

## APPLICATION FOR NOTICE OF ALTERATION

### **Sherridon Extended Aeration Sewage Treatment Plant**

LICENCE #2882

Client File #5356.00

### **Description of the Alteration**

New provincial legislation limits the maximum concentration of sewage treatment plant effluent phosphorus to < 1.0 mg/l from provincially owned mechanical wastewater treatment facilities. The two year average monthly sewage treatment plant effluent phosphorus discharge from the Sherridon Extended Aeration Sewage Treatment Plant as at August 2015 is 1.38 mg/l.

Biological Phosphorus Removal (BPR) is possible at this facility under certain operational conditions. Effluent phosphorus levels of < 0.31 mg/l using only BPR methods were almost continuously achieved at this plant from September 2009 until May 2012, after which BPR was less frequently achieved. As effluent phosphorus limits were not in place at the time, no action was taken to restore BPR.

The requested alteration to the operation of the Sherridon Extended Aeration Sewage Treatment Plant treatment plant includes phosphorus reduction by means of chemical precipitation. Chemical precipitation will be used to remove the inorganic forms of phosphate by the addition and mixing of aluminum sulphate into the activated sludge.

The dosage rate required is a function of the phosphorous removal required. In practice, an 80-90% removal rate is achieved at coagulant dosage rates between 50 and 200 mg/l. Aluminium coagulants can adversely affect the microbial population in activated sludge, especially protozoa and rotifers, at dosage rates higher than 150 mg/l. Empirical data from another similar Extended Aeration plant indicates that ammonia reduction by nitrification can also be negatively affected by aluminum sulphate, although a threshold limit has not been established.

The proposed scope of work includes the supply and installation of the following:

1	ALUM METERING PUMP
1	ALUM CHEMICAL STORAGE TANK
1	ALUM SPILL PALLET
1	STEEL DECK PLATFORM TRUCK
1	THREE MONTH SUPPLY OF LIQUID ALUM

1	AMMONIA AWAY METERING PUMP
1	AMMONIA AWAY CHEMICAL STORAGE TANK
1	AMMONIA AWAY SPILL PALLET
1	THREE MONTH SUPPLY OF AMMONIA AWAY
1	SAFETY EQUIPMENT FOR TWO PLANT OPERATORS
1	SHIPPING ALL EQUIPMENT & CHEMICALS TO SITE
1	MECHANICAL & ELECTRICAL INSTALLATION
1	COMMISSIONING OF CHEMICAL DOSING EQUIPMENT
1	INITIAL OPERATOR TRAINING
1	MODIFICATION OF DAILY CHECKLISTS
1	UPDATE MSDS BINDERS
1	UPDATE O & M MANUAL WITH P REMOVAL SECTION
1	FOLLOW-UP SITE VISITS
12	PHOSPHORUS LAB ANALYSIS & SAMPLE SHIPPING

The addition of 50% aluminum sulphate solution to the aeration basin will be automatically controlled. The aluminum sulphate chemical metering pump will operate at the operator selected speed and stroke each time either aeration blower operates. The pump will initially be calibrated to deliver a 50 mg/l dose to the plant, based on the average daily sewage flow and the number of blower cycles per day. The dosage can be increased / decreased as necessary to meet the effluent P target of < 0.5 mg/l. The aluminum sulphate solution pail will hold a maximum of 40 liters, or approximately 26 days of chemical.

A biological additive – “Ammonia Away” will simultaneously be metered into the final clarifier via its own metering pump to counteract the inhibitory effects of the aluminum sulphate on the nitrification process. *“Ammonia Away is a liquid microbial blend of nitrifying microorganisms designed to reduce ammonia in the effluent of wastewater plants. This product can quickly achieve and maintain nitrification. Ammonia Away seeds wastewater systems with the two types of nitrifying bacteria necessary for ammonia conversion.”*

The most significant change in operation of the plant will be the absolutely necessity for consistent waste activated sludge removal and dewatering.

### **Potential Environmental Impacts**

The potential environmental impacts of chemical phosphorus removal include:

Sewage effluent phosphorus limit of <1.0 mg/l will be achieved when proper operational procedures are followed. Failure to follow proper operational procedures could result in either / both effluent phosphorus and effluent ammonia limits being exceeded.

An anticipated increase in waste activated sludge production will require additional sludge removal from the plant and transportation of the additional sludge to the community landfill site.

There are increased operational requirements associated with chemical transportation, chemical handling and chemical storage. Workplace Safety and Health issues could arise if adequate chemical storage and handling procedures are not followed.

The potential for chemical spills is small, as the aluminum sulphate will be delivered in 20 liter pails. The maximum amount of aluminum sulphate on site will be (<10) 20 liter pails.