



Memorandum

To: Mr. Phillip Schofield, Chair, Gaseous Diffusion Plant ABRWH Work Group

From: Charles D. Nelson

Subject: Responses to SCA-TR-2019-SP002, Observation 1, and SCA-TR-2020-SP001

Date: January 20, 2021

The following responses are provided based on SC&A observations contained in their reviews of the following two National Institute for Occupational Safety and Health (NIOSH) documents:

NIOSH [2019]. Neutron dose assignment for K-25 and Portsmouth Gaseous Diffusion Plants. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. White Paper, May 6. [SRDB Ref. ID 176609]

NIOSH [2020]. Responses to SC&A's review of NIOSH's white paper, "Neutron dose assignment for K-25 and Portsmouth Gaseous Diffusion Plants." Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. SCA-TR-2019-SP002 Rev. 0, Response Paper, February 6. [SRDB Ref. ID 179279]

Response to SCA-TR-2019-SP002, Revision 0, Observation 1

In this document, Observation 1, Apparent Inconsistency in use of Limit of Detection (Portsmouth vs. K-25), states:

The use of the neutron dosimetry data and photon data dosimetry data that were equal to the LOD values needs to be clarified; i.e., were equal to values used in NIOSH's analysis, or only values that were greater than the LOD?

The NIOSH response is:

For both the Portsmouth and K-25 analyses, data greater than or equal to the limit of detection (LOD) were used; i.e., the approaches were consistent. Any corrections or clarifications needed will be made in the Site Profile Technical Basis Documents when revised.

Response to SCA-TR-2020-SP001, Revision 0, Observation 4

In this document, Observation 4, Use of neutron plus photon dose to calculate N:P, states:

It appears that in deriving the N:P ratio of 0.369 on page 6, and in table 6, column 3, of the white paper, NIOSH (2019) used $N:P = n/(n + p)$ instead of $N:P = n/p$. This would create a lower than normal value for N:P from the Portsmouth data. If the QRA method is used for dose reconstruction as presented on pages 10–24 of the response paper (NIOSH, 2020), then the incorrect N:P value of 0.369 would not be used in dose reconstructions. However, either the correct N:P values should be derived and stated in the white paper, or NIOSH should clarify why the current value is correct.

The NIOSH response is:

NIOSH concurs with the SC&A's observation. Any corrections or clarifications needed will be made when the Site Profile Technical Basis Documents are revised. NIOSH intends on using the Quantile Regression Analysis (QRA) method for determining neutron doses and this will be reflected in the Site Profile Technical Basis Documents for both Portsmouth and K-25 when revised.

Overarching issues as discussed in SCA-TR-2020-SPOO1 Revision 0

SC&A suggests that the issue of using the QRA method for deriving neutron dose for dose reconstruction, as well as, using recorded values less than the detection limit in conjunction with the QRA method to be deferred and considered overarching issues. As discussed in the February 6, 2020 "Response to SC&A's Review of the NIOSH's White Paper (Document No. SCA-TR-2019-SP002)," the QRA is an established methodology available for use in the project (see ORAUT-RPRT-0087). The QRA method is currently being used in other Site Profile Technical Basis Documents for radiation dose reconstruction. If the AB WG moves the use of the QRA to overarching issue as recommended by SCA, it will likely fall under the Procedures Subcommittee WG since it affects additional sites.