BIOSOLIDS:

Implications of Land Application in Ontario

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What can you do with your truck full of sludge that will be both economical and safe over the long haul? That question is becoming a tricky one to tackle. Disposal options for sludge are limited – you can either land-apply or land fill.

This article examines land application as a final disposal option for biosolids, and the implications of putting together a land application program.

Liability Issues

Analysts have acknowledged fear of liability as a rein on the widespread land application of biosolids. Liability issues regarding land application include not only legal liability, but also market liability as a result of negative public perceptions of land application.

For municipalities, as generators of the waste, liability stays with them from the time it enters the sewer system until it finds its final resting place in the soil. When a large municipality considers land application as an option, assurances are needed that the program will be sustainable, safe and publicly acceptable.

In the United States there are classes of biosolids, which identify the "safety level" of the biosolids. In Canada, biosolids are governed by a plethora of regulations that determine the quality of materials that can be land applied. In the end, municipalities end up with a product that remains classed as either waste or product. As in the United States, designations determine liability, marketability and invariably perception.

Nutrient Rich, But ...

The main nutrients biosolids provide to crops are nitrogen and phosphorus, with a small amount of potassium. Biosolids can also provide essential micronutrients, including copper, boron, molybdenum, zinc and iron. Lime amended biosolids supply valuable lime to the fields.

Although land application of biosolids can substantially improve land productivity, and also represents a cheap and technologically viable option for many communities, it has limits and risks. If biosolids are improperly handled, pollutants and pathogens could potentially contaminate soils, crops, livestock, and even humans. For example, successive biosolid applications to the same piece of land can result in an accumulation of heavy metals in the soil. The Ontario Ministry of the Environment recognizes this through the Certificate of Approval Process (C of A) for a land application site. Sites are selected for their suitability, including soil type, slope and proximity to waterways. The idea is to give the biosolids time to integrate into the soil and fertilize the next crop in the rotation.

Because biosolids contain concentrations of most heavy metals, as well as some pathogens and toxic organics that are flushed and dumped down residential and industrial drains, the question arises of whether biosolids are safe to be spread on farms. To regulate the amount and type of nutrients put onto the land, sites must have a C of A, and also complete nutrient management strategies for their fertilization program. In addition, because of intensive agricultural practices (factory farming), manure management, which has traditionally resulted in land application – has become increasingly regulated. This has necessitated the development of on-site nutrient management plans for agricultural source biosolids materials. Likewise, municipalities – as generators of

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non-agriculture source material – must also complete nutrient management strategies for the materials that are to be land applied.

Competition for Suitable Sites

Biosolids spread in a municipality do not necessarily originate from the same municipality. Large urban municipalities have to move outside of their boundaries to find adequate land available for biosolids land application. This results in transport of biosolids to surrounding municipalities with larger agricultural bases.

Destination municipalities do not always know of land application sites within their jurisdiction, either; nor do they have the controls in place to limit receipt of biosolids from other municipalities.

This increased competition for land suitable for biosolids application has become an important element in managing biosolids for the future.

Opening the "Product – Door" – Ending Liability

N-Viro is one of the first processes in Canada that takes biosolids and turns waste into a product. Brokers handle marketing the end dry powdery fertilizer product to the regional agricultural communities. More recently, Lystec's success with its Guelph plant pilot project has lead team members to initiate the waste-to-product process themselves. Several processes have been developed to take advantage of the nutrient content of processed biosolids as the vehicle to market to the agricultural community.

Only once a biosolids process is in place to turn that magic key and open the "product door" does liability end for a municipality. And, even then, that might not be the case in an election year if your assurances do not extend to the actual land application contractor.

Having assurances that the wastewater treatment process in place improves water quality and solids quality is integral to a successful land application program. Nevertheless, regardless of the type of material applied, much public perception is based on how the job is done. Having a well-respected land application contractor on your team is the cornerstone to a successful land application program.

Questions to Ask

Key questions when considering land application include:

- Does your product meet the standards so that it can be land applied? Including concentration of contaminants – metals, toxic substances, nutrients? Including concentration of pathogens (disease causing bacteria)?
- Does your biosolids application program meet the requirements of the *Nutrient Management Act*?
- Do you have adequate storage for 240 days? Will your land applier make sure that your storage is empty when you need to fill it again?
- Do you have adequate land available to meet your horizon?
- Are agreements and C of As in place with landowners to assure consecutive availability of application sites?
- Does the land application contractor have the respect of the farming community?

What to do with your truck full of sludge that is both economical and safe over the long haul is not an easy question to answer. Land application, if executed carefully, is a better option than landfill. By returning valuable organic matter and nutrients to the soil, biosolids can be an important fertilizer input for area farmers, as well as a responsible disposal method for municipalities. MW