

# Confidential Information Memorandum

April 2019

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**Randy Campbell\****Managing Director*

Wells Fargo Securities, LLC  
(212) 214-6832

[randall.s.campbell@wellsfargo.com](mailto:randall.s.campbell@wellsfargo.com)

**Nicole Briley\****Vice President*

Wells Fargo Securities, LLC  
(212) 214-6687

[nicole.s.briley@wellsfargo.com](mailto:nicole.s.briley@wellsfargo.com)

**Pat Russell***Managing Director*

Wells Fargo Securities, LLC  
(704) 410-0766

[patrick.russell@wellsfargo.com](mailto:patrick.russell@wellsfargo.com)

**Kevin Hoecker***Managing Director*

Wells Fargo Securities, LLC  
(312) 920-3563

[kevin.hoecker@wellsfargo.com](mailto:kevin.hoecker@wellsfargo.com)

**Chase Robinson\****Director*

Wells Fargo Securities Canada, Ltd  
(416) 607-2994

[chase.robinson@wellsfargo.com](mailto:chase.robinson@wellsfargo.com)

**Jamie McKeown***Associate*

Wells Fargo Securities Canada, Ltd  
(416) 775-2945

[james.a.mckeown@wellsfargo.com](mailto:james.a.mckeown@wellsfargo.com)

**Elizabeth Zhang***Analyst*

Wells Fargo Securities Canada, Ltd  
(416) 607-2930

[elizabeth.zhang@wellsfargo.com](mailto:elizabeth.zhang@wellsfargo.com)

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\*Indicates primary contact

# Important Notice and Disclaimer (Continued)

This Confidential Information Memorandum (the "Memorandum") has been prepared by the University of Iowa (the "University") and its affiliates solely for use of the prospective Concessionaires (as defined herein) in connection with their consideration of a potential Public-Private Partnership (the "Possible Transaction").

Wells Fargo Securities, LLC ("WFS") has been engaged by the University to assist the University in the Possible Transaction and all inquiries and requests for additional information concerning the Possible Transaction should be directed only to the WFS contacts listed on the previous slide. Under no circumstances should the regents, board, management, employees, or officers of University be contacted directly. WFS, including its respective subsidiaries, controlling companies, affiliates, companies under common control and their directors, officers, managers, employees, agents, advisors and consultants ("Representatives"), in providing this Memorandum, are not acting as financial advisors, intermediaries and/or distributors of securities and have no fiduciary responsibility or of any kind to any prospective Concessionaire.

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This Memorandum has been prepared for the purpose of providing prospective Concessionaires with general financial and other information concerning the University. This Memorandum is being furnished to gauge the Recipient's interest in the Possible Transaction and does not constitute an offer to sell or a solicitation of offers to buy, lease, license or sell the assets of the University. The information contained in this Memorandum is selective and is subject to updating, expansion, revision and amendment. It does not purport to contain all the information that Recipients may require to properly evaluate the Possible Transaction. No obligation is accepted to provide Recipients with access to any additional information, or to update, expand, revise or amend the information, or to correct any inaccuracies that may become apparent. Statements made in this Memorandum are made as of the date hereof, unless stated otherwise, and neither the delivery of this Memorandum at any time, nor any subsequent participation in the Possible Transaction, shall under any circumstances create an implication that the information contained herein is correct as of any subsequent time. This Memorandum includes certain statements, estimates and projections with respect to the anticipated future performance of the University. Such statements, estimates and projections reflect various assumptions made by the University concerning anticipated results, which assumptions may or may not prove to be correct. These projections have not been independently verified and cannot be regarded as forecasts. The pro forma and estimated financial information contained herein was prepared expressly for use herein and is based on certain assumptions and management's analysis of information available at the time this Memorandum was prepared. There can be no assurance that management's views or assumptions are accurate or that management's projections and forward-looking statements will be realized. Industry experts may disagree with these assumptions and with management's view of the market and the prospects for the University. The actual results may vary from the anticipated results and such variations may be material.

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By accepting this Memorandum, each Recipient acknowledges that it will be solely responsible for making its own investigations and forming its own view as to the state and prospects of the University. If and when authorized by the University, prospective Concessionaires will be allowed to conduct a comprehensive due diligence review of the University's operations and financial condition regarding the subject of the Possible Transaction. Prospective Concessionaires will be required to rely only upon such review and the terms and conditions contained in a definitive agreement relating to a Possible Transaction, if any. Recipients are advised to seek their own professional advice on the legal, financial, taxation and other consequences of the Possible Transaction as they may deem necessary in order to determine whether to proceed with any Possible Transaction.

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By accepting this Memorandum, the Recipients also confirm, irrevocably and irreversibly, that: (i) they are not relying on (to make any decision, either for investment or otherwise) the guidance, advice or representation (whether written or oral) of WFS, (ii) WFS has not provided (directly or indirectly by any person) any form of assurance or guarantee as to the merits (whether legal, financial, tax, accounting, regulatory compliance, credit, or other) of any information described in this Memorandum; and (iii) they are investors that are qualified, experienced and sophisticated and thereby waive any protection that an investor not qualified may have.

The preparation and distribution of this Memorandum does not constitute a form of commitment or recommendation relating to the Possible Transaction. Neither the information contained in this Memorandum nor any further information made available by WFS or the University in connection with the Possible Transaction will form the basis of or be construed as a contract.

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By receiving this Memorandum, each Recipient declares that it agrees to be bound by all the terms stated above.

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## Executive Summary

# Overview of the Public-Private Partnership Opportunity

*The partnership aims to align with the University's values, add long-term sustainability to the utility system assets, and allow the University to, through investments in its strategic initiatives, create a better environment for current and future students to come*

## Partnership Transaction Rationale

- The University of Iowa ("UI" or the "University") is exploring a **public-private partnership ("P3") concession** involving its on-campus utility system with a private utility operator (the "Concessionaire")
- The P3 partnership aims to provide a new funding source for the University to invest in strategic initiatives
- The Governor of the State of Iowa asked the Board of Regents (State of Iowa) to encourage the University to explore partnerships that could generate new revenue sources
- Proceeds from the upfront payment will be placed into a new University endowment and used to fund its planned strategic initiatives, focused on three areas:
  - **Research and Discovery:** Perform high-impact research
  - **Student Success:** Provide a transformative educational experience for all students
  - **Engagement:** Foster engagement with the State of Iowa and the rest of the world to broaden education, improve health, and enhance economic development



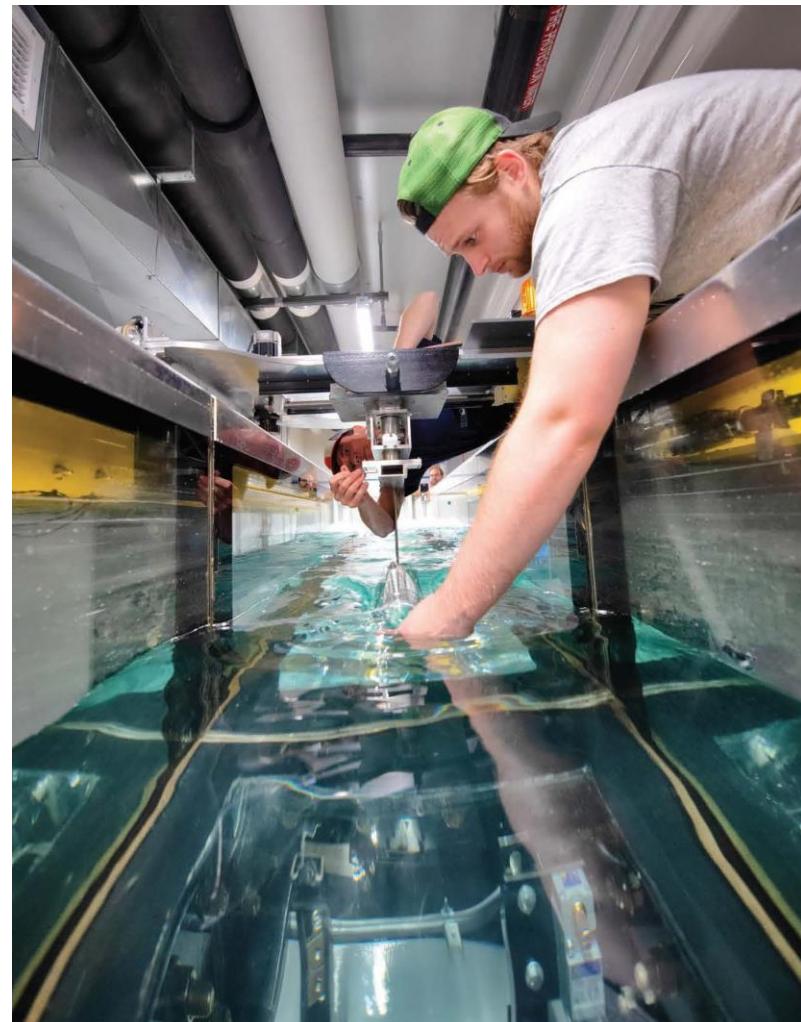
Source: University of Iowa website | University filings

# Overview of the Public-Private Partnership Opportunity (*continued*)

***Reinvested proceeds from the upfront payment will be used to fund future opportunities for academic, research, and campus programs resulting in a collaborative win-win situation for both the University and the Concessionaire***

## Utility System P3 Opportunity

- Opportunity to manage the **on-campus utility systems** for the University through a 50 year lease and concession agreement (the “Concession Agreement” or “Concession”)
- Concessionaire will be responsible for the operation and maintenance of the **electrical systems, steam, domestic water, chilled water, sanitary and storm sewer, high quality water, utility network maintenance, energy control center, environmental compliance, and related distribution systems** serving the Main and Oakdale campuses (“Utility System” or “UI Utilities”)
- **Compensation Structure:**
  - University will receive **an upfront payment** from the Concessionaire, which it will place into an endowment used to fund its strategic initiatives
  - Concessionaire is expected to receive an **annual utility fee payment** for providing agreed upon services
    - Consists of an annual fixed fee with an annual inflation escalator, pass-through of O&M costs, and a deemed return on capital invested into the utility system
- **Concessionaire's Additional Operational Objectives:**
  - Ability to operate the main campus power plant on a coal-free basis by January 1, 2025
  - Continue to explore sources of renewable fuels and incorporate sustainable, lower-cost fuel options into the existing utility system
  - Recognizing that current utility system employees are critical for ongoing system operation and reliability, Concessionaire will provide an attractive employment package to maximize the number of employees who are offered and accept positions with the Concessionaire
  - Concessionaire is expected to maintain utility system assets in similar or better condition
  - Continue to support research opportunities in utility system facilities for faculty & staff researchers



# Investment Highlights

## 1 Stable and Growing Long-Term Cash Flow Profile

- Concessionaire will be the **exclusive provider** of UI's utility system operations subject to limited exceptions
- **Long-term, predictable cash flow stream over a 50 year concession term**
  - Fixed fee revenue component will be structured to include an **annual inflation escalator of 1.5%**; starting in 2021 or 2025 as agreed upon by the University and the Concessionaire
  - **Defined return on capital** for investments made into the utility system
  - **Additional revenue opportunities** for realizing strategic improvements in performance

## 2 Long-Term Partnership with a Premier University

- One of the **nation's premier public universities** perennially ranked in the top 40 of all U.S. public institutions
- Consistent, stable enrollment, with world-class research capabilities and distinction in the arts and humanities
- Low risk, investment grade profile (rated **Aa1, stable** by Moody's), which has remained consistent historically
- Few opportunities in the market rival the **low-risk, stable return profile** of this P3 opportunity

## 3 Reliable System & High Quality Operations Team

- Highly reliable utility system which has seen a **dramatic reduction in reliability deviations** over the past six years
  - 1 recorded steam plant incident in 2018, as compared to 7 in 2012
  - 3 recorded chilled water plant incidents in 2018, 1 of which was weather-related
- **Since 2012, more than \$188MM has been** invested to upgrade and maintain the utility system
- Highly experienced team of 120 full-time utility system employees, averaging ~14 years of campus utilities experience, with **~31% boasting over 20 years of experience**

## 4 Growth and Other Potential Opportunities

- **Near-term and long-term capital investment needs** to meet additional on-campus demand
  - Over **\$1BN of projected capital expenditures** over the concession term, driven primarily by expansion of academic research and patient care facilities
  - Recent capital projects include:
    - Construction of Psychological and Brain Sciences Building (to be completed in January 2020) and construction of new College of Pharmacy building (to be completed in fall 2019)
- Additional opportunities to participate in **energy-related sustainability efforts**:
  - Ability to operate the main campus power plant on a **coal-free basis** by January 1, 2025
  - Sourcing and replacing current fuels with renewable fuels
  - Integration into campus-wide energy and sustainability efforts



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## Overview of the University of Iowa

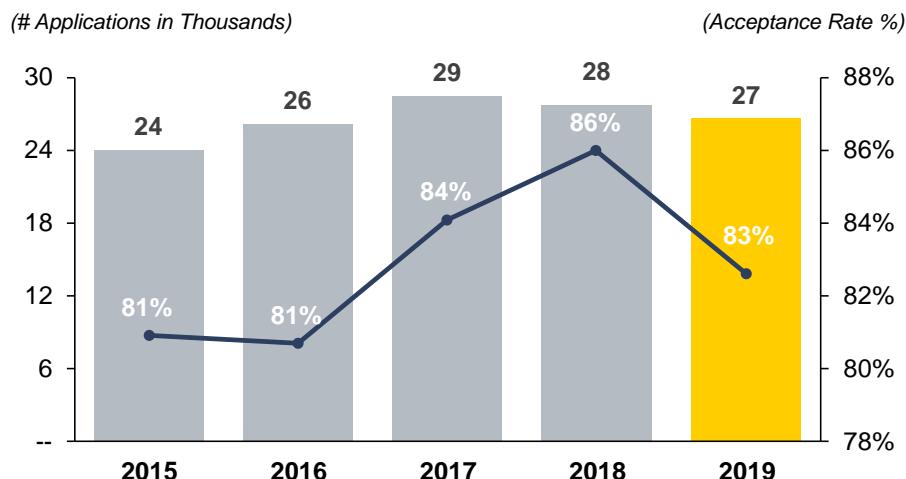
# Overview of the University

**Founded in 1847 and located alongside the Iowa River, the University of Iowa is the State's oldest institution of higher education**

