
Draft White Paper

**SC&A REVIEW OF LAWRENCE BERKELEY NATIONAL
LABORATORY SITE PROFILE MATRIX ISSUE #9**

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S. COHEN & ASSOCIATES: <i>Technical Support for the Advisory Board on Radiation & Worker Health Review of NIOSH Dose Reconstruction Program</i>	Document No.: White Paper – SC&A Review of LBNL Issue #9
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Task Manager: _____ Date: _____ Joseph Fitzgerald	Supersedes: N/A
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Record of Revisions

Revision Number	Effective Date	Description of Revision
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ABBREVIATIONS AND ACRONYMS

ESE	entrance skin exposure
LBL	Lawrence Berkeley Laboratory
LBNL	Lawrence Berkeley National Laboratory
NIOSH	National Institute for Occupational Safety and Health
ORAUT	Oak Ridge Associated Universities Team
PA	posterior/anterior
PFG	photofluorography
SC&A	S. Cohen and Associates (SC&A, Inc.)
TBD	technical basis document

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SC&A FINDING: X-RAY EXPOSURES ARE UNCERTAIN

Table 3-1 of ORAUT-TKBS-0049, Rev. 01 (ORAUT 2007) lists the entrance skin exposure (ESE) doses used for the posterior/anterior (PA) chest exam. It states that until 1975, all dose estimates are defaulted to those provided in ORAUT-OTIB-0006 (ORAUT 2005). There is no information identified as being available on x-ray equipment that was used prior to 1975. Depending on how one views this information, there is no indication that this default is claimant favorable for the years 1942 through 1975. NIOSH needs to better describe what measures were taken to determine what types of equipment were used. For example:

- Where did workers get exams between the years 1942–1975?
- Were medical records available and do they indicate if x-rays were taken?
- Were workers sent to alternate locations for exams and were those records researched?
- Did NIOSH research address the potential use of photofluorography (PFG) to screen workers up through 1960? (SC&A 2010)

The technical basis document (TBD) should be expanded in its discussion of the medical dose to address the issues indicated in the above questions in order to be considered complete.

REVIEW

SC&A re-evaluated this issue based on the issuance of a revised Section 3 of Rev. 02 of the TBD (ORAUT 2010), which significantly expanded what was presented in Rev. 01. This expanded information included more history regarding the pre-1975 period (e.g., before 1964, workers obtained their physicals, including x-ray examinations, from their private physicians). While LBL medical records are clearly not available for these x-ray examinations, the “new” Table 3-1 provides information regarding time frames, frequencies, scope of workforce, and type of chest projections (albeit, the author of this summary is listed as “unknown”). In addition to receiving their medical x-ray examinations offsite prior to 1964, workers subject to “inhalation exposure” received x-ray examinations at their physician’s discretion after 1991. NIOSH indicates that there is no evidence of PFG at the laboratory found in any documentation for LBNL.

Tables 3-2, 3-3, and 3-4 (ORAUT 2010) providing detailed organ doses, skin dose guidance for various chest projections, and skin dose from various chest projections across all pertinent operating periods are a considerable expansion of dose reconstruction guidance from Rev. 01 (ORAUT 2005) of the TBD, which only provided maximum organ doses for 14 in by 17 in PA chest radiography.

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CONCLUSION

Based on the responsiveness of Rev. 02, Section 3 of the TBD (ORAUT 2010) to SC&A's specific questions, and its comprehensiveness and expanded guidance for the dose reconstructor, SC&A recommends closure of this site profile issue by the Work Group.

REFERENCES

ORAUT 2005. *Dose Reconstruction from Occupationally Related Diagnostic X-Ray Procedures*, ORAUT-OTIB-0006, Rev. 03 PC-1. Oak Ridge Associated Universities Team, Cincinnati, Ohio. December 21, 2005.

ORAUT 2007. *Site Profile for the Lawrence Berkeley National Laboratory*, ORAUT-TKBS-0049, Rev. 01, Oak Ridge Associated Universities Team, Cincinnati, Ohio. April 2, 2007.

ORAUT 2010. *Site Profile for the Lawrence Berkeley National Laboratory*, ORAUT-TKBS-0049, Rev. 02, Oak Ridge Associated Universities Team, Cincinnati, Ohio. May 10, 2010.

SC&A 2010. *Review of the NIOSH Site Profile for the Lawrence Berkeley National Laboratory*, SCA-TR-SP2010-0002, Rev. 0. SC&A, Inc., Vienna, Virginia, and Saliant, Inc., Jefferson, Maryland. January 22, 2010.