feature BY ALAN J. DURAND

Beneficial Re-use of Excess Construction Soils

An Opportunity For Ontario Municipalities

Municipal Challenges & Opportunities

The proper handling and management of excess construction soils is a growing concern in Ontario. Many infrastructure projects are underway across Southern Ontario., with construction crews busy at work building and repairing rapid transit lines and roads, and extending and replacing old sewers and watermains. These much-needed investments have created new challenges, including the problem of how to responsibly deal with all the excess soils generated from these excavations.

Municipalities are facing local issues about how to manage the disposal of these excess construction soils. Development and infrastructure projects generate significant volumes of excess soils that are typically shipped and disposed of at landfills. There is no tracking of the amount of excess construction soils moved every year within Ontario. A report by the Residential and Civil Construction Alliance of Ontario (RCCAO) in 2012 estimated that the volume of excess soil could be as much as 25 million cubic metres every year. Construction companies and contractors have fewer options to dispose of this excess soil, which means that it has to be hauled long distances to designated landfills in rural Ontario. As a result, the challenge of how to manage these soils is most prevalent in municipalities surrounding the Greater Toronto Area, where excess soils often end up.

Part of the problem has been the difficulty of defining what constitutes *clean dirt* as opposed to *dirty dirt* in Ontario (see Clean Soil vs Dirty Soil in Ontario). This uncertainty generates understandable local concern about human health and environmental impacts, especially when contaminated or dirty dirt is inadvertently or deliberately deposited in a location where it can cause environmental harm. In addition, moving large volumes of excess construction soils, typically by truck, causes traffic congestion, noise, and wear and tear on local roads.

Continued development and infrastructure renewal projects are critical to foster Ontario's growth and economic prosperity. The challenge for municipalities is how to responsibly plan, manage and handle excess construction soils in Ontario in a way that is environmentally-responsible and considers local impacts.

There is a better way. We need to start thinking of clean excess soils from construction projects not as waste, but as a resource that can be safely and beneficially re-used. Thanks to modern testing methods and a better understanding of how contaminants in the soil affect the natural environment, it is possible to assess which soils pose greater risks.

The solution to the unsustainable "dig and dump" approach is to beneficially re-use as much of this excess soil as possible in infrastructure projects close to the point of origin.

Re-use of excess construction soils has several major benefits:

- It helps keep property taxes low by making municipal and provincial infrastructure projects more cost-effective and affordable;
- It helps to improve air quality by reducing greenhouse gas emissions, as there is less truck traffic hauling soil to distant landfills.
- It helps to improve air quality by reducing the number of trips take n by large trucks hauling soil to distant landfills.
- Less truck traffic means that our roads are safer, and that there will be less wear and tear on local streets.

Best Management Practices – Moving Us Forward

Ontario has already taken an important step to encourage the responsible re-use of excess construction soils. In January 2014, following years of hard work and consultation with experts and interested groups across the province, the Ministry of the Environment and Climate Change (MOECC) released *Management of Excess Soil — A Guide for Best Management Practices*.

When properly implemented and used, these best management practices (or BMPs) give municipalities the recommended protocols to encourage the beneficial reuse and handling of excess soils. The BMPs bring sound practices into the excess construction soil handling equation. The BMPs represent a recommended Ontario framework for the planning, management and responsible handling of excess construction soils across the province. They draw upon current regulatory procedures including soil quality criteria, the involvement of environmental Qualified Persons (QPs) site assessment protocols, and procedures established under the Brownfields Act and the Ontario Records of Site Condition Regulation (O.Reg. 153/04).

The BMPs also draw heavily from soil management approaches used in other jurisdictions. By looking internationally at best practices, particularly those utilized in Europe, Ontario has learned from the experience of the Netherlands, Belgium and the United Kingdom, and established relationships for ongoing insight and understanding. These countries, with their strong environmental focus, have also provided further examples and available expertise in developing new soil handling technologies, training approaches and further Codes of Practice.

