

Making Green Even Greener

Champaign County Forest Preserve District
Environmental Assessment Report



Prepared For the Commissioners of the Champaign
County Forest Preserve District

-by-

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March 2009

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ACKNOWLEDGEMENTS

This Environmental Assessment Report (EAR) could not have been completed without the help of many individuals. First, we are grateful for the opportunity and resources to undertake this complex and important task. We very much appreciate the wealth of knowledge about environmentally sustainable business practices that Cassie Carroll brought with her to the Environmental Assessment position. Cassie spent many hours interviewing CCFPD staff about current operations and potential actions to increase sustainability. She also collected baseline data necessary to evaluate progress in environmental sustainability and related financial savings at the CCFPD. Site supervisors and department heads were very accommodating in this research and contributed ideas and information essential to a thorough report. We thank those that participated in the review of the report as their comments and suggestions have improved the final product. The time dedicated to creating and reviewing the EAR by Natural Resources Department staff should be acknowledged as well. All who have contributed to this project should be proud of their roles in the effort to make CCFPD a leader in comprehensive sustainable practices.

PREFACE

The Environmental Assessment Report for the Champaign County Forest Preserve District (CCFPD) is the culmination of ideas and suggestions made by CCFPD staff as well as experts in the field of sustainability. This endeavor began by examining the possible use of green business practices in order to increase financial savings throughout the District. However, financial savings are only a small aspect of sustainability, and the District should consider implementing sustainable practices whenever possible as part of its overall ecological responsibility. Not all recommendations made in this report may lead to financial savings, especially in the short term, but all should be considered in order for the CCFPD to be a leader in the field of sustainability.

The document details three main ideas. First, with input from CCFPD staff, the document outlines recent applications of sustainability that have been put into place in the District. Some of this information includes actual numbers and savings associated with the applications. The second idea includes past use of resources such as water, electricity, gasoline, and natural gas and how this consumption adds to the District's overall carbon footprint. The baseline information found here will be vital to future comparisons. Finally, the report concludes with an important list of objectives and recommendations for the District. Many of these recommendations were made by CCFPD staff who believe the District can work toward better sustainability without significantly increasing operational costs.

By design, this report does not propose any completion dates. Nor does it put priority on any of the recommendations. As you read the report, you will notice that most recommendations have site superintendents and department heads as action leaders. The success of this report lies with them. The most effective way to make these recommendations work is to have site superintendents and department heads decide on the priority of the projects, and the level of involvement their staff can put toward sustainable efforts. Although we would like to see every practice put into place very soon, greater results may come from concentrating on a few recommendations at a time.

This report is one of very few that have been developed for a forest preserve or park district. It is comprehensive in its recommendations, and timeless in its presentation. This effort has produced baseline data that can be built upon and analyzed in the future. It has also suggested recommendations to enhance data collection so that wise decisions about sustainable practices can be made on actual numbers. This document encourages all employees, at all levels, to be responsible for the sustainability of the District.

I. INTRODUCTION

The Champaign County Forest Preserve District (CCFPD) is entrusted with conserving and maintaining the natural resources of Champaign County for current and future generations. People visit the five preserves to experience and connect with nature in many different ways. They stroll through the Botanical Garden, bike wooded trails, enjoy topical programs, and fish in the county's lakes and streams with their friends and families. In the interest of conserving natural resources on a broader scale, the CCFPD chooses to extend its focus beyond land preservation and restoration and include sustainable procedures in everyday operation.

A recent CCFPD strategic plan update added the objective of, "Recognize financial savings through improved environmental actions." Many of the recommendations in this report will produce long-term financial savings. However, some recommendations are based on principles of responsible consumption, long-term sustainability, and environmental responsibility, and not necessarily on financial savings. This report should be the first step in a multi-year process of evaluating sustainable practices at CCFPD.

Sustainability is defined as meeting the needs of the present generation without compromising the ability of future generations to access the resource (Washington State Department of Energy). Sustainable initiatives, small or large, can be implemented throughout the District to promote responsible resource use. Additionally, each department should incorporate sustainability into public education, either passively or actively. Ideally, visitors will come to CCFPD not only to become educated about the natural and historic wonders of East Central Illinois, but also to learn how to conserve resources within their own homes. This Environmental Assessment Report (EAR) focuses on the implementation of sustainable initiatives into daily CCFPD routines, and on educating individuals about sustainable initiatives. The bulk of the data used in the report is collected from CCFPD records, interviews with CCFPD staff, and suggestions from experts in the field of sustainability.

A. Goal for Using Sustainable Practices at CCFPD

The goal for using sustainable practices is to improve upon environmental and operational sustainability across all departments within the CCFPD. These improvements should reduce the overall and long-term cost of operations and create a more environmentally-responsible organization without substantially increasing employee workload.

B. Vision for Sustainable Practices at CCFPD

The Champaign County Forest Preserve District will become a leader in east central Illinois for adopting sustainable practices. CCFPD will strive to create a sustainable workplace, conserve resources, and educate the public about how to incorporate sustainability into their everyday lives. CCFPD will be seen as a model for the use of green technology, and for the implementation of sustainable operating initiatives.

C. Benefits of Sustainability

The mission of the Champaign County Forest Preserve District is responsible stewardship of the county's natural resources and cultural history. Integrating sustainability throughout the CCFPD would not only uphold the mission of stewardship, but also the vision—"to hold a valued and vital place in the lives of Champaign County residents and be recognized for innovation, leadership and excellence." The CCFPD will be recognized for its innovation and leadership as a result of the implementation of sustainable practices.

Advantages of increasing sustainable efforts at the CCFPD could include:

- public recognition for environmental stewardship and sustainable leadership;
- cost savings resulting from environmental efficiency;
- an increase in the environmental knowledge of CCFPD employees and visitors;
- adoption of a sustainable culture within visitors' homes and communities;
- increased networking opportunities with other organizations and entities within the community through partnered projects

Excellence in sustainability achieved by CCFPD is transferable and will appeal to many different types of community members.

II. DEFINITIONS

A. Sustainability

As stated in the introduction, one definition of sustainability is, "meeting the needs of the present generation without compromising the ability of future generations to access the resource." This definition of sustainability can be applied to all departments within the CCFPD, as all departments consume resources to complete their daily operations to maintain preserves. Many of the departments have already implemented some sustainable practices.

Interviews with CCFPD staff, such as site superintendents and department heads, revealed that each of them defines sustainability based on their own expertise. Below is a list some of some of these definitions.

Sustainability is:

- maintaining the preserve and improving it with new technology without re-doing the entire preserve;.
- meeting a combination of present and future needs while operating in a way that is economically efficient;.
- preventing as much damage to the environment as possible and attaining sufficient awareness or knowledge to make informed sustainable decisions;.
- conducting daily operations while maintaining the work environment's integrity and keeping a certain standard or level without going beyond budget;.
- realizing that everything isn't going to last forever;.

- using the resources we have efficiently, avoiding pollution and following best management practices;
- re-using materials and conserving resources;
- wise use of resources with a view toward the future;
- educating ourselves about how to conserve resources and putting that knowledge into practice (could be by changing some habits or taking advantage of the latest technologies).

These definitions encompass what sustainability means to CCFPD employees. Although they do not strictly follow the DOE definition, the ideas within each statement are in line with the definition's key elements. In short, CCFPD employees believe there are aspects of sustainability in economics, budgeting, purchasing, resource use, efficiency, and education. It was found that each employee is conscious about the importance of sustainability and wants to incorporate additional sustainable methods into everyday operations.

B. "Green" Organization

Green organizations operate in ways that take both environmental and social issues into account when making decisions. These organizations adopt sustainable principles, policies, and practices that improve the quality of life for their customers, employees, and communities, as well as the environment. They also encourage responsible consumerism and community development and thrive by building loyal, environmentally-aware customers, patrons and communities. Green organizations strive to hold a high standard of environmental stewardship within their community and workplace. The critical "first step" in becoming a green or sustainable organization is to set standards to work toward. These standards can be found in Appendix A, specifically objectives one and two. The CCFPD is already working toward becoming a green organization through its natural areas conservation and current sustainable initiatives.

C. Carbon Footprint

A carbon footprint represents the net impact of actions in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide. There are a growing number of practical and affordable solutions available for those looking to take responsibility for diminishing their impact. Carbon offsets can be purchased, more trees can be planted, and more resource conservation techniques can be incorporated in the workplace. CCFPD's carbon footprint will be greatly reduced through the implementation of the sustainable initiatives recommended here.

III. AREAS OF SUSTAINABILITY

There are four main areas of sustainable business performance in which the CCFPD can implement change: (A) energy conservation; (B) water conservation; (C) waste reduction; and (D) pollution prevention. In order to achieve maximum sustainable performance, good preparation and planning is essential. If communication and planning within and between departments is substandard, then sustainable performances will also be substandard. These areas of sustainability were the focus of all interviews, document reviews, and recommendations for this report.

A. Energy Conservation maximizes efficiency without hindering the ability to operate. Energy can be conserved by utilizing energy produced from renewable sources, using photovoltaic lighting, or weatherizing buildings. Implementing energy conservation and efficiency practices also often results in reduced long-term operating costs.

B. Water Conservation identifies and eliminates areas of wasteful or inefficient water use. Over time, even a small leak adds up to substantial water loss. Less than 3% of the water on Earth is fresh, and much of that is tied up in glaciers, icecaps, or lies deep in the earth. Depletion of these water supplies degrades the natural environment and creates costly water conservation projects. Recent concern with the overuse of the Mahomet-Teays aquifer should also be a concern to CCFPD. Water conservation practices, such as use of efficient appliances and fixtures and changes in irrigation practices, can reduce water consumption by as much as a third. Tracking and recording water use will help determine actions that can lead to maximum conservation.

C. Waste Reduction reduces the amount of waste sent to landfills by recycling, re-using resources, purchasing recycled products, and maximizing supply efficiency. Improving recycling programs, purchasing products with minimal packaging, using recycled building materials, and educating employees about waste reduction techniques are all vital components of waste reduction. Additionally, wood burning stoves and compost piles are natural waste reducers for certain CCFPD departments.

D. Pollution Prevention reduces contamination of the air, soil, or water. Use of less toxic alternatives to products such as cleaning supplies can improve employee work conditions and ecosystem health. Driving less often with more fuel-efficient vehicles will reduce the amount of greenhouse gases released into the environment, conserve energy resources, and decrease fuel costs.

IV. REVIEW OF PAST AND CURRENT SUSTAINABLE PRACTICES AT CCFPD

Interviews with key CCFPD staff revealed that CCFPD employees are already practicing many sustainable actions. A synopsis of these interviews is presented here.

A. Energy Conservation

The energy efficiency of each building is primarily determined by its heating, ventilation, and air conditioning (HVAC) system, appliances, insulation, and lighting fixtures. Many actions taken by CCFPD staff have reduced the demand for energy to heat and cool buildings. HVAC systems are regularly maintained to make sure air filters are clean and systems are working properly. The Middle Fork maintenance shop is heated by a wood stove, making use of a readily-available resource at the site and reducing the demand for purchased energy. The Museum Annex and the Sangamon River Forest Preserve residence make use of geothermal systems which take advantage of steady ground temperatures in order to reduce the dependence on conventional

heating and cooling methods. Table 1 highlights the result of installing the geothermal system at the Museum Annex.

