



DATE: May 2, 2022
TO: Wade Bryson, Chair Public Works and Facilities Committee
THROUGH: Katie Koester, Director of Engineering and Public Works
FROM: Denise Koch, Deputy Director of Engineering and Public Works and Brian McGuire, Utility Superintendent
SUBJECT: Biosolids Solutions Update

Problem

The treatment of wastewater (sewage) results in the production of biosolids. Currently, biosolids are transported to Oregon for landfill disposal. This disposal solution is very expensive. The cost of shipping – and not disposal drives the costs. Shipping costs have increased significantly (~25%) in the last few years and are still expected to climb. Currently, it costs \$4,201 to ship a connex and with approximately 340 connex containers shipped per year, an annual operating cost of approximately \$1.4 million.

Potential Solutions - Disposal of Biosolids

Capital Landfill –

Capital Landfill accepted biosolids between March 2019 and May 2021. In May 2021, Capital Landfill stopped accepting biosolids due to general odor concerns at the landfill. Waste Management is still battling odor concerns and is not willing to accept biosolids.

Beneficial Reuse (i.e. land application) –

Biosolids cannot be land applied anywhere in Alaska due to levels of Per- and Polyfluoroalkyl Substances (PFAS) that exceed Alaska Department of Environmental Conservation (DEC) standards. It is possible to land apply CBJ's PFAS affected biosolids in Washington or Oregon. However, this method still incurs the majority of the disposal costs - shipping. Plus, those state's long term position on solids containing PFAS is uncertain.

Thermal Treatment (commonly thought of as incineration) –

There are two permitted thermal treatment units in Alaska that are approved to destroy PFAS in contaminated soil. Both of these units are located in Southcentral Alaska. However, the cost to ship the biosolids and then treat them for PFAS is cost prohibitive.

Maximize bulk density (pack it in!) –

Increase the mass of biosolids per shipping container by reducing the amount of pore (i.e. empty) space. CBJ worked with vendors to get quotes for options such as a crusher or pelletizer. The table below contains estimates for these technologies. Either of these options would reduce the number of connex containers that need to be shipped and significantly reduce annual shipping costs. Operational cost increases associated with additional electricity would be minimal.

| Method | Density (lb/ft ³) | Connex/Yr | 2022 Shipping Cost per Connex (\$) | Annual Shipping Cost (\$) | Estimated additional capital cost of option (\$) | Estimated annual shipping savings (\$) | Simple Payback (YR) |
|------------|-------------------------------|-----------|------------------------------------|---------------------------|--|--|---------------------|
| Current | 10 | 340 | 4,201 | 1,428,340 | 0 | 0 | NA |
| Crusher | 25 | 111 | 4,201 | 466,311 | 2,500,000 | 962,029 | 2.5 |
| Pelletizer | 35 | 79 | 4,201 | 331,879 | 4,000,000 | 1,096,461 | 4 |

Increasing the density of the biosolids will immediately decrease our annual operating costs to ship biosolids out of the community and has a very short payback period.

Recommended Action

Move forward with an ordinance to purchase a crusher using \$2,500,000 from the Wastewater Enterprise Fund.