

## **Construction Complications and Challenges in the Process of Installing Landfill Gas and Leachate Collection System to the Meethotamulla Solid Waste Dump Site Closure**

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The Meethotamulla Municipal Solid Waste (MSW) dumpsite was one of the largest open dumping sites operated in Sri Lanka. As estimated in 2017, about one million ton of waste stock was collected at the site with an area of 78,000 m<sup>2</sup> up to the height of 45-50 m range. Because of the heavy load of waste dump on top of the thick peat layer, the waste dump collapsed in 2017 leading to the death of 32 people. As an immediate action taken by the Government of Sri Lanka, further dumping of MSW to the Meethotamulla dumpsite was terminated. Since the beginning of the dumpsite at Meethotamulla it has created a lot of environmental problems such as unmanaged gas emissions, odour problems and leachate contamination to surrounded water bodies. The Government of Sri Lanka decided to reclaim the site as an Urban Park. The Urban Development Authority (UDA) was assigned the responsibility of managing environmental and social hazards. The National Building Research Organization (NBRO) was designated as the consultant to the project. The reclamation and closure process considered all technical design works including slope stability, leachate management, landfill gas management, final cover material selection and the development of surrounding areas. The concepts used for the design and construction were based on results obtained by an experimental trial fill of 50x30m<sup>2</sup> compacted waste up to 5 m height. Recorded CH<sub>4</sub>, CO, H<sub>2</sub>S, VOC concentrations at gas wells were 10-30%, 19 ppm, 42 ppm, 16 ppm, respectively. The major challenges encountered during the implementation of the design were, installation of gas wells and leachate collection blankets without removing or replacing of waste from the site. As a systematic approach followed in the construction stage, site specific trench system and cut and fill methods with benching were practiced to install the gas wells and leachate blankets. Site specific testing methods have been developed for testing waste compaction, landfill gas content, efficiency of gas wells and leachate collection system. These smart approaches were facilitated to resolve construction complications and to cover the construction targets.

**Keywords:** Municipal solid waste, Construction complications, Landfill gas wells, Leachate collection blanket