Table 1. Natural Gas Use at Museum Annex

Year	Therms	Heating Degree Days	Cost
2004	1469	5336	\$1,334.31
2005	1565	5482	\$1,544.12
2006	846	5002	\$1,140.29
2007	192	5364	\$312.90
2008	200	6094	\$358.73

Heating degree days are a measure of how far daily temperatures drop below 65°F, the temperature at which it is assumed heating of interior spaces would be necessary. The more heating degree days there are in a year, the more therms will be needed to heat a building. For example, Table 1 shows that heating degree days rose from 2004 to 2005, and so did therms purchased to heat the Annex. However, even though heating degree days rose from 2006 to 2007, the amount of therms purchased decreased considerably from 2006 to 2007. The difference is the geothermal system began operating in October of 2006, resulting in over 75% savings on natural gas for the Annex.

Conversely, cooling degree days reflect the demand for energy during the warmer months. The more cooling degree days there are in a given period, the more energy will be needed to cool a building. Comparing cooling degree days to kWh during warmer months will help determine the efficiency of climate control during those periods. Since electricity is used for many tasks other than running cooling systems, it is important to consider any factor that may be contributing to spikes or drops in electric use in any month. Heating and cooling degree day information can be procured through the Illinois State Climatologist Office (<http://www.isws.illinois.edu/atmos/statecli/data.htm>).

Some buildings are being weatherized. New energy efficient doors, windows, and insulation are being installed in several pavilions to increase climate control efficiency. Fans are in use to increase air flow and reduce air stratification. In the Botanical Garden, insulation skirts were recently installed on the greenhouse to reduce drafts and air temperature stratification in the winter. Energy-efficient water heaters that hold the water at the ideal temperature for watering plants are also used.

The largest District-wide project for energy conservation is the recent switching of T12 fluorescent lights to the more compact and efficient T8 fluorescent lights which also included changing ballasts. The new electric ballasts use a negligible amount of energy which results in a 20% efficiency increase over the old magnetic ballasts. Estimates show an approximate 5% decrease in utility costs after the lighting and ballast changeover. There was also a decrease in pollutants associated with lighting use. Lighting emits a significant amount of carbon into the atmosphere. The standard number for how much carbon is released per bulb is 1.39 lbs of CO₂/kWh. The difference in greenhouse gas pollution by CCFPD as a result of the lighting switch can be seen in Table 2.

Table 2. Annual Pounds of CO₂ Produced by CCFPD Due to Fluorescent Lighting*

Preserve	T12 light bulbs	T8 light bulbs	Difference
Lake of the Woods	115,213.09	89,865.89	-25,347.20
Homer Lake	28,939.24	19,461.95	-9,477.29
Middle Fork	26,365.96	21,251.88	-5,114.08
Total	170,518.05	130,579.72	-39,938.57

*Currently there are no lighting fixtures at the River Bend Forest Preserve, and yearly totals are not yet available for the Sangamon River Forest Preserve.

The data show that the energy used from lighting alone is a substantial part of CCFPD's carbon footprint. The overall District lighting changeover will prove to be cost effective in the long term, and the secondary benefit of pollution reduction will be significant.

The forest protected by CCFPD helps to absorb this carbon and reduce the overall carbon released in the environment. One estimate in regard to atmospheric carbon reduction is that one tree can sequester one ton of CO₂ over a 100-year lifetime. Table 3 below shows how many trees would be needed to absorb the amount of CO₂ emitted from using energy to illuminate fluorescent light bulbs throughout the District if a tree were to sequester 20lbs of CO₂ annually.

Table 3. Trees Needed to Offset CO₂ Created by District Lighting

Preserve	No. of Trees needed with use of T12 fluorescent bulbs	No. of trees needed with use of T8 fluorescent bulbs	Difference
Lake of the Woods	5,761	4,493	1,268
Homer Lake	1,447	973	474
Middle Fork	1,318	1,063	255
Total	8,526	6,529	1,997

Energy conservation measures have been taken outside of buildings as well. Homer Lake installed photovoltaic lighting along walkways and in the parking lot. These lights directly convert sunlight to electrical energy. The fixtures need no electrical wiring and can store energy throughout the day within the fixture. The Golf Course irrigation system is not only water-efficient but energy-efficient as well. It operates only when necessary, shutting off during a rain event.

Electric bills from 2004 through 2008 were evaluated for this report.. Use of electric power at CCFPD has declined since 2005. CCFPD was billed for approximately 20% less kWh in 2008 than in 2005. In 2008 prices for kWh, that is a savings of more than \$16,000. This reduction in kWh cannot be traced to any one action, but is likely the result of a combination of factors. Increased monitoring of electric use, and reporting of the implementation of recommendations in the EAR, will aid in future recognition of factors contributing to fluctuations in electric use at CCFPD.

Interviews revealed that a problem area for CCFPD in terms of energy efficiency is the Headquarters building. It has uneven heating in the winter and not much insulation in parts of the building. Employees have used supplemental heat in the form of space heaters to keep warm,

even though the HVAC system is running fine. The Headquarters building should be professionally evaluated to ensure maximum energy efficiency.

B. Water Conservation

Primary water use activities at CCFPD include plant and turf maintenance, equipment and facility maintenance, and human consumption. Many water-conserving measures have been taken within CCFPD. Low-flush toilets, waterless urinals, and faucet timers have been installed in several restrooms. Vault toilets do not need water for flushing, and therefore conserve water in comparison to a conventional restroom. Drip irrigation at the Botanical Garden and well-timed uses of the irrigation system at the Golf Course have reduced the amount of water lost to evaporation or run-off. Several departments have reduced the demand for individual bottled water by installing water filters on taps or providing water coolers.

Water quality at CCFPD is monitored as well. Audubon Sanctuary certification at the Golf Course requires yearly water quality tests in lakes to maintain lake health. Willow Pond at Middle Fork is monitored by the public health department to ensure the safety of swimmers. In the past, water quality was measured at Homer Lake and River Bend.

Data on water use in the District are very limited because of the use of private wells without water meters. The only quantifiable water use was from Sangamon Valley Public Water District, which is what Lake of the Woods (LOW) uses for most of its water needs. Gallons of water used per month were examined from 2001 to 2007 at LOW. The peak season of highest water use was between June and October. Charts of water use can be found in Appendix B3.

B. Waste Reduction

Reducing, reusing and recycling -the three Rs for waste management -are effective measures to reduce the stream of waste destined for landfills. Recycling is becoming the norm at CCFPD. Paper, cardboard, tin and aluminum are recycled at all preserves. Internally, plastic and glass are recycled by the Environmental Education and Natural Resources Departments. Lake of the Woods Operations staff recently collected all T12 bulbs and their associated ballasts for recycling. The Natural Resources Department collects dry cell batteries from all departments for recycling. Plant materials are recycled through composting by the Environmental Education and Botanical Garden Departments. Hazardous materials are recycled appropriately at Environmental Protection Agency-sponsored collection days.

Reusing products keeps them out of landfills as well. Communities surrounding Lake of the Woods, Homer Lake, and Middle Fork drop off Christmas trees to be reused as mulching material or fish structure. Building materials are saved from demolition projects and used for future construction projects. The Botanical Garden reuses plastic pots and flats instead of throwing them out. Inkjet printer cartridges are returned to the manufacturer for reuse.

Waste reduction occurs through selective purchasing. Many departments use rechargeable batteries. Several also buy environmentally-friendly cleaners in concentrated form and use refillable spray bottles to dispense the liquid. The purchase of materials with high post-consumer

recycled material content, like copy paper, bolsters the market for recycling and reduces the amount of paper sent to landfills. Most departments use 30%-50% post-consumer content recycled copy paper in their offices. The Public Information and Human Resources Directors are saving at least two reams (500 sheets each) of paper each month by providing electronic copies of monthly board packet materials.

Homer Lake has reduced the number of garbage cans on site and therefore reduced demand for can liners and increased the efficiency of operations. There has not been an increase in litter as visitors have been utilizing remaining garbage cans or packing trash out with them. The recent announcement of a new recycling center to be constructed in north Urbana may make recycling even more convenient for the CCFPD.

Protection of current infrastructure reduces waste by minimizing the need for replacement. An evaluation at Homer Lake, Lake of the Woods, Middle Fork, and Sangamon River revealed several areas that could be protected with little maintenance cost. Staff must be vigilant to ensure that wood infrastructure is protected from water, rain, mold, and insect damage. Department heads and site superintendents revealed that staff time and availability limit replacement or protection more often than cost. Consideration should be given to wood alternatives such as steel, stone, composites, and polymer-based resins when replacement is necessary.

D. Pollution Prevention

Fuel and chemical use reductions contribute the greatest to pollution prevention at CCFPD. Fuel use, in particular, is a major source of pollution in the form of greenhouse gas emissions (see Table 4). CCFPD employees are making an effort to reduce fuel consumption by increasing fuel-efficient vehicle use and decreasing overall vehicle use. Employees have been making conscious efforts to plan trips in combination in order to minimize miles driven. Fewer greenhouse gasses are being emitted due to mowing reductions that began in 2006 at the Golf Course and throughout Lake of the Woods.

Table 4. Pounds of CO₂ Produced by Fuel Use at CCFPD (2006)

	Gallons	Lbs. CO ₂	Trees needed to offset CO ₂
Gasoline	17,754.4	344,435.4	17,222
Diesel	7,714.3	171,258.1	8,713
Total		515,693.5	25,935

Wise chemical use has increased at the District through purchase of greener alternatives to toxic cleaners and careful and proper use of pesticides. Unused chemicals have been taken to the appropriate EPA-designated drop-off sites. Many maintenance departments have been purchasing latex paints rather than oil-based paints, and all are considering the volatile organic content (VOC) of chemicals when purchasing materials.

Another pollution prevention approach taking place at the River Bend parking lot and Golf Course parking areas is the installation of bioswales. Bioswales capture run-off and naturally filter it through plants to trap harmful pollutants and sediments before being released into the

lakes. Additionally, River Bend has grass buffers along the parking lot and boat ramp to help capture water prior to flowing down the boat ramp into the lake.

V. OBJECTIVES FOR SUSTAINABILITY

The objectives set forth for the District are centered on the use of energy, fuel and water. These three categories are where the largest economic and environmental benefits can be realized at CCFPD. Within each objective are several recommendations which are meant to produce greater sustainability. Objectives with their recommendations can be found in Appendix A. These changes, small or large, should be acknowledged by supervisors and administration. A continuous tracking system should be established so benchmarks are evaluated each year for efficiency and completion. An update on these initiatives should be presented annually to the Board of Commissioners.

Each recommendation may not be applicable to all departments. All departments do not use the same amount of resources or perform the same duties. If a blanket of standards were to be set for all departments, jobs and duties would be affected in some departments, and some projects might even get cut. For example, if a standard 20% fuel reduction were implemented, it might be possible for some to accomplish, while others would have to cut projects and programming to conserve that resource. Each individual department should implement sustainable initiatives that allow it to continue necessary functions while reducing environmental impact.

A. List of Objectives

Objective 1: Set Districtwide standards on environmental oversight, data collection and reporting.

Objective 2: Set Districtwide purchasing and contracting standards that increase environmental responsibility.

Objective 3: Evaluate infrastructure in order to develop a maintenance, repair, and improvement schedule to increase efficiency.

Objective 4: Reduce or eliminate pollutants at their source.

Objective 5: Increase fuel efficiency.

Objective 6: Improve internal and external recycling systems for employees and visitors.

Objective 7: Reduce office and meeting waste.

Objective 8: Increase public and staff awareness of sustainable initiatives.

Objective 9: Evaluate progress, success, or failure of sustainable initiatives after predetermined periods.

Objective 10: Use the Natural Resources and Botanical Garden office building as a model.

