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Dear Chief Scientist & Engineer

RE: Submission on the Asbestos Discussion Paper

The Australian Sustainable Business Group (ASBG) welcomes the opportunity to provide comments on the Office of the Chief Scientist & Engineer's (OCSE) Discussion Paper - Management of asbestos in recovered fines and recovered materials for beneficial reuse in NSW (Discussion Paper)

The Australian Sustainable Business Group (ASBG) is a leading environment and energy business representative body that specializes in providing the latest information, including changes to environmental legislation, regulations and policy that may impact industry, business and other organisations. We operate in NSW and Queensland and have over 100 members comprising of Australia's largest manufacturing companies and other related businesses.

This is the second submission to the OCSE on your Asbestos Review. Overall ASBG welcomes the contents and issues in the Discussion Paper. Our members look forward to a number of recommendations primarily focused on the use of scientific approaches to dealing with asbestos wastes and their beneficial use where appropriate.

This submission is structured to answer the questions asked by the OCSE. Where ASBG can provide additional information related to each question it has.

1 Thresholds and Screening Levels

Question 1: What factors should be considered when deriving a threshold or screening level for asbestos in recovered fines and material for beneficial reuse?

Firstly, there is the issue of the public's poor perception of risks, which tends to be more related to fashion and beliefs rather than a scientific and evidence basis. To gain scientific based criteria on asbestos, with a reasonable sector in the community, will require better and professionally made communications and counter arguments to false claims of risk. However, it is a difficult process, where marginal gains can be considered successful. A key point is for the OCSE to determine a. or set of, concentration/s where below it, such wastes are not considered asbestos waste.

In the practice of beneficial use of asbestos waste ASBG considers there are two threshold required:

1. The handling risks and exposures
2. The environmental risks of where it is beneficially reused

1.1 Handling Risks

Trying to communicate risks to the general public is difficult, but can be done requiring careful delivery. Also acceptable risks vary considerably. For example:

- The Cancer Council uses mass media videos to clearly raise the risks associated with sun exposure verses the fashionable gaining of a tan: E.g. *There is nothing healthy about a tan*.
- Also fashionable is the receiving of Botox injections to kill off nerve cells to prevent muscle contractions, hence bending of skin and potential wrinkle reduction. However, Botox is the most toxic substance known to humans. It is only "safe" to use if it is subjected to strict concentration and many other controls and checks. Many deaths and mental impairments have occurred when Black Market Botox was used.

Physical handling of asbestos containing material (ACM) risks are already reasonably managed under WHS asbestos criteria; e.g. requiring appropriately trained persons. Measurement of the risks at the handling stage, would include all handling up to and including placement in its final position and covering if required. ASBG considers the use of the Membrane Filter Method[1] is reasonable as it measures asbestos fibres. However, other methods, such as guidance materials, of determining handling risks would simplify the actions required. This would also cover the input stream for an asbestos treatment process (see Section 7).

1.2 Environmental Risks

The main environmental risk is the risk of release of asbestos fibres into air over time after the material has been placed into its position. The beneficial end use of a material containing acceptable levels of asbestos (solid) should vary according to the risks, such as of asbestos concentration in the final solids, even blended, and its physical properties. A categorisation of beneficial end uses of ACM can summarised to include:

1. Use as a buried engineering fill at various depths and protections, with varying asbestos concentrations, based on the risks such as exposing the materials sometime in the future.
2. Use as a soil amendment where other substances can enhance the agricultural suitability of the added soil/materials – generally surface exposed.
3. As an additive for use in bonded materials, e.g. concrete, bitumen, asphalt etc.
4. In a high calorific valued material, burnt as a fuel. If it's a waste it is a feedstock for Energy from Waste facilities.
5. Output streams from asbestos treatment processes – see section 7.
6. Other beneficial uses

1.2.1 Burying

Clarification of the airborne risks of buried asbestos at various depths, protections and concentrations needs to be undertaken. Given the emotive position of asbestos, few private landowners would accept a known level of asbestos in a fill or soil amendment material. However, from a scientific basis the risks are well

[1] Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Fibres

under acceptable ranges. Use in Government infrastructure should not have this issue. The main risk is exposure. of the asbestos containing layer, over time, to air. Even here, a set asbestos level in soil, if exposed to air, would not exceed normal risk levels[2].

