Westlake Associates

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CRL 2017_3 Non-Technical Summary

Celtic Recycling Ltd. (CRL) offers a comprehensive waste management service to the electricity-generation and supply industry. The company is actively involved with electricity generators, distributors and transmission companies, together with equipment manufacturers and major contractors, in the dismantling, recovery and subsequent processing of redundant electrical and electronic equipment in support of the Circular Economy.

Its current activities include the dismantling, depolluting and recycling of equipment including capacitors and electrical transformers. Plant arising from decommissioning activities will often have materials such as bitumen associated with it, and the physical association of such materials with other elements, prevent effective materials recycling. More than 90% of materials currently managed at Pyle are recycled and the company would like to increase this to the extent possible.

CRL would especially like to be able to manage these wastes in a way that better supports the waste hierarchy and that creates greater revenue. After significant research, the company has identified the use of cryogenics as the ideal mechanism by which bitumen can be separated from other components in a thorough and efficient manner such that recycling is thereafter facilitated. Processes such as this have been used for some time, for example, in Canada, where cryogenic processes are used in commercial-scale tyre recycling activities.

The company has undertaken NRW-approved cryogenic trials at their site in Pyle and these have shown the cryogenic process to be extremely effective once core temperatures reach at least minus 4^{O}C. As a consequence, they now wish to add the cryogenic process (using carbon dioxide as Dry Ice) to the permitted list of activities on site. This site already has a permit for managing a range of wastes, including those to be used in the new process, as well as the management of CO_2.

The activity will use CO_2 within insulated tanks in such a way that the plant to be separated will be 'bathed' in the cryogenic medium for a period of time, before removing from the reaction tank for physical separation and subsequent recycling.

The CO_2 to be used in the process is manufactured through sublimation from the atmosphere and therefore subsequent release back to the atmosphere within the process will be CO_2 - neutral, while the associated diversion of wastes from Landfill will reduce the overall CO_2 footprint of company activities. In addition, as humans, we exhale carbon dioxide as part of our normal respiratory process and the major hazards associated with carbon dioxide in the process will be that of asphyxiation and (at the temperatures used) skin 'burns'. At the level to be undertaken, both of these are health and safety issues, rather than environmental issues and will be managed through appropriate H&S procedures (as found within the sites management system).