## University Overview

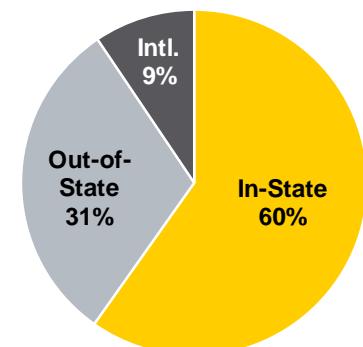
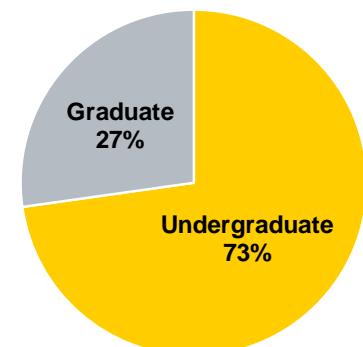
- The University is one of the nation's premier public universities with a core mission of teaching, research, and scholarship
  - Top 3 Hydraulics Engineering program and Top 5 Music and Performing Arts program in the U.S.
  - #1 Creative Writing Program in the U.S.
  - U.S. News & World Report ranks 60 of UI's graduate and professional programs among the nation's best; 11 programs ranked in the top 10 including the nation's top ranked programs in Speech-Language Pathology and Physician Assistant Program<sup>1</sup>
  - Performing Arts buildings and campus Art Museums designed by world renowned architect, Cesar Pelli
- Campus spans 1,700 acres and is home to ~90 major buildings, including the neighboring Oakdale Research Park, and Macbride Nature Recreation Area
- The University is organized into 11 colleges, offering undergraduate, graduate, and professional educations, along with training in the health sciences
  - Academic programs include 200+ majors, minors, and certificate programs, with 85 major / 59 doctorate fields
  - 32,948 students (23,989 undergraduate and 8,959 graduate and professional)
  - 86% first-year retention rate – five points above the national average for four-year public institutions
  - 17,833 full-time, 3,712 part-time and temporary, and 3,021 student employees
  - 741 tenured Professors (99.9% tenure rate) and 436 tenured Associate Professors (94.8% tenure rate)

## Application and Acceptance Trends



## Enrollment Demographics

*The University promotes a diverse mix of students with varying educational, demographic, and ethnic backgrounds*



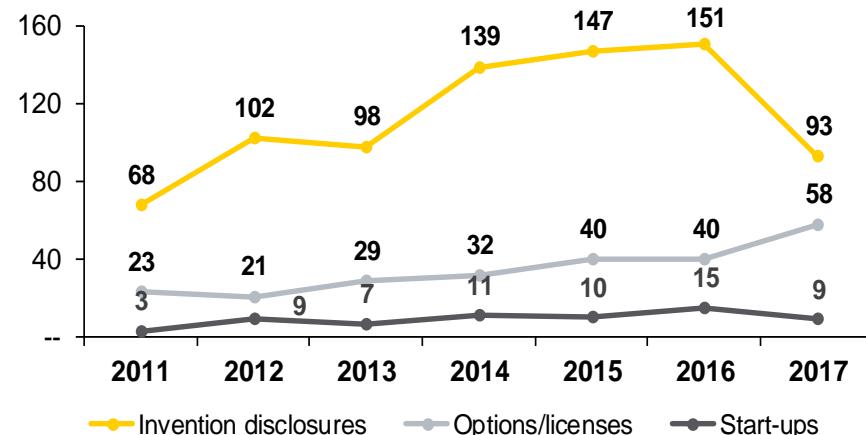
# Overview of the University (*continued*)

**World-class academic health center and a sizeable research portfolio with particular distinction in the arts, humanities, and sciences**

## University Hospital and Clinics (“UIHC”)

- One of the nation's largest university teaching hospitals and the State of Iowa's only medical tertiary / quaternary-level center, providing patient care in all specialties of medicine and supporting both teaching and research functions
  - University Hospitals and Clinics, and Colleges of Medicine, Dentistry, Nursing, Pharmacy, and Public Health
  - 811-bed hospital serving more than 36,000 in-patients and more than 1MM outpatients
  - State's only comprehensive children's hospital
  - 7 adult medical specialties and 4 pediatric specialties ranked among the best programs in the country<sup>1</sup>; top 5 healthcare employer in America<sup>2</sup>
- 28 consecutive years ranked as one of America's Best Hospitals and the #1 hospital in the state of Iowa<sup>1</sup>

## Research and Development Achievements

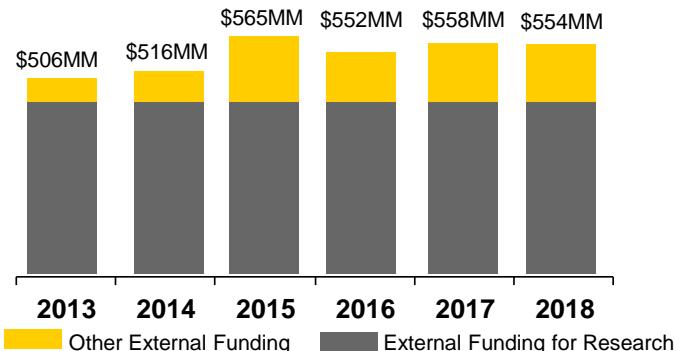


## Research Department

- One of the nation's top research-intensive universities with grant and contract research awards exceeding \$400MM per year (past 9 years)
  - Over 2,477 research grants and contracts received in 2018
- 1,800+ people employed by 35 companies at UI Research Park
- 26th among public universities in terms of federal research and development expenditures
  - 152 patent applications filed by research foundation in 2018
- Iowa Dance Marathon, a student run organization, has raised \$27.5MM for pediatric cancer research at UIHC

## External Funding

*The University received \$554MM in total external funding during 2018, which represents a 9.5% increase from 2013*



Note: UI's Research Park enables growing enterprises to have access to world-class research facilities and a dynamic faculty of scientists, physicians, and engineers

Source: University of Iowa website | University filings | 2018 Utility System Official Statement | <sup>1</sup>U.S. News & World Report | <sup>2</sup>Forbes Magazine

# Overview of the University (*continued*)

***The University of Iowa produces some of the best athletes in the nation, with more than 650 student-athletes competing in 24 sports***

## Athletics Overview

- UI is home of the Hawkeyes with 24 NCAA Division I teams
  - Alumni includes 25 current NFL players including All-Pro players such as Marshall Yanda, Mike Daniels and Desmond King
- 69,250 capacity at historic Kinnick Stadium, making it one of the top 20 largest collegiate stadiums in the country
- 215,000 square foot Campus Recreation and Wellness Center, named the third best university recreational facility in the U.S.
- The Big Ten Conference was established in 1895 as the preeminent consortium of institutions in the nation
  - UI joined the conference as its ninth member in 1899
  - UI's continued membership contributes to enrollment stability

## Other Sports Programs

### Wrestling

- Ranks in Top 5 with 23 national championships and 54 individual champions and over 20 U.S. Olympians
- Hosted “Grapple on the Gridiron” in November 2015, the biggest wrestling event in U.S. history with over 42,000 attendees at Kinnick Stadium



## Kinnick Stadium



## Carver-Hawkeye Arena



Source: University of Iowa website | Big Ten Organization website | The University of Iowa Visitor Guide, 2018

# Overview of the University (*continued*)

**The University of Iowa boasts the #1 creative writing program in the U.S., having produced numerous critically acclaimed alumni**

## Department of English

- Established over 75 years ago, the Department of English has received national recognition for its writing programs
  - Invented the Master of Fine Arts (“MFA”) degree, being the first institution to accept creative work in lieu of a written thesis
  - Voted the top MFA program in creative nonfiction in the U.S.
  - Pioneered fields such as educational television
- Alumni include many of television and film’s more notable screenwriters and filmmakers who are responsible for works including<sup>1</sup>: *Avengers: Infinity War*, *A Quiet Place*, *Juno*, *Tully*, *The West Wing*, *The Sopranos*, *Six Feet Under*, *Mad Men*, *House of Cards*, and *Game of Thrones*



## Writer's Workshop

- For more than 80 years, successful writers have emerged through the UI Writers’ Workshop, widely regarded as the most influential and prestigious writing program in the country
  - #1 creative writing program in the U.S.<sup>2</sup>
  - 40+ Pulitzer Prize-winning faculty and alumni, seven U.S. Poets Laureate, and countless award-winning playwrights, novelists, journalists, and poets
- Notable alumni include: Tennessee Williams, Kurt Vonnegut, John Irving, WP Kinsella and Jorie Graham
- Traditions such as *The Summer Writing Festival*, *Iowa Young Writers Studies*, and the *Iowa Youth Writing Project*, draw hundreds of young writers into the city every year
- Iowa City recognized as the world’s 3<sup>rd</sup> UNESCO City of Literature



Source: University of Iowa website | <sup>1</sup> Iowa Magazine, September 2018 | <sup>2</sup> Poets & Writers magazine

# Experienced Senior Management Team

## **Bruce Harreld, President of the University**



Appointed the 21st President on November 2, 2015. President Harreld came to the University from the Harvard Business School where he served as a faculty member from 2008-2014. Prior to joining Harvard's entrepreneurial and strategy units, he held a variety of positions with Kraft Foods, IBM and Boston Markets.

President Harreld has a Master of Business Administration degree from Harvard University and a Bachelor of Engineering degree from Purdue University.

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## **Montserrat Fuentes, EVP and Provost**



Dr. Fuentes was recently named EVP and Provost and officially begins her tenure with the University in June 2019. She currently is dean and professor in the College of Humanities & Sciences at Virginia Commonwealth University.

Dr. Fuentes holds a PhD in statistics from the University of Chicago and BS degrees in mathematics and statistics and in music and piano from the University of Valladolid, Spain.



## **Terry Johnson, Chief Financial Officer and Treasurer**

Appointed to his current position on January 17, 2015. Mr. Johnson joined the University in 1993 and served as Associate Vice President and University Controller since 1997. Prior to joining the University he worked for a privately held consulting firm.

Mr. Johnson is a registered CPA and holds degrees in Accounting and a Master of Business Administration.



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## **Caroll Reasoner, Vice President for Legal Affairs and General Counsel**

Appointed to her current position in 2008 after spending 32 years in private practice with Shuttleworth and Ingersoll in Cedar Rapids, IA. Ms. Reasoner is the first woman to serve as President of the Iowa State Bar Association in 1991.

Reasoner has served on over 50 boards and commissions. She served 27 years on the UI Foundation Board and was its Chair for three years during its first Billion Dollar campaign. Ms. Reasoner graduated with a BA in 1973 and JD in 1976.

# Experienced Senior Management Team (*Continued*)

## **Rod Lehnertz, Senior Vice President for Finance and Operations**



Appointed to his current position on January 17, 2015. Mr. Lehnertz joined the University in 1994 and served as the University's Director of Planning, Design & Construction since 2004. Mr. Lehnertz also serves as the University Architect.

Mr. Lehnertz holds degrees in Architecture and a Master of Business Administration.

## **Lynne Finn, Assistant Vice President, Facilities Management**



Appointed to her current position in August of 2018, Finn joined the University in 2015, becoming the Director of Business Financial Services of Facilities Management in 2017.

Finn holds a Bachelor's degree in Commercial Economics from South Dakota State University. Overall, Finn has 32 years of experience in facilities management, as well as having served 10 years as the Dean of Energy & Utilities for the APPA Institute.

## **Ben Fish, Associate Director, Utility Operations**



Mr. Fish joined the University in 2004 and has progressively expanded his responsibility from power plant operations to a utility-wide leadership role. Prior to joining the University, Mr. Fish worked in food manufacturing for Cargill, Inc.

Mr. Fish has a Bachelor of Science degree in Chemical Engineering and holds a degree in Master of Business Administration.