ASBG would like to see formal guidance document/s, covering the beneficial reuse at varying levels of asbestos concentrations in solid form[3]. It could use, for example, 4 levels of asbestos concentrations in soil for 4 levels of beneficial use.

a. The highest concentration level, would permit asbestos soils for deep engineering fill such as in road easements or dams, where it is capped with for example 10 m or more of cover and cap. The design could be approved by a Certified Contaminated Site Auditor, perhaps with other engineering controls.
b. A second level for a less thick cap of a specified design
c. Third level for foundations
d. Forth level for likely to be surface exposed

This list is a simple categorisation of current management methods already in use in NSW. Due to the difference in asbestos contamination criteria for wastes and for on-site materials. The contaminated land remediation practices using the Contaminated Land Management Act, Assessment of Site Contamination NEPM and other associate management document, use similar methods to manage asbestos contaminated soils. It is quite common for a housing development, where asbestos contamination is present, to make a cap and contain cell or use other approved burial methods to manage asbestos impacted soils.

R1 ASBG recommends: The current practices used for the management of asbestos soils etc, be also extended to where such soils are used in off-site applications, following the set of rules under contaminated soil management on-site.

1.2.2 Soil Amendment

Application as a soil amendment of asbestos contaminated soils should be available for a variety of applications. This could have a similar assessment / level as permitted under the WA Asbestos guidelines. This approach is used under the Assessment of Site Contamination NEPM for site remediation. However, this does not cover application for agricultural use as a soil amendment. Obviously asbestos and food crops are a poor mix, but there are many non-crop agricultural options. Alternatively, there are many large areas of farmland with high background concentrations of asbestos fibres. In such cases, soil amendments at higher asbestos concentrations may be beneficial, provided there are other beneficial properties within the material.

1.2.3 Other Beneficial Uses

This would depend on the final use. However, use in a bonded material like concrete, bitumen would likely permit a higher level than for surface exposure. If going into an EfW plant etc. it would need to meet that plant's capacity to handle asbestos fibres in air. A key issue is the likely exposure of asbestos to air and the controls to prevent air borne asbestos fibres being generated at some risk-based level. If bonded, like in AC

[2] Generally defined as between 1 in 10,000 to 1 in 1,000,000 – see NHMRC Health Investigation Levels Review, Cancer Risk Assessment Methodology
[3] Generally referred to as asbestos in soils, but should include other media.

sheeting, the risks of release are much lower than for fibrous asbestos. Identification of the ability of the bonded material to release fibres at a tolerable level, when exposed to air and physical actions, would be an important physical property to be identified of that bonded material.

In Section 2, there is reference to use of asbestiform rock in road and infrastructures in California.

R2 ASBG recommends: That new generic guidance be provided on a set of varying concentrations of asbestos, which cover a set of corresponding more restrictive burring actions and other end uses for off-site management of asbestos impacted soils etc.

ASBG uses generic to relate to overarching general guidelines for use. However, for large volumes of material, specific testing programs should also be permitted. The reason for such a two pronged approach is to do with costs. The generic guidelines would be more conservative applying to more sensitive applications and uses. While the individual testing approach would cost more to undertake, but result in outcomes closer to the real risks.

2 Asbestos Waste Management at Recycling Facilities

Question 2: Can you provide any data on annual volumes of C&D waste being recycled or alternatively sent to landfill? Data on rejected loads due to asbestos presence and any other data related to all TOR items is welcomed.

ASBG does not have this information, other than what is contained in the Waste Strategy and Sustainably 2021-41 and within the EPA's large data bases on waste collected under the NSW Waste and Resource Reporting Portal.

Question 3: Can you provide any other information on the potential presence of asbestos in recycled C&D material?

i. Information on the methods of separating and removing asbestos from waste that can inform alternative approaches?

ii. What reuse scenarios are there for recycled waste, including end-products and their use?

While ASBG does not have access to such direct data, there are comparisons which can be made. The list below provides other existences of asbestos contamination in areas and processes outside of the waste area. For example:

- Many ores mined such as iron, nickel and cobalt ores will contain trace levels of asbestos fibres. Asbestos fibres are likely to be found in asbestiform rocks, such as serpentine, which has between 5 to 15% chrysotile.
- Road building in many parts of NSW require cutting through asbestiform rock, where the excavated material is used for road beading and engineering fill.
- There are a number mountain ranges, such as the serpentine belts in NSW[4].

The above points the obvious large regulatory differences between the way asbestos is managed in waste and in other areas (non-waste).

