



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

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Lt. Gen. Warren D. Johnson, USAF
Defense Nuclear Agency
Washington, D. C. 20305.

Dear Sir:

We appreciate the opportunity to review the draft Environmental Impact Statement for the proposed Cleanup, Rehabilitation, and Resettlement of the Enewetak Atoll - Marshall Islands. On the basis of our review, we offer the following comments:

5.3.3.1 Control of Food Sources

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The results of a radiological survey show high levels of contamination on the northern islands and low levels of contamination on the southern islands. This high level of contamination is of significance both from the standpoint of external exposure and from the uptake of the radionuclides by plants as well as by indigenous fauna which if eaten would result in internal dose and deposition of radionuclides. Radiological surveys on Enewetak have found evidence of uptake of cesium-137 and strontium-90, among other radionuclides, in indigenous plants used for food including coconuts, pandanus, breadfruit, and tacca (arrowroot). The surveys also report radionuclides in flesh and organs of indigenous fauna such as terns, rats, and land crabs. Presumably domestic animals such as poultry and swine would, if they foraged on indigenous radioactive plants, also show uptake of these radionuclides. If the driEnjebi faction of the Atoll population are to live on the northern islands and particularly the island of Enjebi, care would need to be taken that the pandanus and breadfruit are grown in non-radioactive soil, either on the southern islands or imported from elsewhere. The alternative would be to provide farm plots for pandanus and breadfruit by removing existing soil and replacing it with non-radioactive soil in sufficient volume to contain the roots of these plants. The removal and replacement of soil to create these farm plots is of questionable and unproven value, since sustained land removal and replacement operation could result in serious ecological damage of unknown proportion. Also, there is no guarantee that sufficient soil could be removed and replaced to assure radiological safety of residents who would be eating plants grown on these plots.

5.6.1 Dose Estimates

It is unclear as to whether the dosage estimates include contribution of potential ground water supplies such as brackish or fresh water wells. While it is clear that the use of grossly contaminated supplies would be precluded, estimates of potential added dosage from these sources in the southern quadrant should be made.

As noted in the statement, the implications of concentrations of cesium and strontium in bone marrow by ingestion routes is an item of considerable concern. However, it is unclear from the draft statement if the mortality rate shown in Table 5.14 (page 5-60) includes the effect of doses to the bone marrow.

6.1 Selection of Cleanup Case 3

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As stated, the selection of Case 3 is preferred as the most favorable mode of resettlement. Inherent in this choice is the restriction of the inhabitants to residence in the lower half of the Atoll, with limited use of the islands in the northern quadrant. This implies as a minimum self-discipline on the part of the inhabitants with respect to public health and safety, i.e., exposure to the on-site hazards in the northern islands. The proposed plan should delineate control or quarantine measures to be implemented and enforced over a specified period of years.

7.2.4 Community Center Development

We found very little information contained in the statement addressing the long-term, on-going, health services following the initial phases of the resettlement. Continuing health services should be included in the preliminary planning in order to receive maximum benefit from the facilities and to establish, insofar as possible, some patterns of health service delivery early in the process. There is no indication as to whether the TTPI will have a medical office on the Atoll. If so, would he have the responsibility for health education, particularly radiology? We note that the TTPI currently has a significant health manpower shortage: MD's, nurses, medics, etc.

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- Remote communities in other districts of the Trust Territory are generally served by a sub-professional health aide with training similar to that of a U.S. Navy Hospital Corpsman serving a small ship or outpost. Ideally, this aide should have at his disposal a supply of drugs with a very simple numbering system. Reliable radio contact with the District Hospital is essential so that the aide can communicate with physicians in case of an emergency. Periodic visits by a physician and other health professionals are important in order to update the aide's training and to replenish his supplies.

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Prior to relocation, all persons should receive physical examinations, necessary immunizations, and have their individual health records prepared or updated.

Should radiation sickness cases develop, is the Majoro Hospital (or Kwaplain Base) prepared to treat them?

In addition, the statement indicates that two small dispensaries (2 room-2 bed) with health aid quarters will be located on Enjebi and Enewetak. However, it is also stated on page 7-10 that "Since development of the Master Plan, it has been shown that it is impractical to...develop Enjebi until such time as it can be shown to be safe." Will the dispensary serving Enewetak be enlarged to adequately care for the people, and/or will an additional dispensary be located in the southern quadrant? In general, much more attention needs to be given to addressing the provision of health services, particularly long-term requirements of the population of the Atoll.

7.2.5 Utilities

With regard to water supply, the statement indicates rain catchment-cistern utilization as the primary potable water source. The statement also projects potential curtailed water availability at the end of the "dry season". The inventory of Atoll resources includes a 43,000 gal/day distillation plant which may be put to limited use. Could this resource be made available for use to augment the Atoll's potable water supply? Further, the use of brackish wells as a limited water source is suggested in the statement.

