

Aluminum Production Wastes in MSWs

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(Excerpted from: Lee, G. F. and Jones-Lee, A., "Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste," Report of G. Fred Lee & Associates, El Macero, CA, December (2004). Last updated Jan (2015) <http://www.gfredlee.com/Landfills/SubtitleDFlawedTechnPap.pdf>

There is concern about the placement of aluminum production wastes in municipal solid waste (MSW) landfills. Stark and his associates have published several papers, Calder and Stark (2010), Stark et al. (2012), Jafari, Stark, and Roper (2013), (2014) on the problems caused by depositing aluminum production in municipal landfills. Calder and Stark (2010) in the paper abstract, "Aluminum Reactions and Problems in Municipal Solid Waste Landfills," Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management" stated,

"Abstract: Aluminum enters municipal solid waste (MSW) landfills from untreated raw curbside trash (MSW), industrial waste, and aluminum production wastes variously called dross, baghouse fines, salt cake, and other designations. Aluminum related reactions can arise and become problematic for landfill operations by generating undesirable heat, liquid leachate, and gases, such as hydrogen, hydrogen sulfide, carbon monoxide, and ammonia. Temperature excursions up to 150°C (300°F) and landfill gas pressures exceeding 210 kPa have been observed. Water from the MSW, precipitation, injection, and/or surface water management can result in sufficient water to trigger problematic aluminum related reactions. Another source of water in a MSW landfill is leachate recirculation, which is not recommended if substantial aluminum is present in the landfill mass because it can lead to a problematic aluminum related reaction. This paper examines the chemical reactions involving aluminum in landfills and the negative consequences of introducing aluminum into MSW landfills regardless of its origin. Proposals for mitigating aluminum reactions are also presented."

As discussed in their paper the reactions of aluminum production wastes generate elevated temperatures in MSW landfills that can damage the HDPE landfill liner. While aluminum production wastes are not classified as a hazardous wastes and managed accordingly and not be allowed to be deposited in MSW landfills.

Calder, G., and Stark, T., "Aluminum Reactions and Problems in Municipal Solid Waste Landfills," Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management 14(4):258-265 October 1 (2010).

<http://ascelibrary.org/doi/abs/10.1061/%28ASCE%29HZ.1944-8376.0000045>

<http://tstark.net/wp-content/uploads/2012/10/JP80.pdf>

Jafari, N., Stark, T., and Roper, R., "Classification and Reactivity of Secondary Aluminum Production Waste," ASCE J. Hazard. Toxic Radioact. Waste, November (2013).

(doi: [http://dx.doi.org/10.1061/\(ASCE\)HZ.2153-5515.0000223](http://dx.doi.org/10.1061/(ASCE)HZ.2153-5515.0000223))

<http://tstark.net/wp-content/uploads/2012/10/JP101.pdf>

Jafari, N., Stark, T., and Rowe, R., "Service Life of HDPE Geomembranes Subjected to Elevated Temperatures," ASCE J. Hazard. Toxic Radioact. Waste 18(1):16-26 January (2014).

[http://ascelibrary.org/doi/abs/10.1061/\(ASCE\)HZ.2153-5515.0000188](http://ascelibrary.org/doi/abs/10.1061/(ASCE)HZ.2153-5515.0000188)

Stark, T., Martin, J., Gerbasi, G., Thalhamer, T., and Gortner, R., "Aluminum Waste Reaction Indicators in a Municipal Solid Waste Landfill," J. Geotech. Geoenviron. Eng. 138(3): 252-261 March (2012). <http://tstark.net/wp-content/uploads/2012/10/JP85.pdf>