[4] Serpentine

Question 4: While this section focuses on C&D waste, are there other waste types which are suitable for beneficial reuse which have the potential to be contaminated with asbestos?

California uses asbestiform rock in road construction and maintenance. Where asbestiform rock is used, usually serpentine or amphibole mineral groups, the regulatory focus is on minimising asbestos fibres in air, not so much in the solid form. Consequently, management practices focus on asbestos dust and use of such rock etc. in infrastructure projects[5]. California Ai Resources Board (CARB) is known for some of the tightest air quality standards set around the world. Unlike Australia, the USA has not fully banned all products containing asbestos, though this is changing. As a consequence, CARB has regulations and measures regarding the use of natural asbestos under strict controls focusing on airborne asbestos fibres[6].

3 Management of asbestos in soil

Question 5: Is it appropriate for the health screening levels for asbestos in soils to apply to asbestos in waste? Note that the threshold level in this instance refers to a level where further action is required.

i. Why or why not?

Yes. ASBG considers that the HSL method is scientifically based and not emotive. A distinction made with waste is that is not as well handled. This may have been true 25 or more years ago, but the waste regulatory system significantly tightened over time and is now very tight.

For example, the amendments made to the POEO Act 1997 in 2024, increased all fines associated with asbestos contaminated waste to a maximum of $4 million for corporations. This included breaches against Resource Recovery Orders and Exemptions (RROE) which prior to 3 April 2024, had maximum fines of $44,000, a 90-fold increase. The liabilities and ease in which asbestos contamination can be found, as there are 500 fibres per m^3, make investment in many recycling and resource recovery operations legally fraught. ASBG is eagerly waiting for the Review of the Resource Recovery Framework, to address such legal concerns. However, given that a regulator need only find one asbestos fibre, makes this a key area to address.

Question 6: Health screening levels are not the only tool used for managing asbestos in soils. If threshold levels in soils were to be applied to asbestos in waste for beneficial reuse,

i. what other tools can support managing asbestos in waste for beneficial reuse?

ii. what would be the limitations, costs or feasibility of safely removing asbestos in waste?

iii. are there certain scenarios where recycled C&D material should not be reused?

iv. are there certain scenarios where reuse of recycled C&D material could result in land legacy issues?

ASBG puts forward California's methods (section 2) used to reuse many asbestiform rock in road and other infrastructure.

R4 ASBG recommends that:

- ***A review of asbestos dust generation and control methods be undertaken, by an independent 3rd party such as a University's Occupational Hygienists School, focusing on the risks and management***

[5] Asbestos Dust Mitigation Plan Application Placer County Air Pollution Control District

[6] CARB Naturally Occurring Asbestos

of such risks in the use of asbestiform materials in fill, filler, infrastructure and for other applications.

- ***The development of a new standards and or testing methods, based on the above, with additional research if required, be developed for use in Australia.***

ASBG considers the terms of reference of R4 need to be properly written, otherwise they may be directed to seek opinion, reflected in legislation etc. rather than focusing on the science.

4 Standards and guidelines for asbestos in waste

Question 7: Are there other standards or guidelines that would be applicable for managing asbestos in waste for beneficial reuse that can be provided?

See recommendation 4 and its comments.

Question 8: Should the approach in the WA guideline (Managing asbestos at construction and demolition waste recycling facilities), be implemented in NSW and if so, why or why not?

i. Are there other factors that should be considered if the WA Guideline is to be implemented?

ii. Is there an alternative approach that could be considered?

ASBG agree the WA guidelines should be used in NSW. However, use of the WA guideline was rejected by the NSW EPA, as it conflicted with the:

- Ban on reuse and recycling of asbestos waste under s144AAB POEO Act
- Presence of asbestos as the limit under s241 POEO Act and EPA documentation.

If the zero emotive basis for asbestos was replaced by a risk-based science backed criteria, then the WA guidelines would be more adoptable in NSW. However, the issue of beneficial use of asbestos contaminated materials is directly affected by these sections under the POEO Act, requiring an amending Act. In the interim, the EPA could adjust its measurement method, such as adopting AS 5370 (which replaced AS 4964), as the measure of the presence of asbestos at 0.01%. However, this may be legally challenged as past cases, EPA v Grafil CCA 2019, have ruled somewhat on this issue.