# State of Iowa and Iowa City

## State of Iowa Overview

- Voted Best State to Live in America (2018) by U.S. News & World Report
- State population of ~3.2MM, up 7.8% since 2000<sup>1</sup>
  - 60% of population is between 18 – 64 years of age
- 2.4% unemployment rate compared to national average of 3.8%<sup>2</sup>
- University's importance to the state includes:
  - Creation of ~\$16 in economic value for every \$1 in state funding
  - University's research discoveries are projected to have a ~\$2.4BN impact on the State of Iowa's economy by 2020E
- Largest employer in the State of Iowa and a top educator of state professionals including: dentists (78%), physicians (53%) and pharmacists (51%)
- State of Iowa ranked AAA (Stable) by Moody's

## Iowa City Overview

- State of Iowa's 5<sup>th</sup> largest city with a population of ~75,800<sup>1</sup>
  - Increase of ~20.5% since 2000
  - Metro population of over 171,000
- Low unemployment rate of 2.3%<sup>2</sup>
  - Top employers in Iowa City include UI and UI Hospitals and Clinics, Iowa City VA Medical Center, Iowa City Community Schools, Mercy Hospital, ACT Inc., P&G, and Hy-Vee
- One of two UNESCO Cities of Literature in the United States and one of 28 globally
- Ranked 4<sup>th</sup> in U.S. as "Best Places to Live"<sup>3</sup>

## Geographic Location

Legend		
	Iowa City	
	Iowa State	
	Surrounding States	

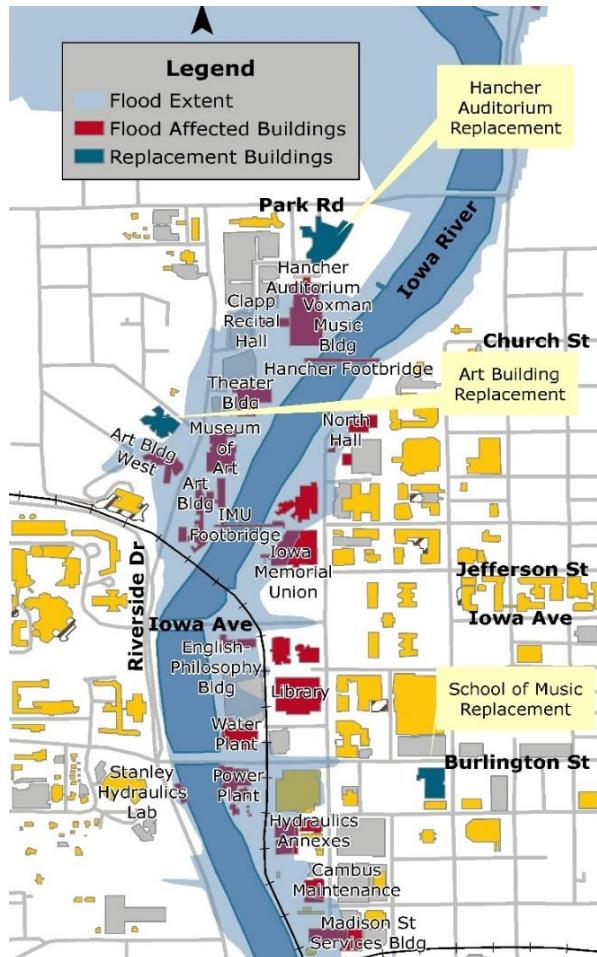


Source: University of Iowa website | <sup>1</sup> US Census Bureau | <sup>2</sup> US Bureau of Labor Statistics, April 2019 and January 2019 | <sup>3</sup> Livability.com

# 2008 Flood Event

**As of Fall 2016, the UI campus has been fully restored from the flood except for construction of a new Art Museum Building**

## 2008 Flood Extent Map



## A Successful Rebuilding Plan Post the Flood of 2008

- **Overview of the 2008 Flood**
  - In June 2008, the University was flooded by waters from the Iowa River
  - Estimated \$10BN in damage statewide; 85 of Iowa's 99 counties were declared federal disaster areas – the 5<sup>th</sup> largest natural disaster in U.S. history (at the time)
  - Costs to fully recover the campus as well as costs for flood mitigation was ~\$700MM (~\$35MM was utility system related)
- **Impact to the Utility System**
  - Main campus power plant was impacted by the flood, resulting in damage to the air compressors, feed water pumps, motors and starters, and boiler forced draft fans
  - New steam equipment was installed, with 42 miles of wiring replaced, 24 large electric motors repaired and 6 new compressors added, and site / building protections were constructed
- **Recovery and Future Protection Program**
  - State of Iowa authorized \$119MM in bond proceeds to support the University's requirement to meet its cost share commitment for funding received from FEMA as well as to fund ineligible costs and improvements
  - University increased its property insurance coverage from \$1BN to \$2BN, including \$250MM in flood insurance, \$5MM deductible for flood coverage
  - Iowa Flood Center was established in 2009 as part of UI's top ranked Engineering Hydraulics Institute
  - Campus-wide flood risk mitigations make UI a national model

Source: University of Iowa website | University filings | 2018 Utility System Official Statement | Iowa Flood Center website

# 2008 Flood Event (*Continued*)

## Post-Flood Mitigation Strategies

- A campus-wide flood response plan was updated to include a HESCO barrier system for flood protection
  - The utility plants are integrated into this HESCO plan and also include additional facility specific measures
  - Utility distribution systems, including utility tunnels and electrical vaults have specific protection measures in the flood response plan
- A new 50,000 lbs / hour capacity boiler was installed at the UIHC complex, capable of remote operation and located above the floodplain
- Permanent steam connection points have been engineered into the steam distribution system to facilitate the operation of rental boilers as back-up to the main power plant
  - Permanent steam connections were installed on the east and west sides of campus
  - Steam connections allow for 280,000 lbs / hour of rental boiler capacity to be installed in a short period of time
- New equipment was installed at a minimum height level of the 500 year flood scenario plus two feet
- The Energy Control Center allows staff to operate the power plant remotely if the plant is inaccessible due to a flood
- An electrical cross tie allows the campus to be powered electrically from either of the two substations
- **A total of \$2.7MM was expended on capital projects to harden the power plant against flooding**

## Tunnel Flooding Preventative Improvements

- Various protective improvements were made to protect against future tunnel flooding, such as:
  - Installation of bulkhead walls with submarine doors in the tunnels to hold water out of the power plant
  - Installation of a second steam service system to allow the power plant to feed steam to the campus

## Bulkhead Door





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## Utility System Operations

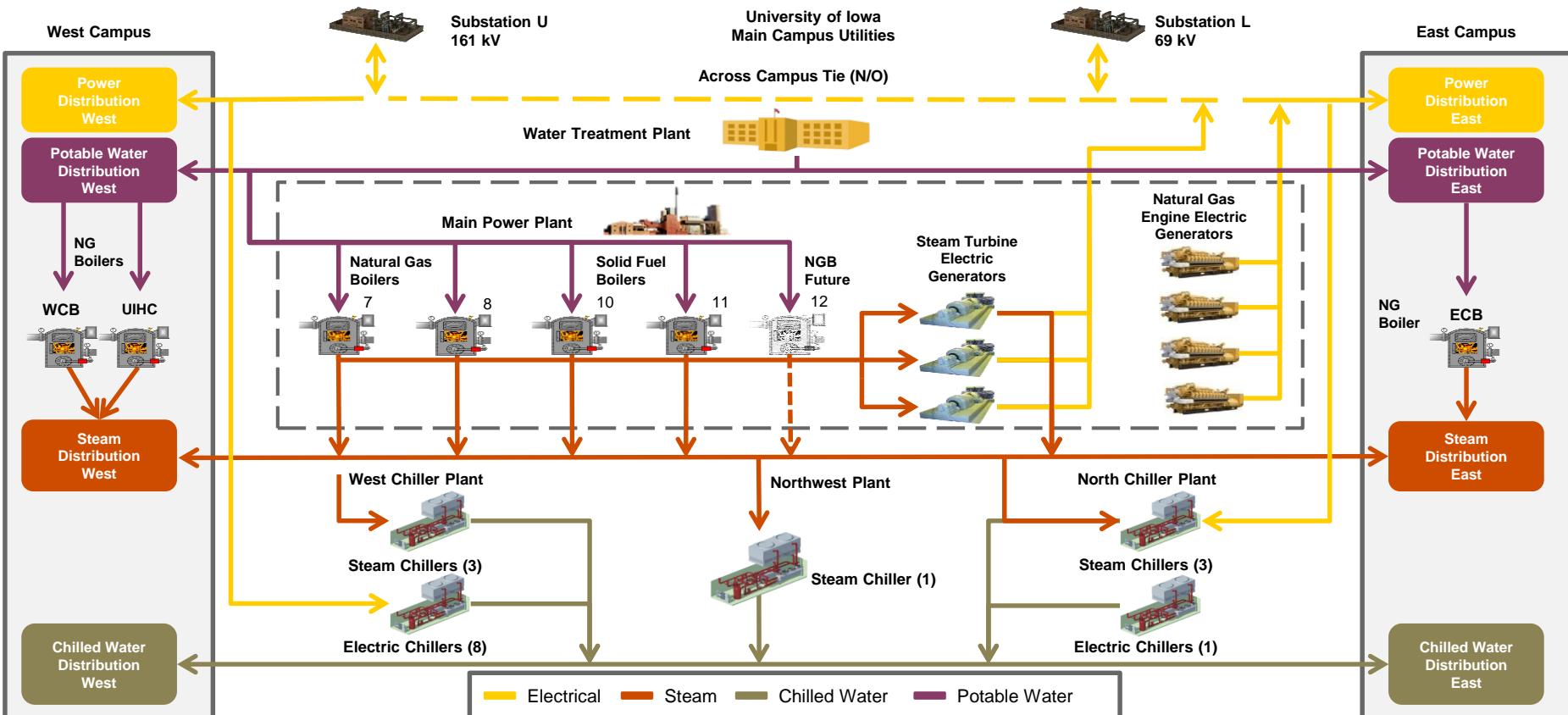
# Utility System Overview

## Description of the Utility Plant Assets and Services

- The University's utility system is operated as a separate enterprise and currently provides utility services to the main and Oakdale campuses
- Operational elements of the utility system include the **production and distribution of steam, electricity and chilled water**, and the **treatment of water**
  - In 2018, the system produced 3.1MM MMBtu of steam and 61.5MM kWh of electricity, in addition to treating 1.3MM MMBtu of chilled water and 0.95MM Mgal of water
  - Currently generates ~20% of all electrical power used on campus
  - As of December 31, 2017, the replacement value of the system was ~\$1.05BN<sup>1</sup>
- Every University department including the UI Hospitals & Clinics, is a consumer of the services provided by the utility system
  - Major users include: UI Hospitals & Clinics (Patient Services) (40%), Academic (27%), Research (17%), UI Athletics / Other (10%) and Residence Services (6%)
- The system consists of the following major facilities and related distribution systems:
  - Main campus power plant: Combined Heat and Power ("CHP") facility with three turbine electric generators and four natural gas electric generators; two solid fuel boilers, four natural gas boilers, and two temporary satellite boilers
  - Main campus chilled water plant: Used for air conditioning and cooling on campus, includes four plants and 16 chillers
  - Main campus water plant: Serves as an important teaching facility for future engineers and water treatment specialists – purifies and distributes 950MM gallons of water annually
  - Oakdale Utility System: Trigeneration plant that provides electricity, heat, and cooling to the Oakdale campus – Fed by one UI owned electrical substation; three natural gas boilers and one wood chip boiler, and one central chilled water plant and one satellite chilled water plant
- Over the past five years, the University's power plants have been reducing its reliance on coal, making use of alternative fuel sources in order to operate coal free by 2025
- Contracts in place to purchase fuel sources and additional energy:
  - Coal is purchased from locally sourced mines in Illinois and Colorado
  - Electricity and natural gas from MidAmerican Energy Company ("MidAmerican")
  - Renewable fuels in the form of oat hulls or energy pellets from regional suppliers
  - The University grows its own Miscanthus grass by working with local farmers

# Utility System Overview (continued)

## Distribution Systems



### Mechanical Distribution

- Maintains all of the University's steam, chilled water, domestic water and over 200,000 feet of storm and sanitary sewer piping
- Semi-annual walkdowns of the steam system to note leaks, insulation damages, ventilation, and sumps
- Steam trap maintenance program

### Electrical Distribution

- Maintains the high voltage substations and distribution lines on campus, providing power to the buildings

### Meters and Controls

- Assembles, operates, and maintains the Utilities network for secure control and communications, and installs, calibrates, and reads utility meters for billing

Source: University of Iowa website

# Maintenance Program Overview

## Utility Maintenance Programs

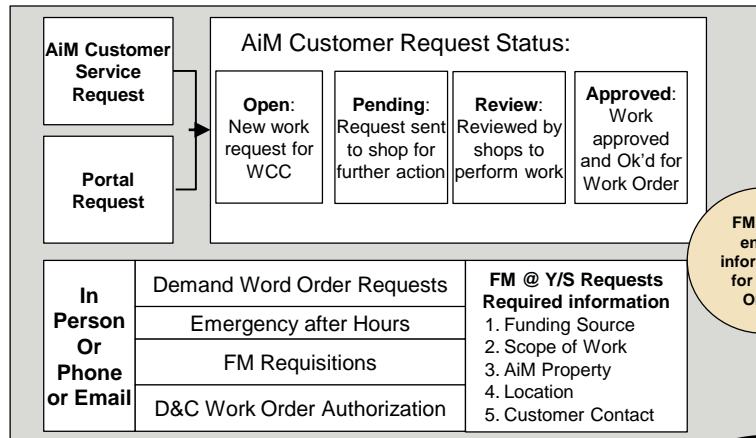
<b>General</b>	<ul style="list-style-type: none"><li>▪ UI Utilities has been using the Marshall Institute system for over 10 years, with a heavy focus on work planning and workflow scheduling, and Preventive Maintenance optimization (“PM”)</li><li>▪ UI Utilities uses the AiM Computerized Maintenance Management System Software (“CMMS”) system tool</li><li>▪ Internal staff makes significant improvements to the program on an as-needed basis</li><li>▪ Planners and schedulers are imbedded in UI Utilities departments</li><li>▪ Vibration routes are performed by a local contractor with many years of baseline history</li><li>▪ Other predictive maintenance tools are used per industry standards</li></ul>
<b>Power Plant</b>	<ul style="list-style-type: none"><li>▪ Bi-annual solid fuel boiler outages managed in-house</li></ul>
<b>Chilled Water Plant</b>	<ul style="list-style-type: none"><li>▪ Annual chiller maintenance performed with in-house staff, overhauls performed with assistance from one Original Equipment Manufacturer (“OEM”) representative</li></ul>
<b>Water Plant</b>	<ul style="list-style-type: none"><li>▪ In process of transitioning to the Marshall Institute style of planning and scheduling; anticipated to be complete by the 2019 summer</li></ul>
<b>Electrical</b>	<ul style="list-style-type: none"><li>▪ All high voltage maintenance and capital work performed in house to ensure quality control</li><li>▪ Thermography used for Power Distribution Modules on substation equipment</li></ul>
<b>Mechanical Distribution</b>	<ul style="list-style-type: none"><li>▪ PM's include a campus-wide valve turning PM program, following industry best practice</li></ul>
<b>Meters and Controls</b>	<ul style="list-style-type: none"><li>▪ Utility System network is maintained separately from the campus network</li><li>▪ PM's in place for over 500 smart meters on campus</li><li>▪ PLC upgrades performed in-house</li></ul>