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The feasibility of using ion-exchange, reverse osmosis or other presently available techniques should be investigated for water supply augmentation.

The housing and community development plans project the use of privie-septic tank-drain field installation for disposal of domestic wastes. While placement of such installations will be carefully considered, the possibility exists that effluents may enter the usable water table, posing potential for contamination of the existing water lens. Therefore, we suggest that a definitive sanitation program be implemented for continued monitoring of the usable water supplies and maintenance of disposal installations. A recently developed small scale aerobic digestion unit may be a possible alternative to the septic-drain field concept. We recommend that the feasibility of utilizing this concept be studied.

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With regard to 7.2.4 and 7.2.5 mentioned above, the Health, Sanitation, Education, and Social Service section of the 1973 HEW/Interior Task Force Report on the Trust Territory of the Pacific Islands should prove a useful reference item.

8.6 Impact of Base Camp Sewage Disposal on Human Health

Sewage outfall lines would best be located to flow into ocean waters rather than the lagoon, because of the possibility of disease transmission through consumption of raw or partially cooked shellfish or other marine organisms contained by partially treated raw sewage. The assumption that raw sewage will be flushed out of the lagoon by ocean currents is apparently based on speculation and observations of the dispelling of solid wastes from the lagoon by this method. Isolations of pathogenic organisms from similar lagoons in the Trust Territory suggest that these waters may become contaminated even under low volume dumping.

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8.11 Impact of Pesticides in Base Camp on Human Health

It is stated that chlorinated hydrocarbons will not be used for pesticide control, but organic phosphates would be used only in the required quantities. The concerns seem to be focused on the environmental residuals. However, some concern should also be focused on the toxic effects to the workers applying the pesticides and to people in the general area. EPA, NIOSH, and USDA are establishing some feasible standards and/or work practices for persons using pesticides.

8.16 Impact of Blasting During Cleanup - Human Health

The draft statement indicates that all kinds of shellfish may be consumed by the people populating the islands. It appears the best shellfish growing site in the lagoon is the blast area. Because shellfish tend to concentrate pollutants, including radionuclides, we believe extensive sampling and testing (for fission and activation products) should be undertaken before any shellfish growing areas are harvested.

8.22 Impact of Toxic Materials Encountered During Cleanup

We note that beryllium contaminated materials will be disposed of along with the radioactive material. However, no mention is made concerning the safeguards needed for the workers conducting the cleanup. Occupational health experience dictates that some degree of expertise is needed in controlling the exposure of workers to beryllium. NIOSH has put out a criteria document which deals in part with control of worker exposure to beryllium and the USAF has had extensive experience with decontamination of buildings where beryllium was being machined.

8.26 Impact of Noise During Rehabilitation and Resettlement

We found no mention in the draft statement concerning the impact of noise levels affecting workers and people on the Atoll during the rehabilitation and resettlement activities.

Summary

Based on information contained in the draft statement, Ujeland has a total land area of 429 acres and Enewetak 1760 acres. Enjebi has a land area of 290 acres. The islands of Enewetak, Medron, and Japtan have areas of 322, 220, and 79 acres respectively for a total 611 acres. This latter area would appear to be ample and certainly an improvement over the current conditions on Ujeland for the resident areas for all of the Enewetakese. The southern islands which have very low residual radioactivity have a total area of 804.68 acres. This makes an additional 193 acres available over and above the resident islands acreage which could be devoted to unrestricted agriculture use. In

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addition, there are 524.31 acres in the northern islands which have intermediate levels of residual radioactivity that are judged to be suitable for raising coconuts.

Based on all of these considerations, it appears that from a cost-benefit standpoint the use of Case 3 would be the optimum solution to the question of resettling the Enwetakese. On the other hand, if the driEnjebi would be extremely dissatisfied under these conditions, political and social indications may be such that they should be allowed to resettle on Enjebi, thus necessitating the use of Case 4. In this instance, the annual dose to individuals would exceed the AEC limits, but would be below those set by the FRC (whole body 0.35 rem/year vs. 0.5; bone 0.975 rem/year vs. 1.5; and bone marrow 0.3 rem/year vs. 0.5). It would leave a residual of approximately 140,000 cubic yards of contaminated soil and/or soil and radioactive debris to be disposed of other than that which could be achieved through crater dumping or crater containment. It would very likely require indefinite storage of soil on the island of Runit until suitable methods of disposal could be developed and agreed upon.

If the technique of crater containment is finally judged to be feasible, it should provide a reasonable degree of protection from the stored radioactive materials. One then might consider utilizing an additional crater to contain the residue of radioactive scrap and soil as mentioned above. This would require a cube approximately 73 feet on a side and 73 feet deep. With the apparent relative insolubility of the residual plutonium and fission products in this material, relatively small leaks into and out of a structure of this sort as well as that from sealed craters would appear to present a minimal hazard.

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Thank you for the opportunity to review this draft statement.

Sincerely,



Charles Custard
Director
Office of Environmental Affairs

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