Remediation ***Continued***

Perhaps the most efficient tool in the effort to clean the site of contamination is the "pump and treat" groundwater system consisting of an underground web of pipes and conduits throughout the affected property that carry groundwater from underground wells to the Groundwater Treatment Plant (GWTP). Newly built and opened in 2012, the GWTP extracts and treats up to 58,000 gallons of groundwater and surface water every day, 24/7, after which the cleaned water is discharged under permit.

The remediation process is deliberately methodical, beginning with extensive soil and groundwater sampling to prepare remediation design plans. After each area was fully excavated, impacted soils were shipped by rail to appropriate licensed landfills, and clean soil was brought to the site to restore and groom those areas with new vegetation.

The cycle begins anew with one eye cast on the winter weather and the other hoping for an early spring when work will commence on final restoration at Landfill 1 and the wetland near the Southern Cove. With Phase 1 of the Plant Area remediation now complete, site workers will focus on Phase 2 in that area and spend the balance of 2019 completing that work and final restoration of the site.

The 2019 calendar will be mostly filled by work on the Plant Area where chemical manufacturing occurred. Part of that area has now been restored, as seen in the above photo.

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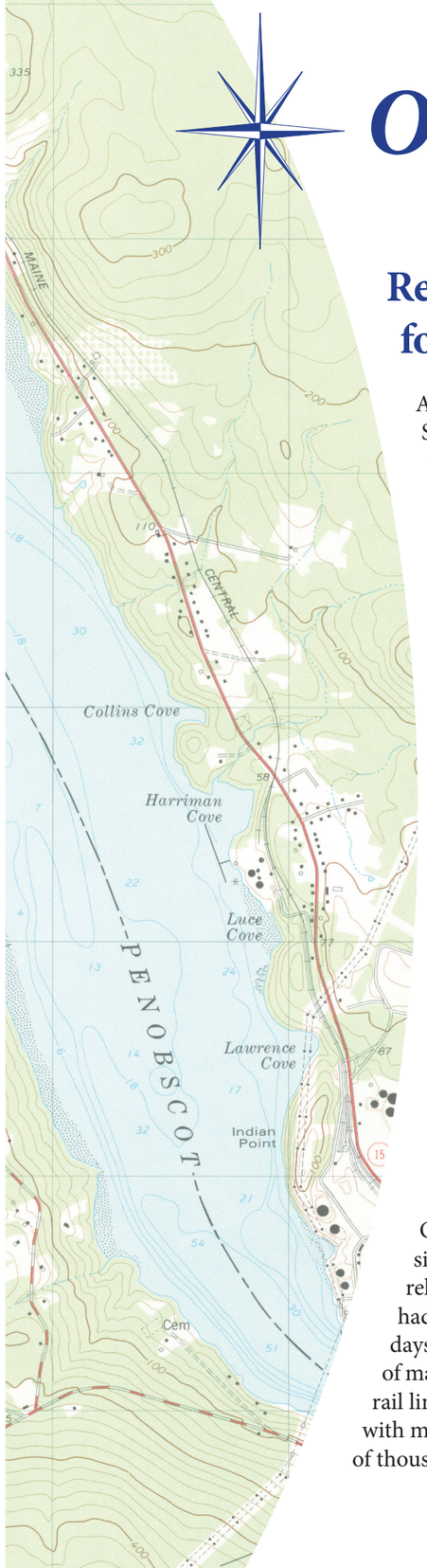

On the Penobscot

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Remediation of HoltraChem site in 2019 focused on former manufacturing plant area

As the fifth year of environmental remediation work at the former HoltraChem Site got underway in 2019, engineering consultants and site workers focused the next phase of their work on the site area where it all began more than 50 years ago: The manufacturing plant area where chemicals to support Maine's pulp and paper industry were produced during the 33 years the plant was in operation.

