

Mulhurst Bay Lagoon Expansion Project



*50 Years of Proudly
Serving Our Communities
1958 - 2008*

**PRESENTATION FOR PIGEON LAKE
WATERSHED ASSOCIATION**

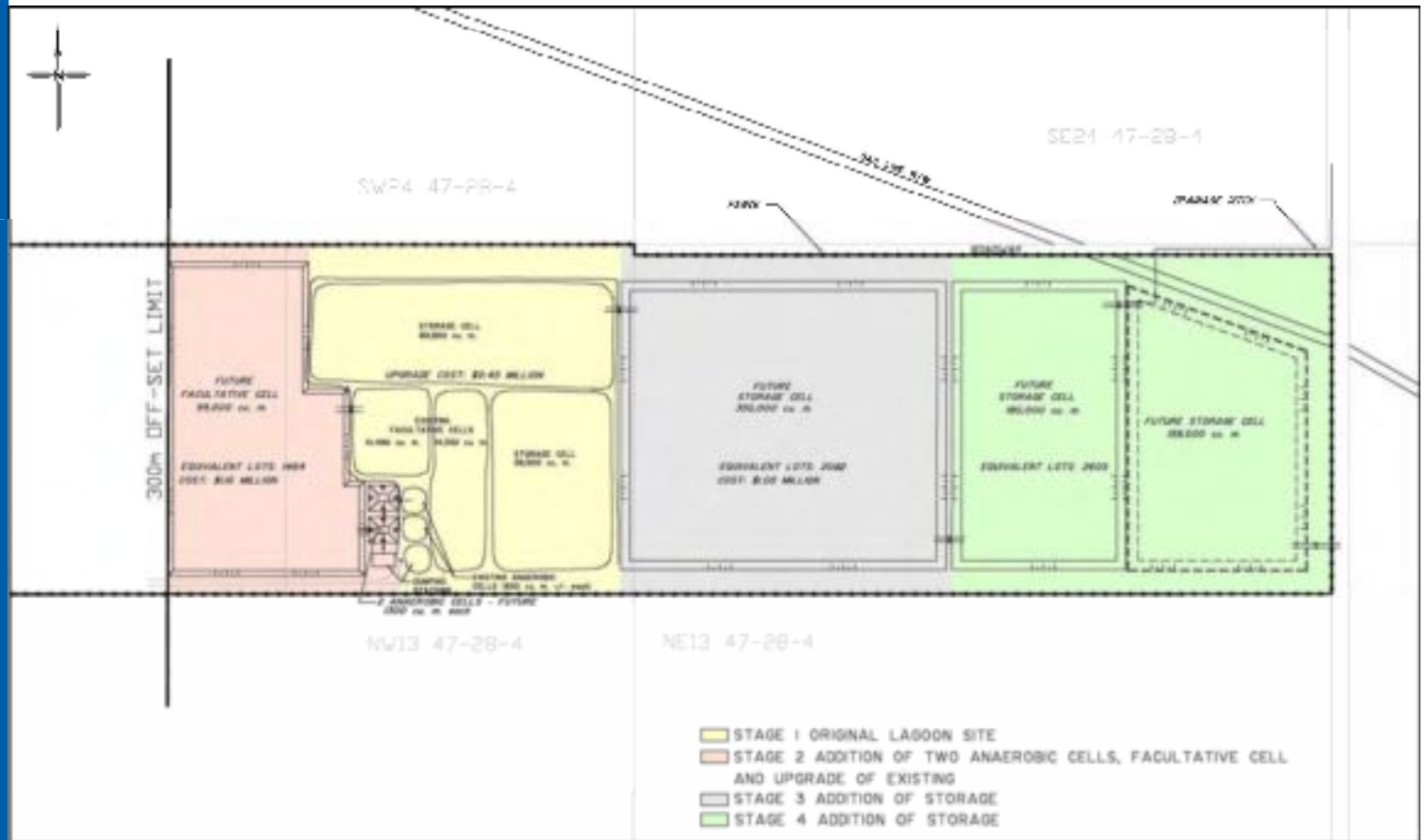
April 12th, 2008

EXH Engineering
Services
Ltd.

History

- The initial waste water collection system was constructed in 1984 by the County of Wetaskiwin to service the Hamlet of Mulhurst.
- In 1987 the system was expanded by the NEPL to include the Summer Villages of : Itaska, Golden Days, Argentia Beach and Silver Beach. This expansion is the system that is presently in place
- In March 2004 a feasibility report on the expansion of the Wastewater Treatment system was prepared for the NEPL that contemplated a phased implementation of an expansion that would meet the project growth requirements of the Pigeon Lake Watershed Area. The expansion included the increasing significant number of truck haul customers.

