

MinEx submission on the Work Exposure Standard (WES) and Biological Exposure Index (BEI) review for Arsenic, March 2020. Submitted 28 August 2020.

- **Do you agree with the proposed adoption for arsenic WES & BEI?**

WES

No. Based on epidemiological data which indicates harmful effects from arsenic begin at approx. 0.2mg/m³, we would support lowering the airborne inorganic Arsenic WES to 0.01mg/m³, and not 0.001 mg/m³ as proposed. The Safe Work Australia review found that: “The TWA is based on an epidemiological study of arsenic exposed workers in which the lowest exposure level associated with an excess risk of lung cancer is 0.2 mg/m³. A no effect level for cancer risk for these compounds has not been established (ACGIH, 2018). A factor of 20 was applied to account for uncertainties in mutagenicity data and no clear NOAEL for carcinogenic effects” (Safe Work Australia, 2019).

BEI

No. Pre-employment medicals conducted by OceanaGold in their New Zealand operations confirm naturally occurring levels above the proposed BEI of 10ug/L, which is consistent with background levels reported in the literature (Hata et.al., 2007; NRC, 1999); SWA, 2020). Given the published evidence, which is consistent with local testing, there is no evidence that elevated biological arsenic levels are occupationally derived.

General

We believe meeting the new proposed BEI would be problematic to achieve and arguably imposes an obligation that goes beyond what is “reasonably practicable” as defined in section 22 of the Health and Safety at Work Act 2015, i.e. reasonably able to be done when taking all practicable steps in relation to ensuring health and safety.

- **Comments on the proposed adoption for arsenic WES & BEI value?**

WES

There is no epidemiological or experimental evidence that indicates such a low WES is either necessary or reliable. The proposed WES of 0.001mg/m³ is significantly lower than any other jurisdiction in the world, including countries with considerably more data and analysis of the occupational exposure impacts.

While we agree that evidence supports a lowering of the WES, much of the evidence comes from copper smelters where the arsenic would be present as a fume and would be more bioavailable than the arsenic bound to dust that is present in mining. The studies quoted for drinking water also deal with a situation where the arsenic is probably more bioavailable than the dust bound matrix encountered in mining.

We would support the Safe Work Australia recommendation of an 8-h TWA of 0.01 mg/m³ to protect for excess skin, lung and liver cancers in exposed workers.

BEI

We have analysed the pre-employment data supplied by OceanaGold, which is consistent with the reported literature (Hata et.al., 2007; NRC, 1999); SWA, 2020). We are extremely concerned if the proposed level were to be implemented, that some potential workers may be discriminated against due to them having naturally high biological arsenic levels. It is extremely likely that employers in our sector would have difficulty finding staff whose pre-test is below the proposed BEI as those employers would have to look at excluding smokers from the employment pool. Although most of the dietary arsenic is excluded by the test there still remains some metabolites that may be present from diet. The proposed low BEI would necessitate workers excluding seafood from their diet 48hrs prior to testing, which would be almost impossible to enforce and implement.

- Do you think exposures below the proposed WES & BEI are feasible to achieve?

WES

No. We believe that there is currently too much analytical uncertainty to have confidence in such low values. There is no epidemiological or experimental evidence that indicates such a low WES is either necessary or reliable.

BEI

No. Many non-occupationally exposed people regularly record biological values in excess of the proposed value, which completely undermines the value of occupational health monitoring. Rather, we need to look at the corresponding increase of biological Arsenic throughout the work week to determine occupational exposure.

- Comments on the feasibility of meeting the proposed WES & BEI value

WES

Until there is standardised, reliable analytical techniques to support the proposed WES, implementing such a low value is not useful in protecting workers. We would support reducing the WES to 0.01mg/m³ thus aligning New Zealand with global best practice in occupational Arsenic management.

BEI

Without the ability to differentiate the occupational contribution of biological Arsenic levels, simply lowering the BEI will be ineffective and potentially undermine the value of biological monitoring.

Employers within our sector would find it very problematic and require significant change to the way they run their business to meet the proposed BEI. Such difficulties may lead to discrimination toward certain groups that have naturally high biological arsenic levels, thus reducing the available workforce and unfairly denying individuals the ability to work in a safe environment.