

WESTERN HEALTH'S ENVIRONMENTAL STEWARDSHIP PROGRAM



Western
Health

Intent

Western Health not only fosters the highest level of care to the patients/residents/clients that it serves, but also is a leader and promoter in an environmental stewardship program. In particular the program consists of pollution prevention, environmental education, and voluntary programs.

Pollution and Waste Prevention

Pollution and waste prevention initiatives have been ongoing within the organization since 2002 through to the present and continuing into the foreseeable future. Notably the initiatives help to reduce: criteria air pollutants, energy consumption (fuel and electrical utility), land waste products, water consumption and overall negative impact on our ecosystem. Actual data as it relates to the initial capital cost, reduced consumption of electrical/fuel utility and the net difference of generated emissions can be seen in appendix A. The intention is to improve environmental quality and provide positive sustainable outcomes for our local and global community. Furthermore, another important attribute to highlight during the positive reduction of harmful emissions/waste production is that the level of patient/clients/resident care is increased because the provision of the systems and equipment is reliable, efficient and effective.

The focus up to the present was on the facility that had the greatest impact which happens to be Western Memorial Regional Hospital. Located in the city of Corner Brook, Newfoundland and Labrador, the facility was originally designed and constructed in the late 1940's. The other significant addition was designed and constructed in the late 1970's. Since this time there have been many changes in technology as it relates to building systems/components and process equipment efficiency and effectiveness.

Some of the technology if it existed was very basic. A great example of this was the building management automated control system. The original program that operated large capacity building systems and components were controlled by a physically inscribed ribbon and tape. Today our building automated management system (direct digital controllers) can signify in real time the process parameters like temperature, pressure, actuator position, airflow, etc to provide intelligent, self-learning, accurate and precise proportional, integral and directive control (PID); ensuring minimal deviation from the desired control setpoint. This helps to reduce excess electrical and fuel utility consumption and better satisfy the comfort requirements of our patients/residents/clients and staff. Night and weekend setback control is also enabled in non-occupied areas; eliminating the need to generate unnecessary energy. Outside reset control is another feature that will manipulate the setpoint of the perimeter hydronic heating system as outside air temperature changes. For example, if the outside air temperature is cold, then the temperature setpoint will be increased, and vice versa. Furthermore, the parameters can be monitored and historically stored for efficiency analysis and decision making processes; especially through benchmarking and continuous improvement.

Several equipment changes further reduce utility consumption and hence emission generation. Original lamps and ballast in the facility were changed from T12 to T8 with electronic ballast. Also, incandescent lamps were replaced with compact fluorescent and reflectors installed in all lighting fixtures. Approximately 200 patient overhead lights were replaced with a modern T5 fixture. All lighting changes helped to provide increased lighting for patients/clients/residents, visitors, staff and doctor's examination at reduced energy consumption/reduced carbon emissions. In addition, two steam absorption chillers were replaced with rotary and centripetal refrigerant chillers to reduce energy consumption. This was provided by optimizing a load sharing control depending on the facilities demand with variable speed chilled water pumps and four staging water pump control on each of the two Baltimore Air Coil (BAC) condenser towers. Furthermore, this reduction of steam demand helped lead to our conventional fire tube steam boilers being replaced with efficiently sized water tube steam generators. A significant retrofit of multiple large piece 500 lb washers was replaced with an automated laundry processing plant. The washers enable batch washing with 100 % heat transfer via direct steam injection and recycling of the cleanest water into the less clean chamber of the seven chamber unit. Another great aspect of the process is that a hydraulic press helps to remove significant amounts of water to enable shorter drying times. The clothes are then delivered to the four dryers via an automated shuttle. Overall the increased recovery of energy efficient equipment provided a further decrease production of pollution and waste while providing the patients/clients/residents with an increased level of care through the services provided.

Reduction of water consumption was achieved by eliminating unnecessary boiler water makeup, removal of water cooled condensers for the kitchen coolers/freezers, and by replacing a medial vacuum and medial air water driven pump seal with models requiring none.