B. The Natural Resources/Botanical Garden Building as a Model

The Natural Resources and Botanical Garden office building should serve as a representative model of environmentally-responsible practices that can be feasibly implemented at CCFPD.

Decreasing Electrical Consumption – Over the past two years, efforts have been made to decrease electrical consumption. The efforts include turning off of lights and machines not in use and the recent changeover in lighting systems. However, opportunities for improvement remain. Solar power use at the NR/BG building is feasible. As certain components of the building need replacement, such as septic systems, lighting, and HVAC systems, the highest efficiency units available should be installed. An energy audit by a professional company should be completed within a year. Recommendations from that audit should be completed in a timely manner.

Decreasing Natural Gas Consumption – Building staff should follow a regular schedule for checking the filter on the furnace. A programmable thermostat should be installed in the office. Staff should make a greater effort to make sure the radiant heating system in the shop area is off or lowered when not in use. Hot water consumption at the building is minimal. There is currently a 20-gallon water heater on the water system. When the heater needs to be replaced, it is recommended it be replaced with an on-demand under-sink hot water heater if the electrical system (possibly solar) is able to handle the load. There are many areas in the offices where insulation can be improved, such as around doors and windows. These efforts should begin as soon as possible.

Use of Rainwater Containment Systems – The NR/BG building has at least 1,500 ft² of roof space. Large containment systems could be placed on the back side of building with little effort. Collected water could then be used to water plants in the shade house or fill water tanks for watering throughout the preserves.

Waste Reduction and Recycling – Seven main efforts to reduce waste and encourage recycling are in place in this building. Office paper recycling and aluminum can recycling is a CCFPD-wide effort that seems to be meeting the current needs of the NR/BG building. Cardboard recycling for the building is done primarily by stockpiling cardboard in the shop area until a substantial load can be taken to the Golf Course for recycling.

Two years ago, the NR/BG staff started efforts to recycle plastic, glass, aluminum and tin. There is currently no community-wide effort to recycle these materials in Mahomet. Staff members take the materials home to recycle. Approximately 15 30-gallon bags of materials are recycled each year. Three years ago, the NR Department began collecting dry cell batteries for recycling. Batteries can be dropped off at Headquarters and the NR office, or NR staff can pick them up at

each site. Batteries are shipped to a certified battery recycler in a reusable container. In three years, approximately 85 pounds of batteries have been recycled.

Currently, the NR department is in the process of making meetings, trainings, and educational classes more sustainable. Plates and kitchen supplies have been donated by staff to use during these events. The goal is to have enough reusable plates, cups, mugs, and silverware for a class of approximately 30 individuals. Efforts to make meetings and trainings paperless have also been made.

Toxic waste disposal days organized by the Illinois Environmental Protection Agency and local companies have been utilized to dispose of or recycle several hundreds of pounds of materials. Oils and other industrial liquids that can be recycled are done so as part of the CCFPD-wide effort. Although the volume of fluids is minimal, some of them can be toxic and warrant proper disposal. Most environmental efforts in the NR/BG building over the last 10 years have been in waste reduction and recycling; therefore only two recommendations are made in this regard. First, reusable hand towels or an air dryer system in the bathroom should be considered. Second, when the septic system needs improvement or replacement, the highest efficiency unit that uses multiple stages to clean the waste should be considered.

VI. CONCLUSION

Compiling the 2008 Environmental Assessment Report has been an exercise in identifying how CCFPD can become a more environmentally-responsible organization while simultaneously realizing financial savings in the long term through increased efficiency. The single most important finding during the research for the EAR is the significant lack of valuable baseline data. Better tracking and reporting of resource and energy use will result in more thorough baseline data, which can be used to evaluate progress toward increased efficiency. Many recommendations in Appendix A address this issue. Following through on other recommendations presented in Appendix A will directly increase the sustainability of CCFPD financially and ecologically, taking the organization from “green” to “greener”. Sustainability truly lies in the hands of all employees and commissioners. Actions taken to improve sustainability will become a success if all staff communicate, share resources, and work together to develop and implement the most effective sustainable goals.

VII. APPENDICES

Appendix A: Objectives and Recommendations

Objective 1: Set Districtwide standards on environmental oversight, data collection and reporting.

Recommendations	Item Leader	Notes
Designate or hire an individual to oversee environmental assessment data collection and recordkeeping.	Executive Director, Human Resources Director	
Keep monthly records of electrical, natural gas, water use, well water use and propane for future baseline data.	Environmental Assessment Person, Financial Assistant	
Record monthly mileage for each District vehicle and send data to compiler.	Site Superintendents, Department Heads, Environmental Assessment Person	There is a line in our vehicle inspection sheets for recording mileage.
Change how energy use, water consumption, and gasoline use are reported to each department so accountability can be clearly seen.	Finance Director	
Consider installing separate gas and electrical metering to better record specific energy use.	Executive Director, Planning Director, Site Superintendents	
Periodically review and update District Rules and Ordinances to upgrade them to a higher sustainability standard.	Executive Director, Commissioners	
Research funding and granting opportunities to enhance sustainability.	Grant Coordinator	Cassie has put together a list of granting options for this that can be explored.
Consider developing an Environmental Impact Statement process to be used prior to contract work, construction work, or alteration to the landscape.	Natural Resources Director, Executive Director	

Position CCFPD to be able to accept carbon credit or sequestration payments when time arrives.	Natural Resources Director, Executive Director	
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Objective 2: Set Districtwide purchasing and contracting standards that increase environmental responsibility.

Recommendations	Item Leader	Notes
Develop a standard for purchasing water-efficient equipment and plumbing.	Executive Director, Department Heads, Commissioners, Site Superintendents	<ul style="list-style-type: none"> • Working with the public health department is a must when dealing with toilet and sink options. • Purchase low-flush toilets (1.6 gal or less) and low flush urinals. • Purchase timed faucets for restrooms and low-flow, aerated nozzles (1.5gpm). • Purchase water purification filters for faucets to reduce the amount of water bottles/coolers in offices/buildings. • Check www.epa.gov/watersense for more information.
Schedule a water audit with a professional water specialist.	Planning Director, Site Superintendents	
Encourage contractors to be able to reuse demolition materials or give preference to those that recycle construction materials.	Executive Director, Commissioners	
Schedule regular inspections and repairs to ensure plumbing is not leaking.	Site Superintendents	
Develop and post signs in restrooms to encourage water conservation for employees and visitors.	Environmental Education Coordinator, Public Information Director, Site Superintendents	

Review the list of janitorial supplies used throughout the District and check whether they are Green Seal certified and replace products that are not.	Environmental Assessment Person, Site Superintendents	Check for Green Seal certification at www.greenseal.org .
Research alternative cleaners to replace products that are not Green Seal certified.	Environmental Assessment Person	
Set standard for purchase of low volatile organic compound (VOC) chemicals.	Department Heads, Site Superintendents, Executive Director, Commissioners	<ul style="list-style-type: none"> • Substitute cleaners/chemicals for less hazardous materials and lower toxic chemicals. • Purchase from the Green Seal product list. • Replace aerosols with non-aerosol alternatives (pump sprays). • Purchase low VOC paints and products. • Purchase low emission/natural building materials, carpeting, furniture. Purchase unbleached or chlorine-free paper products.
Find stable source for proper disposal of old cleaners.	Site Superintendents	
Phase out old cleansers or dispose of them properly.	Site Superintendents	This should be done continuously.
Ensure that the most fuel-efficient, reliable vehicle or utility vehicle is purchased.	Site Superintendents, Department Heads,	
Provide research and a fuel cost analysis for purchasing a new vehicle when developing agenda items for the Board.	Site Superintendents, Department Heads	
Purchase recycled construction materials whenever possible.	Executive Director, Construction Manager, Site Superintendents	
Develop a standard for purchasing recycled materials.	Department Heads, Executive Director, Commissioners, Site Superintendents	Notes: Standards should include: <ul style="list-style-type: none"> • 30%-100% post consumer recycled content; • items made from recycled

		materials; <ul style="list-style-type: none"> • recycled construction and building materials; • purchase of rechargeable batteries; • purchase of automatic dryers to replace all paper towel dispensers in washrooms; • purchase of products that are multi-purpose.
Develop a standard for purchasing energy-efficient equipment, including appliances, electronics, and office equipment.	Department Heads, Executive Director, Commissioners, Site Superintendents	Information on energy-efficient equipment can be found at www.energystar.gov .

Objective 3: Evaluate infrastructure in order to develop a maintenance, repair, and improvement schedule to increase efficiency.

Recommendations	Item Leader	Notes
Use Leadership in Energy and Environmental Design (LEED) standards or certification in all new as well as updated construction even if not going for LEED certification.	Planning Director , Construction Manager, Site Superintendents, Golf Director	This can be done on everything from playground equipment to new insulation technologies.
Contact the Smart Energy Design Assistance Center (SEDAC) to schedule a free energy audit of infrastructure.	Planning Director, Executive Director	Done for Museum
Review SEDAC report to determine actions to implement.	Planning Director, Executive Director	
Schedule periodic free audits from utility companies.	Planning Director	
Develop an infrastructure maintenance, repair and improvement schedule to increase efficiency.	Planning Director, Site Superintendents, Construction Manager	
Schedule a water audit with a professional water specialist.	Planning Director, Site Superintendents	
Conduct regular inspections and repairs on HVAC systems	Site Superintendents	

(dusting coils, cleaning air filters, etc.).		
Conduct regular building inspections to look for energy efficiency problems.	Site Superintendents, Construction Manager	
Weatherproof windows and doors to close air gaps (caulking and weather stripping).	Site Superintendents, Construction Manager	
Insulate buildings or make sure insulation is effective.	Site Superintendents, Construction Manager	
Insulate and repair pipes, water heaters, and duct work to keep heat and cool air in buildings.	Site Superintendents, Construction Manager	
Make sure wood that touches concrete near the ground is not rotten or damaged. If it is, fill with wood filler.	Site Superintendents, Construction Manager	
If the HVAC/AC system has a humidifier, have the humidifier properly maintained to reduce mold build-up.	Site Superintendents, Construction Manager	
Check roofs for the winter season to make sure ice dams or other leaks are prevented.	Site Superintendents, Construction Manager	
Install water meters on all well pumps and record monthly use.	Site Superintendents, Garden Supervisor, Golf Director	
Install lighting controls such as occupancy sensors or delay timers where appropriate.	Site Superintendents, Construction Manager	
Install photovoltaic or solar outdoor lighting wherever possible.	Site Superintendents, Construction Manager	
Replace old thermostats with programmable thermostats to regulate AC/Heat systems.	Site Superintendents, Construction Manager	
Consider programming thermostats 74-76° F for cooling and 68° F for heating.	Site Superintendents	
Install ceiling fans to promote air circulation and prevent stratification in large buildings.	Site Superintendents, Construction Manager	

Improve indoor exit sign efficiency by using LED/CFL light bulbs instead of incandescent bulbs.	Site Superintendents, Construction Manager	
Install small, on-demand water heaters wherever applicable.	Site Superintendents, Construction Manager	
Periodically check thermostats in rooms, buildings, refrigerators, etc. to maintain optimum performance.	Department Heads, Site Superintendents	
Use wood burning stoves to reduce the amount of energy used through natural gas and electrical heating systems.	Site Superintendents	
Use or invest in renewable energy throughout the District when available.	Planning Director	Small solar panels can be placed for supplemental energy.
Replace all outdoor incandescent bulbs with CFL/LED lighting.	Site Superintendents	Even streetlights have an LED Option.
Set a goal to reduce the amount of irrigation water used through meter tracking and an improved monitoring system.	Garden Superintendent	
Develop and follow a daily/weekly watering plan to only water for a specific length of time and when necessary (before 7 a.m. or after 9 p.m., time watering length, etc.).	Garden Superintendent, Site Superintendents, Golf Director	
Research water-efficient sprinkler systems and possible upgrades for the current system.	Garden Superintendent, Golf Director	
Incorporate drip irrigation and soak hoses wherever feasible.	Garden Superintendent, Site Superintendents, Golf Director	
Use drought-tolerant plant options in landscaping.	Site Superintendents, Garden Superintendent, Planning Director, Golf Director	
Make sure all erosion control on construction areas meets the newest Illinois Environmental Protection Agency Guidelines.	Planning Director, Construction Manager, Natural Resources Director, Golf Director, Site Superintendents	

Use permeable pavement material whenever possible.	Executive Director, Commissioners, Planning Director, Site Superintendents	
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Objective 4: Reduce or eliminate pollutants at their source.

