

Cooling Water

The McNeil site is approximately 1 mile from Lake Champlain. During the design phase, analyses were done to compare obtaining cooling water for the station from Lake Champlain versus an onsite cooling tower. Economically, the options were very close. A cooling tower was selected primarily for environmental considerations. A two-cell mechanical draft counter flow cooling tower was purchased from Research Cottrell. The tower handles a cooling water flow of 44,000 gpm and a 71°F ambient wetbulb temperature for thermal design conditions.

Ash Removal

Flue gas is cleaned via a bank of cyclones and an ESP. Combined particulate removal efficiency is about 99.9%, and particulate emissions are typically about 0.0007 gr/dscf. The unit generates approximately 5000 t/yr of ash; approximately 10% of this ash comes from the bottom ash pit. The cyclones capture 65% and the ESP accounts for the remaining 25%. The ash is mixed with agricultural-grade limestone and used as a soil conditioner for farmlands.

Fuel System

The on-site processing of wood is limited to magnetic separation of tramp metal and grinding of oversized wood feed. Fuel chips are stored in an open pile (~30 days supply, ~7 acres), fed by conveyor belt through an electromagnet and a disk screen, then fed to the surge bins above the boiler by belt conveyors. From the surge bins the fuel is metered into the boiler's pneumatic stokers by augers.

Staffing

McNeil Station has a full-time staff of 39 employees, including four foresters and 20 operators.

Fuels

An average of 70% of the wood fuel used by the plant consists of whole tree chips from low-quality trees and harvest residues that are cut and chipped in the forest, and transported by trailer truck to the station or to a railcar loading site in Swanton, Vermont. Wood chips may be obtained from any forestland where low quality trees are found. Most of these wood lots are privately owned, although timber is also purchased from large land holding companies, wood product manufacturers, and wood sales on public lands.

Approximately 25% of McNeil's wood requirements are met by sawmill residues. Mill chips and bark are purchased from local sawmills. The amounts of sawdust and mill residues burned at the McNeil plant have increased in recent years, with the reduced number of Vermont farms that use sawdust for bedding material. The McNeil plant also receives approximately 5% of the fuel requirements in the form of clean urban wood waste from the surrounding area.

Approximately 60% of the wood used by the station is hardwood and 40% is softwood. Approximately two-thirds of the wood supply comes from Vermont; the balance comes from New York, Quebec, and occasionally from New Hampshire and even Massachusetts. The McNeil Station also has a trial onsite plantation where short rotation energy crops are grown as future fuel for the McNeil Station.