APozA
AUSTRALASIAN POZZOLAN ASSOCIATION

5/41-47 Five Islands Rd, Port Kembla NSW 2505
PO Box 85, Port Kembla NSW 2505
info@apoza.asn.au
02 4258 0165
www.apoza.asn.au
02 4258 0169
ABN 22520652890

Department of Water and Environmental Regulation
8 Davidson Terrace
JOONDALUP WA 6027
wastereform@dwer.wa.gov.au

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Australasian Pozzolan Association – Waste Reform Submission

The Australasian Pozzolan Association ('APozA') was formed by a leading group of companies involved in natural and manufactured pozzolan supply chain such as; (1) producers, (2) processors and (3) users in October 2018.

This submission has been prepared for the Department with the objective to advise and inform the Department about the value-added benefits which can derived from emerging manufactured by-product pozzolan sources within any waste reform policy.

POZZOLANS

The term 'Pozzolan' used in the name of the Association more accurately reflects the material characteristics of interest to members, which don't fit within the charters of any existing Associations interests or material defined as; cement, lime, amorphous silica, slag or coal ash.

Pozzolans can include a broad category of materials, both naturally occurring and by-products of various manufacturing processes, but can be generally defined as being mainly siliceous or silico-aluminous material that will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds having cementitious properties. Typical pozzolans found across Australia fall into either 'manufactured' or 'natural' sources.

Interestingly, manufactured sources have typically attract a 'waste' label.

Manufactured Pozzolans	Natural Pozzolans
• Lithium mining by-products • Ferro-nickel slag • Metals extraction by-products • Waste to Energy (WtE) by-products • Red mud • Glass waste • Calcined clay • Rice husk ash	• Volcanic rock/ash • Geo-silica • Kaolin • Metakaolin • Chert • Shales • Tuffs • Diatomaceous earths • Pumice

Table 1 - Typical pozzolans found across Australia

During a Forum in October twenty two (22) stakeholders participated in completing a heat mapping exercise. Based on feedback from participants there was clear and common interest to addressing identified challenges to increase user, business and government awareness of the construction properties and value-added benefits derived from natural and emerging manufactured pozzolan sources.

In the case for manufactured pozzolans, being by-products of various mining, metal extraction, resource and energy recovery processes, an important role of APozA will be;

(1) to advocate for the beneficial utilisation of these by-products, in particular the;
(2) resource recovery benefits to the environment and economic sustainable development for all stakeholders, and
(3) contributing to a sustainable circular economy.

CIRCULAR ECONOMY

Why is a circular economy important? The circular economy is a modern term used to describe an alternative to a traditional linear economy (manufacture, use, dispose). In a circular economy we keep resources in use for as long as possible, thus extracting the maximum value from them whilst in use, then recover and regenerate products and materials until the end of each service life.

In simple terms the circular economy adds value to manufacturing by closing the loop on non-core resources and extracting maximum value by using them as input materials in other products or applications. In the case for mineral by-products such as pozzolans using the term ‘wastes’ to describe them is inconsistent with ‘resource conversation’ and ‘sustainability principles’.

The processing of minerals from mining operations, e.g. for lithium extraction, various mineral by-products are produced. Historically these by-products have been referred to as either; wastes or residuals. We hold these labels are inconsistent with modern industrial ecology, moreover labelling by-products as ‘wastes’ only stigmatise opportunities for mineral resource recovery.

An example comes from the iron and steel slags (ISS) which are considered by-products of iron and steel manufacture and not wastes. ISS are broadly described as amorphous inorganic oxides, having similar chemistry to naturally occurring materials, such as quarried stone. Globally, iron and steel manufacture gives rise to millions of tonnes of metallurgical slag and over the past 40 years important 'hard won' end use markets for ISS have been developed within what has become termed the circular economy.

Industrial 'waste' is generally referred to as the type of waste produced by industrial activity, such as that generated by factories, mills and mines. Waste can be more generally defined as any substance which is unwanted or unusable material. However, within some State legislative frameworks 'a' substance is NOT precluded from being waste for the purposes of [legislation] merely because it can be reprocessed, re-used or recycled. This is relatively out of date concept and consistent with 'resource conversation' and 'sustainability principles' established back in the 1990's [Brundtland Commission] and needs to be addressed.

PATHWAYS

One primary objective for creating the APozA has been to provide formal representation and a voice for members on par with that available to other industry segments within the construction industry. That is giving us a collective, coordinated voice.

Arising from the heat mapping exercise the APozA committed to investigating and developing a new Australian Standard to facilitate market understanding and develop the use of pozzolans into value added applications. The collection and publication of production and utilisation of natural and manufactured pozzolans data will be an important objective for the Association, in particular applications and end uses by regions.

