

National Institute for Occupational Safety and Health (NIOSH) Comments on the Interagency Science Discussion Draft IRIS assessment of Libby Amphibole Asbestos (dated August 2014)

Date: November 3, 2014

Informal comments from the National Institute for Occupational Safety and Health (NIOSH) November 3, 2014

The following October 29, 2014 comments are from one NIOSH physician. They are being submitted as written by him and are intended to supplement the previous comments that NIOSH sent during the Step 6B Interagency Review. These (non-major) comments pertain to the three redline courtesy copies sent by the EPA after the step 6B comment period and are intended to provide additional assistance to the EPA with the IRIS review of Libby Amphibole Asbestos.

IRIS SUMMARY

Page 6:

1 nonmalignant respiratory disease) in the analyses using internal referent groups in McDonald et
2 al. (2004), Sullivan (2007), and Larson et al. (2010b). Radiographic evidence of small opacities
3 (evidence of parenchymal damage) and pleural thickening (DPT, LPT, and pleural plaques; note
4 that LPT was introduced by ILO in 2000 comprising only those plaques with width of at least 3
5 mm when viewed in profile to reduce the number of false positive findings) has also been
6 shown in studies of Libby workers (Larson et al., 2012a; Larson et al., 2010a; Whitehouse, 2004;
7 Amandus et al., 1987a; McDonald et al., 1986b), and in the studies of workers in the Marysville,
8 OH plant (Rohs et al., 2008; Lockey et al., 1984).

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25 subset of LPT was introduced in 2000 comprising only those plaques with width of at least 3
26 mm when viewed in profile to reduce the number of false positive findings) relative to exposed
27 people with no pleural plaques.

Page 12:

6 (where x-rays were used to diagnose pleural plaques or LPT)

9 The risk of pleural plaques, and thus LPT, continues to increase throughout life (even with

TOXICOLOGICAL REVIEW OF LIBBY AMPHIBOLE ASBESTOS

Page 4-25:

10 films collected in a research or clinical setting. Findings that were considered to be definitely or
11 probably not pneumoconiosis were to be noted by the readers to allow resolution of
12 discrepancies (ILO, 1980).

Page 4-26:

18 2002) include a requirement that LPT must have a minimum width of 3 mm when viewed in
19 profile on the chest wall to be recorded as present.

21 variously used terms such as “discrete pleural thickening,” “circumscribed pleural thickening,”

Commented [CU1]: “thickening” should be replaced by “abnormalities” (In the 1980 ILO guidelines, in particular, calcification—a type of pleural abnormality) is classified separately from pleural thickening.)

Commented [CU2]: Suggest deleting entire parenthetical content here in the Summary. Without more explanation, it is confusing. LPT is used as an alternative term for pleural plaques in ILO 2000 guidelines, so it is confusing to list it in a series along with pleural plaques. It is not true that LPT comprises only those plaques with a thickness of more than 3 mm when viewed in profile. Conceptually, LPT includes all plaques, including en face plaques. What the ILO 2000 guidelines did make explicit is that, when thickness of a plaque can be assessed in profile, only those plaques with a thickness of at least 3 mm are to be recorded.

Commented [CU3]: This statement is not correct. While ILO 2000 did explicitly instruct that “A minimum width of about 3 mm is required for an in profile plaque to be recorded as present,” those were not the only plaques that were to be recorded. As stated in the ILO 2000 guidelines, “Pleural plaques may also be seen on the diaphragm, on the chest wall (...face-on), and at other sites. At times they are recognized only by their calcification. Pleural plaques are recorded as present or absent.” The minimum width requirement for recording plaques under ILO 2000 applies only to in-profile plaques on the chest wall. Any other plaques identified are to be recorded, regardless of thickness (which can’t be assessed for en-face plaques).

Commented [CU4]: More properly, this should simply be “identify pleural plaques” because “diagnose” has clinical implications that may not be appropriate to an epidemiological study. And it’s confusing to refer to “pleural plaques and LPT” when LPT itself refers to pleural plaques (see ILO 2000 guidelines).

Commented [CU5]: This is a bit confusing. Suggest it be made more clear that LPT are pleural plaques, perhaps as follows: “pleural plaques (also called LPT)” or, as worded on page 38 in Appendix I, “pleural plaques (and correspondingly LPT).”

Commented [CU6]: The insertion of this sentence serves to muddle things. Why is it that the instructions for the 1980 guidelines are mentioned here, but not the very different instructions for the 2000 guidelines? In the interest of clarity, it might just be best to delete this newly inserted sentence. If it is retained, then it would be best to also mention the very different general instructions provided with the ILO 2000 guidelines. But that will end up getting into study protocols, and then EPA will realize that most published papers do not mention their general instructions to those classifying chest radiographs.