Once the state's largest producer of chlorine and other chemical products used in the paper industry, the plant has sat idle since it was closed in 2000. Mallinckrodt US LLC, a successor to one of the former owners has sole responsibility for remediating and restoring the site. Mallinckrodt began a methodical process of dismantling and removing more than a dozen buildings and other site structures in 2003 under oversight of the Maine DEP. Mallinckrodt also commissioned the design and construction of a new groundwater treatment plant (GWTP) which began operation in 2012. The additional capacity designed into the new GWTP ensures that it will be capable of treating all ground and surface waters pumped into it from the Site.

The final phases of remediation were begun five years ago after Mallinckrodt reached agreement with the Maine Department of Environmental Protection to remove soils over the cleanup criteria, remove two landfills and recap three others.

The site of what had been Landfill 2 on the former HoltraChem plant now appears as a meadow after the landfill was excavated and its soil replaced with new soil and new vegetation.

One of the first tasks of the site-wide remediation was rehabilitating a railroad spur that had fallen into disrepair from its days as the major source of transport of materials to and from the plant. That rail line has been at the heart of the soil excavation and removal operation at the Site with most of the materials being transported offsite by rail, without the disruptive use of thousands of trucks on local streets.

Remediation ***Continued on back page***

Report Card on Remediation Activities

Eight of the nine major areas for remediation have been completed and Phase 1 of the remaining Plant Area will also be complete by the time this newsletter reaches your mailbox. The status of those areas are as follows:

- ✓ Landfill Ridge Area excavation and restoration complete, Closure Report (Feb 2017) accepted by DEP in Aug 2017.
- ✓ Landfill 2 excavation and restoration complete, Closure Report (Dec 2017) approval by DEP Jul 2018
- ✓ Landfills 3, 4 and 5 three new caps installed, Closure Report (Jul 2017) accepted by DEP Oct 2017
- ✓ Scrap Metal Yard excavation and restoration complete, Closure Report (Jul 2017) accepted by DEP Oct 2017
- ✓ Southerly Stream excavated and restoration complete, Closure Report (Nov 2017) approved by DEP Oct 2018
- ✓ Northern Drainage Ditch excavation and restoration complete except in limited area used as part of Landfill1 / Plant Area work, Closure Report (Nov 2017) approved by DEP Oct 2018
- ✓ Southern Cove removal of impacted sediments and restoration of wetland areas complete, Closure Report (Jan 2018) approved by DEP Aug 2018
- ✓ Landfill 1 excavation complete and restoration underway, Closure Report to be submitted in January 2019
- ✓ Plant Area Phase 1 excavation complete and restoration underway, Phase 2 approach presented to DEP in December, design to be submitted in January 2019

The fall weather was ideal last October as site workers backfilled the area where Landfill 1 was located with clean soil before it was then groomed and readied for new vegation.

Workers replanting and restoring the vegetation along the shore at the Southern Cove of the Penobscot River during low tide.

By the Numbers

The successful and safe remediation of the former HoltraChem plant has required a methodical and precisely planned approach involving highly trained and experienced engineering firms from Maine and New England. The project has required the use of large earth-moving machinery, a specially-designed dredging barge, thousands of soil and groundwater samples and transportation logistics to multiple off-site approved landfills. Some of the statistics for the completed work as of December 30, 2018 include:

- Pounds of aluminum, brass, copper recycled: 8,005
- Tons of scrap metal removed during demolition and dismantling: 993
- Gallons of water (groundwater, surface water and construction water) treated in the new Groundwater Treatment Plant: 85,048,266
- Number of compliance samples collected for treated water: 992
- Predesign samples collected to develop design plans: 8419
- Confirmation samples collected to confirm remediation was complete: 871
- Square feet of new landfill caps installed: 106,000
- Number of rail cars used to ship soil offsite to secure landfills: over 2863
- Tons of soil disposed in offsite secure landfills: over 280,000
- Donuts, sandwiches and pizzas ordered at Dunkin Donuts, Freshies and Pizzaland at Snows Corner? A lot!

One of the big numbers driving the remediation is the amount soil excavated and hauled off site for safe disposal. The cycle begins with extensive soil and water analysis and then moves on to excavation, disposal, back filling with new soil and then vegetating the area with new grass and plant life. The photos above (top left and clockwise) show that cycle with the Southerly Stream and the Scrap Metal Yard in before and after photos.