

ISSUES IN ENVIRONMENTAL CONTROL DATA
USED IN DD&ER WORKER DOSE EXPOSURES

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Sites designated for decontamination and decommissioning (D&D) or remediation are frequently from the U.S. Department of Energy operations that began during and shortly after World War II. In addition, sites have been identified that were contaminated from nuclear energy industrial activities, which have been operating in this country for several decades. The source term at each site differs and may include broad categories of several forms of contamination with radionuclides, chemicals, or combinations of radioactive and chemical materials. The reasons for the cleanup process may include the need for reutilization of the land and facilities or may come from a concern for the impact on populations surrounding these sites. Scientifically based health protection from the source terms being cleaned up is not only important for those in the surrounding communities, but also is a key concern for the workers involved in the D&D and environmental restoration (ER) cleanup process. Some of these issues will be addressed by other presentations. This paper discusses selected problems in the use of environmental data for D&D and ER worker dose exposure calculations.

The need to identify sources of potential worker dose exposure prior to beginning D&D activities at contaminated sites is not always recognized as a critical planning element by the project engineer assigned to plan, design, manage, and conduct the cleanup operations. When contractors are selected to perform the D&D or ER efforts, some previous environmental characterization already has been accomplished and documented. These data

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may or may not be available to the current project manager. It is critical that a thorough search be accomplished to locate such data for evaluation, including the objectives of the data collection, before site activities occur.

Measurement program design for the initiation of a D&D project depends on the objectives of the project for which the measurements will be accomplished. Objectives of measurement activities depend on how precise, accurate, or verified measurements have to be to offer the required support for a planned operation. For this reason, in some field situations, measurement variability is tolerated within certain limits of environmental control, depending on the requirement for predictability and the analytical processes available to assist in determinations. This potential for variability implies that data generated for an unrelated objective may not be suitable as the basis of calculations of worker dose exposure at a previous time. Other variabilities in requirements for verification also are involved.

Previous environmental data available should be subjected to a formal documented process of expert review and verification. Specifically, such a process is essential where several D&D and ER projects are scheduled to be conducted in similar environmental regions. Such a documented review will provide support for more cost-effective contractual characterization work to be performed. Methods for the review of data in the interest of expediting the schedule of the D&D project will be discussed, thus reducing the exposure of personnel and its associated cost.

Information also will be provided on the use of environmental processes to render contaminants more soluble. Such processes increase the likelihood of uptake and effect in workers. The desert mound studies performed by the Nevada Applied Ecology Group at the Nevada Test Site provided an excellent example of changes in the anticipated solubility of plutonium and americium in desert environments.

Specific indications of data quality impact and specific recommendations will be discussed for assistance in validation and verification of data to be used for worker exposure calculations in D&D activities. Standardization of environmental measurements builds data quality and allows comparability of dose exposures at varying times and in various operations. Standardization can be accomplished by the use of procedures which

- Produce reliable and duplicative data,
- Are understandable and able to be implemented,
- Can be verified to be representative of the sampling area or structure,
and
- Permit cross-referencing of other data for possible integration into a larger picture for comprehensive evaluation.

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