

EP 200-1-8  
15 Feb 96

Methodology and User's Manual. EPA 520/1-87-026, Office of Radiation Programs, USEPA, Washington, D.C.

### **COMPUTER MODEL/EPA**

USEPA, 1993 PRESTO-EPA: A Low-Level Radioactive Waste Environmental Transport and Risk Assessment Code - Methodology and User's Manual. USEPA, Washington, D.C.

### **COMPUTER MODEL/NRC**

Mills, M. and D. Vogt, 1983. A Summary of Computer Codes for Radiological Assessment. NUREG/CR-3209, US Nuclear Regulatory Commission, Washington, D.C.

### **CONSIDERATION or JUSTIFICATION/Commercial**

Burris, J.A.; Buckley, S.E. Date: 1993. Title: Ecological Risk Management in Superfund. Corporate Author: ABB Environmental Services, Inc., Washington, DC. Pub: CONF-930570; Proceedings of the Second Annual Federal Environmental Restoration Conference and Exhibition, Washington, DC, May 25-27, 1993. Hazardous Materials Control Resources Institute, Greenbelt, MD, 477 pp.; (pp. 190-193) Abstract: Ecological Risk Assessments at Superfund sites are undertaken to support the remediation decisions. Benefits to human health and the environment, as well as remediation costs, are considered in the decision making process. The cost of remediation is understandably linked to the amount of acceptable residual risk, and the confidence that the assessor has in the assessment results. This paper provides an introduction to the ecological risk assessment process in Superfund and ecological risk management. Two examples of the risk management process are provided. Each illustrates the importance of considering ecological risk management during the assessment process and before actual decision making takes place.

### **CONSIDERATION or JUSTIFICATION/Commercial**

Chidambariah, V.; Travis, C.C.; Trabalka, J.R.; Thomas, J.K. 1992. A Risk-based Approach to Prioritize Underground Storage Tanks. pp. 136-139. Proceedings of Federal environmental restoration conference and exhibition. Conference title - 1992 Hazardous Materials Control Research Institute (HMCRI) federal environmental restoration conference and exhibition, Vienna, VA, 15-17 Apr. 1992.

Abstract: The purpose of this paper is to present a risk-based approach for rapid prioritization of low level liquid radioactive waste underground storage tanks (LLLW USTs) for possible interim corrective measures and/or ultimate closure. The ranking of LLLW USTs is needed to ensure that tanks with the greatest potential for adverse impact on the environment and human health receive top priority for further evaluation and remediation. Wastes from the LLLW USTs at the Oak Ridge National Laboratory (ORNL) were pumped out at the time the tanks were removed from service. The residual liquids and sludge contain a mixture of radionuclides and chemicals. Contaminants of concern that were identified in the liquid phase of the inactive LLLW USTs include, the radionuclides, strontium-90, cesium-137 and uranium-233 and the chemicals, carbon tetrachloride, trichloroethene, tetrachloroethene, methyl ethyl ketone, mercury, lead and chromium. The risk-based approach for prioritization of the LLLW USTs is based upon three major criteria: (1) leaking characteristics of the tank; (2) location of the tanks; and (3) toxic potential of the tank contents.

#### **CONSIDERATION or JUSTIFICATION/DOE**

Adler, D. Date: 1988, October. Title: Presentation on the Role of Risk Assessment in FUSRAP Remedial Planning. Corporate Author: Bechtel National, Inc., Oak Ridge, TN. Pub: CONF-8810239; Remedial Action Programs Annual Meeting, Proceedings of a U.S. Department of Energy Conference, Gaithersburg, MD, October 18-20, 1988, 456 pp.; (pp. 5-59 - 5-74) Abstract: Although the primary emphasis of the FUSRAP program is to mitigate hazards by removing and disposing of contamination exceeding relevant generic guidelines, current FUSRAP protocol allows for application of supplemental risk-based standards in unique cases where generic standards are inappropriate. This presentation provides background information on the rationale supporting current generic cleanup standards, and how site-specific, risk-based standards can be applied to improve the cost effectiveness of overall remedial strategies.

