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Health and Ecological Risks Associated with Toronto Biosolids Pellets

History

- In 1996, the incineration of sewage sludge at the Ashbridges Bay Treatment Plant (ABTP) was partially phased out, and by 2003 incineration was completely stopped.
- In 1998, the City Council for the former City of Toronto directed staff to pursue 100% beneficial land application of ABTP biosolids, including further processing into dry pellets.
- In 2001, the Works and Emergency Services Department agreed to fund a biosolids review study and requested the Medical Officer of Health to commission and oversee this study.
- In August 2003, the ABTP pelletizer was destroyed in a fire.

Biosolids

- During the sewage treatment process, the solids remaining after anaerobic digestion of sewage sludge are dewatered to produce biosolids cake (30% solids, 70% water), which is then available for land application as regulated by the Ontario Ministry of the Environment.
- Biosolids can undergo further heat-based processing in a pelletizer plant to create small (3 mm) solid granules with low (<3%) moisture content.
- Biosolids pellets have a greatly reduced pathogen content compared with biosolids cake.
- Biosolids, including pellets, have potential value as a fertilizer and as a soil amendment capable of improving the structure of soils.

Biosolids Pellets Review Study

- The purpose of the study was to assess the human health and ecological risks associated with longterm (25-year) use of biosolids pellets in the city.
- The assessment considered three environments for pellet use – on city-owned property (such as landfill cover seeded to establish a vegetative cover); on parkland (such as city-owned parks and golf courses); and on residential property (such as lawns and urban food gardens).
- The study examined risks to young children (seven months to five years), adult residents, and workers applying pellets on land.
- The chemical risks to human health were assessed through a quantitative risk assessment for metals and key organic chemicals present or potentially present in Toronto biosolids.

- To assess biological risk, the study examined the effectiveness of the pelletization process in destroying biological agents of potential concern, such as indicator bacteria, enteric viruses and parasitic pathogens.
- The assessment of ecological risk was based on the potential for harmful effects on indicator species, including pets (dogs and cats), wildlife (vole, shrew, fox, robin and hawk), and plant and soil organisms.

Main Findings

- Overall, the study found that there was negligible risk to human health from possible chemical pathways of exposure arising from pellet use in all scenarios assessed.
- Regarding microbiological risk, there is less certainty than with the assessment of chemical risk, however, overall, microbiological risk is likely very low if appropriate precautions are taken, as identified in the study.
- The ecological component of the study suggests that overall risks to pets and wildlife are negligible. There is some concern regarding the impact of chromium on robins, however, the risk is small and would likely diminish with time as chromium levels drop in sewage sludge.
- To ensure the viability and safety of pellet use, there is a need to implement adequate monitoring of the pelletization process and testing of pellet quality, and to adopt precautionary measures regarding the use and storage of pellets.
- As a precaution, the use of pellets should be avoided on lawns with extensive bare patches until such time that microbiological monitoring results can demonstrate negligible risk from ingestion of pellets visible and readily accessible to young children.
- Use of pellets on lawns free of bare patches, or in situations where the pellets are mixed into the soil, is not of concern.
- The City's stringent Sewer Use By-law has been effective in reducing the levels of most metals in sewage sludge, and should be continually strengthened to deal with new and emerging issues.

Conclusion:

- There is no evidence to date that microbiological or chemical concerns are sufficiently significant to preclude the beneficial use of pellets for agricultural or horticultural purposes.
- The report identifies many important recommendations that need to be addressed if the City proceeds with pellet production and use in the city and beyond.
- The initial marketing of pellets should focus on demonstrating successful use of pellets for horticultural, forestry or land reclamation applications prior to making pellets available to the home retail market.