Recommendations	Item Leader	Notes
Minimize or eliminate the use of hazardous materials.	Department Heads, Site Superintendents, Garden Superintendent	
Make sure that reducing pollution or waste from one source does not transfer pollution to another source.	Site Superintendents	
Keep parking, landscape, and dumpster areas clean and free from litter, debris, and oil drips.	Site Superintendents, Garden Superintendent	
Do not allow waste water from buildings to enter a storm drain.	Site Superintendents, Department Heads	
Apply herbicides/pesticides when weather is dry, not before a rain.	Site Superintendents, Department Heads	
Check dumpsters and trashcans for leaks and make sure they are tightly covered.	Site Superintendents, Botanical Garden Superintendent	
Purchase and transport cleansers and pesticides in small quantities to ensure use and limit spills.	Site Superintendents, Department Heads	
Use the least amount of cleaner possible to complete a job.	Site Superintendents, Department Heads	Spray bottle vs. bucket mixes

Objective 5: Increase fuel efficiency

Recommendations	Item Leader	Notes
Create adequate record-keeping procedure to record mileage and gasoline consumption for each vehicle.	Financial Assistant, Site Superintendents	
Streamline the interdepartmental gas and diesel charges so each department knows how much gasoline they consume.	Site Superintendents	
Determine economic benefits of Site Superintendents and Department Heads fuel efficient-vehicles and fuel conservation techniques.	Site Superintendents, Planning Director	
Purchase fuel-efficient vehicles and sell inefficient vehicles.	Executive Director, Commissioners	
Use large, fuel-inefficient vehicles only when necessary.	Site Superintendents, Department Heads	
Check and clean automobile air filters regularly.	Site Superintendents, Site Superintendents, Department Heads	
Institute alternative fuel mowers on District lands.	Commissioners, Executive Director, Site Superintendents, Golf Director, Garden Superintendent	
Turn off vehicles if they are idling for more than 10 seconds	Site Superintendents, Department Heads	
Keep up to date on EPA standards on fuel efficiency for two-cycle engines and phase out inefficient models.	Environmental Assessment Person, Department Heads	
Make sure tires are properly inflated.	Site Superintendents, Department Heads	
Plan trips and combine errands to pick up materials/equipment.	Site Superintendents, Department Heads	
Order more products online for delivery rather than making long trips.	Site Superintendents, Department Heads	

Objective 6: Improve internal and external recycling systems for employees and visitors

Recommendations	Item Leader	Notes
Review current recycling system and processes.	Environmental Assessment Person	
Develop a recycling system that is easily accessible, easily picked up, and able to take a diverse amount of recyclables for employees and visitors.	Department Heads, Environmental Assessment Person, Site Superintendents	
Make sure that large outdoor dumpsters are clearly labeled as to what they accept.	Site Superintendents, Golf Director	
Diversify recycling options.	Site Superintendents, Volunteer Coordinator, Golf Director	
Review current cardboard recycling efforts at Golf Course for all of LOW.	Golf Director, LOW Superintendent	Some complaints have been that the cardboard dumpster at the Golf Course is often full and in need of more frequent pick-up. Additionally, others have voiced that there may be a demand for cardboard recycling at LOW West Maintenance. Check into need for this.
Implement large event recycling such as clean up days, Freedom Fest, golf outings, etc.	Site Superintendents, Department Heads	
Implement a more extensive recycling system to reduce the amount of waste produced.	Site Superintendents	By 2010, reduce the following internally: <ul style="list-style-type: none"> - Batteries 100% - Ink Cartridges 100% - Cardboard 90% - Newspaper 100% - Office Paper 100% of waste - Aluminum 100% - Glass 100% - Plastic 70% - Metals (Scrap) 100% - Biotic Waste 100% - Lighting Waste (Bulbs) 100%

		- Oil- and Latex-based products 100% of waste
Make sure recycling bins are distinct and easily available for employees and visitors.	Site Superintendents	
Collect and properly dispose of all materials at appropriate sites.	Natural Resources Director	
Evaluate the need for biotic waste management at each preserve.	Natural Resources Director, Site Superintendents	
Consider hosting a drop-off day with the EPA or metal drive on our sites for profit or publicity.		

Objective 7: Reduce office and meeting waste.

Recommendations	Item Leader	Notes
Combine or eliminate unnecessary meetings for efficiency and reduced travel time for employees.	Executive Director, Human Resources Director	
Allow teleconferencing to reduce travel.	Executive Director	
Send electronic files of agendas and meeting packets.	Human Resources Director	
Eliminate cover letters for faxes by sending them electronically.	Site Superintendents, Department Heads	
Reduce the amount of junk mail, faxes and multiple catalog mailings.	Site Superintendents, Department Heads	
Print promotional materials with soy ink and recycled paper.	Public Information Director	
Use permanent-ware in break rooms, kitchens, trainings, programs, and meetings instead of disposable options.	Site Superintendents, Department Heads	
Mail materials that do not require an envelope by folding and sending or postcard.	Department Heads	
Refill ink cartridges for cost	Department Heads	

savings recycling the cartridge.		
Combine departmental orders and have items delivered to conserve fuel.	Department Heads, Site Superintendents	This type of fuel conservation is more global since a delivery truck will be delivering to multiple areas and less about District savings.
Determine amount of non-recyclable waste picked up at each preserve in respect to dumpster yardage to form baseline data on trash removal.	Site Superintendents, Golf Director	
Evaluate the frequency of non-recyclable and recyclable waste pick-up to minimize unnecessary trips.	Site Superintendents, Golf Director	

Objective 8: Increase public and staff awareness of sustainable initiatives

Recommendations	Item Leader	Notes
Develop materials on how the general public can implement sustainable actions in their own homes.	Public Information Director, Environmental Assessment Person	Look to www.actonenergy.com for energy-saving tips for home and business.
Publicize sustainable initiatives in the District through various outlets.	Public Information Director, Environmental Assessment Person	
Designate a web page for sustainability that will contain the EAR, sustainability facts and future data for public viewing.	Public Information Director	
Develop direct marketing documents in the form of pamphlets, fact sheets, or web materials for community members to learn about CCFPD sustainable initiatives.	Public Information Director, Environmental Assessment Person	
Develop a passive interpretation program for sustainability in the District	Public Information Director, Site Superintendents, Environmental Education	

through pamphlets and signage.	Coordinator	
Periodically review materials and new technologies that can be implemented at the CCFPD.	Environmental Assessment Person, Natural Resources Director	
Present new employees with green operations and infrastructure initiatives and standards within the District.	Human Resources Director	
Provide incentives and rewards for innovation or meeting certain sustainability goals to encourage and motivate staff and employees.	Executive Director	
Develop a Sustainability Pledge for the District to help promote our efforts.	Executive Director, Commissioners, and Public Information Director	An example could be: The CCFPD pledges to provide a healthy, sustainable environment for our visitors, employees and community by taking such actions as: 1. Reducing energy and water use; 2. Reducing fuel use; 3. Reducing waste; 4. Purchasing environmentally-friendly products; 5. Implementing pollution prevention measures; 6. Being an environmentally-responsible role model.

Objective 9: Evaluate progress, success, or failure of sustainable initiatives after predetermined periods.

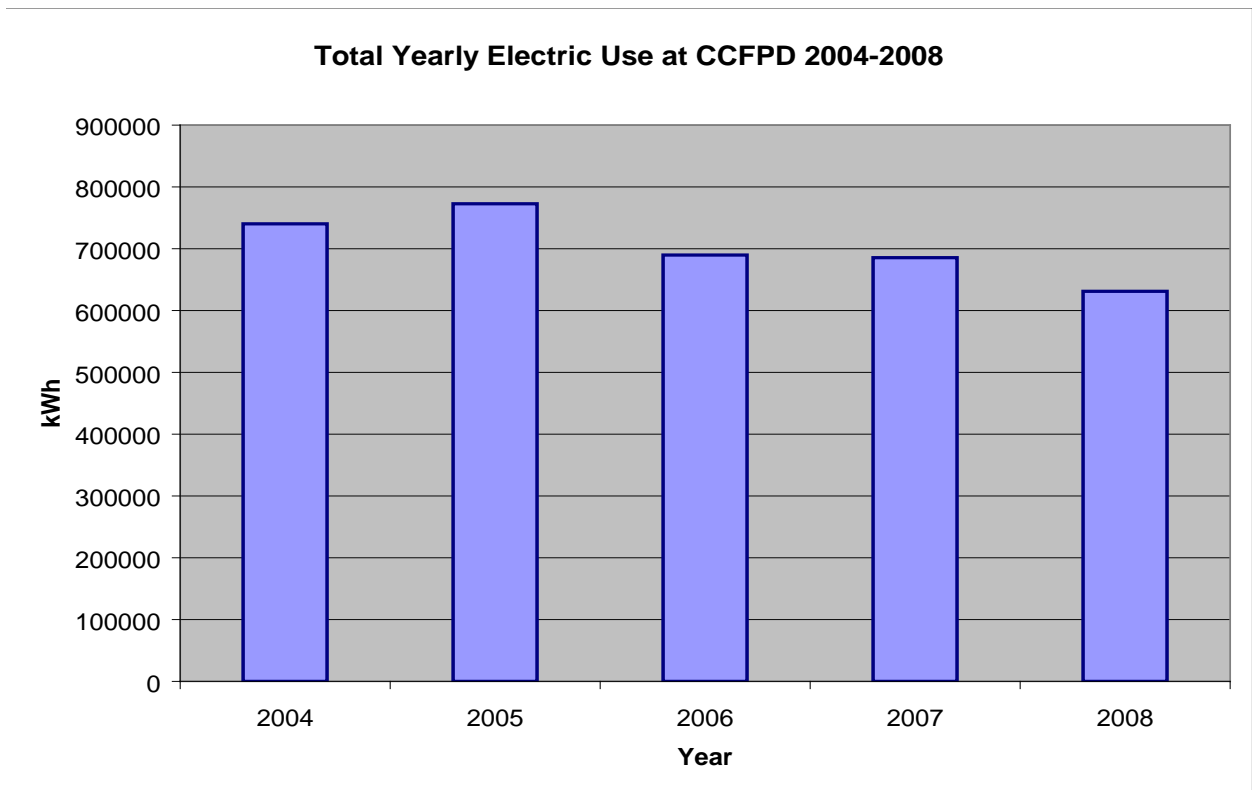
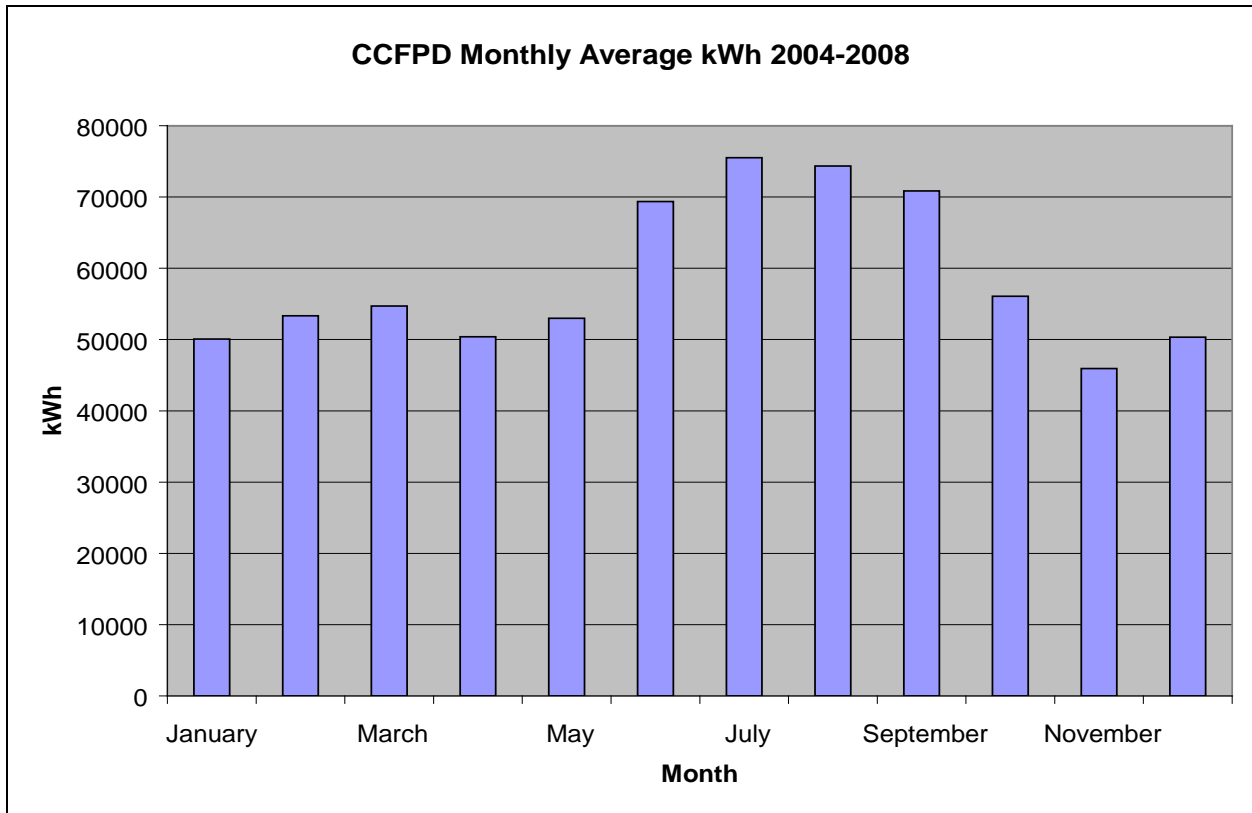
Recommendations	Item Leader	Notes
Evaluate successes/failures by comparing usage and purchasing over a three- and five-year period since initiatives began.	Site Superintendents, Department Heads	

