

*The City is conducting a review of the options for handling the solids from the wastewater treatment plant to plan for the future. There are a variety of options available for handling of the solids and the City is inviting the community to be part of the study and get involved in the decision. The following document provides background to assist you in understanding the need and the issues.*

### Current Process and Need

- The City treats sewage at the Advanced Wastewater Treatment Plant along Highway 97 near Fairview Road. The steps in the treatment process include:
  1. Pre-treatment – The sewage is screened to remove large items.
  2. Primary treatment – The sewage flows through large tanks to settle the solids. The water and solids are separated.
  3. Water treatment – The water goes through several treatment processes including aeration, biological solids separation, filtration and UV to reduce contaminants. It is then used for irrigation on sports fields and parks or disposed of in the channel.
  4. Solids treatment– The solids are removed from the main liquid stream and then dewatered. The resulting dewatered solids are trucked to the Campbell Mountain Landfill.
  5. Solids stabilization – The dewatered solids are mixed with wood waste and then composted to a high level at the Campbell Mountain Landfill site. The compost is used on parks and fields and is available for sale.
- The City has used the current process for handling solids for approximately two decades. Over time, the market for the compost has declined, the regulations have changed and the equipment needs to be repaired or replaced. It is estimated that a minimum of \$2.5 million investment is needed to repair the current site.
- The City has an opportunity to determine if the current process continues to be the best investment or if another option should be considered. The City announced plans to study the options and involve the community at a Council meeting last April.
- The handling of the solids can be a contentious issue as some people believe there is a potential risk to public health created by the trace amounts of heavy metals and chemicals from pharmaceuticals and personal care products in the water and solids. The requirements for treatment of contaminants are regulated by the provincial government and continue to evolve. The City works closely with regulators to ensure Penticton's processes meet current regulations.
- Once the study is completed, the City will make a recommendation to Council on what the best investment is for Penticton in the future.

### Study Scope and Findings

- Through a competitive RFP process, the City hired AECOM to perform the study. Twenty-three different processes were reviewed by the consultants according to the following criteria:
  1. Provision for long-term process redundancy and reliability (25+ years)
  2. Maximizing beneficial end use and marketing potential of any products
  3. Ensuring end product can be produced predictably and consistently over the project's life
  4. Compliance with existing and potential future regulatory limits
  5. Minimizing impacts to local residents through odour, dust, noise, and visual and traffic mitigation

6. Sustainability through lower greenhouse gas emissions and maximizing energy efficiency
  7. Provision of good value to the City by minimizing capital and operating costs, and adopting innovative solutions
- Based on this review, eight options were shortlisted to evaluate further and review with the community. A summary of the options is provided below. A full description and the [findings of the review](#) is available at [shapeyourcitypenticton.ca](http://shapeyourcitypenticton.ca).

### **1. Anaerobic Digestion**

Anaerobic digestion involves the decomposition of organic and inorganic matter in the absence of oxygen. This is a well proven process that can be accommodated on the current AWWTP site. This process would improve the reduction of contaminants as well as drastically reduce the volume of solids that would need further treatment, disposal or re-use. It would also generate biogas that could be captured for power generation or supplemented into the utility grid. The disadvantage of this process is the high capital cost and some operational challenges.

### **2. Advanced Anaerobic Digestion**

With additional modifications, the conventional anaerobic digestion process discussed above can be made more efficient and effective, further reducing the volume of residual solids and the amount of contaminants while increasing the amount of biogas.

### **3. Anaerobic Digestion Pretreatment – Thermal Hydrolysis Process**

Anaerobic Digestion Pretreatment exposes the dewatered solids to high pressure and temperature through direct steam injection before anaerobic digestion to provide additional solids reduction, increase digester capacity, increase biogas production, and improve contaminant reduction. The disadvantages are that it is an energy intensive process, involves a specific operational skillset, and requires a significant capital cost.

### **4. Composting**

This is the current process for handling the solids. The solids are trucked to Campbell Mountain where they are mixed with an amendment (wood waste) and composted. The City has the option of replacing the compost pad and introducing enhancements such as in-vessel composting to improve odour and leachate control. This simple process has served the City well, meets provincial requirements and is cost effective but requires a large footprint, can be inconsistent, can generate odours, and may generate a product that is no longer in demand.

### **5. Thermal Drying**

Thermal drying involves the use of heat to further decrease water content and volume of the solids. It is used in the last stage of processing before disposal / re-use. There are three different types of dryers that each use a different drying medium including hot air, hot oil or steam, or a conducting surface. Thermal drying is an energy intensive process and has high capital costs.

### **6. Gasification and Pyrolysis**

Gasification and Pyrolysis are established processes for converting organic waste into a fuel gas called syngas. Although common in many industries, they are still considered innovative in the wastewater industry. The solids need to be dried through another means such as thermal drying before they can be gasified. This is the most effective method for destroying contaminants, reduces

the residual waste solids for disposal, and generates fuel. This is one of the more costly and technical solutions and is not yet proven in the wastewater industry.

### **7. Land Application**

Land application is an option if the solids are converted to the highest quality of biosolids (Class A). Land application is an alternative to compost for disposing of the solids. It involves applying the material on an operation such as a mine or gravel pit or distributing the material over a large land area such as hayfields or forests. This option is cost competitive and can provide nutrients in soils that have been stripped from commercial operations. It can be expensive if trucking the material over great distances is required, and is often met with public opposition if the area proposed for the application is in the vicinity of residential communities.

### **8. Compost Biocovers for Landfill Gas Capture**

This option works in partnership with the Campbell Mountain Landfill. A layer of high-grade compost is placed over a landfill cell. The microorganisms in the compost digest the methane released from the landfill reducing the greenhouse gas emissions and providing a use for the compost product. There are a few different ways of using compost as a biocover for landfill gas capture. The challenge with this method is it requires a large footprint to produce and age the compost. The Regional District of Okanagan Similkameen is currently conducting a pilot project of this method at the Campbell Mountain Landfill.

- Options 2, 3, 5 and 6 all produce Class A biosolids which is the highest quality and provides the greatest flexibility for disposal or reuse.

### **Next Steps**

Each of the options on the shortlist will be further evaluated according to financial, environmental, operational and social impacts. Residents are invited to contribute to the weighting of the criteria that will be used to evaluate the options. Once the options are evaluated according to the criteria, the City will prepare a recommendation. Depending on the recommendation, the City may seek further involvement of the community before it is reviewed with Council in the fall. Register with [shapeyourcitypenticton.ca](http://shapeyourcitypenticton.ca) to receive information about this work directly.