POLLUTION PREVENTION

INTERN PROGRAM

2013 ANNUAL REPORT

Pollution Prevention Services provides confidential, nonregulatory technical assistance to business and industry; working with plant managers to identify and implement improvement projects, leading to more efficient use of resources and economic savings.

Through the intern program, upper-level engineering and environmental science students from Iowa colleges and universities provide host companies with a designated resource to analyze processes, research alternatives, evaluate efficiencies, document savings and provide implementation support of environmental projects.

Since 2001, more than 166 dedicated companies have saved more than $72 million by opening their doors to pollution prevention interns. Iowa's top students have gained irreplaceable experience leading to employment in their chosen fields – often in our own state.

Businesses that partner with the Pollution Prevention Intern Program are as varied as the projects summarized in this report. Collectively, they repeatedly demonstrate that investing in environmentally sustainable projects provides lasting economic benefits.

We thank the 2013 host companies for their partnership and continued pursuit of environmental excellence.

2013 IMPLEMENTED SAVINGS

CATEGORY	REDUCTION	COST SAVINGS
WATER CONSERVATION	29,818,107 GALLONS	$57,445
SOLID WASTE	3,787 TONS	$320,901
HAZARDOUS WASTE	12 TONS	$31,836
ENERGY	9,047,357 KWH 540,286 THERMS	$356,414 $112,284
OTHER		$35,937
		TOTAL: $914,817

AIR POLLUTANTS AND GREENHOUSE GASES IN METRIC TONS:

CONVENTIONAL AIR POLLUTANTS DIVERTED IN METRIC TONS			
SO_2	NOX	VOC	PM_{10}
74.97	40.67	11.07	3.29
GREENHOUSE GASES DIVERTED IN METRIC TONS			
CO_2	CH_4	N_20	CFC
26,505.71	2,955.86	230.66	190.03

Note: Air emissions and greenhouse gases shown in the following case summaries are Life Cycle estimates and include external activities such as purchasing utilities. Totals do not solely represent emissions generated at the plant sites.

PROJECT AREAS IMPLEMENTED

- Lighting retrofits
- Boiler efficiency
- Heating and ventilation effectiveness
- Air conditioning usage
- Air compressor efficiency
- Water usage and wastewater treatment
- Interior and exterior thermographic analysis
- Solid waste reduction and management
- Process improvements
- Replacing hazardous chemical with less toxic alternatives

COMPANY TESTIMONIALS:

"This project fully met our needs and occurred at a time when resources were committed to other projects. The timing and depth of research could not have been better. This program has been an extremely valuable resource to CNH."

— Mike Nelson, ***CNH America, LLC***

"We had an excellent experience. We saved thousands of dollars and advanced toward our green goals."

— Brian Kumm, ***Hormel Foods***

FULL CASE STUDIES MAY BE VIEWED AT:
WWW.IOWAP2INTERNS.COM

Iowa Department of Natural Resources

SUMMARY OF 2013 PROJECTS

ADDISON ARDOLINO
INDUSTRIAL ENGINEERING, THE UNIVERSITY OF IOWA

BRIDGESTONE AMERICAS TIRE OPERATIONS

DES MOINES, IOWA

Firestone Agricultural Tires is a branch of Bridgestone Americas Tire Operations which specializes in the production of agricultural and forestry tires. The Des Moines plant is the largest agricultural tire manufacturing facility in the country. The intern researched outlets for challenging waste streams to increase diversion of recyclable materials from the landfill and improve the efficiency of recovery and collection processes at the facility.

OLIN POSTLETHWAIT
MECHANICAL ENGINEERING, IOWA STATE UNIVERSITY

CNH AMERICA, LLC

BURLINGTON, IOWA

CNH America, LLC (Case) is a global manufacturer of heavy construction and agricultural machinery. The Burlington plant specializes in producing tractor-loader-backhoes, tractor-loader-landscapers and rough-terrain forklifts for Case and New Holland. The intern researched opportunities to reduce energy consumption in the process curing ovens. Recommendations included upgrades to premium efficiency motors, additional insulation and implementation of a preventative maintenance plan.

AUSTIN RUTHERFORD
MECHANICAL ENGINEERING, THE UNIVERSITY OF IOWA

DANFOSS POWER SOLUTIONS INC.

AMES, IOWA

Danfoss Power Solutions, Inc. is a world leader in the design, manufacture and sale of engineered hydraulics. Most of the electric systems and components manufactured at the facility are used in mobile equipment. The intern made recommendations to reduce energy usage and associated costs of the compressed air system. Improvements will contribute to increased productivity. A commercial single-stream recycling process was also implemented to increase landfill diversion and reduce disposal costs.