Each year, discuss with District personnel further sustainable initiatives or improvements on current initiatives.	Site Superintendents, Executive Director	
Each year, include an overview of initiatives to the Board of Commissioners.	Site Superintendents, Executive Director, Commissioners	
Monitor and adapt sustainable initiatives for following years with new research, initiatives, and technology.	Site Superintendents, Department Heads	

Objective 10: Use the Natural Resources and Botanical Garden Building as a model for sustainability practices.

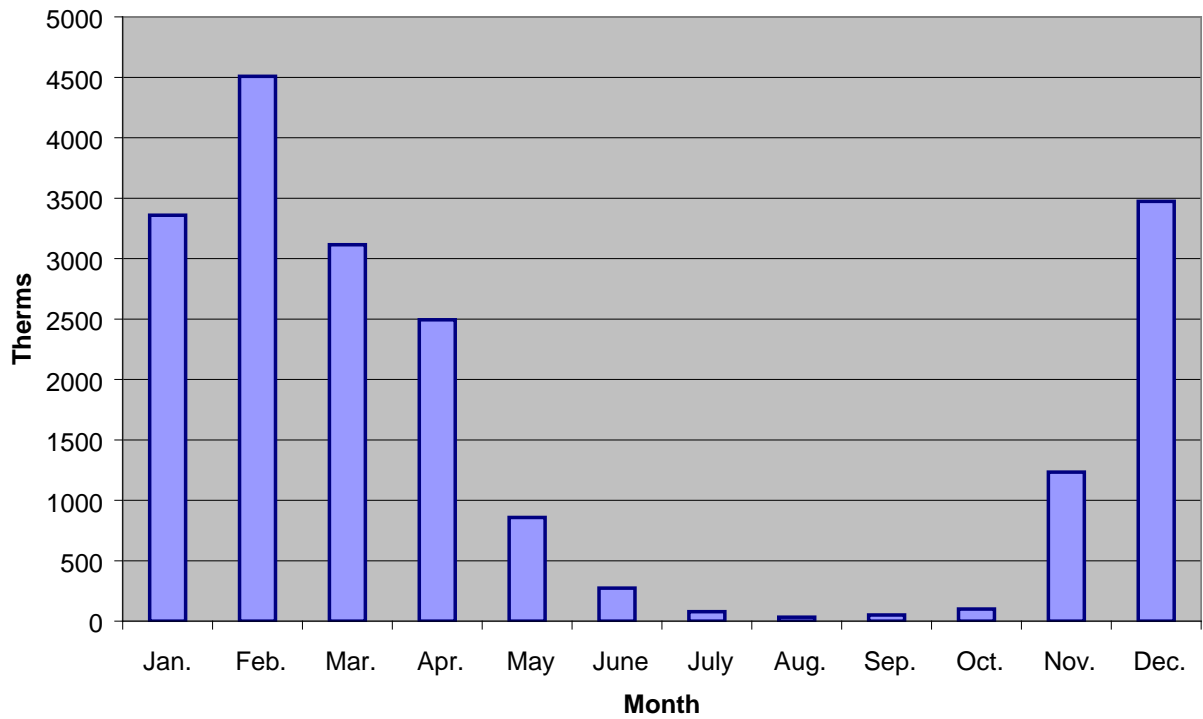
Recommendations	Item Leader	Notes
Install rainwater collection devices for shadehouse watering.	Natural Resources Director	
Phase out hot water tank system to new on-demand system.	Natural Resources Director	
Install solar panels for electrical use.	Natural Resources Director	
Phase out old plumbing to low-flow or waterless options.	Natural Resources Director	
Enhance internal recycling efforts for glass, plastic, etc.	Natural Resources Director	
Install a programmable thermostat.	Natural Resources Director	

