

SUMMER 2017 CONNECTION



Sean Furey with his fishing buddy and grandson.

Hello Neighbours and Friends,

You'll notice a common theme in this edition – trees! From our research on mixing sawdust into our fuel mix, reforestation and reclamation projects at the Genesee Mine, to celebrating Canada's 150th with a tree planting event in Warburg, Capital Power is having a "tree-mendous" start to the year.

Have a safe and happy summer!

Sincerely,

SEAN FUREY, Plant Manager
Genesee Generating Station, Capital Power

Tree Canada Planting in Warburg

Despite a cool and wet day on June 10, Capital Power employees and their families along with community members planted a forest in Warburg. Community volunteers included the Village Deputy Mayor, Councillors, CAO and local Girl Guides and their families.

Equipped with shovels and rubber boots, 74 eager volunteers helped plant 450 trees in less than an hour. The planting area, previously an empty field, is now full of 21 different varieties of trees and shrubs, including: bur oak, peach-leaf willow, balsam poplar, mountain alder, white spruce, pussy willow, wild rose and two Lodgepole pines, Alberta's provincial tree.

"Our Capital Power employees and their families are proud to work together to leave a legacy of Canada's 150th for the community to enjoy," remarked Darcy Trufyn, SVP Operations, Engineering and Construction. "We look forward to watching the forest grow and thrive in the coming years."

After cleaning up and drying off, everyone was treated to a BBQ lunch by Maureen's Desserts at the Warburg Seniors Centre.

See inside page for more photos from the event.

Forestation Activities at Genesee Mine

12,000 PINE TREES PLANTED

Since 2008, reclamation activities at the Genesee Mine have included significant efforts to re-establish forested areas as part of Genesee's license commitments.

This spring, our forestry consultant, Chickadee Reclamation planted approximately 12,000 pine trees on four hectares of land consisting of sandy subsoil. Pine, while not common, is present in the Genesee area. This is the first significant forestry work that has been done using the mine lands.

The location should provide excellent growing conditions for the trees. This project is unique in that the trees will be planted into mineral subsoil without the placement of topsoil. Pine do well on mineral soils, and the addition of topsoil would introduce competitive weed species that would affect tree growth.



Members of Chickadee Reclamation planting several of the 12,000 pine trees in spring.

NAIT RESEARCH PLOT

Capital Power partnered with NAIT's Boreal Research Institute to conduct reforestation research activities at the Genesee Mine to determine native plant species that can be planted along with tree seedlings.

The multi-year project kicked-off in 2016 with greenhouse trials at NAIT's Peace River research facility, and focused on methods to effectively spread root material of desirable native plant species. The companion plants would be beneficial to the trees by reducing competition from invasive agricultural weeds, while introducing native species early to create a natural ecosystem.



NAIT students proudly stand amongst their research (L-R: Molly Bannister, Trish Hiley, Amanda Schoonmaker, Taylor Lund).

Genesee Mine Receives Reclamation Certificates

Capital Power and Westmoreland Coal are proud to celebrate a significant milestone in 2016: final reclamation certificates from the Alberta Energy Regulator (AER) on 983 acres (398 hectares) of reclaimed land in the Genesee Mine, bringing the total reclamation certified lands to 1,081 acres (437 hectares).

The certificates confirm Capital Power's mine reclamation initiatives leave the land in equal to or better than condition than before mining. Included in the certified lands are Capital Power's first reforested area.

Hands-on Learning Opportunity for U of A Land Reclamation Students

In early February, a group of 13 land reclamation students from the University of Alberta visited the Genesee Mine as part of a class project that required the development of a realistic, forward thinking, creative land reclamation plan.

Not unlike Capital Power's reclamation plans, the student's vision for the end land use was to reclaim the area to agricultural crop land, a reforested natural area and a constructed wetland, and promote positive relationships with surrounding community members by incorporating public concerns, feedback, needs and desires.



U of A reclamation students in front of a retired dragline bucket in the west field, south of Genesee Station.



Innovative Biomass Co-Firing Research at Genesee Produces Positive Results



Capital Power is working to implement biomass co-firing at Genesee on a permanent basis. The Alberta forest sector currently produces significant amounts of wood waste that otherwise do not have a productive end use.