Commented [CU7]: More properly, “that plaques viewed in profile must have a minimum thickness of 3 mm to be recorded as present.” (Other plaques are recorded without regard to their thickness.)

22 or “pleural plaques” to describe what is currently called LPT.

22 or “pleural plaques” to describe what is currently called LPT. DPT is now defined as pleural thickening on the chest wall that is present “only in the presence of and in continuity with an

Page 4-35:

2 radiographs using the 2000 ILO classification system (ILO, 2002). Rohs et al. (2008)
3 determined that diffuse pleural thickening was present when at least two of the three readers
4 recorded pleural thickening with blunting of the costophrenic angle, otherwise localized pleural
5 thickening was present when at least two of the three readers recorded thickening, with or
6 without calcification, excluding solitary costophrenic angle blunting, and that interstitial
7 abnormalities indicative of asbestosis were present if at least two of the three readers identified
8 small irregular opacities of profusion 1/0 or greater.

Page 4-48:

2 pleural thickening (pleural plaques, LPT, and DPT) has also been shown in studies of Libby

12 number of exposure pathways (Peipins et al., 2003). The presence of pleural plaques is
13 associated with a small decrement in lung function (approximately 5%) when evaluated based on
14 mean values (Weill et al., 2011), and presence of LPT is associated with an increased risk of
15 restrictive lung function (Larson et al., 2012b).

Page 5-18:

In the Marysville workers evaluated in 2002–2005, differences in exposure patterns are
also apparent among outcome groups (see Table 5–4).

Page 5-14:

Figure 5-2. Radiographic outcomes among Marysville, OH workers.

Page 5-19:

Table 5-4. Characteristics of workers at the O.M. Scott plant in Marysville, OH, with health evaluations in 2002–2005

Page 5-21:

(LPT was introduced in 2000 comprising only those plaques with width
of at least 3 mm when viewed in profile)

Page 5-27:

(LPT was introduced as a diagnostic term in the ILO guidance in 2000 comprising only those plaques
with width of at least 3 mm when viewed in profile) has been shown to increase
as TSFE increases, even in the absence of continued asbestos exposure.

Page 5-46:

the study by Rohs et al. (2008) showed that in 2002–2005, the prevalence of LPT increased to 26.2% (in
workers without other asbestos exposure; see Table 5-3 and Figure 5-2).

APPENDICES:

Page A-3

LPT was introduced in 2000 comprising only those plaques with width of at least 3 mm
when viewed in profile to reduce the number of false positive findings).

Commented [CU8]: More properly, “what is currently called “LPT” or “pleural plaques.” (see ILO 2000 guidelines where LPT is used synonymously as a term for pleural plaques.

Commented [CU9]: More properly, this should be “DPT is now defined as diffuse pleural thickening....”

Commented [CU10]: This “otherwise” should be deleted. It implies something that is not found in the methods description in Rohs’ paper (which is clearly lacking in detail).

Commented [CU11]: LPT is an alternative term for pleural plaques. Thus, it is confusing to include both in this series. Suggested revisions: “...(pleural plaques and DPT) ...”

Commented [CU12]: More simply: “The presence of pleural plaques is associated with a small decrement in lung function (approximately 5%) when evaluated based on mean values (Weill et al., 2011), and with an increased risk of restrictive lung function (Larson et al., 2012b) ”

Commented [CU13]: Should this be 2004-2005? Rohs et al. (2008) indicates that “Current data were collected between 2004 and 2005.”

Commented [CU14]: The source of the data presented in this figure should be inserted in a footnote to this Figure. The numbers with various radiographic abnormality in this figure (and the accompanying text) do not correspond to the numbers given in the Rohs et al. (2008) paper, so perhaps there is another source for the data summarized in this figure.

Commented [CU15]: The source of the data presented in this table should be inserted in a footnote to this table. The numbers with various radiographic abnormality in this table (and the accompanying text) do not correspond to the numbers given in the Rohs et al. (2008) paper, so perhaps there is another source for the data summarized in this table.

Commented [CU16]: This is not true. LPT includes en face plaques and plaques located in sites other than the chest wall. It would be best just to delete this entire parenthetical content, as it is not needed here.

Commented [CU17]: This is not true. LPT includes en face plaques and plaques located in sites other than the chest wall. It would be best just to delete this entire parenthetical content, as it is not needed here.