Appendix B1: CCFPD Electrical Use Figures

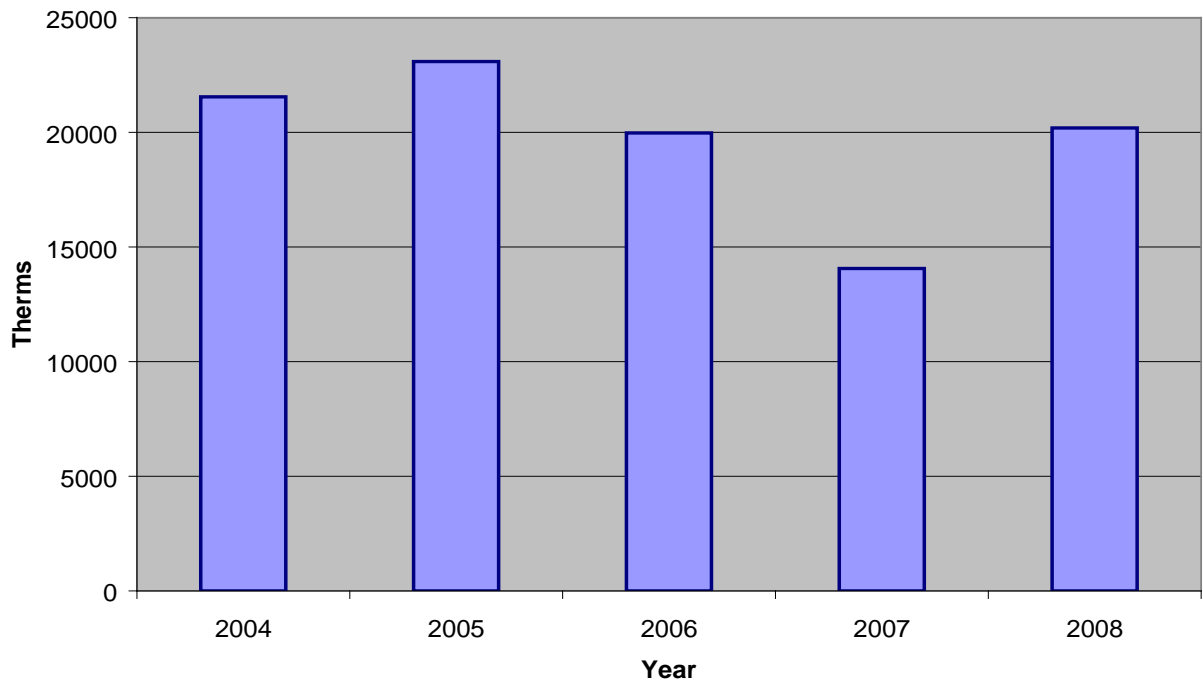


Appendix B2: Natural Gas Use Charts

Monthly Average CCFPD Natural Gas Use 2004-2008

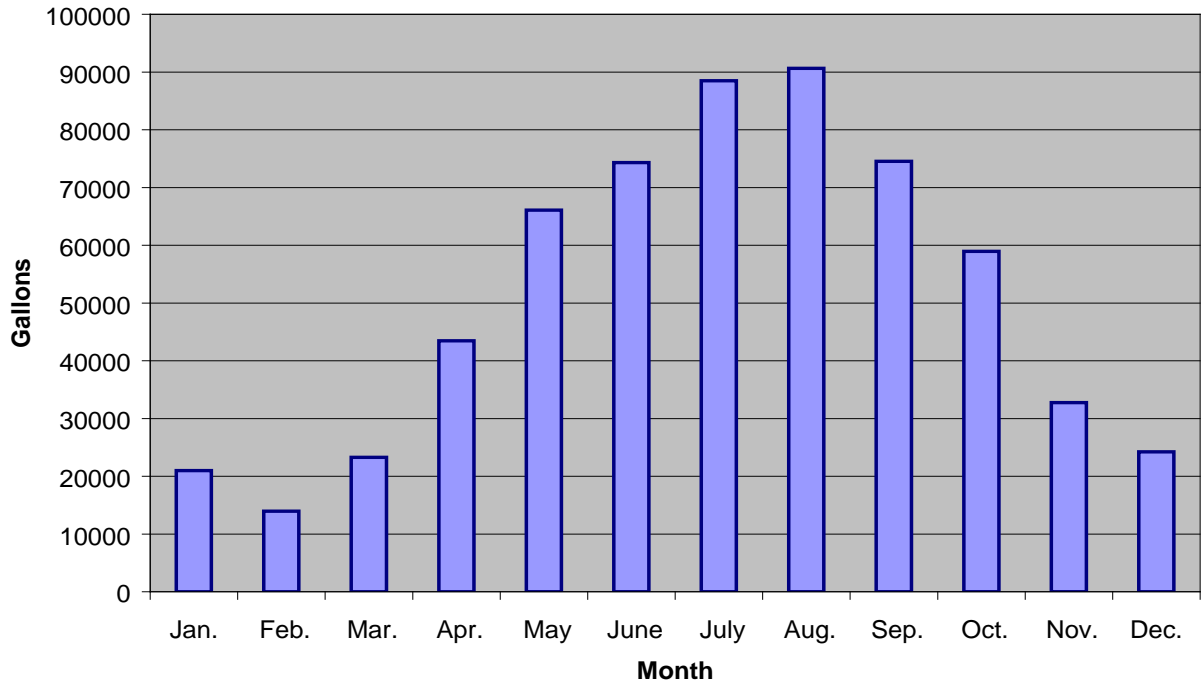


Total CCFPD Natural Gas Use 2004-2008

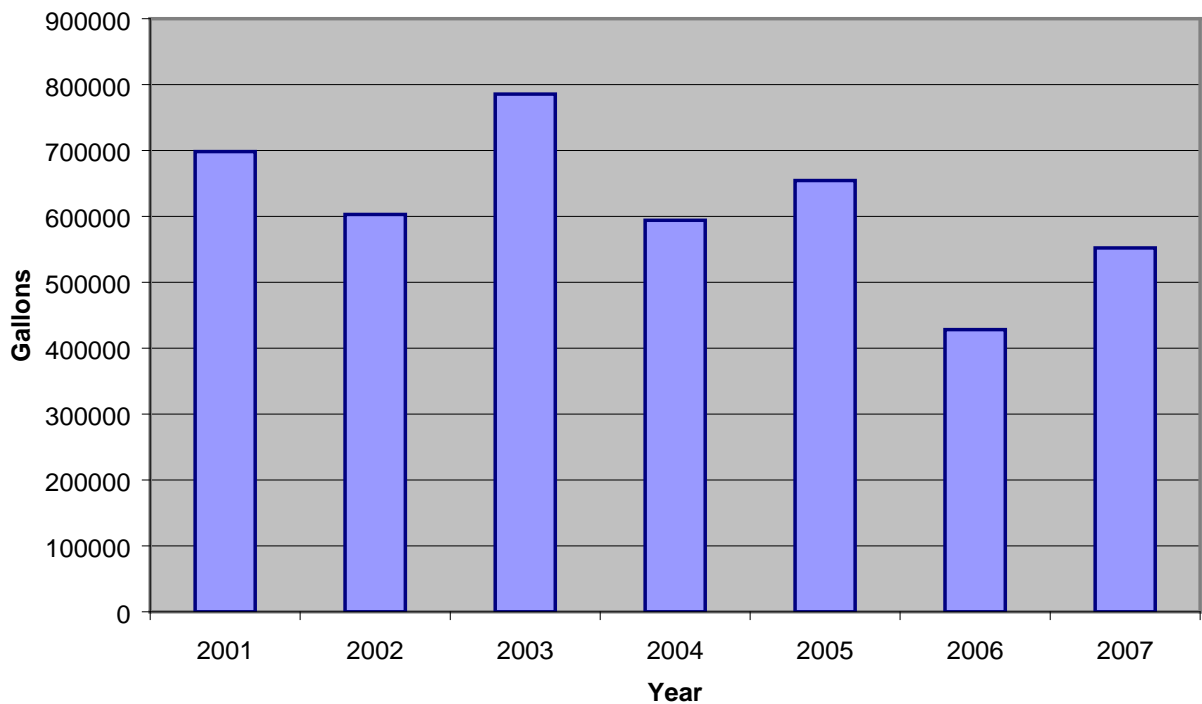


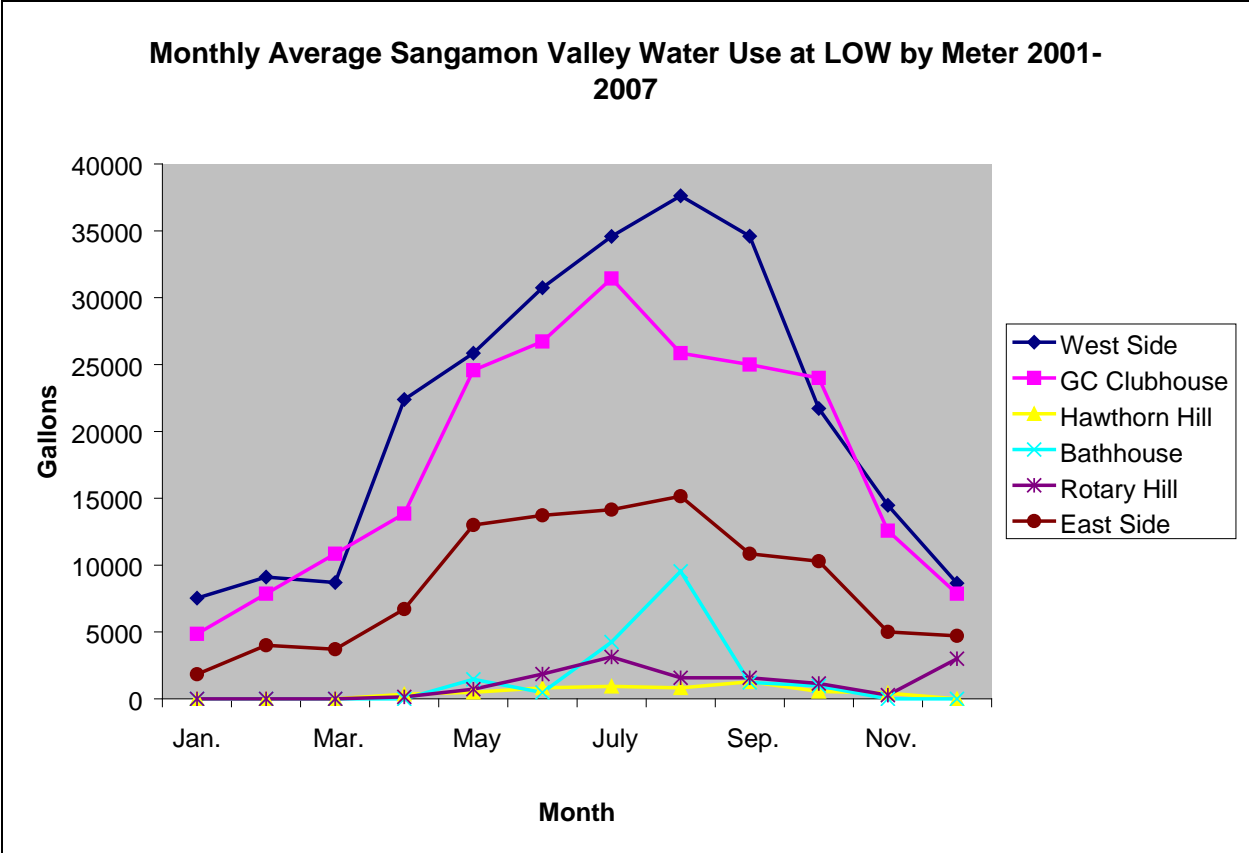
Appendix B3: Water Use Charts

Monthly Average Sangamon Valley Water Use 2001-2007



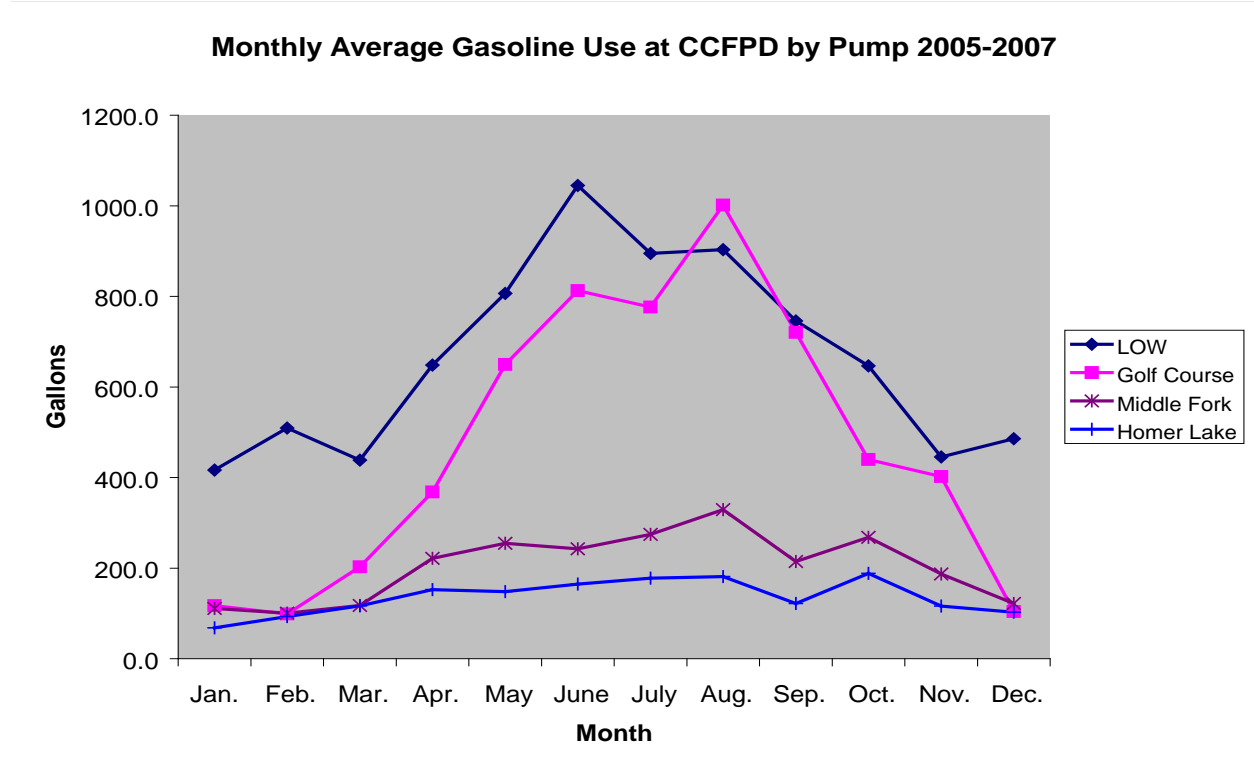
Total CCFPD Sangamon Valley Water Use 2001-2007