Source: University of Iowa filings

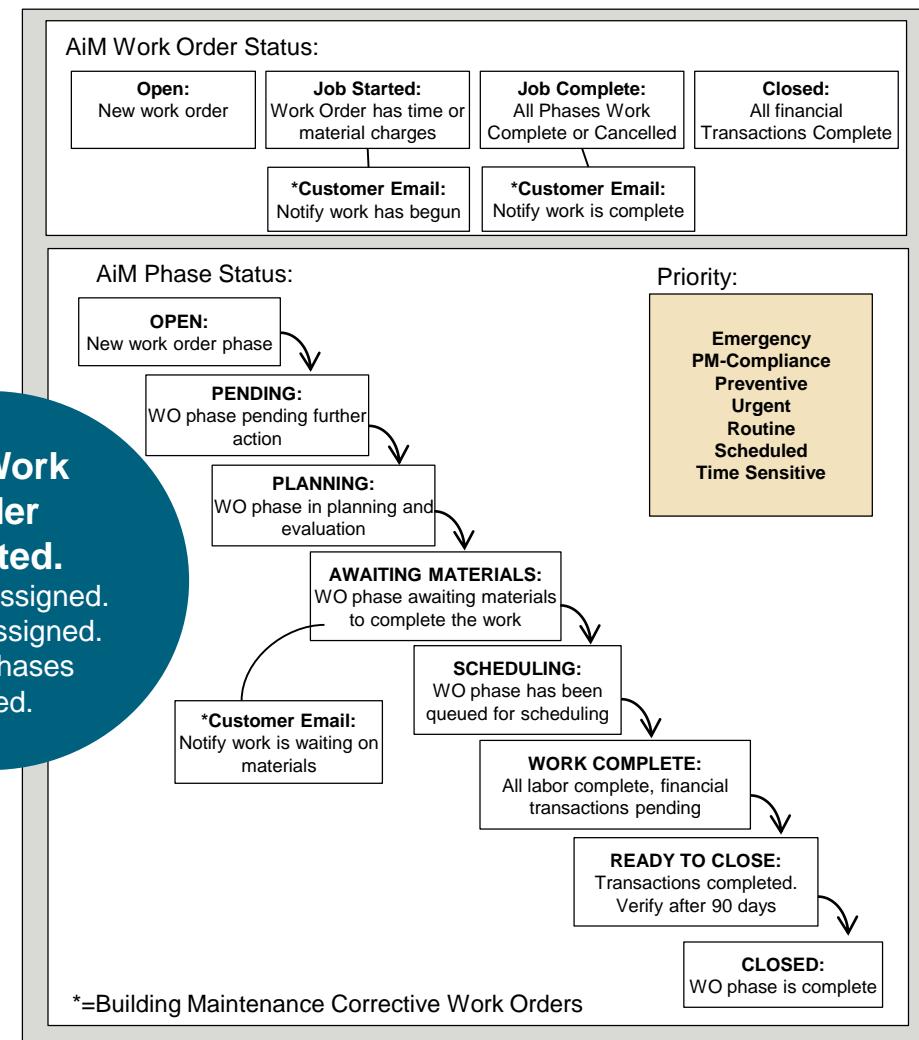
# Maintenance Program Overview (continued)

## AiM FM Workflow

### FM@YourService Request Process

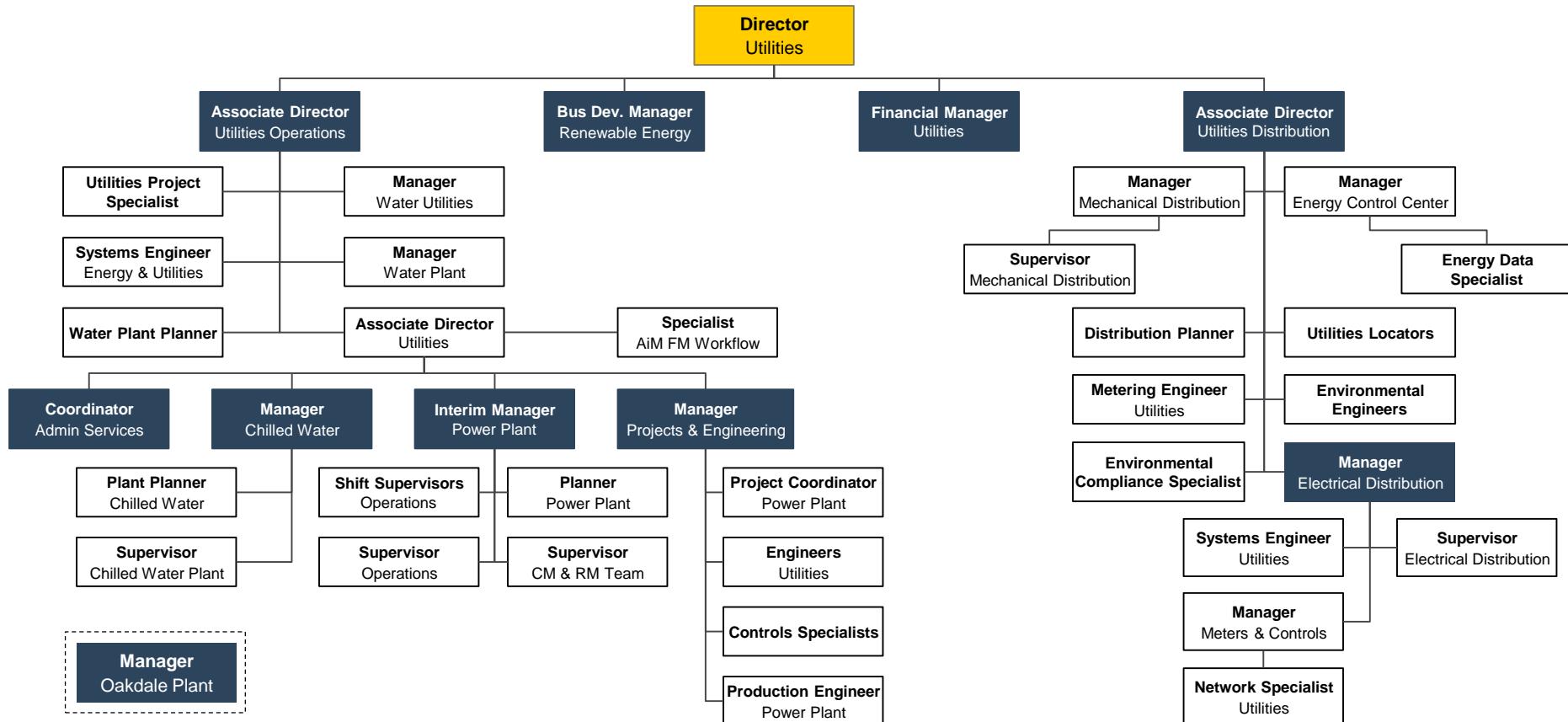


### Work Management Process



Source: University of Iowa filings

# Organizational Chart



## Utility System Employee Overview

- 120 full-time employees and 45 student part-time employees
  - Highly skilled work force averaging 14 years of campus utilities experience
  - ~31%, or 39 employees, have over than 20 years of experience
- Employee Census:
  - Electrical System (13), Steam System (42), Chilled Water System (17), Water System (14), Engineering, Environmental and Energy Control Center (15), Meters and Controls (8), Administrative / Finance (6), Oakdale Campus (5)

Source: University of Iowa filings | Note: Employee by division do not add up to total given open positions currently not filled

# Summary of Commercial Contracts

## Main Campus Commercial Contracts Summary

Purchased Electricity Contract – MidAmerican Energy	<ul style="list-style-type: none"><li>▪ The additional power required by the University is procured under a power purchase contact with MidAmerican. UI Utilities passes all increases or decreases in costs associated with the MidAmerican power purchase contract to its users<ul style="list-style-type: none"><li>▪ Contract set to expire in 2019; contract renewal in progress</li></ul></li><li>▪ Regulated by the State of Iowa Utilities Board</li><li>▪ Electric rate determined by summer / winter and on / off peak time of use</li><li>▪ 51% of electricity purchased from MidAmerican Energy in 2017 was renewable</li><li>▪ A curtailment program provides financial incentive for reducing electrical demand</li></ul>
Natural Gas	<ul style="list-style-type: none"><li>▪ Natural gas is purchased from MidAmerican retail<ul style="list-style-type: none"><li>▪ Contract set to expire in 2020 (10 year tenor)</li></ul></li><li>▪ Gas Commodity pre-purchase contracts are in place for winter months through 2023</li><li>▪ Gas Transportation contract is regulated by the State of Iowa Utilities Board</li></ul>
Solid Fuels	<ul style="list-style-type: none"><li>▪ Renewable fuels in the form of oat hulls or energy pellets are purchased from regional suppliers<ul style="list-style-type: none"><li>▪ Oat Hull contracts with Quaker Oats, subsidiary of PepsiCo<ul style="list-style-type: none"><li>▪ Contracts set to expire June 2019; renewal in progress</li></ul></li><li>▪ Renewable Pellet Fuel contract with Convergen Energy, subsidiary of Libra Group<ul style="list-style-type: none"><li>▪ Contract renewal in process; new expected expiry date in 2026 (7 year tenor)</li></ul></li></ul></li><li>▪ Coal is purchased from mines in Illinois and Colorado<ul style="list-style-type: none"><li>▪ Coal contracts with River Trading Company LTD<ul style="list-style-type: none"><li>▪ Contracts are set to expire June 2024 (10 year tenor)</li></ul></li></ul></li></ul>
Other Contracts	<ul style="list-style-type: none"><li>▪ In addition to these agreements, there are various other small contracts supporting operations and maintenance of the Utility System<ul style="list-style-type: none"><li>▪ Nalco and Solenis contracts for water treatment chemicals</li><li>▪ OSI Soft contract for data historian software</li><li>▪ GE Cimilarity contract for utility system controls network</li></ul></li></ul>
Other Fuels	<ul style="list-style-type: none"><li>▪ The University grows its own energy in the form of perennial Miscanthus grass and currently has 1,200 acres planted to produce over 10,000 tons of renewable fuel for the campus annually</li></ul>

Source: University of Iowa filings

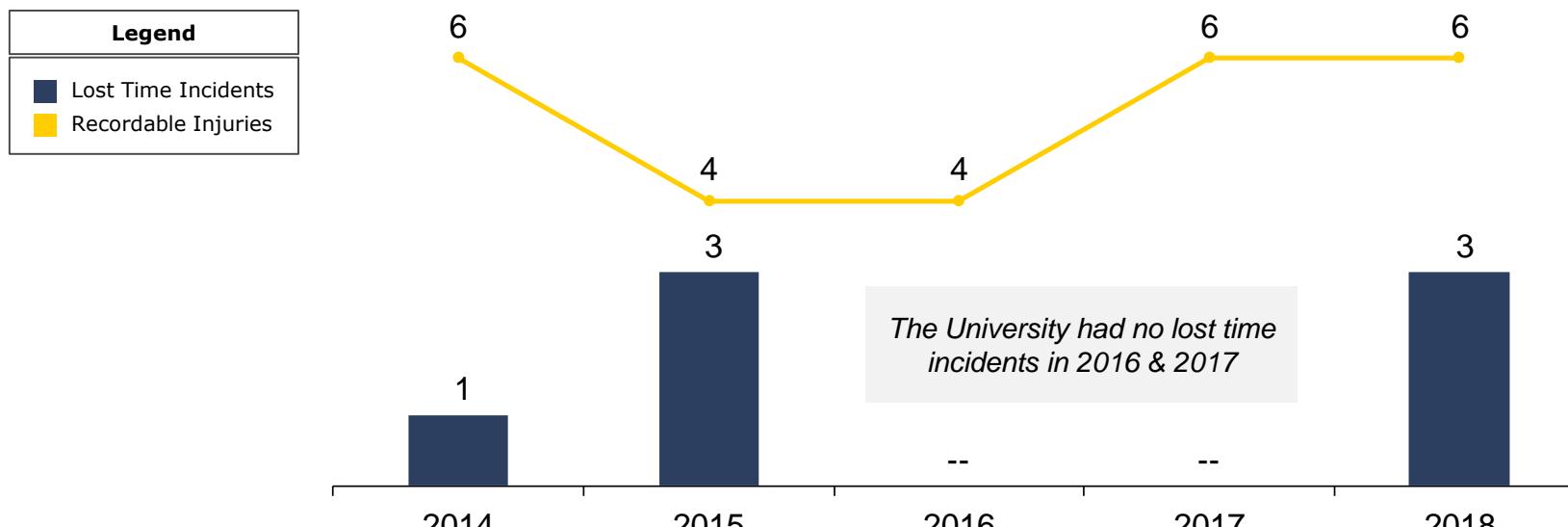
# Utility System Safety Overview

## Safety Committee Overview

- The main campus power plant safety committee prioritizes safety issues and uses the AiM workflow system to plan, schedule and execute safety improvements
- The Campus Environment, Health and Safety Office performs annual safety audits in each shop with documented findings and resolutions
- Tunnel and vault safety improvements have been ongoing for the past two years (to be completed in 2020), and include:
  - Tunnel clean-up to remove trip hazards, debris, head-knockers
  - Comprehensive insulation program to reduce burn hazards and working environment
  - Ventilation upgrades in tunnels and vaults
  - Development of ladder replacement program for unsafe ladders in tunnels and vaults
  - LED lighting upgrades in tunnels

## Historical Lost Time Accidents and Recordable Employee Accident Rate

(# of Incidents)



Source: University of Iowa filings

# Energy Control Center Data and Networking

## Overview of the Control Center

- The Energy Control Center (“ECC”) functions as the central data collection and analysis point for both utility production and consumption
- Operational data from the plants and substations, along with metering data are collected in the ECC via the PI System (OSISoft)
- By combining production and consumption data into a single point, ECC uses extensive analysis and data presentation tools from the PI System to continuously improve energy performance and provide reporting capabilities
- Currently, ECC is finalizing implementation of the EnergyCap Utility Billing System – a fully automated billing process – used for billing of steam, electric, chilled water, water, and sewer consumption
- Constructed to allow secure remote operation of the plants in the event of a natural disaster
- Joint planning room for Plant and Building Systems staff to work together to resolve issues

## Network Overview

- Operates and maintains an independent, secure network upon which the plants and substations operate and communicate
- The extensive network, built on the GE Cimlicity platform, has more than 50 miles of fiber installed and is built in a ring configuration with multiple redundancies built into the system
- Network has over 1,500 devices, including:
  - 50+ Servers
  - 400+ Electric Meters
  - 80 Programmable Logic Controllers (“PLCs”)
  - 95 Chilled Water Interfaces (control and metering)
  - 230+ Domestic Water Meters
  - 145 Steam Meters
- Various key points throughout the system are monitored and alarmed to allow for rapid response in the event of a sub-par condition
- Consumption of all buildings on the UI Utilities system is metered, with most meter readings automated across the network



