proposal, we requested additional information regarding several aspects of the revised Majorana experiment to confirm whether they represented significant departures from the existing approval. Specifically, we were interested in establishing which activities were associated with various phases of Majorana; and in clarifying the type, number and purpose of each detector.

Your May 20, 2003, letter clarifies a number of the Agency's original concerns and specifically answers our questions. We now understand that:

> Majorana Phase One is SEGA. SEGA will consist of three counting stations: the SEGA detector, (TUNL-ITEP) detectors, and the Los Alamos National Laboratory (LANL) detectors that are similar to those planned for the original Phase One. These detectors will be used to test which is appropriate for experimental use in the WIPP environment.
>
> Majorana Phase Two is MEGA. MEGA will be used to test a scaled up detector array. This configuration will be used to develop optimum cooling and array operation.

Based on the new information provided, the Agency agrees that the proposed changes represent an appropriate evolution of the Majorana experimental program. Therefore, EPA approves these minor changes to our original approval of Phase One (SEGA) and Phase Two (MEGA) of the Majorana Experiments. The additional detail in your May 2003 letter was critical to our decision, and we appreciate the completeness and clarity of the information. We encourage you to provide a similar level of detail in future submissions to expedite our review.

Once again, our consideration or approval of emplacement of any experiments is based solely on technical grounds in accordance with 40 CFR 194. Please be advised that any consideration or approval does not in any way constitute a determination that DOE has actual statutory authority under the WIPP Land Withdrawal Act to conduct such activities, nor is this letter intended to indicate in any manner the Agency's opinion on this question.

If you have any questions about this guidance, please contact Betsy Forinash at (202) 564-9310.

Sincerely,

Frank Marcinowski, Director
Radiation Protection Division

cc: Lynne Smith, DOE/HQ
Cindy Zvonar, DOE/CBFO
Russ Patterson, DOE/CBFO
Matthew Silva, EEG
Steve Zappe, NMED