Staged Strategy of Development



History

- In November of 2004 funding for the first stage of expansion of the Mulhurst Lagoon was applied for under the Alberta Municipal Water/Wastewater Partnership Program.
- In February of 2006, the County of Wetaskiwin and the NEPLRSC received funding approval for the Mulhurst Lagoon expansion project that had been applied for in 2004.
- In December of 2006, EXH Engineering Services Ltd. was engaged to provide engineering services, including design, tendering and contract administration services for the Mulhurst Lagoon expansion project.

Design

The design of the first stage of the expansion of the Mulhurst Lagoon incorporated:

- a 96,000 cubic meter facultative cell
- the reconstruction of the existing 830 cubic meter anaerobic cells to increased capacity of to 1300 cubic meter each.
- two additional 1300 cubic meter anaerobic cells
- two new truck dumping facilities
- an interconnected recirculation system to facilitate the reduction of sludge volumes in the anaerobic cells.

The facultative and anaerobic cells are designed to meet the projected 20 year population growth (based on 2004 population statistics and Provincial growth projections) for the Pigeon Lake watershed area. Upgrades to the existing storage cells and development of future storage cells will be dependant on existing collection, transmission system upgrades and development in the area.

Tender / Contract Award

- The Mulhurst Lagoon Expansion Project was tendered on March 15th, 2007 with a closing date of April 13th 2007.
- Eighteen copies of the contract were sold and 3 addendums were issued. Two bids were received; Iron Horse Earthworks (\$5,533,319) and BYZ Construction Inc. (\$4,144,877).
- The contract was awarded to BYZ Construction Inc. on June 13, 2007 for \$4,144,877. The total value of the project is currently estimated at \$4,404,877.

Construction Site

BYZ Construction mobilized onto site on June 29th 2007 and commenced the stripping and earthworks construction for the facultative cell in the first week of July 2007.