5 Sampling and analysis

Question 9: Apart from AS4964 and ASC NEPM, are there other sampling and analysis methods for detecting and quantifying asbestos in waste materials or recycled products that are being received and processed at recycling facilities?

i. Are you aware of any other methods/processes for sampling and analysis of asbestos that the Review should consider? If so, please provide details and basis for their relevance to this Review.

ii. How reliable and accurate are these methods in ensuring that recycled waste is not contaminated?

This can be resolved under recommendation 4, where a search for scientific methods are undertaken with development of guidelines and testing methods.

6 Risk-based approaches for managing asbestos in waste

Question 10: Would a through-chain approach to managing asbestos in waste, where each business looks to minimise or eliminate the risk from asbestos in waste for beneficial reuse, work?

i. What elements would be part of the system/approach?

ii. What would be the advantages/disadvantages of such a system?

This would likely apply to construction and demolition wastes, which can be somewhat separated from asbestos impacted soils from contaminated land remediation.

Question 11: Are there other risk-based approaches to managing asbestos in waste for beneficial reuse?

ASBG can only offer an expanded list of where risk-based approaches should be used, and can off that research is required to discover more useful risk based approaches. These will likely be different depending on the beneficial end use aimed for. R4 should also include specific risk-based approaches to cover the beneficial end use classifications, such as under section 1.2 and 7. Each end use may require a different risk-based approach.

7 General

Question 12: Is there any further information you would like to provide the Review to assist us with in responding to the Terms of Reference?

7.1 Carbonation of Serpentine

The NSW presence based approach to asbestos waste and ban on reuse is likely to impact on the developing technology of carbonation of minerals. Serpentine contains large amounts of magnesium silicate ($Mg_3Si_2O_5(OH)_4$), which can be carbonated into $MgCO_3$. Innovative companies are looking to use this process to sequester CO_2 and subsequently gain Australian Carbon Credit Units (ACCUs).

One Australian company[7] has set up a pilot plant on Kooragang Island to start processing serpentine into a carbonate rock for reuse as a product. It can be argued under NSW definition of waste, that products generated by such processes can be defined as a waste. Even second hand cars can be classified as waste as the waste definition is so broad. Serpentine rock contains between 5% to 15% white asbestos, so a carbonation process would require to be 100% conversion without fail, otherwise it could meet the presence based level on asbestos. Concern over the presence of asbestos in such products may result in two NSW legal issues:

1. It is likely to be classified as asbestos waste requiring landfill disposal only
2. Be considered a product containing asbestos, which the manufacture and importation of is banned across Australia.

If the removal of the presence based level for asbestos waste is replaced by a scientific measure, then it could be used under the resource recovery methods discussed in section 1. However, there is the issue of being considered an asbestos containing product. The latter is generally overseen by SafeWork NSW, where the outcomes of OCSE should have direct influence on this issue, and also influence at the Commonwealth

[7] Mineral Carbonation International

level. Note this issue can be separated into two opposing views of anti-asbestos vs greenhouse gas capture and sequestration.

7.2 Carbonation of Asbestos Waste

Carbonation of asbestos can also be used to treat, or destroy white asbestos, maybe other forms as well. There are a number of commercially available processes which claim to convert asbestos sheeting, perhaps other forms, into non-asbestos forms. Thermal Recycling in the UK[8] claims it converts the asbestos into a safe, likely $MgCO_3$, form. This appears to require full AC sheeting.

Mineral Carbonation International also has claimed it can treat asbestos, including asbestos containing soils. However, such processes would need to achieve 100% conversion all the time, every time to meet a presence based limit.

Regardless, as such new technologies are at or close to a commercial level, then NSW Government should welcome them, especially the Australian company.

Many remediation project may find asbestos waste carbonation process costs are lower than the ever increasing NSW landfill gate fees and handling costs of asbestos waste.

Additionally, the greater Sydney area is fast running out of landfill space, exhausted by 2028. As NSW Councils operate most landfill space outside of Sydney, they are likely to reject asbestos waste from Sydney area. Consequently, the main option will be to send asbestos waste to SE Queensland where there are commercially run landfills. Consequently, the option to have commercial asbestos waste treatment facilities becomes more attractive.

R5 ASBG recommends that OCSE formally recognises the usefulness of commercial mineral carbonation and asbestos treatment facilities with the need for NSW Government to set reasonable operational and product criteria.

[8] Thermal Recycling UK

Should you require further details and clarification of the contents of this submission please contact me.

Yours Sincerely

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