

Town of East Gwillimbury

Site Alteration and Fill By-law Update

Management of Liquid Soil and “Wet Fill”

Through the process of updating the Town’s Site Alteration and Fill By-law (2013-066, Amended in 2018) questions have been posed as to how the Town will manage “wet fill”.

What is “wet fill”?

In simple terms, “wet fill” or “wet soil” is the same as dry soil except that it is mixed with water to form a slurry. Provincial Regulations use the term Liquid Soil to describe this slurry. The section below describes relevant definitions and regulations that apply to Liquid Soil.

Provincial Regulations that apply to wet fill (Liquid Soil)

Ontario Regulation 406/19

There is no regulatory term for “wet fill” however there is a definition for Liquid Soil in in Ontario Regulation 406/19 Onsite and Excess Soil Management which is also used in Ontario Regulation 347 General Waste Management. It is stated as:

“liquid soil” means soil that has a slump of more than 150 millimetres using the Test Method for the Determination of “Liquid Waste” (slump test) set out in Schedule S to Regulation 347; (“sol liquide”)

This is the definition used in the draft Site Alteration and Fill By-law update.

Liquid Soil is a type of Excess Soil defined in Ontario Regulation 406/19 as:

“excess soil” means soil, or soil mixed with rock, that has been excavated as part of a project and removed from the project area for the project; (“sols de déblai”)

Based on Ontario Regulation 153/04 Liquid Excess Soil can be beneficially reused on sites within Town jurisdiction with specified controls and restrictions.

Ontario Regulation 347

Ontario Regulation 347 has the following definition of liquid waste:

“liquid waste” means waste that has a slump of more than 150 millimetres using the Test Method for the Determination of Liquid Waste (slump test) set out in Schedule 5. O. Reg. 558/00, s. 2.

Transportation management and disposal of liquid waste must be in accordance with Ontario Regulation 347. All waste receiving and disposal sites are required to have an Environmental Compliance Approval (ECA) issued by the Ministry of Environment Conservation and Parks (MECP).

The Town’s current Site Alteration and Fill By-law excludes waste management in Section 4 recognizing that the Town has no jurisdiction:

c) The use, operation, establishment, alteration, enlargement or extension of a Waste management system or Waste disposal site within the meaning of Part V of the Environmental Protection Act, R.S.O. 1SS0, c.E.1S, as amended; and...

The Town’s proposed By-law does not include any Town control or management of Liquid Waste for any purpose. It is noted that Excess Soil and Liquid Soil that is to be managed or are proposed to be deposited for beneficial reuse under the new proposed Site Alteration By-Law is not Waste disposal.

Sources of Liquid Excess Soil

Liquid Excess Soil (“wet fill”) that is defined by Ontario Regulation 406/19 and mentioned in the Town By-law is predominately water saturated excess soil derived from such sources as vac trucks, tunnel and micro tunnel boring slurry, and geothermal drilling slurry. Typically, it is transported in waterproof vessels such as vac trucks or tanker trucks.

Vac trucks are specialized vehicles that use vacuum suction to excavate soil usually from places where conventional extraction is not practical such as tight spaces and close to sensitive structures such as buried utility lines (sewer, water, gas, electrical etc). Vac trucks use high pressure clean water from an on-board tank to help break up the soil and enhance vacuuming. The vac truck water pressure system requires the use of clean water.

Similar equipment used to empty septic tanks and clean out storm sewers is regulated under Ontario Regulation 347 for waste management and is not applicable to this discussion.



Figure 1 Typical Vac-Truck

The contents of the vac truck container are dry soil from the excavation system mixed with clean water used to help with the vacuuming. If the dry soil is clean and the added water is clean the liquid soil would be clean. Figure 1 above depicts a typical vac truck.

Liquid Soils generated from Geothermal Installation

Slurry derived from tunnelling or geothermal installation drilling is similar as clean water and sometimes environmentally acceptable additives are used to assist with the tunnel boring or drilling process. If the soil is clean and the water is clean the slurry will be clean.