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## Detailed Facility Descriptions

# Electrical System Overview

## Plant Overview

- The University's main campus power plant is a combined heat and power ("CHP") facility, established in 1946 as a steam co-generation plant
- The University uses a co-generation process for production of electricity generating electrical power as a by-product of steam production
  - The co-generation system acts as a back-up to the grid providing business continuity for critical services on the UI campus
- The main campus power plant generates ~20% of the University's electric power needs in addition to nearly all of its heating needs
- The remaining power for the UI main campus is fed by two MidAmerican owned electrical substations (Substation U – West Campus and Substation L – East Campus), capable of meeting the total campus electric demand
- Equipment: Three turbine electric generators and four natural gas electric generators



Note: Electrical Substation U (Main – West Campus)



Note: Electrical Substation L (Main – East Campus)

Source: University of Iowa website | University filings

# Electrical System – Detailed Facility Description

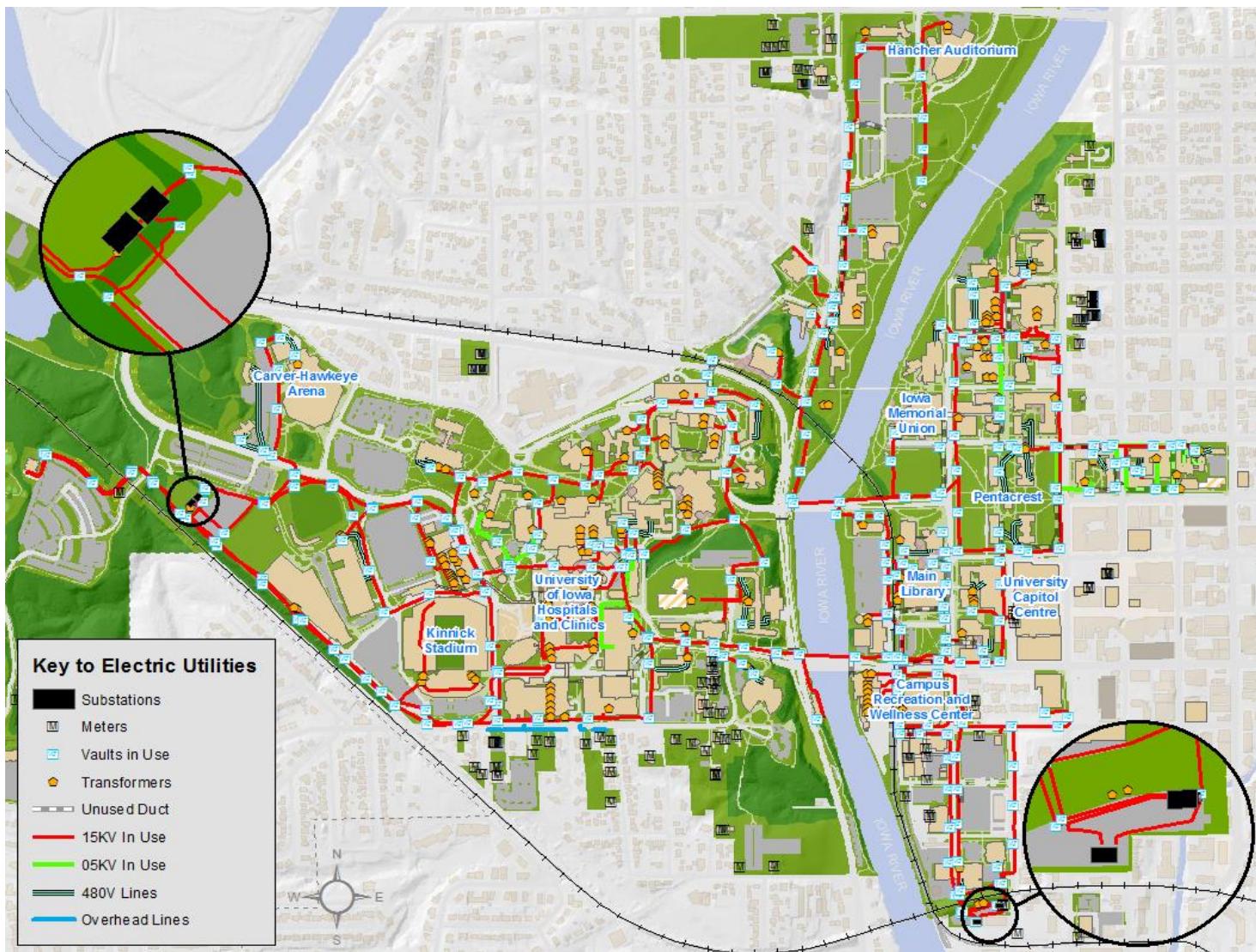
## Detailed Facility Description

	Detailed Facility Description
<b>Substation L (Main – East Campus)</b>	<ul style="list-style-type: none"><li>▪ 13.8kV ring bus re-constructed in 2008 / 2009</li><li>▪ Tied to MidAmerican Energy 69kV system – Direct feed from MidAmerican Sub B</li><li>▪ Equipment: Two transformers 13,800 volts, 33 MVA each (MidAmerican owned); 2018 Peak Load 20 MW</li><li>▪ Services: Feeds five 13.8kV loops (H, I, J, K, M); Carries Main Power Plant Generation; Across-Campus-Tie (“ACT”) terminal</li></ul>
<b>Substation U (Main – West Campus)</b>	<ul style="list-style-type: none"><li>▪ 13.8kV ring bus re-constructed 2008 / 2009</li><li>▪ Tied to MidAmerican Energy 161kV System. Looped feed on MidAmerican Subs P and J line</li><li>▪ Equipment: three transformers in ring bus configuration, 13,800 volts, 33 MVA each (MidAmerican owned); 2018 Peak Load 42.7 MW</li><li>▪ Services: Feeds 12 13.8kV loops (A, B, C, D, E, F, N, O, P, Q, R, S); Across-Campus-Tie (ACT) terminal</li></ul>
<b>Primary Electrical Distribution Infrastructure</b>	<ul style="list-style-type: none"><li>▪ Main campus is a retail customer of MidAmerican Energy; Oakdale campus is retail customer of Alliant Energy</li><li>▪ Looped feeds on Main and Oakdale Campuses at 13.8 kV in underground concrete duct banks</li><li>▪ Over 250 building transformers, 500-3000kVA typical</li><li>▪ Primary switchgear, S&amp;C Electric; SCADA system</li><li>▪ Secondary service protectors, General Electric, AKD, 480V</li></ul>
<b>Controls Architecture</b>	<ul style="list-style-type: none"><li>▪ Programming in place to automatically switch the east campus to "electrical island mode" when a drop in grid frequency is detected</li><li>▪ The automatic switch occurs in a fraction of a second, making the transition seamless to campus customers</li><li>▪ In the event of a larger electrical grid disturbance, low criticality electrical loops trip, cutting off power to low priority buildings and preserving back-up power availability for critical buildings</li></ul>

Source: University of Iowa filings

# Electrical System – Service Area

Map of Operations



Source: University of Iowa filings

Note: Does not include Oakdale campus substation

# Steam System Overview

## Steam System Description

- The main campus power plant began operating in 1927 and converted to a steam co-generation plant in 1946
- Today, the main campus power plant burns coal, oat hulls, energy pellets, miscanthus grass, and natural gas
- The primary function of the main campus power plant is to convert fuel energy into thermal and electric energy for use on the UI campus including the UI Hospitals and Clinics
- Steam is distributed to campus at two different pressures to maximize the efficiency of the cogeneration process
- Steam produced by the plant is used for:
  - Building heat and hot water
  - Chilled water production
  - Medical equipment sterilization
  - Food preparation
  - Building humidification
- Equipment:
  - Two solid fuel boilers
  - Four natural gas boilers
  - Two temporary satellite boilers

## Steam System Operating Hours (2015 – 2018)

*Main campus power plant reached a peak boiler load of 456,000 pounds per hour in January 2018*

Boiler Unit	2015	2016	2017	2018
Boiler #10	7,115	7,045	5,820	8,197
Boiler #11	7,121	7,317	7,112	7,408
Boiler #7	3,866	5,221	2,898	3,700
Boiler #8	4,425	5,222	7,246	6,449
UIHC Boiler	4,098	4,227	4,371	3,046
<b>Total</b>	<b>26,625</b>	<b>29,032</b>	<b>27,447</b>	<b>28,800</b>

## Main Campus Power Plant



Source: University of Iowa website | University filings

# Steam System – Detailed Facility Description

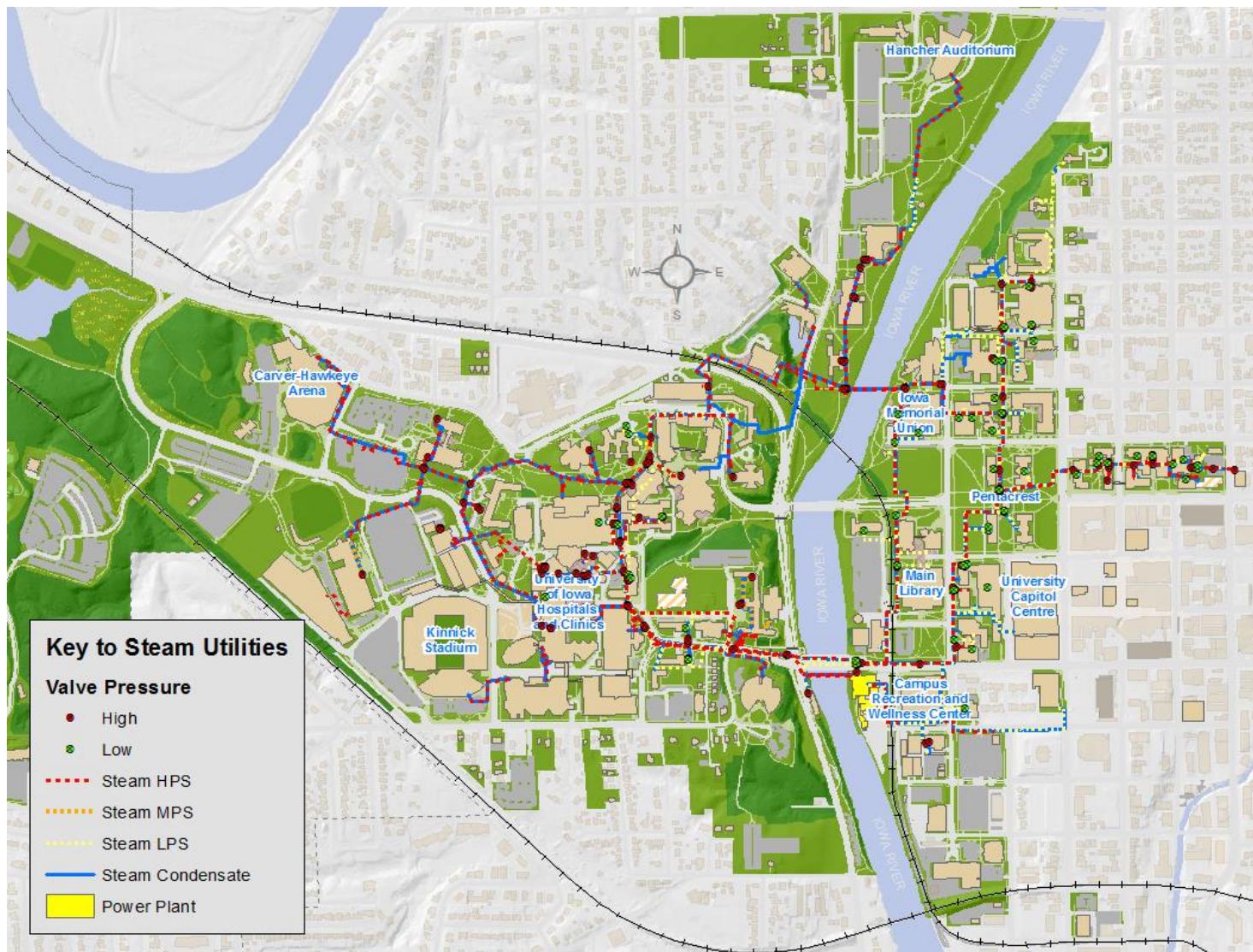
## Detailed Facility Description

Boilers	<ul style="list-style-type: none"><li>▪ Two Solid Fuel Boilers<ul style="list-style-type: none"><li>▪ Boiler #10: Installed in 1975; Capacity 170,000 lbs / hour; Baghouse with Dry Sorbent Injection emissions control</li><li>▪ Boiler #11: Installed in 1987 (modified in 1996); 170,000 lbs / hour; Baghouse with Dry Sorbent Injection and SO<sub>2</sub> emissions control</li></ul></li><li>▪ Four Natural Gas Boilers<ul style="list-style-type: none"><li>▪ Boiler #7: Installed in 1991; Capacity 115,000 lbs / hour; Low Nox Burners emissions control</li><li>▪ Boiler #8: Installed in 1991; Capacity 140,000 lbs / hour; Low Nox Burners emissions control</li><li>▪ UIHC Boiler: Installed in 2009; Capacity 50,000 lbs / hour; Low Nox Burners emission control</li><li>▪ Boiler #12: Installed in 2019; Capacity 175,000 lbs / hour; Low Nox Burners emissions control</li></ul></li><li>▪ Two satellite boilers will be removed from service upon successful commissioning of Boiler #12</li><li>▪ Combined boilers have over 770,000 lb / hr of steam capacity versus peak demand of 456,000 pounds per hour in January 2018</li></ul>
Emission Control Systems	<ul style="list-style-type: none"><li>▪ Two dry sorbent storage silos installed in 2017, reusing space that had previously been coal storage</li><li>▪ Redundant pneumatic sorbent injections systems for each boiler/baghouse</li></ul>
Boiler Feedwater Treatment Systems	<ul style="list-style-type: none"><li>▪ Two condensate receiver tanks with a combined capacity of over 6,000 gallons</li><li>▪ Four anthracite carbon condensate filtering units</li><li>▪ Three U.S. water condensate polishing units, treatment capacity of 20,000,000 gallons between regenerations</li><li>▪ Make-up water treated with a two train double-pass reverse osmosis system, 150 gpm capacity with each train</li><li>▪ Three feedwater deaerators with a combined capacity of 1,000,000 pounds per hour</li><li>▪ One atemperation deaerator with a capacity of 100,000 pounds per hour</li></ul>
Controls Architecture	<ul style="list-style-type: none"><li>▪ The existing control system is primarily an ABB Infi-90 DCS system with a Conductor NT HMI with Allen Bradley PLCs and RSView32 HMI supporting ancillary systems. The system is being upgraded and combined into a single Rockwell FactoryTalk View HMI</li><li>▪ New boiler and turbines are being provided with current generation Allen Bradley PLCs. Future projects are expected to convert the remaining ABB Infi-90 controls to Allen Bradley PLCs</li></ul>

