Bull HN Information Systems, Inc. is a privately-held subsidiary of Honeywell, NEC, and Groupe Bull. Bull makes printed circuit boards that are used in its parents' hardware. In 1988, the Brighton facility made 217,000 circuit boards.

Brighton's products have changed since 1980, when the company made primarily two sided boards. Now they manufacture boards that are twenty layers thick, with each layer manufactured in the same manner as the two sided board of 1980, in effect increasing production twentyfold. The layered board is more expensive to make, as the processes must be more finely controlled, production mistakes have greater ramifications, and the prices of energy, labor, and water have increased. In addition, the boards are now made with water based solvents rather than chemical based solvents, as they were in 1980. Because the industry has become very competitive and is rapidly changing, Bull wants to cut down on all resources by using them more carefully. Water conservation programs and waste minimization are an integral part of Bull's cost control program.

Bull tracks its water use carefully and accurately. The company meters all its process water and water going to cooling towers and boilers. Meters are read daily and use is tracked on a spreadsheet.

Water used for plating process lines is controlled on several different levels. First, water is manually shut off on processes which do not yet have automatic shutdown controls. All other machines have been fitted with automatic control valves so that the flow of water is turned off with the machine. On some equipment, water sources have been interconnected with product carriages so that water flows only when product is being processed. The cost of these measures was approximately $3000, and the amount of water saved is 20,000,000 gallons per year.

Water filtration, done at three different points in the operations, is the key to Bull's high level of water recycling. Like many electroplaters, Bull operates a series of water filtration systems to control the quality of incoming process water and to treat process effluent as required by waste treatment regulations. Filtration of effluent through carbon filters with a polishing step for deionization enables Bull to return approximately 19,000 gallons per day to the process and
approximately 2 million gallons per day to the cooling tower as make up. As the effluent had to be treated in order to meet discharge requirements, the cost of adding piping, pumps, and controls to refine the water further was only $30,000, while the additional water savings are an impressive 30,000,000 gallons per year.

Bull also operates a more unusual filtration system, one designed primarily for the removal of organic chemicals from groundwater under the plant. This system has been leased over a five year period at a cost of $60,000, and installed for $35,000, in anticipation of groundwater remediation requirements, and was put to immediate use treating seepage from basement footing drains and adding it to the cooling tower at a rate of five gallons per minute. The system runs water through a particle filter, then the water is given ultraviolet treatment. Next it is given ozone treatment, then run through a carbon filter. This system could also treat rainwater collected from the building drains, which is estimated to yield an additional five million gallons per year.

Bull has changed its two once through cooling towers to closed loop towers in order to recirculate a total of 3200 gallons per minute. The towers cool plating rectifiers, air compressors, chillers, etchers, solvent stills, developers, strippers, lamination presses, and other equipment. If all the machines that are currently on the system were still using once through water, Bull would find itself using 663,000,000 gallons per year more than it currently does. Most of the building's air conditioners are air cooled by this system, and waste heat is recycled to provide most of the building's space heat. A small air compressor has been connected to the cooling tower water recycling system, which will save 1,900,000 gallons per year. The cooling towers are equipped with automatic blowdown and chemical addition controls, reducing blowdown volume by 90% and saving 2,680,000 gallons per year.

Automated controls have been installed on fume scrubbers on all processes, saving an estimated 10,500,000 gallons per year. In addition, a water recycling tank and pump systems have been installed on two fume scrubbers serving the Black oxide area, saving an additional 5,250,000 gallons per year. These two measures have brought the water use for all ten fume scrubbers from a total of approximately 72 gallons per minute to about one gallon per minute. The cost of conservation measures was $5,600.

Bull in Brighton has been so successful in its conservation efforts that when the parent companies studied which Bull sites to expand, Bull/Brighton was chosen, even over very conservation minded facilities such as one in Arizona. Bull/Brighton has taken over several operations from the Arizona facility, and has inherited another process from Lawrence.