

# Options for Managing Dredged Stormwater Sediment



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The practice of applying stormwater detention facilities to treat runoff in new urban developments first became commonplace in Ontario, Canada during the 1990s. Today there are over 1,000 stormwater management facilities (SWMFs) in the Greater Toronto Area alone, many of which are at or past the point where they need major maintenance interventions. As facility owners and operators set aside budgets for the maintenance activities necessary to ensure SWMFs continue to provide the intended level of environmental protection, a dialogue has emerged about cost-effective strategies for carrying out these cleanout projects.

In many jurisdictions, the costs associated with hauling and disposal of dredged SWMF sediment constitute a significant portion of the total project cost. In the greater Toronto area, landfill tipping fees range from \$76 to \$112 Canadian dollars (CAD)/m<sup>3</sup> for this type of material, but in some areas of the province these rates can be even higher, particularly where there are few local landfills and/or a shortage of space in those facilities. For example, the only operating landfill in the Region of Waterloo, Ontario charges a tipping fee of \$150 CAD/ton for contaminated SWMF sediment. This is roughly equivalent to \$300 CAD/m<sup>3</sup> based on a standard sediment conversion factor of 2 tons per m<sup>3</sup>. For some clean out projects, these fees would represent more than 100% of the total project cost. Based on data collected from 10 facilities, as part of the Inspection and Maintenance Guide, the median clean out cost was \$158 CAD/m<sup>3</sup>, with a range of \$104 to \$512 CAD/m<sup>3</sup>.

The fate of the dredged sediment—beneficial reuse or landfill disposal—is largely determined by its chemistry. Based on a field study of 61 Canadian SWMFs carried out by Francine Kelly-Hooper, there are certain sediment contaminants that are often present at concentrations that exceed the local quality standards and render the sediment unsuitable for reuse. These include petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs) and sodium adsorption ratio (SAR). SAR, the primary indicator of contamination from road salt, is subject to high seasonal variability, dropping drastically after the spring. Some of the primary sources of PHCs and PAHs in stormwater pond sediment include gasoline, motor oils, vehicle emissions, roofing tar, asphalt pavement and coal tar pavement sealants.

In Ontario, there is no specific legislation that defines the circumstances under which SWMF sediment can be reused. In the absence of specific criteria, the Soil, Ground Water and Sediment Standards set out in Ontario Regulation 153/04—known as the “Records of Site Condition” regulation—are often referenced. The Standards list the allowable concentrations of a variety of soil contaminants according to the land use category. While they are normally applied to support the assessment and clean-up of contaminated sites, they are frequently applied to other projects, including the characterization of SWMF sediment that is being considered for reuse. This approach is not the official policy of the Ontario Ministry of Environment and Climate Change




(MOECC), but rather a case by case operational approach that is used in the absence of a specific legislative framework.

In January 2014, the MOECC published and circulated a document entitled "Management of Excess Soil: A Guide for Best Management Practices." This guide was created to encourage the beneficial reuse of excess soil in a manner that promotes sustainability and environmental protection. According to this guide, reuse of excess soil requires assessment and confirmation that the planned soil placement at the receiving site will not degrade its existing conditions. It refers to the use of a qualified person, who should be enlisted to evaluate reuse options, prepare a soil management plan and determine testing requirements if reuse is being considered.<sup>6</sup> Some of the potential excess soil management options described in the guide include reuse on-site (with or without on-site processing), off-site reuse at a construction or development site and reuse at a commercial fill site.

While the 2014 Excess Soil BMP Guide was an important step toward encouraging diversion of SWMF sediment from landfills, the absence of a legislative framework remains an issue. Approvals for reuse are currently handled on a case-by-case basis; the Ontario Regulation 153 Standards are normally taken into consideration, but there are no assurances that approval will be granted in a consistent way. This uncertainty can serve to discourage SWMF owners from embarking on a beneficial reuse evaluation, which could require additional consulting and laboratory analysis fees and potentially delay the project. Without some certainty that these efforts will result in the expected payoff—cost savings on landfill fees—many facility owners may choose the more predictable option of landfill disposal.

One solution used in Wisconsin was a rule developed by the Department of Natural Resources (DNR), known as Chapter NR 528 "Management of Accumulated Sediment from Stormwater Management Structures." This innovative rule, which went into effect in 2009, puts forth a self-implementing regulatory structure that allows for alternative uses of SWMF sediment without the need for formal approval. The approach requires the submission of an online form, which must be certified and signed by the sediment manager to ensure accountability and compliance. By developing a policy specific to SWMF sediment,

the DNR has put in place a process that is appropriate for the conditions of this material, its potential reuse options and the required timeliness for decision making on its disposal.

In Ontario, policy changes are underway and they are targeted at providing greater certainty surrounding what is permitted with respect to excess soil reuse. In January 2016, the MOECC released a proposed framework for an excess soil management policy. One key element of the new policy would be a regulation on excess soil management which would require larger and/or riskier source sites to develop and implement excess soil management plans certified by a qualified person, and made available to MOECC and local authorities. The policy will also involve the establishment of quality standards for excess soil, which will clarify the process of soil characterization and facilitate beneficial reuse. Overall, the policy strongly encourages diversion of excess soil from landfill and promotes beneficial reuse. As such, it represents an important step toward improving the cost-efficiency and overall sustainability of stormwater pond clean outs and other projects that generate excess soil. 

## References

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*Sediment sampling. Photo by Francine Kelly-Hooper.*