PLANT PROFILE

LAKE COUNTRY REVAMP

Wastewater treatment facility responds to unprecedented growth

History:

In 1998, just three years after the municipality's incorporation, the District of Lake Country began the construction of its first municipal wastewater treatment facility. The need for construction of a dedicated facility was due to an increase in community growth and a number of failing septic systems. This project was completed under a public-private-partnership agreement.

Stage 1

The Lake Country WWTP facility is a biological nutrient removal plant originally designed with no primary clarifier. The collection system was designed to equalize flow and the plant only received flow from 200 homes via two lift stations. There were two operators that worked out of a 200 square foot room that functioned as office, lab, lunchroom, washroom and change room. Effluent was discharged from the plant via a subsurface tile field that ran beneath the driveway to the facility.

Stage 2

In 2004, due to an increase in flow from the growing community, the design of a second phase of the treatment plant was undertaken. This phase included a secondary clarifier, conversion of the existing secondary clarifier to a primary clarifier, and the addition of a septage receiving site – to name a few of the upgrades.

By 2004, the number of lift stations throughout the community increased from 2 to 11 and the number of households went from 200 to 2,000. There were also three satellite plants added to the community during this five year period. The plant size almost doubled, but the operator working space had not increased. Shortly after completion of the plant upgrades it was deemed necessary to add a portable trailer to give staff a proper lunch and change room area. Staff at this time had increased to four operators.

Current:

By 2013 the District of Lake Country had seen unprecedented growth. Approval of additional development was dependent on increased capacity in wastewater treatment and Lake Country had to again increase the capacity of the WWTP. Phase 3 of the wastewater treatment facility was a 6.8 million dollar investment that would service Lake Country in the years to come.

Admin Building:

The old facility had one room that functioned as a lab/office, and with the planned upgrades that room was repurposed to become an electrical room. A new detached building was designed to function as a shop, lunchroom, change room, lab and office.

New bioreactor

Stage II - 2006 Aerzen blowers

(2x50HP, 1x25HP not shown)

Polymer make-up and feed

Bioreactor upgrade:

It was determined that the bioreactor was a limiting factor in the treatment process and therefore it needed to be up-sized. An upgraded bioreactor would provide for redundancy and could serve as emergency storage if needed. A mirror copy of the existing bioreactor was built next to the old bioreactor.

Fine Air Diffusion:

Prior to the development of WWTP phase 3, aeration was achieved with mechanical pump style blowers. Not only were these blowers energy inefficient, they were high maintenance and had poor oxygen transfer. Three new high efficiency blowers were installed that reduced aeration power consumption by 75%.

Dewatering/Septage Receiving Site:

The Septage site at the WWTP receives as much as 26,000 USG per day from septic tanks in the Central Okanagan. At times, it has been difficult to store and process the volumes received.

In order to limit disruptions, a second centrifuge was installed along with higher capacity feed pumps, and a fully automated polymer make-up system. These upgrades offer back-up for maintenance, a 25% increase in processing ability, and a reliable and consistent polymer feed that will result in lower overall chemical usage.

Sydex feed pumps and macerator

Foul air/heat recovery unit

Bio-filters

New Pieralisi centrifuge

Foul Air Handling:

Since the existing AHU's were nearing their end of life, an all-new foul air system was put in place.

The main focus of this upgrade was to be energy efficient, so a heat exchange unit was installed to capture and recover some of the heat being lost through the high volume of foul air being discharged.

These upgrades also included an increase in the size to the bio-filters as well as a complete reconditioning of the filter media.

2014

Parameter	Permit	Annual Average
Flow	2.2 MLD	1.28 MLD
Total Soluble Nitrogen	6.0 mg/l	3.75 mg/l
BOD	10 mg/l	<5 mg/l
Ortho-phosphate	1.5 mg/l	0.05 mg/l
TSS	20 mg/l	5 mg/l

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