One of these approaches is commonly known as soil matching. The construction industry, led by RCCAO, established SOiiL — Supporting Ontario Infrastructure Investments and Lands — a web-based soil matching and tracking service based on tried-and-tested methods already used in the United Kingdom. Construction and excavation projects that generate excess soils are matched with other projects, like sewers and watermains, which can re-use these soils locally. A key condition of participating in SOiiL is the adoption and implementation of the new Ontario BMPs. Both donor and receiving parties have to be registered with the service, and information about the environmental condition of

CLEAN SOIL vs DIRTY SOIL in ONTARIO

Part of the problem in Ontario with respect to managing excess construction soils is the lack of a clear technical or strict legal definition of *clean soil* versus *dirty soil*. The latter is typically referenced as contaminated or impacted soil.

In 2004, the adoption of the Records of Site Condition Regulation (O.Reg. 153/04) incorporated new, made-in-Ontario soil quality reference Tables, with permitted contaminant threshold levels based on future land use. The intent was to use these Tables and associated testing protocols for the remediation of Brownfield or contaminated sites where a Record of Site Condition (RSC) requirement was involved. There was general reference in O.Reg. 153/04 to "inert fill," which by default became known as clean soil.

In the absence of clear direction or criteria from the Ministry of Environment and Climate Change for handling clean soil, the general practice in Ontario has been to apply the Records of Site Condition protocols and criteria by default. As a result, the most pristine soils, known as Table 1 soils, became the standard for clean soil and everything else was deemed contaminated, removed and sent to an approved landfill due to liability concerns. In Ontario, Table 1 soil numbers are based on background soil quality data called the Ontario Typical Range criteria. These numbers are conservative and not risk-based.

This situation has resulted in significant confusion and the default use of the "dig and dump" approach in Ontario. Large volumes of excess construction soils are trucked at high cost, with associated health, safety and environmental concerns to a dwindling number of approved landfill sites typically located in rural areas. This situation underlines the need for clear soil management practices in Ontario that focus on beneficially re-using excess soils with science and risk-based criteria.

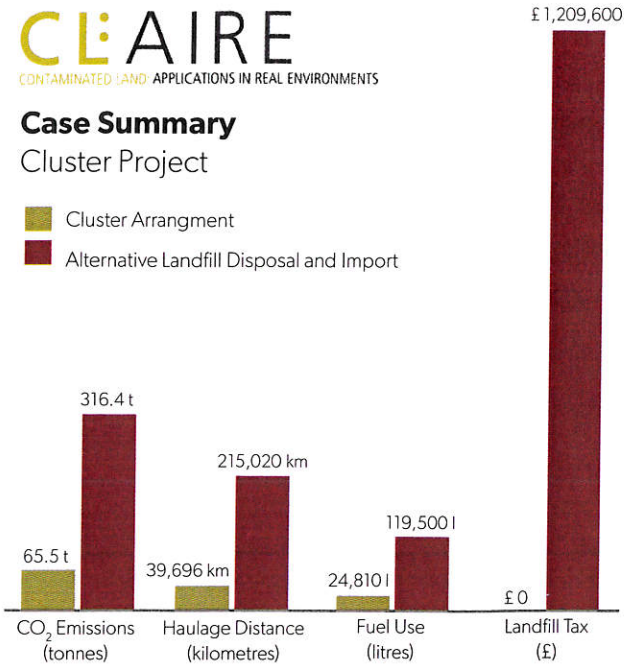
the soil is required to prevent environmental harm. SOiiL helps owners of construction projects find the soils they need in a timely fashion and in close geographic proximity. As a result, soils can be safely re-used locally instead of being hauled away to distant landfills. Municipalities and construction companies are encouraged to sign up, as this will create a safer, more environmentally friendly way of using excess construction soils.

Experience in the U.K. demonstrates that there are significant economic benefits and savings in beneficially re-using excess soils versus land filling as a waste. The high tipping fees in the U.K. versus typical disposal costs in Ontario are a compelling reason to re-purpose excess construction soils wherever possible. This is an increasingly important consideration in Ontario as tipping fees escalate given the dwindling number of available and approved land fill sites in the province.