JAY STEINES
MECHANICAL ENGINEERING
UNIVERSITY OF WISCONSIN-PLATTEVILLE

EATON CORPORATION

SHENANDOAH, IOWA

Eaton Corporation is a leading global manufacturer specializing in electrical and industrial products. The Shenandoah plant supplies transmissions for several major manufacturers of heavy-duty trucks. Using thermographic imaging equipment the intern developed recommendations that included both operational improvements and equipment modifications to the facility's heat treat furnaces. When implemented, these recommendations will significantly reduce utility costs and emissions associated with the process furnaces.

ZACH CARTER
MECHANICAL ENGINEERING, THE UNIVERSITY OF IOWA

GOLDEN CRISP PREMIUM FOODS, INC.

SIOUX CENTER, IOWA

Golden Crisp Premium Foods, Inc, a division of Patrick Cudahy LLC, processes fresh pork bellies into smoked, sliced, cooked and ready-to-eat bacon products for both food service and retail customers. The intern conducted a comprehensive analysis of the facility's landfilled solid waste streams. Programs were developed and implemented to divert many of those materials from the landfill which will move the company closer to achieving zero landfill status.

DANIELLE UNDERWOOD
INDUSTRIAL ENGINEERING, IOWA STATE UNIVERSITY

GRINNELL COLLEGE

GRINNELL, IOWA

Grinnell College is a private, liberal arts college founded in 1846. The mission of the College is to provide students with a broad, deep, and life-enhancing education. The intern developed a comprehensive spreadsheet documenting the lamp use, type, location and wattage of the various lamps that will help manage and control inventory. Recommendations for upgrades to the lighting system and the addition of sensors and controls are expected to considerably impact annual energy costs.

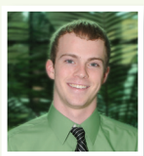
NICOLE UNDERWOOD
MECHANICAL ENGINEERING, IOWA STATE UNIVERSITY

GRUNDY COUNTY MEMORIAL HOSPITAL

GRUNDY CENTER, IOWA

Grundy County Memorial Hospital was founded 61 years ago and now serves four counties. The hospital has a regional reputation for its orthopedic services and offers a variety of outpatient services. The intern evaluated ways to increase efficiency of the boiler and steam system. Strategies included reducing boiler pressure, optimizing the air-fuel ratio, and heat recovery methodologies to preheat intake air. Thermographic imaging equipment was utilized to identify leaks and heat loss in the steam system.

JOHN BAUMHOVER
MECHANICAL ENGINEERING, THE UNIVERSITY OF IOWA



HORMEL FOODS

ALGONA, IOWA

Hormel Foods produces the top selling brand of pepperoni in the nation, including both classic *Hormel*® brand pepperoni as well as specialty-recipe pepperoni. The intern first conducted a lighting assessment of targeted areas in the facility. He then identified potential markets for critical waste streams to support a corporate initiative for landfill diversion. The additional diversion of waste from the landfill will provide significant cost savings and improve environmental performance.

KELSEY OLSON
INDUSTRIAL ENGINEERING, BRADLEY UNIVERSITY

JELD-WEN WINDOWS

GRINNELL, IOWA

JELD-WEN formerly known as WENCO was started in 1969. JELD-WEN Windows manufactures vinyl windows and sliding patio doors for new construction and remodels for residential markets. The intern recommended process improvements to reduce the amount of scrap generated during the manufacturing process. The intern worked with personnel and management to improve the efficiency of recycling collection within the production lines and reduce cross contamination of recyclable materials.

AARON STRAND
MECHANICAL ENGINEERING, UNIVERSITY OF WISCONSIN-PLATTEVILLE

JOHN DEERE DAVENPORT WORKS

DAVENPORT, IOWA

John Deere Davenport Works includes a production plant, a training center and a shipping facility. The plant houses five product lines: skidders, wheeled feller-bunchers, four-wheel-drive loaders, articulated dump trucks and motor graders. The intern completed a motor survey and identified opportunities to reduce energy usage at the plant. Recommendations included upgrading to synchronous belt drives and premium efficiency motors and strategies to reduce run time.

ROBERTO JESUS GARCIA
MECHANICAL ENGINEERING, IOWA STATE UNIVERSITY

JOHNSON CONTROLS, INC.