Commented [CU18]: Contrary to the implication of the citation of the paper by Rohs et al. in this statement, it does not appear that these results are from the published paper by Rohs et al. (2008). Rohs et al. (2008) indicates that “Current data were collected between 2004 and 2005.” And the 26.2% figure does not seem to appear in Rohs et al. (2008). (See previous comments on Table 5-3 and Figure 5-2 concerning how the numbers in those tables do not correspond to the numbers presented in Rohs et al. (2008).

Commented [CU19]: It is not true that LPT comprises only those plaques with a thickness of more than 3 mm when viewed in profile. Conceptually, LPT includes all plaques, including en face plaques. What the ILO 2000 guidelines did make explicit is that, for in-profile plaques (i.e., when thickness of a plaque can be assessed), those less than 3 mm in thickness are not to be recorded. A better way of stating this would be: “LPT was introduced in the 2000 ILO guidelines as an alternative term for pleural plaques. Those same guidelines instructed that a plaque viewed in profile was to be recorded only if it was at least 3 mm in width (i.e., thickness) to reduce the number of false positives.”

Page I-1:

LPT was not defined by the ILO until the 2000 guidelines were published (ILO, 2002). Previously, the 1980 ILO guidelines defined circumscribed pleural thickening (plaques) and diffuse pleural thickening (DPT), either with or without costophrenic angle obliteration. The 2000 ILO revision defines LPT as comprising only those plaques with width of at least 3 mm when viewed in profile (intended to reduce the number of false positive findings), and included plaques found on sites other than the chest wall (e.g., diaphragm). Neither classification for pleural thickening (LPT or DPT) in the 2000 ILO guidelines corresponds with the previous ILO classification systems for pleural thickening; LPT is defined differently than the previous category of pleural plaques, and DPT is defined more narrowly due to the requirement for costophrenic angle obliteration and also 3 mm minimum width when viewed in profile.

Different researchers have used different terminology for circumscribed pleural thickening or plaques when implementing the 1980 ILO guidelines, most often using the term “pleural plaques.” Although not specified in the 1980 ILO guidelines, some studies did include in reported plaques sites other than the chest wall. Other studies did not explicitly describe the consideration of plaques in other sites and/or costophrenic angle obliteration other than citing a reference (e.g., ILO, 1980).

Page I-34:

The 2000 ILO guidelines define the outcome of LPT as plaques with width of at least 3 mm, a more detailed (i.e., less false-positives) definition compared to the 1980 ILO guidelines. Although no studies reported results for plaques with width of at least 3 mm (i.e., LPT), one large study Clin et al. (2011) (reported results for plaques less than 2 mm and found that those with such plaques had at least 100%pred FVC and FEV1. Thus, results of this analysis for pleural plaques can be seen to apply to LPT.

Page I-35:

Thus, EPA could not examine fiber characteristics in this analysis. However, EPA is not aware of any studies of pleural plaques and lung function that indicated potential differences in association by fiber.

Commented [CU20]: Not exactly true. (LPT is just another term for “pleural plaques.”) This statement would be better worded as: “LPT is an alternative term for pleural plaques that was introduced by the ILO in the 2000 guidelines.”

Commented [CU21]: This is muddled. This statement would be better worded as: “The 2000 ILO revision defines LPT as comprising in-profile plaques with width of at least 3 mm (intended to reduce the number of false positive findings), along with all other plaques identified.” (The original wording failed to encompass en-face chest wall plaques.)

Commented [CU22]: Would be good to insert “exactly” along the following lines: “corresponds exactly with” or “exactly corresponds with” because they do, in fact correspond, but the original wording might leave some readers thinking that they don’t correspond at all.

Commented [CU23]: This is also less precisely stated than it could be, leaving potential for confusion. Here’s an alternative wording: “and DPT is defined more narrowly due to the requirement for continuity with costophrenic angle obliteration and a 3 mm minimum width for DPT extending up the lateral chest wall.”

Commented [CU24]: The phrase “Although not specified in the 1980 guidelines,” is confused and confusing. Here’s a better wording of these last two sentences in the paragraph: “Some studies clearly included in reported plaques sites other than the chest wall, while other studies did not explicitly describe inclusion of plaques in other sites.” (I would delete the “and/or…” ending of the statment, as it is potentially confusing and does not add anything of import with regard to plaques/LPT.

Commented [CU25]: Suggested revision: “The 2000 ILO guidelines instruct that in-profile plaques are not to be recorded if they are less than 3 mm thick, a more specific criterion compared to the 1980 ILO guidelines, which allowed for recording of identified in-profile plaques thinner than 3 mm.

Commented [CU26]: The logic leading up to this conclusion is not clear.

Commented [CU27]: This statement should end with “by fiber type.” (not “by fiber.”)