AUSTRALIAN STANDARDS

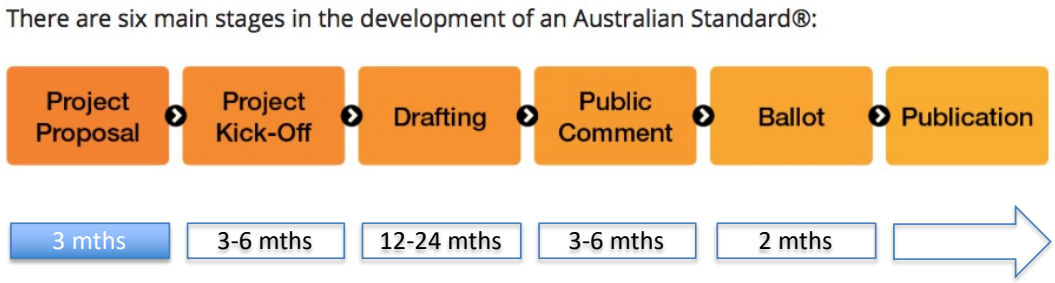
Pozzolans can include a broad category of materials, both naturally occurring, processed materials, and by-products of various manufacturing processes but can be generally defined as being mainly siliceous or silico-aluminous or dicalcium silicates material that will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds having cementitious properties.

Whilst natural pozzolans sources are well understood, there is an emerging class of manufactured pozzolans arising from various non-metallurgical and mineral processing industries which warrants greater focus given 'circular economy' drivers to minimise wastes generated.

One example is the manufacture of aluminosilicate by-products from Lithium production. To put in context, Australia is fast becoming a major stakeholder in the global supply of lithium products given its large resources of spodumene. This lithium bearing mineral occurs in hard rock pegmatites and can be processed to extract lithium compounds used to make valuable products such as lithium ion batteries, ceramics and lubricants, creating a lithium aluminosilicate by-product. Whilst by-product volumes are difficult to estimate, industry

predictions based on forecast demand for lithium for use in lithium ion batteries, ceramics, lubricants will result in significant quantities of lithium aluminosilicate by-product being generated over the next 5 years. Other non-metallurgical pozzolans can include by-products such as; ferronickel slags, nickel slags, copper slags, beneficiated coal combustion products, incinerator ashes (WtE) and natural sources which can be beneficially used.

These material(s) characteristics don't fit within existing standards for mineral binders such as; cement, lime, amorphous silica, slag or coal ash. Accordingly, the Association is committed to developing a new Standard to facilitate resource beneficial use through well-defined standards ensuring these resources can be incorporated into value added applications.



The above figure provides an example of the typical stages and timeline to develop new Standards. This development timeline can vary considerably.

Australian Standards are published documents setting out specifications and procedures designed to ensure products, services and systems are safe, reliable and consistently perform the way they are intended to. They establish a minimum set of requirements which define quality and safety criteria. Australian Standards are voluntary documents that are developed by consensus.

Many Australian Standards, because of their rigour, are adopted into legislation to become mandatory or referenced in contracts. Australian Standards development process is based on the key principles of transparency, consensus and balanced expert committee representation. This process is regarded as one of the most rigorous in the world.

NEED TO REDEFINE WASTES

As an industry association with an interest in resource conservation and recovery policy throughout Australian jurisdictions, we support and encourage pragmatic, scientifically-sound and consultative based action towards the development of legislation, regulations and other necessary measures designed to provide relevant industries with the level of 'legal certainty' required for capital investment to efficiently and effectively recover and use by-products for beneficial ends.

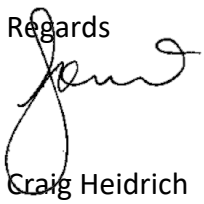
The need to create 'legal certainty' should not be underestimated as it underpins all corporate commercial decision-making processes where investments lead to secure associated 'property rights' arising from investment in the development of resources. Specifically, it's these investments which lead to employment security and economic activity

which underpin our industry development. That is, without 'legal certainty', investors, business operators and customers operating in highly competitive commercial markets will avoid the associated regulatory uncertainty risks -- resulting in widespread loss of current and future beneficial utilisation opportunities.

Sustainable industry development, whilst protecting the environment and human health, is implicit in the community license to operate obligations for industry today. Accordingly, we encourage the Department to be mindful of these aspects when formulating any waste reform policy.

In closing the Australasian Pozzolan Association is aware of the Kwinana Industries Council submission *'Waste not, want not: valuing waste as a resource'* and echo the sentiment and recommendations which enable industry to invest into resource conservation.

Regards



Craig Heidrich
CEO
Australasian Pozzolan Association