RED OAK, IOWA

Johnson Controls Inc. is a global corporation comprised of three divisions: building efficiency, power solution and automotive experience. The Red Oak facility is part of the Power Solutions division and specializes in production of battery grids. The project examined free-cooling technology at the plant to reduce energy usage. The intern also evaluated filtration technologies for process cooling water to improve production, extend equipment life and reduce costs.

BRIANI CAREY
MECHANICAL ENGINEERING, THE UNIVERSITY OF IOWA

STANLEY ENGINEERED FASTENING

DECORAH, IOWA

Stanley Engineered Fastening provides fasteners for use in a diverse range of applications including automotive and commercial technologies, electronics, construction and industrial use. The intern conducted an audit of the compressed air system using ultrasonic leak-detection equipment to identify and quantify leaks and made recommendations to improve the operating efficiency and reduce costs. An an ongoing leak detection plan was also developed that will help keep the system operating efficiently.

KIM SCHERBER
CIVIL ENGINEERING, IOWA STATE UNIVERSITY

TYSON DELI, INC.
CHEROKEE, IOWA

Tyson Foods, Inc. is a major producer of chicken, beef, and pork products for consumers globally. This facility receives and processes raw meat into ready-to-eat products. The intern completed a water balance and investigated water reduction opportunities at the facility to meet corporate reduction goals. Strategies included production and operational improvements that will significantly reduce the amount of water and energy used in the wastewater pretreatment process.

CALLIE SCHULTES
CHEMICAL ENGINEERING, IOWA STATE UNIVERSITY

UNITYPOINT HEALTH–DES MOINES
DES MOINES, IOWA

UnityPoint Health-Des Moines prides itself on the treatment it provides in the areas of cancer, cardiology, trauma and emergency, physical rehabilitation, maternity care, behavioral health, orthopedics, weight loss, pediatrics, sports medicine, and radiology. The intern conducted an audit of the hospital's hazardous waste streams, focusing on the pharmaceutical waste collection program. Increasing the segregation of this waste stream and reducing the amount of pharmaceutical waste being generated will significantly reduce purchasing and disposal costs.

LUCAS BLACK
MECHANICAL ENGINEERING, UNIVERSITY OF WISCONSIN-PLATTEVILLE

WEST LIBERTY FOODS, LLC
WEST LIBERTY, IOWA

West Liberty Foods, LLC has been certified as a landfill free facility. The company continually seeks to increase its environmental stewardship and is now is working to reduce energy consumption. The intern identified leaks in the compressed air system at two plant facilities. He then evaluated the control and distribution portions of the system and made recommendations to improve storage opportunities and add variable frequency drives and load controls to help optimize the system.

NICHOLAS ZAHNER
CONSTRUCTION ENGINEERING, MECHANICAL EMPHASIS
IOWA STATE UNIVERSITY

WESTERN IOWA TECH COMMUNITY COLLEGE
SIOUX CITY, IOWA

Western Iowa Tech is a comprehensive community college with five campuses in northwestern Iowa. More than 70 degree options are currently offered. The intern developed a profile of energy use and assessed reduction opportunities of the mechanical systems at the main campus in Sioux City, Iowa. A window retrofit was also evaluated that would reduce heat-flow and help maintain ambient temperature reducing the load on mechanical equipment.

ANDREW JARVEY
INDUSTRIAL ENGINEERING, IOWA STATE UNIVERSITY

WINNEBAGO INDUSTRIES, INC.
FOREST CITY, IOWA

Winnebago Industries operates the largest facility for motor home production in the United States (U.S.) and is a leading U.S. Class A and Class C recreational vehicle manufacturer. The intern conducted a waste stream analysis and identified new markets to increase the amount of recyclable material diverted from the landfill. The intern also recommended process improvements to streamline the collection and shipping of recyclable materials to generate cost savings.

BRYCE NEUMAN
MECHANICAL ENGINEERING, UNIVERSITY OF WISCONSIN PLATTEVILLE

ZOETIS
CHARLES CITY, IOWA

Zoetis develops and manufactures animal health medicines and vaccines designed to meet the real-world needs of veterinarians, farmers and companion animal owners. Vaccines for cattle, swine, poultry and companion animals are produced at the Charles City facility. The intern conducted a water balance and evaluated process improvements to reduce water consumption at the facility. Strategies included hot water recovery, set-point adjustments, flow-control switches and a closed-loop cooling system.

DANIELLE DILKS
INTERN PROGRAM COORDINATOR
POLLUTION PREVENTION SERVICES

Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319-0034

www.iowap2interns.com