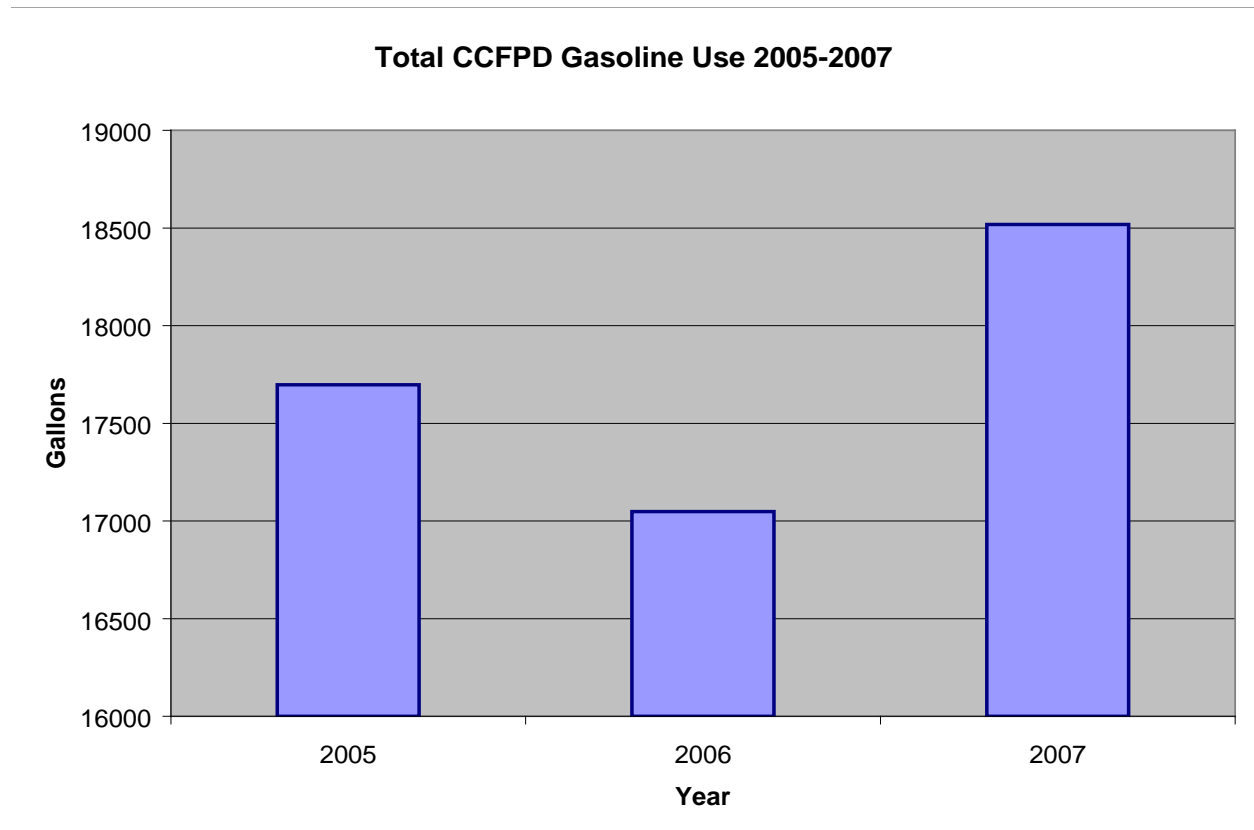


- Notes: 1) West Side includes LOW Operations, Construction, Natural Resources, Botanical Garden, and the Museum.
 2) East Side includes Headquarters, Elks Lake Pavilion, and LOW Pavilion.
 3) Meters are gauged per 100 gallons. Less than 100 gallons of use in a day is recorded as zero.

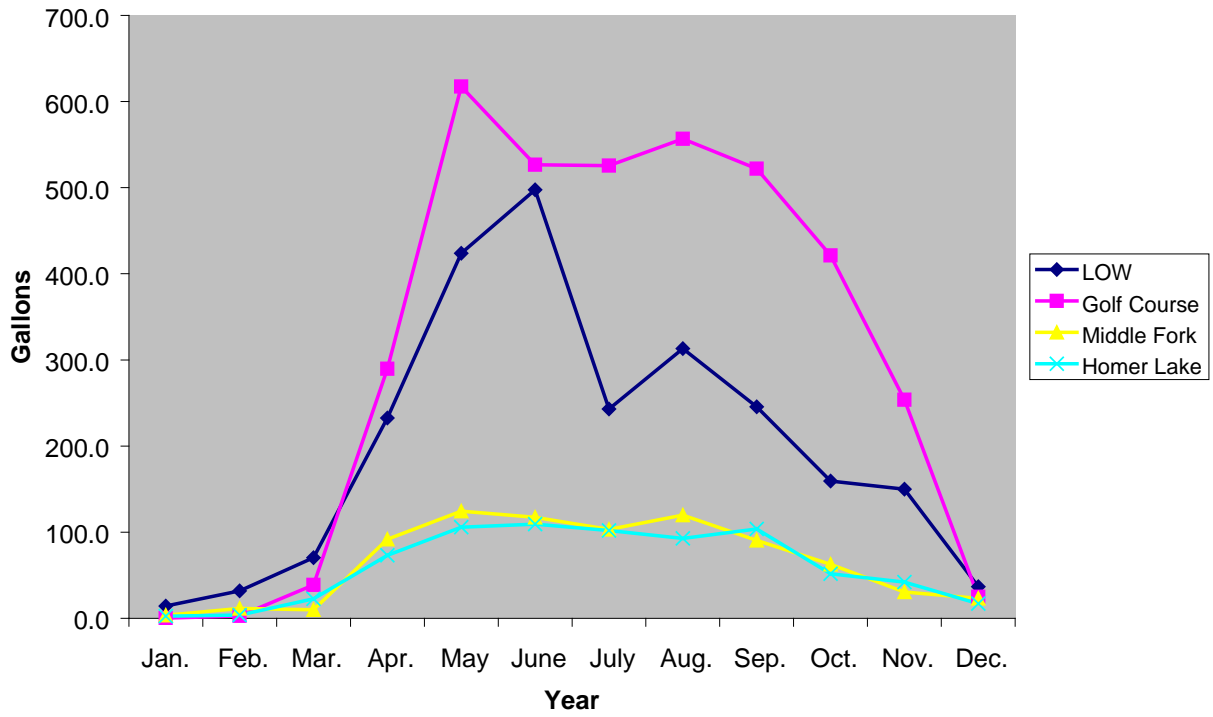
Appendix B4: Fuel Use Data Charts



Note: Fuel use is not broken down by department.

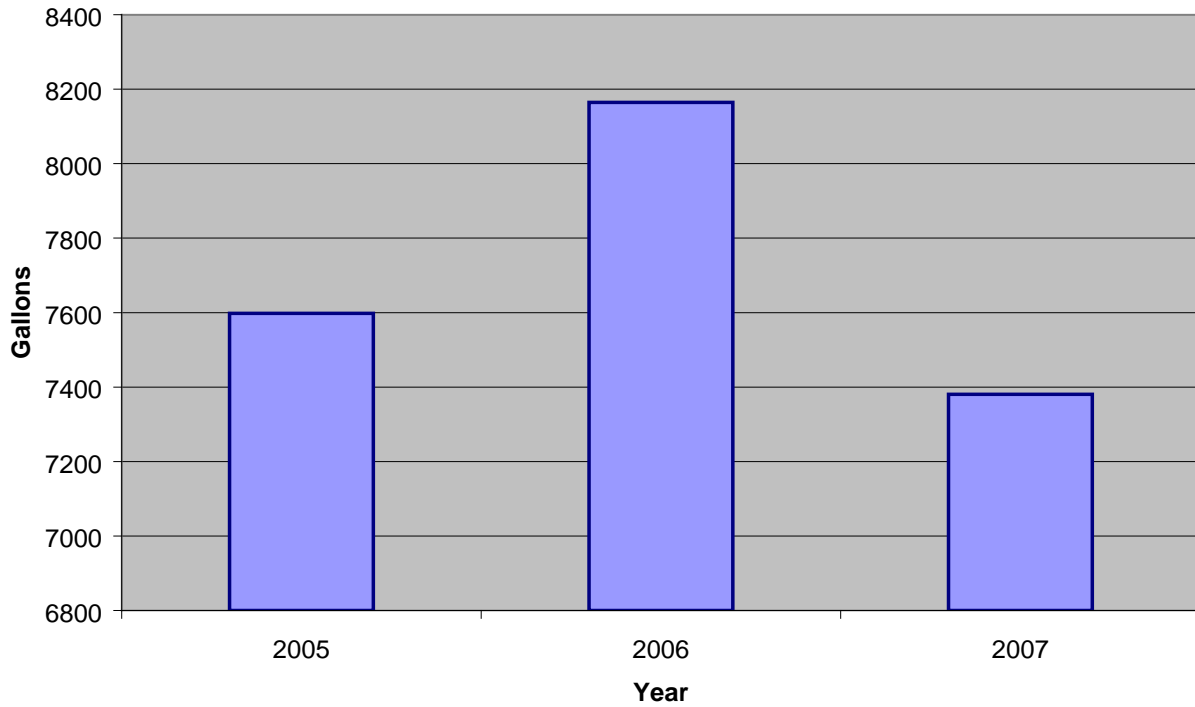


Monthly Average Diesel Use at CCFPD by Pump 2005-2007



Note: Fuel use is not broken down by department.

Total CCFPD Diesel Use 2005-2007



Appendix C1: Electrical Baseline Data

Lake of the Woods Electrical Baseline Data

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Headquarters												
Mean	600.3	608.0	591.3	523.7	439.3	346.3	354.3	368.3	409.7	252.3	371.0	444.3
SD	290.3	397.7	294.0	213.2	184.1	154.2	124.5	130.6	108.6	92.5	109.8	164.3
Heritage Hall												
Mean	3001.0	2853.3	2582.3	2697.3	2279.7	2685.3	2945.7	3574.3	3022.3	2892.0	2114.0	2563.7
SD	148.1	286.4	149.7	134.0	148.1	108.5	135.8	596.2	323.7	468.9	374.4	55.8
Museum												
Mean	5851.3	6272.3	5738.0	6198.3	6453.0	10629.3	11787.7	11406.3	9536.7	7365.3	6490.0	7133.7
SD	1969.5	929.9	728.4	497.6	377.5	653.1	1270.4	1872.7	705.6	1080.4	228.7	378.6
West Complex												
Mean	4207.0	4054.3	3673.7	3904.7	3024.3	4279.7	3978.0	4208.0	3646.3	3851.7	3197.7	3629.3
SD	285.2	261.9	191.8	524.1	471.1	798.0	543.0	613.0	519.6	787.9	487.6	77.5
Gardens												
Mean	1517.7	1148.3	944.7	922.3	2839.7	6489.0	5529.0	4065.0	5461.0	5423.3	3402.7	1336.7
SD	193.3	233.6	167.7	325.3	743.5	3175.5	2382.0	611.4	1495.7	578.8	3089.6	216.2
BT Restroom												
Mean	258.33	343.00	259.67	293.33	226.33	241.67	221.33	231.67	216.00	193.67	272.67	294.33
SD	29.02	34.83	34.99	26.50	26.95	34.56	34.39	19.14	41.07	32.19	69.41	49.70
Bathhouse												
Mean	1.67	0.00	0.67	5.00	139.33	273.33	250.67	257.00	224.67	127.67	42.33	1.00
SD	2.08	0.00	1.15	4.00	236.14	367.12	326.99	210.01	186.51	122.17	24.13	1.00

Note: Calculated from 2004-2008 data

Lake of the Woods Electrical Baseline Data – Rental Buildings

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Elks Lake												
Mean	800.00	735.33	1008.33	531.67	593.67	1308.67	1333.67	1411.00	1235.33	1063.00	812.33	896.67
SD	31.48	20.03	258.65	198.45	39.58	102.77	70.87	323.41	81.51	191.57	134.45	102.93
LOW Pav.												
Mean	701.67	730.33	659.33	684.33	518.00	1152.67	1425.67	1674.33	1283.67	1045.67	575.67	563.33
SD	79.65	148.39	146.94	311.37	40.60	36.25	134.89	288.07	11.06	188.08	186.83	27.15
Izaak Walton												
Mean	316.00	323.00	258.00	192.67	238.33	417.00	312.67	303.67	297.67	232.00	218.33	293.00
SD	91.66	43.27	26.51	76.06	51.55	75.32	52.84	47.27	34.96	40.58	89.13	90.34
Rotary Hill												
Mean	154.00	246.00	414.33	107.67	255.33	478.67	532.33	446.00	481.33	586.33	337.33	263.00
SD	82.05	230.98	189.80	37.61	94.88	16.26	82.65	191.09	98.40	171.78	211.23	250.41
Riverview												
Mean	51.67	32.67	28.33	30.00	269.00	245.33	250.33	238.33	185.33	155.33	106.33	0.00
SD	58.20	47.06	40.41	37.24	173.26	36.50	60.50	39.55	39.00	49.92	127.87	0.00
Swiss Valley												
Mean	28.67	19.33	20.33	23.33	17.00	31.33	21.00	24.33	27.00	18.67	25.67	26.00
SD	17.21	11.93	12.86	12.50	7.00	13.43	9.85	11.06	12.53	15.04	16.50	12.53