#### **CONSIDERATION or JUSTIFICATION/DOE**

Alexander, D.R. Date: 1991, December 30. Title: A Proposal for Establishing Environmental Restoration Clean Up Levels of Radioactive Contamination from a Risk Based Perspective. Corporate Author: Westinghouse Idaho Nuclear Company, Inc., Idaho Falls, ID. Pub: WINCO-11770; CONF-9111253; Proceedings of the Department of Energy Technical Information Exchange Meeting, Augusta, GA, November 17-20, 1991; (4 pp.) Abstract: Due to the large quantities

EP 200-1-8  
15 Feb 96

of low-level radioactively contaminated soil encountered at the Idaho National Engineering Laboratory and the lack of available disposable facilities, anticipated storage and disposal problems are imminent. The space available for disposal of the low-level radioactively contaminated soil in the present Radiological Waste Management Complex is very limited. The removal and disposal of low-level radioactively contamination in soil is prohibitive. The status of radioactivity as carcinogenic poses a societal and regulatory obstacle in the environmental restoration process. The use of the risk assessment, as applied to chemically based hazardous substances, must be applied to low level radiological contamination in establishing clean up standards.

### **CONSIDERATION or JUSTIFICATION/DOE**

Bilyard, G.R.; Bascietto, J.J.; Beckert, H. Date: 1992, October. Title: Regulatory and Institutional Considerations in the Application of Ecological Risk Assessment at Department of Energy Facilities. Corporate Author: Pacific Northwest Laboratory, Richland, WA; U.S. Department of Energy, Washington, DC. Pub: CONF-921029; Waste Management and Environmental Restoration, Proceedings of the Eighth Annual DOE Model Conference, Oak Ridge, TN, October 18-22, 1992, 228 pp.; (7 pp.) Abstract: Ecological risk assessment is a promising tool that the U.S. Department of Energy (DOE) can use to help meet its regulatory and institutional obligations during environmental restoration activities. It can also provide information for resource management decisions. The adoption of ecological risk assessment has several implications for DOE, including the need to define a process for using ecological risk assessment to support regulatory compliance and institutionally mandated activities. This paper first identifies regulatory requirements and institutional considerations that could be important to DOE. Considering the often diverse characteristics of DOE sites, a process for using ecological risk assessments at DOE sites is proposed in this paper.

### **CONSIDERATION or JUSTIFICATION/DOE**

Buck, J.W.; Strenge, D.L.; Droppo, J.G., Jr. 1990. Analysis of Risk Indicators and Issues Associated with Applications of Screening Model for Hazardous and Radioactive Waste Sites. Dec. 1990. Pacific Northwest Laboratories, Richland, WA. Contract number - DOEAC06-76rl01830 Report number - PNL-SA-18892 20-22 Feb 1991. National research and development conference on the control of hazardous materials, Anaheim, CA (USA) Abstract: Risk indicators, such as

population risk, maximum individual risk, time of arrival of contamination, and maximum water concentrations, were analyzed to determine their effect on results from a screening model for hazardous and radioactive waste sites. The analysis of risk indicators is based on calculations resulting from exposure to air and waterborne contamination predicted with Multimedia Environmental Pollutant Assessment System (MEPAS) model. The different risk indicators were analyzed, based on constituent type and transport and exposure pathways. Three of the specific comparisons that were made are: (1) population-based versus maximum individual-based risk indicators; (2) time of arrival of contamination, and (3) comparison of different threshold assumptions for noncarcinogenic impacts. Comparison of indicators for population and maximum individual-based human health risk suggests that these two parameters are highly correlated, but for a given problem, one may be more important than the other. The results indicate that the arrival distribution for different levels of contamination reaching a receptor can also be helpful in decisions, regarding the use of resources for remediating short- and long-term environmental problems. The addition of information from a linear model for noncarcinogenic impacts allows interpretation of results below the reference dose (RFD) levels that might help in decisions for certain applications. The analysis of risk indicators suggests that important information may be lost by the use of a single indicator to represent public health risk and that multiple indicators should be considered. 15 refs., 8 figs., 1 tab.