It was typical for the boiler plant to consume up to 13,000 imperial gallons per day during heating season and 9,000 imperial gallons per day during cooling season. Now typical water consumption in the heating season is about 1,200 imperial gallons and 800 imperial gallons during cooling season. This was achieved by waste reduction and optimization of steam and condensate distribution. Some of the activities that made this possible was the repair of several hundred steam traps that were either passing to drain or venting into the atmosphere. Ensuring that steam quality (dryness) was increased from approximately a 70% range into an approximately range of 95% through proper and frequent boiler maintenance (combustion calibration, boiler blowdown, chemical treatment, and general component repair/replacement) along with improvements to user equipment/end processes, steam and condensate distribution loops. This means reducing dead end lines at end of process loops, supplying appropriate steam pressure and temperatures necessary for the end user while making sure steam can be distributed as efficiently as possible with as much as the condensate returning to be reprocessed. The increase in steam quality also ensures that more energy was removed by the heating process through latent phase change versus a less desired sensible heat transfer. Another major change was optimizing the secondary air intake for the boiler system. Approximately 500 boiler horse power is dedicated to the heating of supply air, hydronic

systems, and domestic hot water. The secondary air originally used was 100% outside air, therefore as the demand on the heating boiler increased with decreasing outside air temperature the adverse effect was a decreasing boiler efficiency. Now 100% of the air is taken from the top of the boiler room ceiling where all the hot air resides. The boiler room intake air temperature is approximately a constant 50 degrees Celsius versus outside air, which at times could be as low as minus 20 degrees Celsius. This change allows the full steam production capacity to be reached and aid in reducing water consumption and uneasy energy consumption. One more major attribute that dramatically reduced the pollutants released to the environment was the change from burning number 6 crude oil with ultra low number 2 light distillate diesel fuel.

Eliminating water from both coolers/freezers and the medical vacuum/air systems not only provides a means of discontinuing unnecessary water consumption, but provides a system that can continue functioning if water utility is compromised. Once again this shows Western Health's forward thinking in preserving the environment and placing pinnacle precedence on patient/clients/resident's health care.

Land waste products have been reduced notably through reduction of paper usage with technological developments in computer and electronic equipment/availability, recycling programs (reduce/reuse/recycle) and by kitchen services ability to decrease waste products to landfill with newly installed process handling equipment.

Computers have been made widely available to staff throughout the organization. This allows correspondences like memorandums to be view electronically versus having to produce paper copies for distribution. Other processes that help reduce landfill are related to the organization's significant recycling of paper and cardboard. For instance, a strategy is implemented to: reduce paper waste through expanding existing paper recycling programs, ensuring that paper waste reduction programs are established in all facilities, providing employees with access to the internal e-mail system and the organization's intranet site where forms and documents can be viewed and distributed electronically, purchasing printing and copying equipment that is capable of double sided printing, and promoting initiatives that all staff can include into their daily activities to reduce and reuse paper waste such as asking staff to think before they print, printing double sided documents, reviewing and editing documents before printing and reusing waste paper, file folders and envelopes.

The kitchen has installed a high capacity gaurburator that helps to reduce surface area of disposed food products. The reduced volume of the cut up product is then put through a screw separator; segregating the water for reprocessing along with compacting the product. By reducing the volume and compacting the product, less garbage bags are sent to landfill. Also, suppliers are contacted to minimize their packaging. Local goods are first items for purchase. Also, chemical usage is kept to a minimum along with food preparation; limiting leftovers/wastage when preparing product.

All the initiatives discussed so forth is in relation to Western Health's existing facilities. What really illustrates Western Health's forward thinking and governments commitment

to patient care and protection/preservation of the environment is the new long term care facility that was constructed; adhering to a LEED silver certified status. It uses latest technology like ground source heat pumps, advance control and verification systems, numerous heat recovery techniques, and natural purification of septic waste through the use of a manmade wetland.

Underway is the planning, design and construction preparations of the future new acute care hospital (Western Memorial Regional Hospital's replacement facility). The future of health care and its harmonious unity with nature and the environment is one that will both nurture patient care and preserve our earth for years to come.

Environmental Education

Education is the key to ensure that everyday choices made by all people within and without the organization recognize the fundamental principle of preserving the environment and the positive impact on the ecosystem. This is enabled by communication, participation in working groups, and by the leadership and attitude demonstrated by Western Health.

Western Health communicates with the public through media outlets like the newspaper and their own website, internal correspondence and posters, audio visual presentations, and event booths setup in common areas during special recognized environmental events like Earth Day. It is anticipated that other industry and individuals will become aware of the choices we make in everyday life, the impact that it has on the environment and initiatives/actions that they can implement to make a difference. It is observable that even small decisions we make contribute globally to enhance environmental prosperity. As mentioned, it is the choices that are made each day that will make a difference and further continue to promote the cause of protecting and preserving the environment.