In addition, the BMPs provide further potential benefits by reducing the overall cost of infrastructure projects, while positively reducing greenhouse gas (GHG) emissions. The use of the old "dig and dump" approach for moving large quantities of excess construction soils to remote landfill facilities produces significant carbon dioxide (CO_2) emissions. The CO_2 comes from the large number of trucks involved

CL:AIRE
CONTAMINATED LAND: APPLICATIONS IN REAL ENVIRONMENTS

Case Summary
Cluster Project



in removing excess soils and back-filling sites with new, replacement virgin materials. For example, the Eglinton Crosstown Light Rail Transit project in Toronto may generate over 60,000 tonnes of CO_2 just from the disposal and

How Municipalities Can Take Action

Municipalities now have the tools and the opportunity to address the challenges they face with respect to the proper handling and beneficial re-use of excess construction soils. So what are the key actions that a progressive municipality can undertake to successfully manage excess construction soils and capitalize on the benefits of more cost effective infrastructure, reduced environmental impact and less wear and tear on local roads?

TRAINING – Become familiar with the new BMPs through outreach sessions and implementation activities under the direction of Ontario's Ministry of Environment and Climate Change. Understand what your municipal employees need to know in order to make the beneficial re-use of construction soils a positive solution for your community.

BY-LAWS – Make beneficial re-use and the adoption of Ontario's BMPs a part of your municipal process by passing locally-sensitive by-laws that reference and incorporate the use of BMP requirements and the use of responsible purchasing policies that encourage planning for soil management and beneficial re-use.

STANDARDIZED MUNICIPAL INSTRUMENTS – Adopt standardized contracting and procurement practices. This would include a mandatory Material Management Plan (MMP) or Fill Plan for larger volumes of excess construction soils.

SOIL RECYCLING FACILITIES – Support the development of local soil recycling depots and facilities to provide the responsible management and eventual reuse of excess soils from smaller development and construction projects.

SOIL MATCHING – Encourage local contractors to participate in the posting and sharing of soil disposal information by becoming members of SOiiL (**www.soiil.com**). By matching contractors with locally-available excess construction soils that are suitable for re-use, municipalities will see cost savings for infrastructure projects and reduce landfilling.

replacement of excess construction soils. Experience from the U.K. has shown that local, beneficial re-use can reduce CO_2 emissions by about 80%. (See graph)

Working Together to Better Manage Soils

During the development of the Ontario BMP guidance document, municipalities and industry stakeholders including the Ontario Stone Sand and Gravel Association (OSSGA), the Ontario Good Roads Association (OGRA), the Ontario Environmental Industry Association (ONEIA), the Residential and Civil Construction Alliance of Ontario (RCCAO) and others worked with governmental and non-governmental groups to further enhance the BMP content and implementation.

Following the release of the BMP Guide, MOECC has initiated an 18-month review under the Environmental Bill of Rights (EBR) to further examine the need for more comprehensive soil policies in Ontario. We fully support the Provincial review, but we can't afford to put these much needed BMPs on the sidelines. Municipalities, the construction industry, and the Provincial government have the opportunity to start adopting and implementing BMPs right now. This will help reduce infrastructure costs while better protecting our environment. With the BMPs in place under real world conditions, we can properly monitor and learn lessons that will make soil management policies in Ontario even more effective. Together, the expert comments from the policy review and the experience with implementing BMPs will help shape a comprehensive policy for the future.

Significant thinking, time and effort has gone into addressing the Ontario challenges in dealing with excess construction soils and the adoption of best management approaches. While further work is required and continues, now is the time for municipalities to start making a positive, progressive change in soil management. Ontario is moving towards a more transparent, documented, risk-based soil management approach after many years of uncertainty. Recognizing excess construction soils as a resource will help us reduce waste, cut environmental pollution and keep taxes low by making infrastructure projects more affordable. It's a principle that we can all support.

By implementing the Best Management Practices and undertaking pilot projects there is a real opportunity to gain practical experience and help shape a comprehensive soil policy for all municipalities. By acting now, municipalities, contractors and local residents can all win and see the benefits of better soil management. It's the best approach to solve one of the challenges we face and keep Ontario growing and moving forward in the years ahead.

Alan J. Durand is the Project Manager for SOiiL
www.soiil.com