#### **CONSIDERATION or JUSTIFICATION/DOE**

Hammonds, J.S.; Hoffman, F.O.; White, R.K.; Miller, D.B. Date: 1992, October. Title: Background Risk Information to Assist in Risk Management Decision Making. Corporate Author: Oak Ridge National Laboratory, Oak Ridge, TN. Pub: ES/ER/TM-40; 15 pp. Abstract: The evaluation of the need for remedial activities at hazardous waste sites requires quantification of risks of adverse health effects to humans and the ecosystem resulting from the presence of chemical and radioactive substances at these sites. The health risks from exposure to these substances are in addition to risks encountered because of the virtually unavoidable exposure to naturally occurring chemicals and radioactive materials that are present in air, water, soil, building materials, and food products. To provide a frame of reference for interpreting risks quantified for hazardous waste sites, it is useful to identify the relative magnitude of risks of both a voluntary and involuntary nature that

EP 200-1-8  
15 Feb 96

are ubiquitous throughout east Tennessee. In addition to discussing risks from the ubiquitous presence of background carcinogens in the east Tennessee environment, this report also presents risks resulting from common, everyday activities. Such information should not be used to discount or trivialize risks from hazardous waste contamination, but rather to create a sensitivity to general risk issues, thus providing a context for better interpretation of risk information.

### **CONSIDERATION or JUSTIFICATION/EPA**

Bascietto, J.J. Date: 1992, October. Title: Development of Ecological Risk Assessment - An Historical Perspective. Corporate Author: U.S. Department of Energy, Office of Environmental Guidance, Washington, DC. Pub: CONF-921029; Waste Management and Environmental Restoration, Proceedings of the Eighth Annual DOE Model Conference, Oak Ridge, TN, Oct. 18-22, 1992, 228 pp.; (8 pp.) Abstract: This paper gives the history of the U.S. Environmental Protection Agency's (EPA's) effort to develop a regulatory framework for ecological risk, beginning in the 1980s. This effort arose from the EPA's difficulty in establishing the proper level of ecological risk for the cancellation of two pesticides (diazinon and carbamate carbofuran). Diazinon, which was canceled first in 1990 after a six-year special review by the EPA, was less widely used and less toxic than carbamate carbofuran, which was canceled in 1991 after another six-year special review. EPA's 1992 framework for ecologic risk was the first published consensus document on generic ecological risk assessment principles, and is expected to form the basis for all future EPA ecological risk assessments. The current EPA regulatory framework, which is based on these early ecological risk assessment efforts, is given in another paper in this same conference session.

### **CONSIDERATION or JUSTIFICATION/EPA**

Boyd, M.; Nelson, C.B.; Martin, J.A.; Ralston, L. Date: 1992, March. Title: A Review of the Superfund Risk Assessment Approach for Quantifying Radiation Risks. Corporate Author: U.S. Environmental Protection Agency, Washington, DC; Cohen (S.) and Associates, Inc., McLean, VA. Pub: CONF-920307 (Vol. 1); Waste Management '92: Working Towards a Cleaner Environment, R.G. Post (ed.), Proceedings of a Symposium, Tucson, AZ, March 1-5, 1992, Vol. 1, 994 pp.; (pp. 505-508) Abstract: When the Environmental Protection Agency (EPA) calculates the risk of developing cancer from radiation exposure at Superfund sites containing radioactive

material, it must consider the risks from ingestion and inhalation of radioactivity as well as from external radiation. This paper will focus on the derivation and application of slope factors for estimating the age-averaged lifetime excess cancer incidence (including fatal and nonfatal radiogenic cancers) per unit intake or exposure to the radionuclides of concern from these three exposure pathways. This paper has been reviewed in accordance with the U.S. Environmental Protection Agency's peer and administrative review policies and approved for presentation and publication.

### **CONSIDERATION or JUSTIFICATION/Other**

Morgan, M.G., and M. Henrion, 1990. Uncertainty. a Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis. Cambridge University Press, NY.

### **CONSIDERATION or JUSTIFICATION/Other**

Wartenberg, D., and R. Simon. 1995. Comment: Integrating epidemiologic data into risk assessment. American Journal of Public Health. 85(4):491-493. April, 1995.

### **ECOLOGICAL/Commercial**

ASCE. 1989. Proceedings of the 1989 Specialty Conference Austin, TX, USA CD- 1989 Jul 10-12. Publ by ASCE, New York, NY, USA. ASCE, Environmental Engineering Div, USA; Univ of Texas at Austin, Civil Engineering Dep, Austin, TX, USA; ASCE, Texas Sect, Austin, TX, USA; American Acad of Environmental Engineers, USA. Abstract- The volume contains 117 papers presented at the conference. The papers are grouped under general topics that include point-of-entry/point-of-use water treatment devices, activated sludge wastewater treatment, multi-media environmental risk assessment, effluent polishing, radon mitigation in new construction, hazardous waste site cleanup, treatment facility design and operation, sludge management, surface water quality assessment and modeling, mixed waste and low-level radioactive waste disposal.