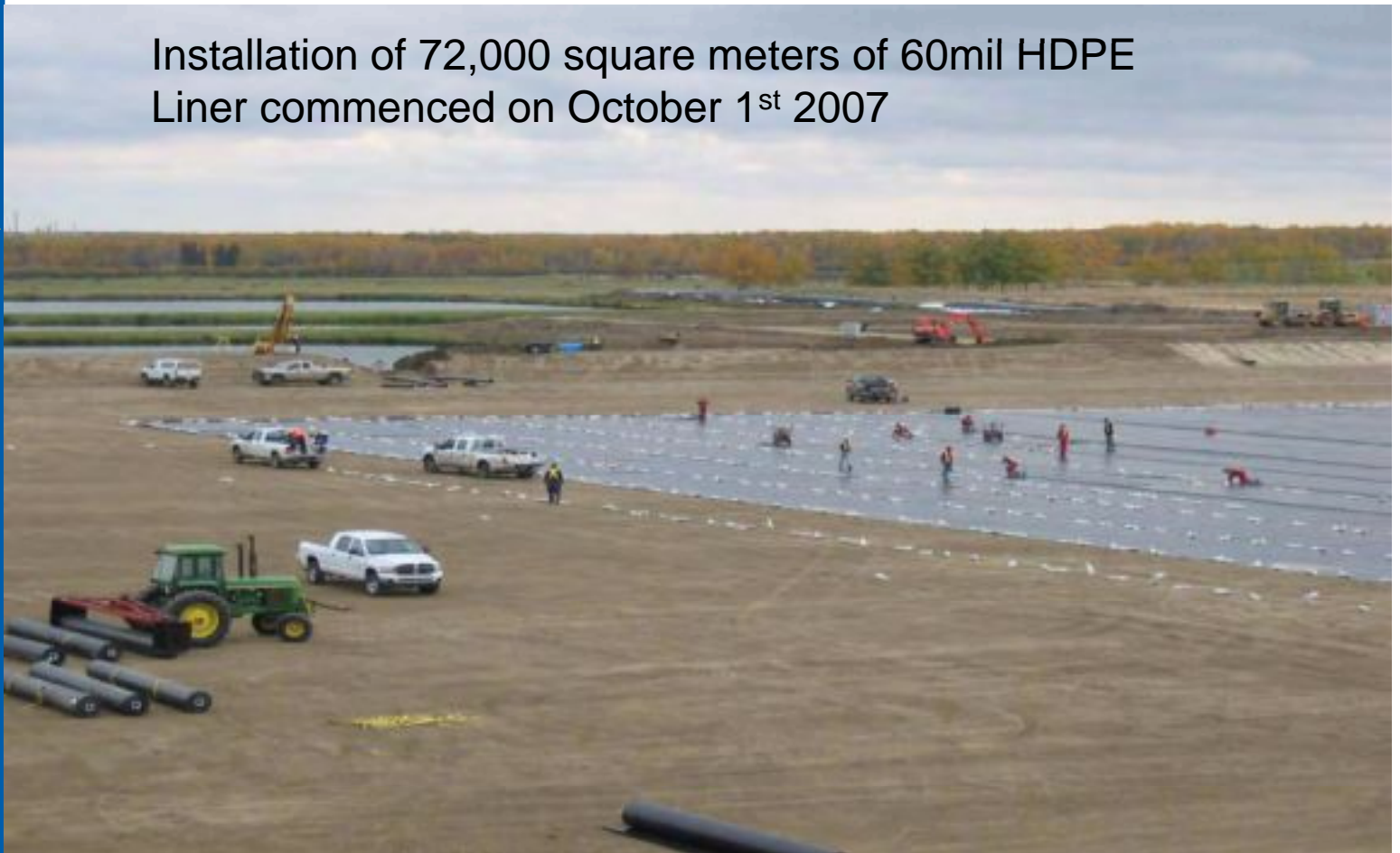
Facultative Cell

136,000 cubic meters of material was excavated to construct the facultative cell



Facultative Cell

Installation of 72,000 square meters of 60mil HDPE
Liner commenced on October 1st 2007



