Report to Council

To: Waterworks Committee (New Business)

From: Administration

File #: DOP-CC-15

Date: September 14, 2015

Re: Nutrient Reduction Functional Design Final Report

ISSUES FOR DISCUSSION:
The Wastewater Treatment- Nutrient Reduction Functional Design Report has been completed by AECOM Engineering and requires acceptance.

ALTERNATIVES:
1) Do not accept the functional design final report.
2) Accept the functional design final report as prepared by AECOM Engineering.

BACKGROUND / ANALYSIS:
The Province of Manitoba implemented the Water Quality Standards, Objectives, and Guidelines regulation to limit the concentrations of phosphorous and nitrogen being discharged from wastewater facilities into bodies of water that feed into Lake Winnipeg. The deadline to meet this regulation is January 1, 2018.

On September 24, 2012, AECOM Engineering was hired to conduct the preliminary design, functional design, and environmental impact assessment for the expansion of the Water Pollution Control Facility that is required to meet the wastewater effluent nutrient limits as determined by regulations set out by Manitoba Conservation.

After consultation with industry, it was determined that a centralized facility for nutrient reduction would better service the users, as opposed to several smaller systems located on each industrial site as well as at the WPCF. AECOM identified two technologies; one for nitrogen and one for phosphorous, that provided sufficient load reduction of nutrients to the secondary system while focusing on lower operating costs and satisfying the regulatory requirement for beneficial reuse of nutrients and the reduction of chemical addition, and reducing energy consumption. These systems were piloted in the Spring and Summer of 2014 on incoming industrial loads and produced effluent quality that was deemed acceptable for full scale process design.

There are several components in the final design. This includes the industrial Nitrogen and Phosphorus reduction technologies that were piloted, as well as the chemical addition that is required to further reduce phosphorus and nitrogen loading within the secondary system. Additional new components include a second digester; two storage domes for sludge storage; energy co-generation for reuse of biogas; and tertiary filters. Upgrades to existing systems includes

refurbishment of head works and UV disinfection system; updates to automation systems; as well as installing mixing to the existing digester and sludge storage tanks. A new Bulk Volume Fermenter (or low rate anaerobic reactor, LRAR), the onsite anaerobic pre-treatment facility that is operated by McCain Foods, is also included.

The final cost for the project has been estimated at $106,000,000. This includes 15% engineering allowance and 20% estimating contingency. A complete breakdown is available in Section 11 of the Functional Design Final Report. This section also outlines the expected $1,000,000 increase in annual operation and maintenance costs.

It is anticipated that funding for this project will be secured in early 2016. This will allow for Environmental Proposal Act and licensing to be approved. It is anticipated detailed design will be ongoing throughout 2016, and with tendering for the first phase of construction in 2017. Based on these timelines, construction would commence in 2017 and require 2 years for completion with commissioning. This is displayed in figure 12.1 of the Functional Design Final Report. A request for extension to meet the effluent regulation deadline was granted by Manitoba Conservation extending the compliance date to January 1, 2018; however, this date is not achievable.

The final design report demonstrates a facility that is capable of meeting the nutrient limits as well as using sustainable, biologically dependent technologies as stipulated by Manitoba Conservation regulation. This is achieved while still meeting the City of Portage la Prairie's objective of minimizing ongoing operating costs, and Net Present Value of the Upgrade.

Proposed site layout of WPCF, including new and existing processes.

Administrative Recommendation:
That the Council of the City of Portage la Prairie accept the Wastewater Treatment- Nutrient Reduction Functional Design Report as prepared by AECOM Engineering, dated July 2015.