Note: Calculated from 2004-2008 data

Golf Course Electrical Baseline Data

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cart Building												
Mean	137.3	47.3	53.7	177.3	176.7	292.3	303.0	268.7	285.3	225.7	194.3	219.0
SD	27.2	29.0	39.3	44.5	19.4	46.3	15.5	106.7	68.2	20.1	52.9	240.1
Maintenance												
Mean	3445.7	4300.7	3629.0	2283.7	1670.0	1388.0	1919.7	1344.7	1542.7	1459.3	1975.3	3342.3
SD	303.4	385.7	323.6	53.9	104.5	210.5	510.00	14.0	235.0	172.8	208.6	395.0
Clubhouse												
Mean	3896.0	5490.3	4368.7	6246.0	7661.7	12220.7	14794.0	14627.3	12310.3	10276.0	6775.3	5836.3
SD	793.7	206.1	168.5	507.3	487.0	915.70	533.7	1053.6	421.8	956.9	451.6	425.6
Well												
Mean	113.7	192.3	168.0	145.7	191.7	226.7	141.7	692.3	347.7	520.3	368.3	221.0
SD	76.4	46.6	1.7	60.8	34.1	67.9	45.8	387.6	141.7	268.9	200.4	79.7
Pump												
Mean	14.0	8.0	8.0	144.0	2186.7	5714.0	6550.7	5246.0	8317.7	6589.7	1613.7	116.3
SD	6.9	13.9	9.2	30.0	798.3	3159.9	1074.1	598.6	90.3	1775.9	995.2	135.6

Note: Calculated from 2004-2008 data

Homer Lake Electrical Baseline Data

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
House												
Mean	4859.3	4784.0	4078.3	3612.0	2380.7	2117.0	2478.7	2599.0	2049.7	1896.0	2606.3	3633.7
SD	166.2	119.6	118.6	371.3	579.3	263.7	1729.6	396.3	246.9	324.4	82.4	261.7
Walnut Hill												
Mean	240.3	233.7	160.3	148.0	164.7	274.7	269.7	176.0	239.0	199.0	190.7	142.0
SD	56.9	58.3	26.1	36.5	94.0	162.5	170.9	166.4	116.5	128.8	59.5	36.4
S.F. Center												
Mean	590.7	639.3	471.7	413.3	631.0	1180.3	1252.3	1300.3	1027.0	979.0	545.7	515.7
SD	103.7	220.8	97.0	23.2	8.5	187.9	121.5	153.0	39.5	50.7	88.1	55.9
Maintenance												
Mean	1036.7	987.0	960.7	917.7	977.3	1073.7	1119.0	1116.3	1034.7	982.3	905.0	908.0
SD	73.7	4.0	47.0	82.6	6.7	53.7	62.2	75.7	92.2	56.5	82.3	53.7
Environ. Ed.												
Mean	3775.7	3686.3	3116.7	2646.3	1566.7	1412.0	1500.7	1571.3	1530.3	1497.7	2282.0	2877.3
SD	65.7	482.1	199.6	376.6	241.9	97.0	90.1	229.6	64.8	246.0	416.7	427.5

Note: Calculated from 2004-2008 data

Middle Fork Electrical Baseline Data

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
West Barn												
Mean	3.3	13.3	0.0	0.0	0.0	0.0	3.3	0.0	0.0	4.0	0.0	3.3
SD	5.8	5.8	0.0	0.0	0.0	0.0	5.8	0.0	0.0	5.3	0.0	5.8
East Barn												
Mean	33.3	56.7	33.3	46.7	74.7	64.3	8.0	10.0	22.0	29.7	63.3	80.0
SD	57.7	56.9	30.6	35.1	45.0	48.6	7.2	0.0	29.9	0.6	15.3	60.8
Gate												
Mean	80.0	83.3	26.7	33.3	23.3	36.7	36.7	30.0	69.3	53.3	40.0	80.0
SD	10.0	11.6	15.3	30.6	5.8	15.3	20.8	17.3	68.9	50.3	30.0	17.3
House/ Camp/ Maint.												
Mean	13260.0	14460.0	12780.0	12060.0	11040.0	13740.0	15180.0	12000.0	14160.0	10860.0	11400.0	12360.0
SD	1672.5	3013.8	540.0	1428.7	2483.3	1672.5	1729.6	207.9	1351.0	1633.3	1264.3	2047.1

Note: Calculated from 2004-2008 data

Appendix C2: Natural Gas Baseline Data

Natural Gas Baseline Data (Therms)

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Greenhouse												
Mean	919.3	865.0	665.3	562.3	300.7	57.0	15.3	9.7	14.7	17.3	262.3	822.3
SD	41.9	92.9	62.9	85.7	298.5	67.6	2.5	6.7	5.5	7.4	33.5	281.0
LOW Maint.												
Mean	578.7	833.3	505.0	336.0	57.3	17.7	1.0	0.0	0.7	1.0	137.7	385.7
SD	61.0	87.5	90.9	76.9	30.9	19.5	1.7	0.0	1.2	1.7	28.7	163.6
BT Restroom												
Mean	73.3	108.7	67.3	44.0	13.3	2.3	0.0	0.0	0.0	0.0	24.0	78.0
SD	18.1	8.1	6.7	4.6	3.5	2.5	0.0	0.0	0.0	0.0	5.0	12.5
Annex												
Mean	172.0	202.3	126.0	93.3	31.3	15.3	8.0	2.0	0.3	2.0	35.0	58.0
SD	111.4	123.7	78.3	78.3	38.6	15.0	7.2	3.5	0.6	3.5	43.3	41.8
GC Clubhouse												
Mean	703.7	1091.0	742.3	469.0	117.0	20.7	13.0	12.0	11.7	17.3	137.3	827.3
SD	76.8	100.5	75.6	72.8	40.0	5.1	2.0	0.0	1.2	6.7	55.6	138.7
Museum												
Mean	1177.7	1589.7	1074.0	825.0	252.7	66.7	32.0	6.0	7.3	34.7	430.3	1277.7
SD	138.8	122.7	219.5	113.3	48.3	11.6	33.6	5.3	5.9	15.5	66.2	152.2

Note: Calculated from 2004-2008 data

Appendix C3: Water Baseline Data

Sangamon Valley Water Baseline Data (Gallons of Water Used)

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
West Side												
Mean	7240.0	8740.0	9100.0	16280.0	24100.0	28060.0	34720.0	37180.0	34420.0	19760.0	13540.0	8140.0
SD	1171.8	1677.2	3722.2	5160.6	5994.6	8108.2	12886.3	18016.0	13406.6	6723.3	6203.9	1546.9
GC Clubhouse												
Mean	4800.0	6400.0	7400.0	13000.0	24200.0	25800.0	27200.0	24200.0	24800.0	17600.0	12800.0	5600.0
SD	1643.2	3577.1	5319.8	1732.1	5263.1	2774.9	6870.2	4658.3	6140.0	6465.3	4969.9	5594.6
Hawthorn Hill Restroom												
Mean	0.0	0.0	0.0	160.0	440.0	640.0	880.0	640.0	740.0	560.0	140.0	0.0
SD	0.0	0.0	0.0	151.7	114.0	439.3	408.7	230.2	167.3	181.7	219.1	0.0
Bathhouse												
Mean	0.0	0.0	0.0	0.0	1060.0	280.0	1180.0	3880.0	520.0	967.5	0.0	0.0
SD	0.0	0.0	0.0	0.0	1297.3	476.5	1237.7	7912.5	1162.8	1730.7	0.0	0.0
Rotary Hill												
Mean	0.0	0.0	0.0	0.0	200.0	800.0	2200.0	1400.0	1800.0	600.0	200.0	0.0
SD	0.0	0.0	0.0	0.0	447.2	1303.8	2049.4	1341.6	1788.9	894.4	447.2	0.0
East Side												
Mean	2200.0	3800.0	2800.0	6000.0	9000.0	12600.0	13000.0	14000.0	8800.0	8400.0	4400.0	3800.0
SD	2683.3	2280.4	1643.2	3873.0	7314.4	10526.2	2549.5	5788.0	3346.6	6767.6	4159.3	3701.4

- Notes: 1) West Side includes LOW Operations, Construction, Natural Resources, Botanical Gardens, and the Museum.
 2) East Side includes Headquarters, Elks Lake Pavilion, and LOW Pavilion.
 3) Meters are gauged per 100 gallons. Less than 100 gallons of use in a day is recorded as zero.
 4) Calculated from 2001-2007 data

Appendix C4: Fuel Use Baseline Data

Gasoline Baseline Data (Gallons)

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
West Side												
Mean	416.6	509.5	438.6	648.4	806.6	1044.8	894.7	903.1	746.0	646.4	445.3	485.5
SD	94.9	162.2	216.0	192.2	121.1	92.5	101.6	120.6	131.1	65.2	75.2	102.3
Golf Course												
Mean	117.2	98.7	202.8	367.9	649.6	812.5	776.2	1001.4	720.4	439.6	402.1	104.0
SD	29.4	21.9	71.2	107.3	48.1	120.4	87.3	292.6	243.4	86.7	103.7	51.2
Middle Fork												
Mean	111.0	100.4	117.4	221.8	254.9	242.7	274.7	329.3	214.8	267.9	187.1	122.2
SD	63.4	11.8	52.6	91.3	88.3	26.5	38.7	92.4	105.3	38.0	23.3	18.1
Homer Lake												
Mean	68.4	93.3	116.8	152.7	148.2	164.9	177.9	181.6	121.8	188.3	116.1	102.6
SD	16.7	32.7	24.0	21.8	23.3	63.2	28.3	51.4	21.7	3.2	11.2	49.2

Note: Calculated from 2005-2007 data

Diesel Baseline Data (Gallons)

Building	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
West Side												
Mean	14.3	31.9	70.3	232.5	423.8	497.4	243.0	313.3	245.6	159.4	150.0	36.8
SD	12.6	22.0	59.7	144.9	124.1	219.6	139.3	130.7	17.5	63.9	74.7	10.7
Golf Course												
Mean	0.3	2.8	38.7	289.7	617.3	526.7	525.6	556.7	522.0	421.4	253.7	24.9
SD	0.6	4.1	20.5	33.0	133.2	28.1	12.1	117.6	45.5	75.8	76.7	23.6
Middle Fork												
Mean	3.5	11.5	9.9	91.8	124.3	117.2	103.4	119.9	90.6	62.8	30.7	23.2
SD	6.1	19.9	9.5	12.6	19.7	48.5	17.8	21.5	86.9	12.7	6.2	20.4
Homer Lake												
Mean	2.7	3.9	22.8	73.1	105.8	109.4	102.0	92.9	103.9	51.9	42.0	17.1
SD	2.5	6.8	15.0	77.4	36.6	76.0	77.8	26.0	69.5	40.8	21.2	17.1

Note: Calculated from 2005-2007 data