Geothermal installation drilling involves small diameter shallow drilling for the installation of closed loop circulatory heat exchanger systems. All materials are environmentally safe. The generated excess dry and liquid soil, which is typically clean, is removed from the site for disposal.

Due to the saturated physical nature of liquid excess soil, it is managed with additional regulatory requirements and constraints than dry excess soil. It is simply dry excess soil with added clean water to make it a saturated flowable material. The chemical quality of the liquid soil reflects the chemical quality of the dry soil.

Why are Hydro Vac trucks used?

Hydro Vac Trucks utilize high-pressure water and vacuum systems to excavate, minimizing damage to underground utilities, Requiring smaller excavation size, and faster response times.

What are the benefits of using a Hydro Vac receiving site?

Allowing a Hydro-Vac receiving site will provide a regulated location for Hydro-Vac trucks to dump. This will help eliminate illegal dumping and provide a site closer to construction sites within EG and surrounding areas. This will help reduce the carbon footprint of construction sites as they will not have to travel to further regulated sites.

What is the approval process to permit a Hydro Vac Receiving Site?

The applicant will be required to provide a Fill Management Plan which will detail their acceptance protocol for the Hydro Vac liquid soil. This will be reviewed by the Town and their Peer Review consultant to ensure compliance with MECP Standards.

Once all comments, questions, and concerns are addressed the applicant will be required to host a Public Information Meeting and seek approval from Council.

Why should the Town accept the use of Liquid Excess Soil as Fill?

As noted above, the beneficial reuse of Excess Soil (both dry and liquid) is outlined in Ontario Regulation 406/19 and encouraged by Provincial policy for reuse and recycling.

The Town's proposed Site Alteration and Fill By-law update considers the beneficial reuse of fill as dry excess soil and also considers the management of dry excess soil with added clean water making it a liquid excess soil.

The Town, developers and businesses within the Town use hydro-vac and other equipment such as boring machines and tunnelling equipment that generates liquid soil from dry soil on a regular basis as part of their ongoing operations to efficiently excavate and complete work. The Town recognizes the need to manage and beneficially reuse this material. In some cases, it may involve the physical separation of the soil and water phases prior to disposal (dry soil and clean water) such as via a cyclone separator. In other cases, the placement of the liquid soil in a vessel or pond where it can settle and separate with each component managed separately.

Like the management of dry soil being used as fill, liquid soil management and final placement of fill requires control, environmental protection measures and oversight.

The proposed Town By-law and supporting Guidelines Manual outlines the requirements for any application for the beneficial reuse of dry excess soil as fill as well as liquid excess soil as fill.

In the case of any application for the beneficial reuse of excess liquid soil for filling, the By-law requires Public Consultation and Council approval.

How is Liquid Soil managed at a receiving site?

There are different methods used across Ontario to manage Excess Liquid Soil. Some facilities are completely indoors and utilize centrifuges, presses, and other mechanical means to separate the soil and water. Other methods may include the addition of environmentally benign solidifying agents to create a dry soil. The dry soil would then be tested and shipped off to an appropriate receiving site.

Other facilities typically outdoors have a concrete receiving basin to contain the liquid soil for inspection and sampling. Upon receipt of the sampling results, the soil and liquid components would be shipped to an approved receiving site.

By-Law update overview

The Town is proactive in requiring the adoption of regulatory agency and industry best management practices for the management of both dry and liquid soil focusing on environmental and human health protection. As the Town's proposed new By-law will require an operator to demonstrate through a robust Fill Management Plan that they can manage fill and wet fill in a safe manner in accordance with regulations and best management practices, before it will contemplate issuing a Permit. All Permits will include Conditions and the posting of financial securities. Oversight of Permits will be conducted by Town engineering and By-law staff with the assistance of the Town's Qualified Person. Any failure to meet the Permit Conditions would result in revocation of the Permit and/or Orders.