Facultative Cell



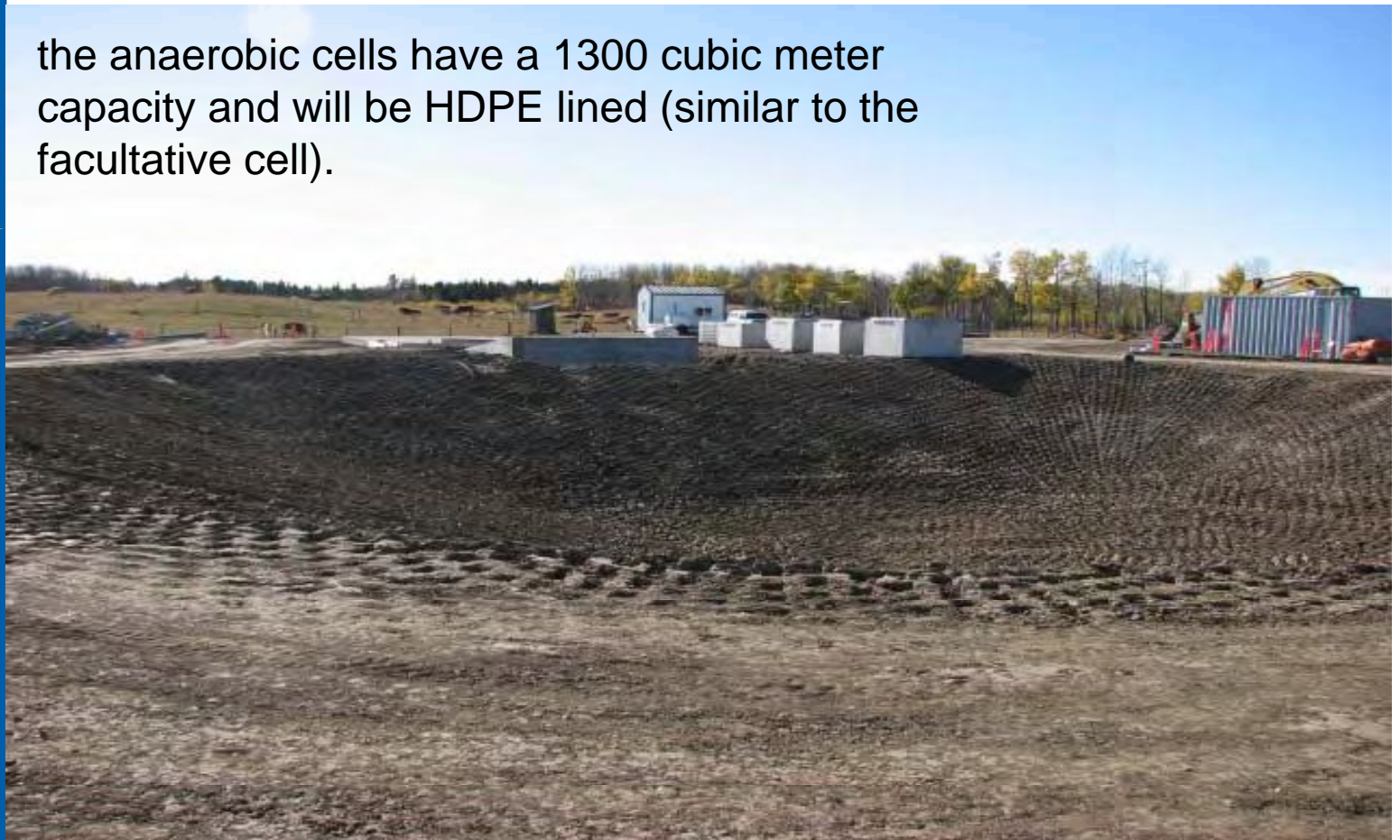
Facultative Cell

the construction of the facultative cell was completed at the end of October and water was pumped back from the storage cell to secure the liner.



Anaerobic Cells

the anaerobic cells have a 1300 cubic meter capacity and will be HDPE lined (similar to the facultative cell).



