

Meyer, K.R., P.G. Voillequé, D.W. Schmidt, S.K. Rope, G.G. Killough, B. Shleien, R.E. Moore, M.J. Case, and J.E. Till. 1996. "Overview of the Fernald Dosimetry Reconstruction Project and source term estimates for 1951-1988." *Health Physics*. 71(4):425-37.

ABSTRACT: The Feed Materials Production Center, northwest of Cincinnati, processed uranium concentrates and uranium compounds recycled from other stages of nuclear weapons production, as well as some uranium ore and thorium. Particulate releases were primarily uranium (natural, depleted, and slightly enriched). In addition, two large silos containing radium-bearing residues were emission sources of radon and its decay products. The Fernald Dosimetry Reconstruction Project was undertaken to help the Centers for Disease Control and Prevention to evaluate the impact of the Feed Materials Production Center on the public from radionuclides released to the environment from 1951 through 1988. At this point in the study, the project has estimated the quantities of radioactive materials released to air, surface water, and in groundwater; developed the methodology to describe the environmental transport of the materials; developed mathematical models to calculate the resulting radiation doses; and evaluated environmental monitoring data to verify that the estimates of releases and transport are reasonable. Thorough review of historical records and extensive interaction with former and current employees and residents have been the foundation for reconstructing routine operations, documenting accidents, and evaluating unmonitored emission sources. The largest releases of uranium to air and water occurred in the 1950's and 1960's. Radon releases from the silos remained elevated through most of the 1970's. The quantity of uranium released to surface water was much less than that released to air. Best estimates of releases are reported as median values, with associated uncertainties calculated as an integral part of the estimates. Screening calculations showed that atmospheric pathways dominate the total dose from Feed Materials Production Center releases. Accordingly, the local meteorology, effluent particle size and chemical form, and wet and dry deposition, were particularly important in this study. The final goal of the project is the calculation of radiation doses to people living in the study domain, which is represented by a circle with radius of 10 km centered on the Feed Materials Production Center production area.