Source: University of Iowa filings

# Steam System – Service Area

## Map of Operations



Source: University of Iowa filings

# Chilled Water System Overview

## Chilled Water System Description

- The University's first main campus chilled water plant commenced operations in 1970
- The system has since expanded to include four plants with a total capacity exceeding 40,000 tons
- A river crossing pipeline was installed between 2008 and 2009 to connect the east and west sides of campus, allowing one plant to serve the entire Main campus in low demand periods
- The University's chilled water system is driven ~50% by electricity and ~50% by steam, giving operational flexibility to minimize costs
- Chilled water equipment is dispatched based on costs of operation
- Electrical rates are higher during the June / September period, so steam-driven chilled water equipment is maximized during that time
- Outside of summer, electrical equipment is maximized
- Total equipment consists of 16 chillers with a total capacity of over 40,000 tons



Note: UI main campus chilled water plant



Note: UI main campus chilled water external cooling towers

# Chilled Water System – Detailed Facility Description

## Detailed Facility Description

Pumps	<ul style="list-style-type: none"><li>▪ Four chiller plants: One on the east campus and three on the west campus</li><li>▪ East campus:<ul style="list-style-type: none"><li>▪ North Chilled Water Plant (“NCWP”): Constructed 1989; Capacity 7,000 tons; Primary / secondary flow; Electric / steam energy source</li></ul></li><li>▪ West campus:<ul style="list-style-type: none"><li>▪ NorthWest Campus Chilled Water Plant (“NWCCWP”): Constructed 2000; Capacity 5,000 tons; Primary / secondary flow; Steam energy source</li><li>▪ Chilled Water Plant 1: Constructed 1970<sup>1</sup>; Capacity 19,300 tons; Primary / secondary and variable primary flow; Electric energy source</li><li>▪ Chilled Water Plant 2: Constructed 2008; Capacity 12,000 tons; Variable primary flow; Steam energy source</li></ul></li><li>▪ Total Main Campus Nameplate Capacity: 43,300 tons</li></ul>
Chillers	<ul style="list-style-type: none"><li>▪ 16 chillers<ul style="list-style-type: none"><li>▪ Seven York electric driven centrifugal, five York steam driven centrifugal, two Trane CenTraVac electric driven centrifugal, and two Trane steam absorption chillers</li></ul></li></ul>
Cooling Towers	<ul style="list-style-type: none"><li>▪ 17 cooling towers, heat rejection of 36,000,000 – 66,500,000 Btuh; 6,000 – 10,000 GPM; a 150 – 250 HP fan; and a ΔT of range of 10°F – 16.5°F</li><li>▪ Cooling towers installed between 1989 and 2018 by Ceramic Cooling Tower Company and Tower Engineering, Inc.</li><li>▪ All towers designed to a wet bulb temperature of 78 or 80°F</li></ul>
Filtration System	<ul style="list-style-type: none"><li>▪ Two side stream sand filter units with a combined capacity of 440 GPM</li></ul>
Controls Architecture	<ul style="list-style-type: none"><li>▪ The chilled water control system resides on the utility network. Main campus chilled water plant controls are on the GE Cimplicity HMI platform, with each chiller controlled by an Allen Bradley PLC. PI OsiSoft data historian records and collects all data from plant transmitters and operator actions</li></ul>

Source: University of Iowa filings

<sup>1</sup> Equipment in plant modified and / or replaced

# Chilled Water System – Operating History

## Chiller Operating Hours (2015 – 2018)

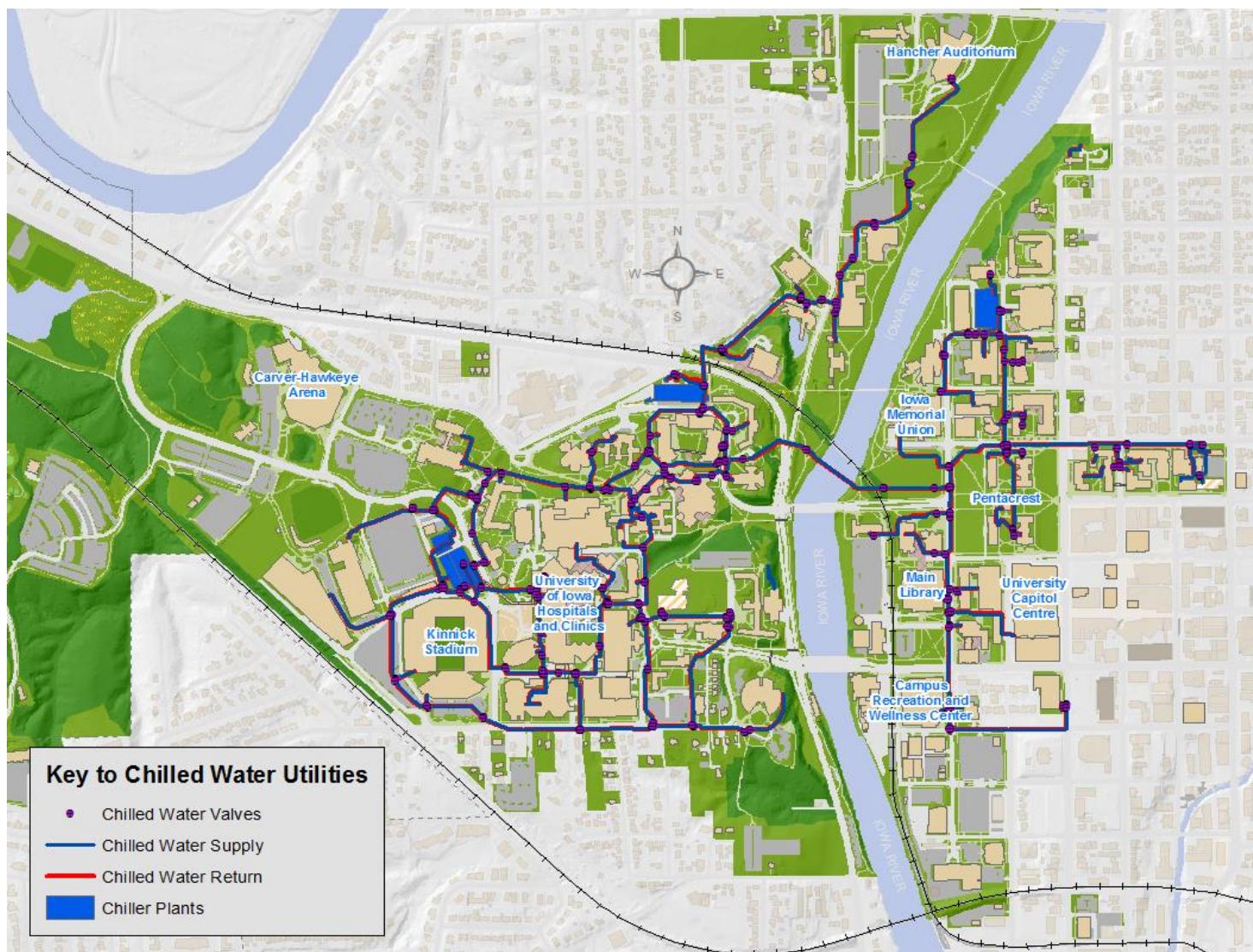
***Chilled water system reached an all-time peak load of 33,800 tons in July 2017***

Chiller Unit	Year Installed	2015	2016	2017	2018
West Plant #1 - Chiller #1	2006	3,271	2,231	4,331	3,541
West Plant #1 - Chiller #2	2006	4,758	3,823	4,211	3,696
West Plant #1 - Chiller #3	2007	3,456	4,119	3,053	52
West Plant #1 - Chiller #4	2007	3,605	3,334	3,675	238
West Plant #1 - Chiller #5	1983	720	925	754	1,501
West Plant #1 - Chiller #6	1983	575	1,001	875	1,022
West Plant #1 - Chiller #7	1993	873	981	624	768
West Plant #1 - Chiller #8	1995	982	908	884	471
West Plant #2 - Chiller #7	2008	--	1,883	1,711	2,668
West Plant #2 - Chiller #8	2008	451	1,882	644	1,713
West Plant #2 - Chiller #9	2008	1,563	1,562	1,684	2,014
Northwest Plant - Chiller #1	2000	3,261	3,432	3,279	2,934
North Plant - Chiller #1	1993	5,578	6,266	3,566	3,122
North Plant - Chiller #2	1989	2,239	2,702	2,256	2,685
North Plant - Chiller #3	1989	2,338	2,705	2,431	2,745
North Plant - Chiller #4	1998	2,142	2,493	1,658	2,421
<b>Total</b>		<b>35,812</b>	<b>40,247</b>	<b>35,637</b>	<b>31,592</b>

Source: University of Iowa filings

# Chilled Water System – Service Area

## Map of Operations



Source: University of Iowa filings

# Water System Overview

## System Overview

- The University's main campus water treatment plant was constructed in 1963
  - The University is one of only a few universities in the U.S. that operates its own water plant
- In addition to providing a cost-effective source of water for the campus, it also serves as an important teaching facility for future engineers and water treatment specialists
  - Main campus water plant customers include: UI Hospitals and Clinics; Dorms and student / staff housing; Academic buildings and research facilities; Utilities; Emergency supply for Iowa City and Coralville
- The water plant purifies and distributes over 900MM gallons of water annually of which over 400MM gallons goes to campus customers, 250 – 300MM gallons is transferred internally to make chilled water and steam, and the remaining 200 – 250MM gallons is losses and in-plant use
  - Maximum capacity of 5 mgd; Average daily demand of 2.6 mgd; Historical peak of 3.9 mgd; Water is sourced from the Iowa River with a Jordan Aquifer well as back-up
- The UI water department also maintains building water systems including:
  - High quality water for pharmaceutical manufacturing; Reverse Osmosis for research and humidification; Softeners; UI campus swimming pools



Note: UI main campus reverse osmosis water plant



Note: UI main campus water plant (exterior)

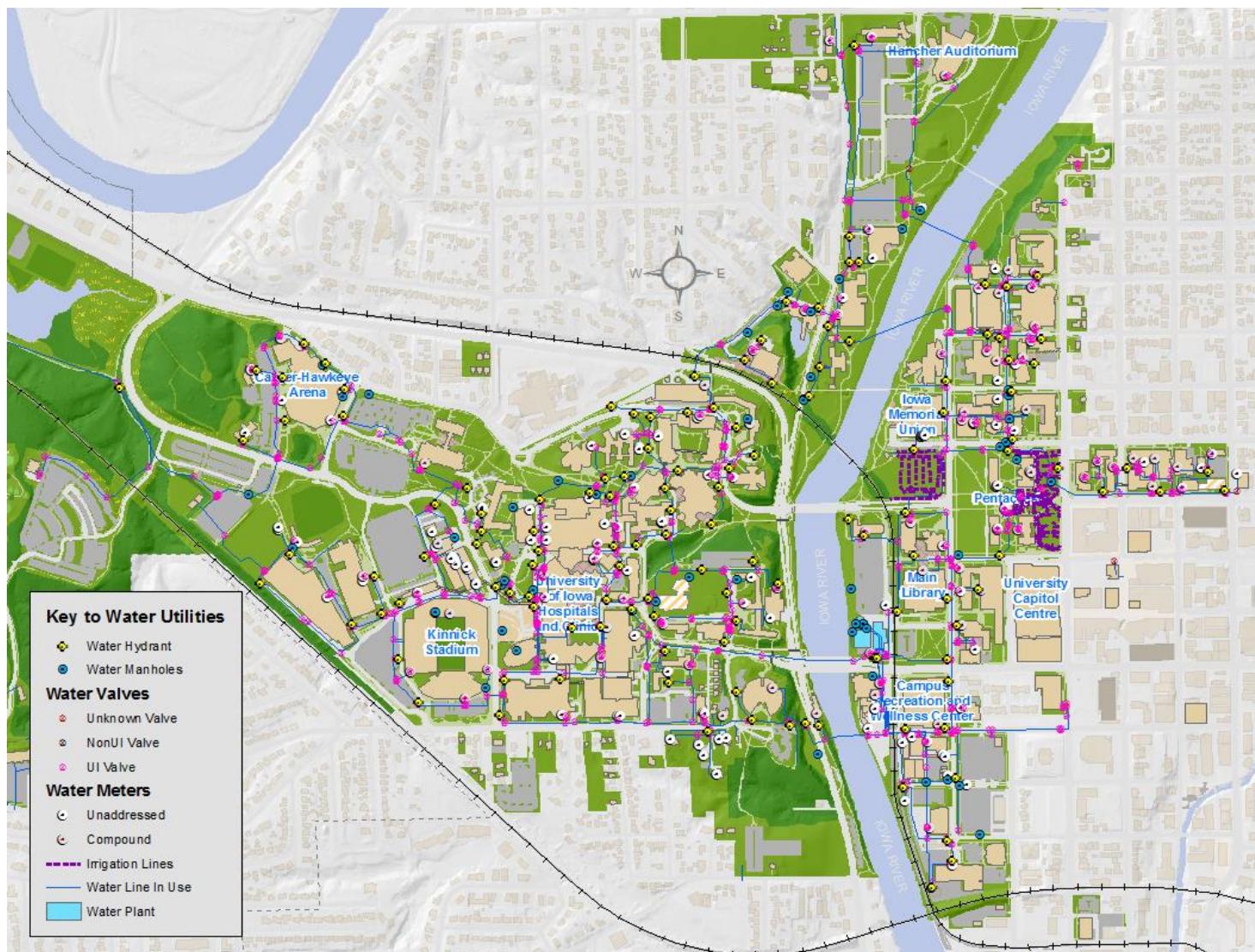
# Water System – Detailed Facility Description

