Overview of

*BAYESIAN METHODS FOR ESTIMATION OF UNMONITORED Y-12 EXTERNAL PENETRATING DOSES WITH A TIME-DEPENDENT LOGNORMAL MODEL*

(ORAUT-OTIB-0015, Rev. 0)

Workers at many Department of Energy and Atomic Weapons Employer facilities have the potential to receive an external radiation dose due to exposure to radioactive material. The Technical Information Bulletin (TIB), *Bayesian Methods for Estimation of Unmonitored Y-12 External Penetrating Doses With a Time-dependent Lognormal Model* (ORAUT-OTIB-0015), provides guidance on the use of a method, based on the mathematical technique of Bayesian analysis, for assigning doses at the Y-12 Site to personnel who have limited or no monitoring data. This assignment of dose is based on data appropriately taken from records of other workers with similar work history on the same site.

**SUMMARY OF FINDINGS RESULTING FROM THE TECHNICAL REVIEW**

The technical contractor for the Advisory Board on Radiation and Worker Health (the Board) reviewed the TIB and produced the four findings summarized below:

*Finding #1:* Certain variables are not defined.

*Finding #2:* The method to determine potential radiation dose uses a factor called Limit of Detection (LOD) related to the sensitivity of radiation monitoring. The Limit of Detection assumed by this procedure is too low and therefore not claimant favorable.

*Finding #3:* The TIB makes use of 40 calendar quarters of coworker exposure data for 1956–1965, but another technical document indicates that only the data from 37 quarters are reliable.

*Finding #4:* The procedure does not contain any prescriptive information. Additionally, it contains a level of detail related to the theory underlying the methodology that is far more than reasonable, needed, or desired for dose reconstruction.

**RESOLUTION OF FINDINGS**

The National Institute for Occupational Safety and Health (NIOSH) decided to no longer use Bayesian methods for dose reconstructions and cancelled the TIB. Therefore, all findings with respect to this OTIB are no longer relevant.