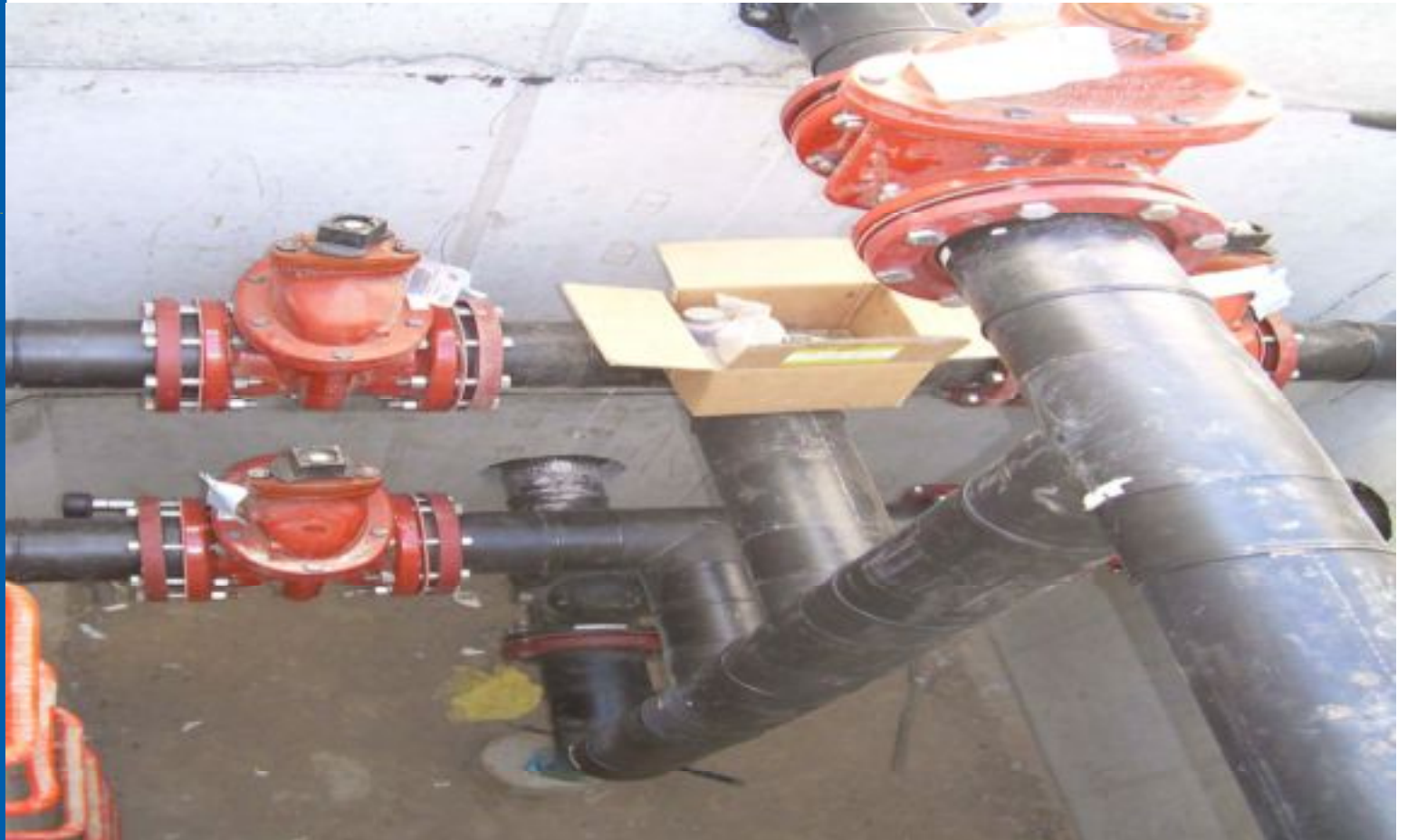
Recirculation System

- To better handle the increased volumes of sludge and septage the design of the anaerobic cells and truck dump incorporate maximum efficiency.
- The four anaerobic cells will be interconnected by piping system that provides a monitored, effective circulation and recirculation of the wastewater.
- The anaerobic cells will be designed to provide an environment that facilitates bacteria growth that will mineralize sludge and reduce sludge volumes up to 70%.

Recirculation System



Recirculation System



Truck Dump Facility

Truck dump facilities are designed to enable the facility operator to monitor quantities and view wastewater prior to be drained into the anaerobic cells.



Geo-tubes

The use of Geo-tubes for Municipal Wastewater treatment in Alberta is an innovative process incorporated into the Mulhurst Lagoon design. The accepted procedure for sludge disposal across Alberta is to land spread. This was not an option for County and NEPL elected officials due to the environmental sensitivity of the Pigeon Lake and Pipestone Creek watersheds.



Geo-Tube the Future

The geo-tubes store the sludge removed from anaerobic cells, dewater and reduces the BOD by 85% to 90%. After a period of time the material from the Geo-tube is transported to a suitable landfill.



Step 1: Filling



Step 2: Dewatering



Step 3: Consolidation

Testing of Ground Water Monitoring Well



Schedule and Timelines

- Construction of the facultative cell, the interconnecting recirculation system and the truck dump facilities are complete.
- The placement of the HDPE Liner in the anaerobic cells is complete.
- Construction of the force main tie-in and truck dump facilities to the anaerobic cells is complete.
- Seasonal deficiencies to be completed in the spring of 2008:
 - Landscaping and seeding
 - Removal of Geo-tube to sanitary landfill
 - Lighting for the truck dump

Mulhurst Bay Lagoon Expansion

Costs

Cost of the current lagoon expansion

■ Contract costs	\$3,768,070
■ Contingent costs	376,807
■ Engineering Costs	<u>260,000</u>
	<u>\$4,404,877</u>

Funding for the expansion

- Funding from Alberta Infrastructure and Transportation	\$3,492,464
- Contribution from County of Wetaskiwin	132,000
- Transfer from NEPLSC reserves	408,664
- Issuance of a debenture	<u>371,749</u>
	<u>\$4,404,877</u>

Mulhurst Bay Lagoon Expansion

Costs

- The total amount of the lagoon expansion not funded by the provincial government is \$912,413. This amount is being paid for by the residents of the County of Wetaskiwin and Summer Villages of Golden Days, Silver Beach, and Argentia Beach as prior contributions or as future debenture payments.
- The debenture will be paid down by increasing current service rates over 25 years.

Wastewater Services Agreement

■ Customers

- Summer Village of Norris Beach
- Summer Village of Crystal Springs
- Summer Village of Poplar Bay
- County of Leduc



■ Agreement Effective Date January 1, 2007

- 5 year term

■ Agreement Highlights

- County of Wetaskiwin/NEPL will accept wastewater from customers
- Customers will pay for the operational costs for the "Truck Dumping Station" only
- Capital costs for the lagoon and improvements including the "Truck Dumping Station" have been born by the County of Wetaskiwin and NEPL

Summary

- The County of Wetaskiwin and NEPL have been proactive in the protection of Pigeon Lake by constructing state of the art waste treatment facilities with the following features:
 - The lagoon is fully staffed during operating hours (open 7 days a week in summer)
 - HDPE Liners
 - Truck dump with recirculation system
 - Geo-tube treatment and disposal of sludge
 - Ground water monitoring wells
 - Environmental insurance.
- The County of Wetaskiwin and NEPL work closely with Alberta Environment to ensure that all standards are met.
- The County and NEPL are currently undergoing a professional review of the waste collection and treatment systems as part of our ongoing commitment to a well maintained system.