Wood waste from the Alberta forest sector is often incinerated, or left to decompose. Genesee has the potential to turn these clean waste materials into renewable electricity.



During the testing, Capital Power was able to feed 10% biomass into the Genesee 1 power boiler, producing 40 megawatts, enough renewable electricity to supply 40,000 homes.

INCREASING DIVERSITY OF FUEL MIX

Over the past year, Capital Power has been actively exploring and researching opportunities to use biomass as a future supplemental fuel source at Genesee Station.

Biomass co-firing is a viable way for Capital Power to use a renewable fuel source, while continuing to provide reliable base-load power. Mixing biomass into the fuel at Genesee may reduce coal usage by up to 30% of Genesee 1 & 2. This would increase the diversity of the fuel mix, and decrease the costs related to the new Carbon Competitiveness Regulation, effective in 2018.

CO-FIRING TESTS LAST FALL

In September and October 2016, Capital Power conducted four days of testing, involving the addition of wood biomass (i.e. sawdust) into the fuel stream of Genesee 1, while co-firing with coal. This marked the first successful Canadian test of this magnitude completed with co-firing wood biomass and coal at a pulverized coal generating station.

Through the testing, Capital Power gained valuable information on how to optimize design and operations for use of wood biomass at Genesee. The test verified that it would be technically feasible to implement a biomass fuel co-firing system for sustained, long-term operation at Genesee. A permanent 15% biomass co-firing system could reduce CO₂ emissions from coal by approximately 400,000 tonnes per year.

CLRA Field trip to Genesee Mine

On June 28, Capital Power and Westmoreland Coal hosted a tour for the Canadian Land Reclamation Association, an organization that encourages personal and corporate involvement where reclamation or rehabilitation of disturbed lands is planned or implemented.

Since 2008, the mine has developed reforestation plans on reclaimed mine lands that would have normally been directed into agricultural production. Part of the tour compared reclaimed sites at varying stages of vegetation growth: one with a man-made lake and trees planted a few years ago versus a site with trees planted in May of this year.

"Participants were interested in the types of trees selected, how they were responding to their environment, and which methods worked best for specific types of trees," stated Land Services Manager George Greenhough.

Initially, the U of A – and now currently NAIT's Boreal Research Institute – along with Chickadee Reclamation Service, have played a very active role in the reforestation initiatives. Many tree establishment techniques have been tried and the operation is seeing significant results towards reforestation goals.

CLRA Field trip to Genesee Mine (cont.)



Tour participants gather in front of the Genesee Hall.



Forester Ekhart Marenholtz and Land Services Manager George Greenhough walk through Capital Power and Westmoreland's forestation program on Genesee reclaimed land.

G4/5 UPDATE

Preparatory site work continues this summer for the proposed Genesee 4 and 5 Project. Continuation and timing of the project will be considered once more Alberta market structure certainty exists and new generation is required to balance supply and demand.

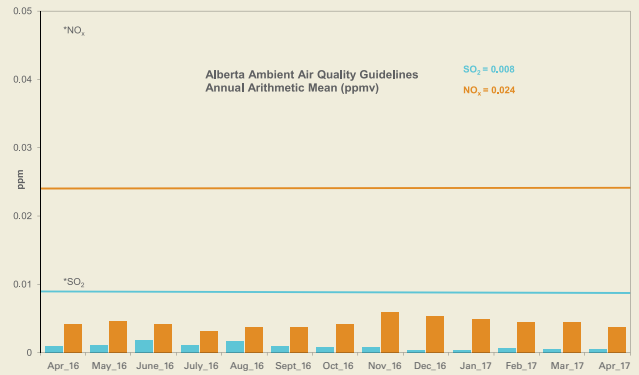
Genesee Station Environmental Performance

The following graphs show the most recent environmental performance results:

