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GREEN PRODUCTS & GREEN PROCESSES

Making more from less and doing it efficiently!

Mesa Minerals Limited ("Mesa") is a world leader in hydrometallurgical process technology designed to facilitate the production of manganese electrolytic products and fertilizer products from low grade manganese dioxide ores and from solid wastes containing significant levels of manganese. The suite of products that are economically and environmentally viable using Mesa's patented processes include:

- consistently high purity, low cost electrolytic manganese dioxide (EMD) suitable for use in the manufacture of both alkaline and lithium-ion batteries;
- consistently high purity, low cost electrolytic manganese metal (EMM) suitable for use in the manufacture of specialty steels, other specialty non-steel products and ferrites used in electronics;
- manganese rich micro nutrient fertilizer micro nutrient fertilizer (MNF); and
- fertilizer grade, granulated manganese sulfate granulated manganese sulfate (GMS).

Importantly, the use of Mesa's highly efficient sulfur dioxide leach process, to generate manganese sulfate electrolyte from manganese oxide ores, will allow the use of much lower ore feed grades than could be tolerated in any roasting based process. (Roasting is currently used as a means of reducing manganese ores and thereby rendering them soluble in hot acid.) In times such as these when high grade ore feeds are difficult to acquire, and expensive if they can be sourced, a plant's ability to utilise much lower cost low grade ore feeds by adopting the Mesa processes could well make the difference between forced closure and continued profitable operation.

Since our manganese extraction process is a hydrometallurgical one, as compared with the conventional pyrometallurgical roasting process employed today to extract manganese from oxide ores, users will derive additional important environmental advantages including:

- a 50% reduction in energy consumed;
- the total elimination of carbon dioxide emissions; and
- the ability to eliminate virtually all particulate and metal ion emissions.

When Mesa's patented MNF production process is adopted in conjunction with its sulfur dioxide leach process, an EMD or EMM plant's tailings (ie, everything in the ore that does not end up in the electrolytic products) will be in a form suitable for the production of a valuable slow release micro nutrient fertilizer product, rather than in the very undesirable highly soluble form which results from roasting and requires expensive and problematic long term impoundment. The interplay of these two patented processes will provide an economic and environmentally sound basis for any new EMD or EMM plant based upon oxide ore feed, or the rejuvenation of old plants that otherwise are faced with closure. With



Whether it be as a technology vendor or as a technology user, Mesa has before it the challenge to commercialise these technologies to meet the demands of today's world for products that can truly claim to be 'green' in their production, their use and their ultimate disposal.

Successfully meeting this challenge will generate strong future cash flows for Mesa and thus deliver value to shareholders!

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