Detailed Facility Description	
<b>Pumps</b>	<ul style="list-style-type: none"><li>▪ Four low service pumps: 15 – 25 hp, 1.8 – 4.0 mgd</li><li>▪ Four high service pumps: 100 – 300 hp, 1.6 – 4.0 mgd</li><li>▪ Three transfer pumps: each 75 hp, 6.0 mgd</li><li>▪ Two backwash pumps: each 125 hp, 9.0 mgd</li></ul>
<b>Pre-Treatment, Lime Softening, and Recarbination</b>	<ul style="list-style-type: none"><li>▪ Powdered activated carbon</li><li>▪ Two straight line sedimentation basins: 0.5MM gallons capacity each</li><li>▪ Two paste lime slakers: 0 – 1,000 lbs / day</li><li>▪ Two high pressure CO2 feeders: 0 – 12 lbs / hour at 75 psi</li><li>▪ One low pressure CO2 feed system: 0 – 35 SCFM at 10 psi</li><li>▪ Three upflow solids contact units: 133,000 gallons each</li><li>▪ Three recarbination chambers: 20,000 gallons each</li></ul>
<b>Chlorination, Filtration, and Reverse Osmosis</b>	<ul style="list-style-type: none"><li>▪ Three gas chlorine feeders: 0 – 500 lbs / day</li><li>▪ Six rapid rate sand and dual media filters: 35,000 gallons capacity each</li><li>▪ Three reverse osmosis skids: 1 – 0.5 mgd, 2 – 1.0 mgd</li><li>▪ Two clearwells: ~30,000 gallons capacity each</li></ul>
<b>Water Storage and Distribution</b>	<ul style="list-style-type: none"><li>▪ One chlorine contact tank: 1MM gallons</li><li>▪ One ground storage tank: 1MM gallons</li><li>▪ One elevated storage tank: 750,000 gallons</li></ul>

Source: University of Iowa filings

# Water System – Service Area

## Map of Operations



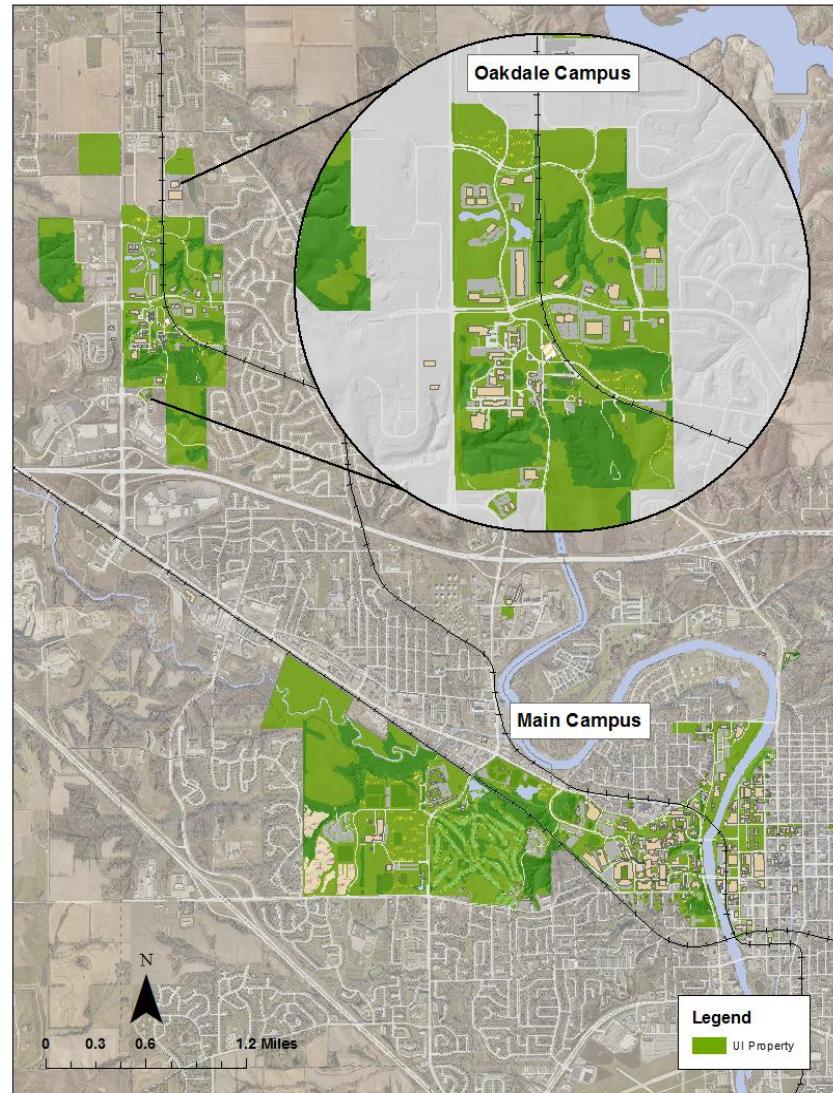
Source: University of Iowa filings

# Oakdale Campus Overview

## Campus Description

- The Oakdale Research Park and Campus are separately owned land areas, combined by the University into one research campus in the 1940s
- The campus and its adjacent research park now host a growing collection of research-related facilities and functions
- Oakdale Utility System operates a tri-generation plant that has provided electricity, heat, and cooling to meet the energy needs at the UI Oakdale Research Park since the 1960s
  - Energy is provided to the Hygienic Lab, Data Center, and the Environmental Management Facility
  - 80% overall efficiency when operating in combined heat and power mode
- **Electrical System Overview**
  - Oakdale Campus is fed by one UI owned electrical substation (Substation O)
- **Steam / Hot Water System Overview**
  - Oakdale Campus has three natural gas boilers and one wood chip boiler
- **Chilled Water System Overview**
  - Oakdale Campus has one central chilled water plant and one satellite chilled water plant for a combined capacity of 2,300 tons
- **Water System Overview**
  - Two well water pumps provide potable water for the campus; water is treated with chlorine and corrosion inhibitor

## Oakdale Campus in relation to Main Campus



Source: University of Iowa website | University filings

# Oakdale Campus – Detailed Facility Description

## Detailed Facility Description

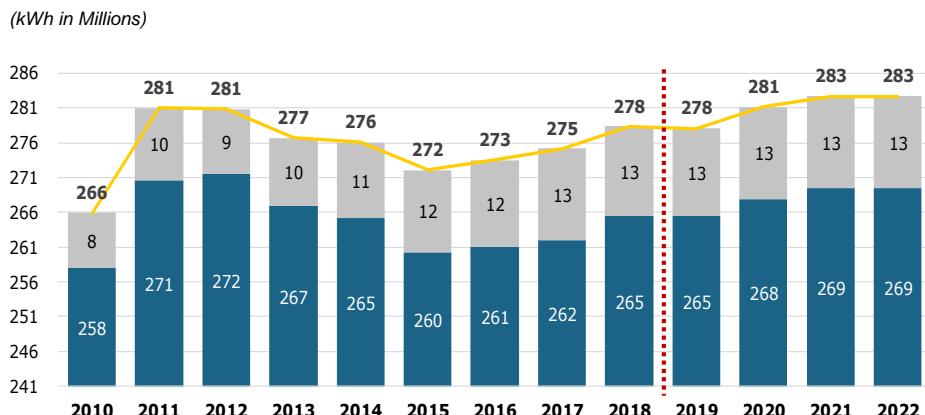
Electrical Power Plant	<ul style="list-style-type: none"><li>▪ Substation O was constructed for UI by Alliant Energy in 2009</li><li>▪ Tapped on ITC Midwest LLC 69kV system</li><li>▪ Tapped between MidAmerican Sub K Tiffin and Alliant Energy Squash Bend substations.</li><li>▪ Equipment: One transformer 69/13.8kV, 10 MVA, UI owned; 2018 Peak load 3.3 MW</li><li>▪ Services: Most load on one 13.8kV underground loop in concrete duct banks. Provisions for future additional loop; Small amount of load on 7200V overhead system; Automated central backup generation initiated on loss of power for critical campus loads only</li><li>▪ Primary electrical distribution infrastructure: Looped feeds on main and Oakdale campuses at 13.8 kV in underground concrete duct banks</li></ul>
Steam System	<ul style="list-style-type: none"><li>▪ Hurst biomass and natural gas boiler, installed in 2011; 20,000 lbs / hour at 120 PSI</li><li>▪ Bigelow natural gas boiler, installed in 1960; 18,000 lbs / hour at 120 PSI</li><li>▪ Bigelow natural gas boiler, installed in 1960; 18,000 lbs / hour at 120 PSI</li><li>▪ Murray natural gas boiler, installed in 1957; 14,000 lbs / hour at 120 PSI</li></ul>
Chilled Water System	<ul style="list-style-type: none"><li>▪ Located at the Oakdale main plant:<ul style="list-style-type: none"><li>▪ York electrically driven chiller, 600 ton capacity installed in 2009</li><li>▪ Two Thermax hot water absorption chillers, 220 ton capacity each, installed in 2015</li></ul></li><li>▪ Located at the State Hygienic Laboratory – University of Iowa:<ul style="list-style-type: none"><li>▪ Satellite chillers</li><li>▪ Two York electrically driven chillers, 600 ton capacity, installed in 2008</li></ul></li></ul>
Water System	<ul style="list-style-type: none"><li>▪ West Silurian / East Jordan:<ul style="list-style-type: none"><li>▪ Flow (gpm): 94 / 235</li><li>▪ Total Head (ft): 421 / 473</li><li>▪ Pump Model: WS 150 – 200 / WS 300 – 500</li><li>▪ # of Stages: 11 / 14</li><li>▪ Est. BHP: 16.5 / 50.4</li><li>▪ Pump Efficiency: 62% / 70%</li></ul></li></ul>

Source: University of Iowa filings

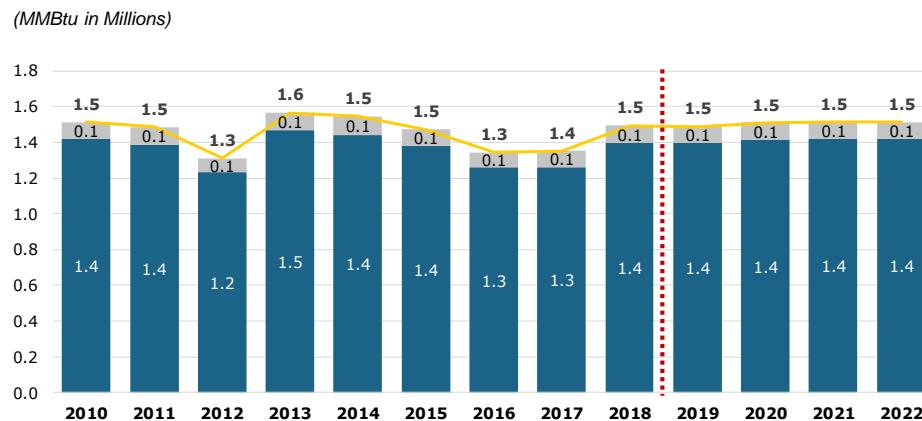
# Historical and Projected Campus Operating Consumption

## Historical & Projected Consumption Units (2010 – 2022)

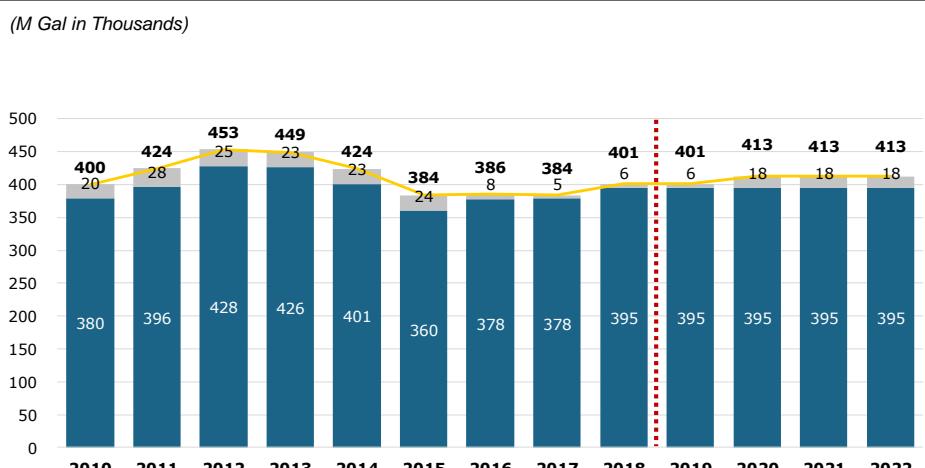
### Electric



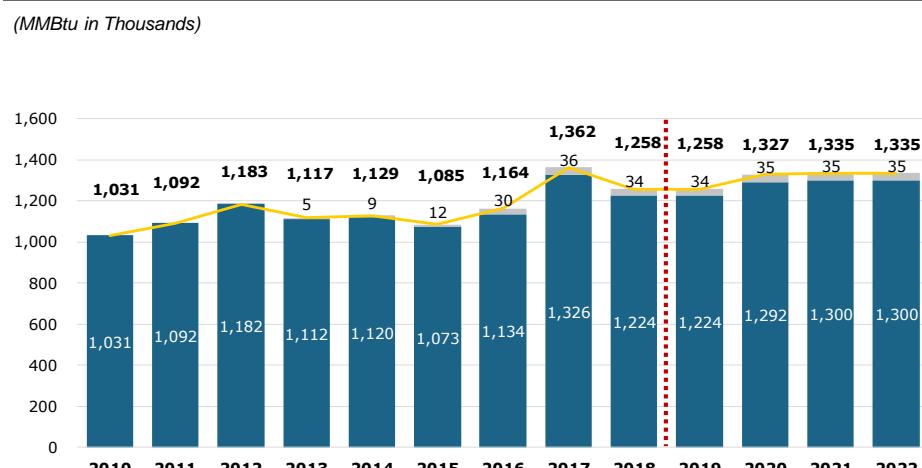
### Steam



### Water



### Chilled Water



Source: University of Iowa filings | Note: Includes both main and Oakdale campuses