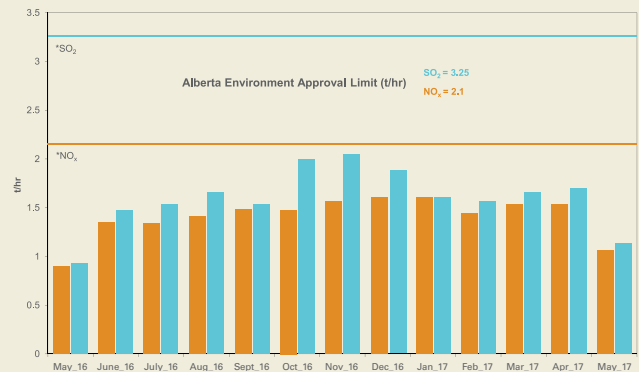
- ▢ Ambient air quality as measured by the Genesee ambient air monitoring trailer;
- ▢ Stack emissions for stack one (for generating units 1 and 2);
- ▢ Stack emissions for stack two (for generating unit 3).

Measurements are compared to guidelines and approval limits set by Alberta Environment. Genesee continues to operate below maximum levels set for ambient air quality and stack approval limits.

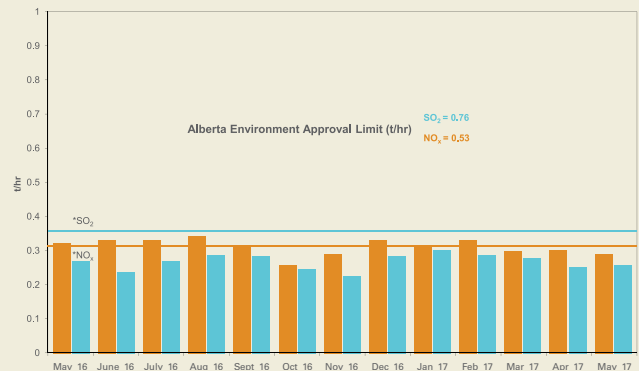
AMBIENT EMISSION LEVELS



G1/2 EMISSION LEVELS



G3 EMISSION LEVELS



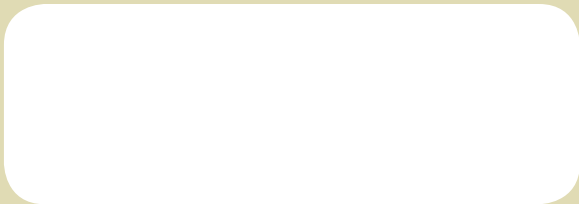
***Sulphur Dioxide (SO₂):** a strong smelling, colourless gas that is formed by the combustion of fossil fuels. In high concentrations, SO₂ is known to be harmful to vegetation and human health. SO₂ is soluble in water and excessive levels can lead to sulfuric acid deposition or acid rain.

Nitrogen Oxides (NO_x): the term used to describe NO (nitrogen oxide), NO₂ (nitrogen dioxide) and other nitrogen oxides. The major sources of man-made NO_x are high-temperature combustion processes, such as those occurring in automobiles and power plants. When concentration is high, NO_x is of concern because it contributes to ground-level ozone or smog. Genesee 3 approval limits are based on a 720 hour rolling average.

Note: All results are converted to reference standard conditions to be comparable to other coal fired plants in Alberta and elsewhere, and are dry concentrations corrected to 50% excess air; ppm: parts per million. An example of the quantity of Sulphur Dioxide and Nitrogen Oxides measured at ambient air sites in parts per million would be equal to approximately 1/100th of a grain of salt per breath of air. G3 has separate approval limits from G1 and G2 for its stack emissions. G3 approval limits are in terms of a mass emission rate (i.e. tonnes per hour). To be consistent for all units, we have shown G1 and G2 emissions and limits in tonnes /hour as well.

Effective February 1, 2016, new G3 permit levels have decreased sulfur dioxide limits from 0.76 t/hr to 0.36 t/hr [on a monthly (i.e. 720 hour) rolling average] and decreased NO_x from 0.54 t/hr to 0.31 t/hr [on a monthly (i.e. 720 hour) rolling average].

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WHAT IS IMPORTANT TO YOU?

If you have an idea or suggestion for the Genesee Connection Newsletter, contact Community Engagement and help us continue to provide relevant information of interest to you.

GENESEEE CONTACT INFORMATION

If you have questions or comments about our operations, community engagement or our land management practices, please feel free to contact us.

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Capital Power Website
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