

New odour control system allows powdered yeast product plant to re-open

By Martin Slepko



When wastewater entered the treatment basin it released sodium selenite, a robust and heavy compound that smells like horseradish and rotten eggs.

Lallemand was founded in Montréal at the end of the 19th century and now develops, produces and markets enriched active/inactive yeast, bacteria and derivatives of micro-organisms for bakeries, wine, beer and other alcohol beverage producers. The company also supplies industries such as animal and human nutrition, pharmaceutical, other food manufacturers and the agriculture industry.

Today, Lallemand is a global leader in yeast and bacteria production, with 26 manufacturing sites throughout the world, employing over 2,800 people.

The company's Bio-Ingredients Division was formed in 1984 to develop value-added products while optimizing the seasonally available extra capacity in the yeast fermentation plants, and to

recover biomass from fermentation. Lallemand Bio-Ingredients purchased an out-of-commission powdered food ingredient facility located in Tara, Ontario.

In 2014, it began to convert the Tara plant to dry food and feed yeast by upgrading the facility's existing equipment. Recruiting staff that had been employed at the plant two years earlier and using local contractors, an engineering team from the Quebec facility brought the once dormant production plant back to life.

Yeast products are made in various forms, including powder, liquid and paste. Functions of inactive yeast and yeast extracts include water-binding, emulsifying, and adding nutritional value such as vitamins D and B-complex. It is a high quality protein that is also used as a taste enhancement. Manufacturing

such a product is done with strict quality compliance for safety and consistency and testing is conducted throughout production, meeting Halal and Kosher certifications.

Drying yeast products is very tedious and the byproduct can be rather odorous. Receiving liquid yeast via tanker trucks from the Montréal facility, the raw material is pumped into a gas box dryer. Gas from the drying process is exhausted to atmosphere. Separated wastewater flows to a 530 m³ treatment basin across the street, at a rate of 12 to 15 litres per minute when the plant is in full operation.

As the plant began operation, the surrounding community began to experience odours and expressed their concerns. One issue was that the plant's odour control system burner did not

have sufficient capacity to treat the drying process's 18,000 cfm exhaust stream. So, Lallemand made plans to increase the burner's capacity by installing additional ports to improve its efficiency. This would also increase exhaust retention time, allowing the retrofitted oxidation equipment more time to achieve its goals.

However, it was soon apparent that the wastewater treatment basin was the major odour source and not the dryer exhaust stack discharge. When wastewater entered the treatment basin, it released aerosolized sodium selenite (Na₂SeO₃). This inorganic compound is robust, very heavy and smells like horseradish and rotten eggs. It can travel long distances, following low lying ground.

By early December 2014, working in partnership with the Municipality of Tara and the local office of the Ministry of the Environment and Climate Change, Lallemand Bio-Ingredients agreed to shut down all production until the problem could be effectively resolved.

With help from an Owen Sound, On-



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tario-based engineering firm specializing in environmental analysis and solutions, a plan was developed to cover the 41 m wide x 19 m oval shaped water basin by constructing a 1.2 m concrete retaining wall with a rigid 9 metre canvas dome. This would trap the aerosolized sodium selenite for treatment by a custom engineered odour abatement technology.

To avoid having to renovate the current wastewater treatment building to

accommodate a chemical scrubber or media absorption device as well as air handling infrastructure, Lallemand chose Odorox® atmospheric hydroxyl generating technology from Hydroxyl Environmental Inc. It has proven to be successful with other wastewater treatment plant applications in Ontario for treating hydrogen sulfide. Since the electron potential of atmospheric hydroxyls

continued overleaf...

CASE STUDY

"Chicken Processor"



ISSUE: Progressive Ontario based chicken processing company expands capacity while surrounded by a rapidly growing urban retail, office and residential population base.

PROBLEM: Birds dressed on conveying systems through stunning, Halal/Kosher, hot water scalding, de-feathering, evisceration and chilling processes create extensive fugitive odors. Community odor complaints escalate, leading to extensive pressure from the Ministry of the Environment.



SOLUTION: After years of installed exhaust air dispersion, misting and masking, enzymes, electronic purifiers, ozone generators, and air scrubbing technologies fail to resolve the problem, an engineered system of Odorox® atmospheric hydroxyl generating units became the successful solution.

OUTCOME: Odor complaints stop and clearance is received by the MOECC. Producer continues to expand production while in harmony with the surrounding community.

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exceeds that of Na_2SeO_3 , this was an odour problem Odorox could also solve.

Odorox hydroxyl generators have been independently tested and scientifically verified. They produce the same steady state levels of atmospheric hydroxyl radicals and other oxidants as the sun's rays in our atmosphere. These oxidants react with volatile organic compounds, water vapour and other chemicals in the air to generate the same mixture of organic byproducts produced in nature.

These byproducts continue to be oxidized until they yield O_2 , CO_2 , H_2O , etc., as found in nature. The technology can be used in occupied spaces as proven through recent independent, FDA compliant toxicology studies, which showed animals exposed to Odorox treated air were no different than unexposed animals.

Based on the economical odour abatement solution that Hydroxyl Environmental offered and the research the client had done investigating the technology, it agreed to move forward with Odorox equipment. All that was needed to accommodate the hydroxyl generators was a concrete pad for an aluminum storage shed, and the retrofit of two simple static ventilation screens. The shed was assembled adjacent to the dome and 9 metres from the current wastewater treatment building, where a 120v dedicated 20 amp service was made available to power the generators, and a single Odorox automation control panel was mounted.

Sitting within the shed on separate elevated aluminum platforms, two MVP14™ hydroxyl generators, each with its own 1,400 cfm blower package, draw clean outdoor air through the static ventilation screens and then blow hydroxyl-rich air through a 35.5 cm cut-out within the dome and shed walls. The 4,757 m³ domed structure created the perfect retention vehicle to allow generated hydroxyl ions to break robust Na_2SeO_3 molecular bonds, thus neutralizing the odour.

Mounted close to the exhaust vent within the dome is a Draeger Polytron 7000 oxidant sensor, which is used by the Odorox controller to adjust hydroxyl production from the generators. This unit measures oxidant concentration and compares it to pre-set limits within the



Hydroxyl generators are housed in a shed adjacent to the treatment basin.



Generators blow hydroxyl rich air into the basin enclosure.

controller. If the hydroxyl oxidant production is measured below the set-point, it is assumed that the generated hydroxyls are being consumed in reactions with odorous compounds and the device receives a signal to maintain hydroxyl production.

Once the measured oxidant level is above a set-point, hydroxyl production is stopped. This results in energy savings and optic life extension over an "always-on" configuration. This automation feature and the ease at which the Odorox system could be connected to Lallemand's internal network was another factor in the company's decision to move forward. Hydroxyl production levels and other system status data are monitored through a web application. This allows engineers and maintenance staff to follow in real time the environmental conditions in the basin dome from their smartphones, or home computers.



In March 2015, Lallemand Bio-Ingredients received approval from the Ontario Ministry of the Environment and Climate Change to restart production. The company is continuing to work with residents of Tara as part of their commitment to eliminating all lingering fugitive odour concerns.

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