A new method of education is executed in the new long term care facility. It actually promotes responsible energy consumption and organizational accountability to protect the environment within our delicate ecosystem. All of the data collected (sensor feedback) within the advanced building control management system is taken from a storage database and complied to produce a friendly graphical user interface on a monitor screen that is predominately installed in a high traffic area. Hence all residents, staff, visitors and general public will be able to view and monitor Western Health's progress as it strives to implement best practices to protect the environment.

Anyone would agree that it is just not good enough to 'talk the talk', but also to 'walk the walk'. This is where Western Health was one of the first to lead the way by implementing several policies. For instance, a no idling policy for vehicles located at entrances to our buildings, smoke free work environment policy, and even a smoke free properties policy (inside, outside, everywhere); for all owned and leased properties which Western Health operates. We also have a practice not to use pesticides for cosmetic reasons.

Voluntary Programs

Two of the most significant voluntary programs are the Green Team and West Lane Recycling.

The Green Team has been providing leadership and direction to many areas of the organization with an emphasis on the basics of any environmental action, “reduce, re-use and recycle”. All members are welcome; including members from the general public and other community based industrial groups. The philosophy is a bottom down approach where the only goal is that of improving environmental quality and achieving sustainable outcomes. Active agendas are created and moved forward for implementation. One such example of an agenda item included a small monetary value to be awarded within the organization to the group which would best use the funding to enhance the environment, i.e., planting flowers or trees, etc. Another function that occurs within the team is the occasional participation in educational seminars. Topics of discussion related to environmental stewardship are attended and the information delivered to the group for discussion, planning and action.

Western Health funds the operations of West Lane Recycling. West Lane Recycling Program provides a supportive work environment for adults (19 years and over) with mental illness. An assessment is required prior to admission into the program. These individuals gather and sort materials from blue recycling containers at Western Memorial Regional Hospital and a few other sites within Corner Brook. We are currently seeking ways to expand this program to other Western Health facilities. Each day these people are always so friendly, kind and genuine; believing in the cause that they perform. Really they are an inspiration.

Summary

Western Health has been and will continue to be a leader in contributing to responsible and sustainable efforts to reduce adverse effects towards our environment and ecosystem. This is achieved by fostering a stewardship program supporting initiatives in pollution prevention, environmental education, and voluntary programs.

Pollution prevention from within Western Memorial Regional Hospitals was accomplished through waste reduction and system/equipment optimization which includes a lighting retrofit, chillier replacement, boiler replacement, best practices facility maintenance management program, recycling of paper, replacement of water required medical vacuum/medical air system and cooler/freezer condensers, and operation of a high capacity garburator and screw separator. The extreme affect was an annual emission reduction of 1001.245 Tonnes of CO₂, 8.497 Tonnes of SO₂, and 0.898 Tonnes of NO₂ (oxides of Nitrogen). An estimated water reduction of 16,000 imperial gallons per day, and significant unnecessary volumes of consumables sent to landfill. All this was achieved within the last several years at an approximate capital cost of \$6,020,000. A critical point to elaborate on is the fact that all this was achieved by

successful planning, teamwork and a will to ensure that the patients/clients/residents receive the best health service as possible; while becoming ecologically savvy.

The start-up of the new LEED silver certified long term care facility (within the next few months) sets an example of how achieving excellence in harmonizing patient/client/resident care and environmental quality is the way of the future.

Environmental education helps to focus on environmental awareness and what we all can do or what experiences we all can share to make the environment a healthy one. Modes of conveying this message are through media communication, participation in working groups, and by instilling a positive attitude and leadership towards everyone being able to make a difference - make a contribution. Western Health participates and communicates green messages both external and internal, and has taken initiatives to enforce a no idling policy for vehicles located at entrances to our buildings, smoke free work environment policy, and even a smoke free properties policy (inside, outside, everywhere); for all owned and lease properties which Western Health operates.

Finally Western Health has cultivated a Green Team to lead the charge in improving environmental quality. Its direction is to foster the reduction of waste, reuse and recycling of consumables.

The most important aspect to finish with is that green initiatives and actions are great for the environment and just as great for patient/client/resident care. It truly is a 'win-win' scenario whereby the preservation of the world's ecosystem is nurtured in coexistence with public health for future generations to come.