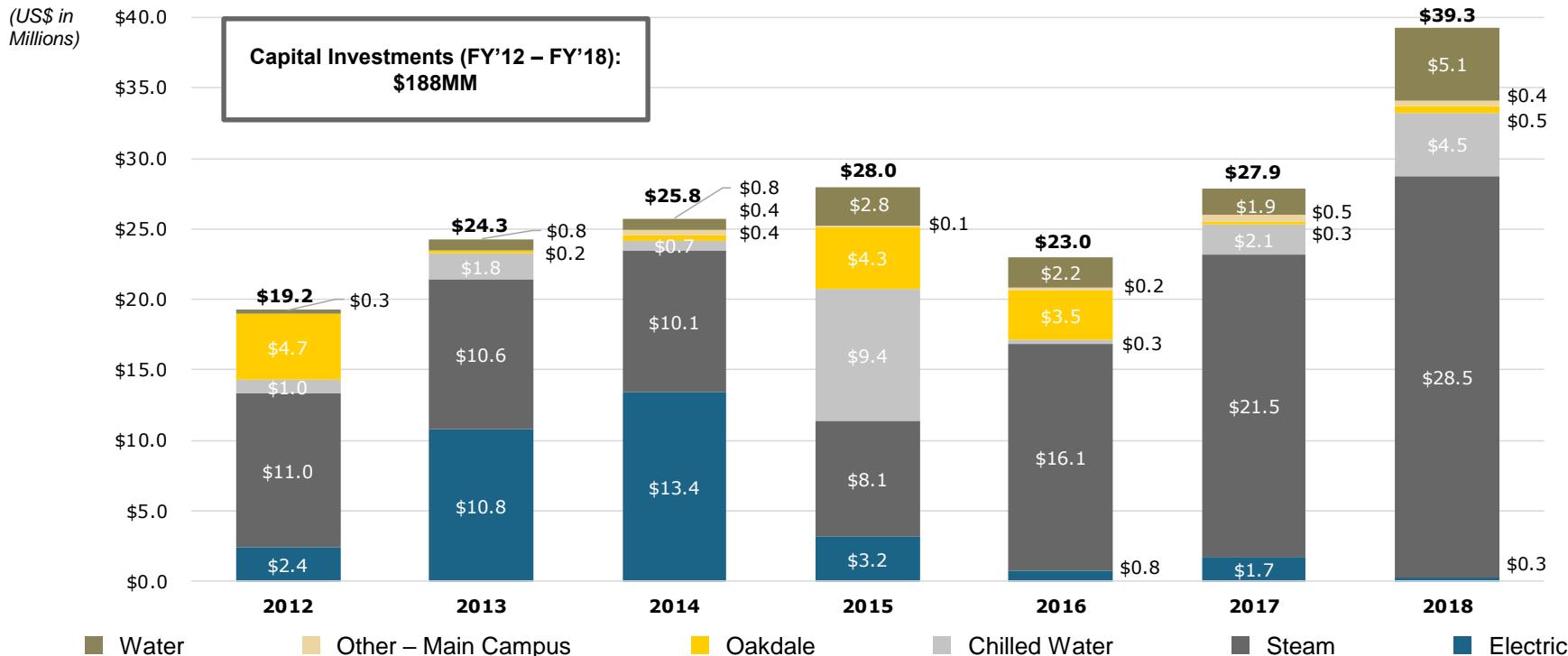


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## Utility System Capital Expenditure Plans

# Utility System Historical Capital Expenditures

## Historical Capital Investments 2012 – 2018



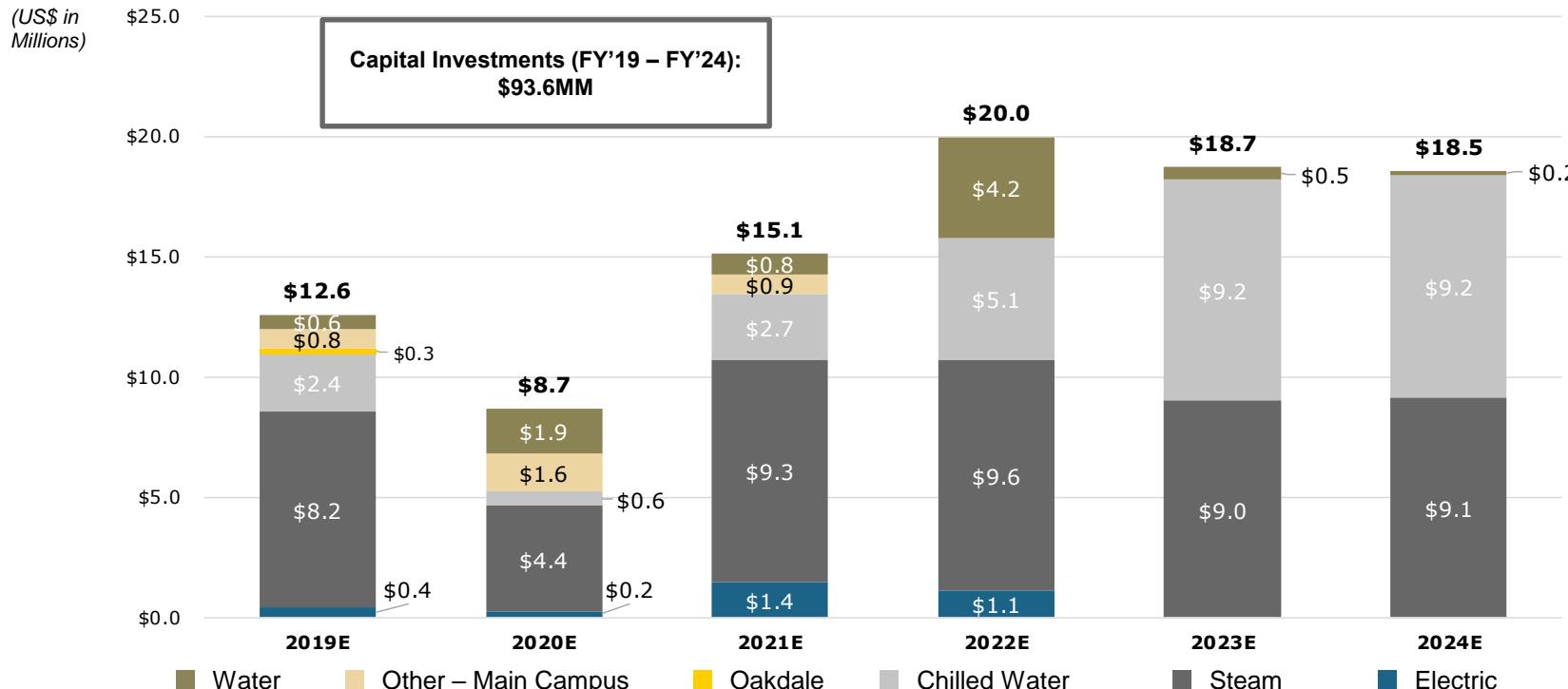
## Major Capital Projects

- Phase II of the Riverside Drive / Grand Avenue Steam Replacement Project:** \$17.9MM invested to replace the steam line from the Grand Avenue vault to a vault south of the Pharmacy building and the 70-year-old steam distribution system from Burlington Street Bridge to West Campus
- Flood Recovery and Mitigation Projects:** \$35MM invested as part of the flood recovery and mitigation projects which includes the replacement of vital steam service components, including 42-miles of wiring, 24 large electric motors, six large air compressors, and the installation of two temporary boilers. Also includes mitigation work in the utility tunnels to prevent recurrence of flooding of the power plant via the tunnel system
- Water Plant Project:** \$5.8MM invested to add a reverse osmosis system to remove ground water contaminants and improve quality of drinking water
- West Chilled Water Plant Project:** \$5.2MM invested to add an additional cooling tower to the roof of the Chilled Water Plant 2 ("West") facility, which will allow the existing plant to operate at full capacity during peak cooling days

Source: University of Iowa filings

# Utility System Projected Capital Expenditures

## Projected Capital Investments 2019 – 2024



## Major Capital Projects

- Power Plant Capacity Expansion Project:** Installation of new boiler and turbine capacity of the Main Power Plant. New boiler will provide critically important firm capacity to serve projected campus steam loads with the anticipated removal of the temporary West Campus boilers. Project is expected to be completed by spring of 2020
- Main Campus Steam Tunnel Repair Projects:** Repair degradation and structural deficiencies in the Old Capitol Tunnel and Currier Tunnel systems, which are required to access and maintain utility distribution assets. Estimated cost of \$19MM, over the next four years
- North Chilled Water Plant Capacity Expansion Project:** Multi-phased project that will replace end of life equipment with more efficient and higher capacity equipment. New chilled water assets will provide improved reliability and capacity to meet projected campus chilled water loads and to maintain firm capacity. Estimated cost of \$18MM, over the next five years

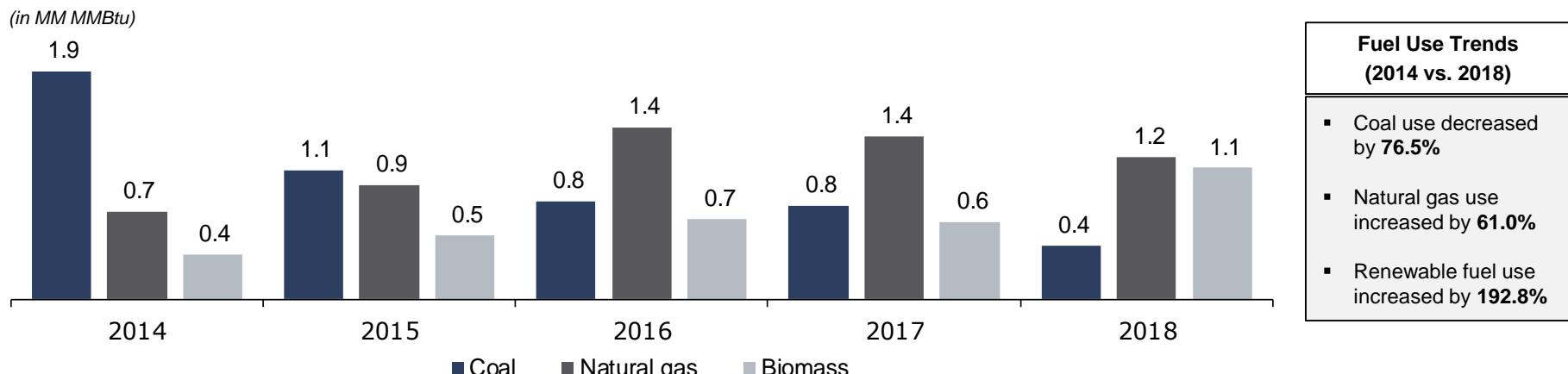
Source: University of Iowa filings

# Objectives for De-carbonization and Fuel Sourcing

*Over the past five years, the University's main campus power plant has been reducing its reliance on coal, making use of alternatives such as oat hulls, miscanthus grass, and renewable pellet fuels*

## A Plan for the Future

- **Phasing out need for coal by 2025**
  - From 2014 to 2018, main campus coal consumption decreased by 76.5% to 444,795 MMBtu; whereas gas and renewable fuel consumption have both increased by 61.0% and 192.8%, respectively
  - Phasing out coal is not only a financial strategy but an environmental one
    - Request for proposals for coal supply have had minimal responses over the past 10 years due to the University's relatively low coal volumes
  - The University has switched from solid fuel sources – which have historically been used to burn coal – to renewable sources
    - Switching to renewable fuels limits the University's reliance on any single fuel source to power the campus
    - Natural gas will continue to be part of the fuel portfolio, but will not be the sole source of fuel
- **The University is seeking a Concessionaire that will ensure the following commitments are kept:**
  - Ability to operate the main campus power plant on a coal free basis by January 1, 2025
  - Continue to explore new sources of renewable fuel creating sustainable, lower-cost fuel options



Source: University of Iowa website | University filings



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## Overview of Proposed Transaction

# Overview of Proposed Transaction

## Transaction Overview

- Opportunity to manage the on-campus energy systems for the University through a 50 year lease and concession agreement
- **Benefit to the University:** Proceeds realized will be used for strategic initiatives of the University including: professional scholarships, teaching, student scholarships, research, and other core functions of the University
- **Benefit to the concessionaire:** The Concessionaire will receive a steady return on its upfront investment and on any additional investment made to the utility system during the term of the Concession Agreement. Concessionaire returns are based in part on its ability to depreciate utility system assets, including improvement on its federal and state income tax returns
- The Concession aims to align with the University's values, add long-term sustainability to the utility system assets, and allow the University to, through investments in its strategic initiatives, create a better environment for current and future students to come
- Annual revenue to the Concessionaire will be based on a "Utility Fee" consisting of three components as outlined below: 1) a fixed fee payment, 2) the pass-through of operating and maintenance ("O&M") expenses, and 3) a return on additional capital invested in utility system improvements

### Utility Fee Components

<b>1</b> Fixed Fee	<ul style="list-style-type: none"><li>■ Flat, non-negotiable annual amount paid by the University to the Concessionaire, to be set on an agreed upon value for the first year of operation (2020E)</li><li>■ Based on bids received, the University and the Concessionaire will decide whether to escalate the fee at a rate of 1.5% beginning in year 2021 or 2025 of the agreement</li></ul>
<b>2</b> O&M Recovery	<ul style="list-style-type: none"><li>■ Operations and Maintenance ("O&amp;M") expense:<ul style="list-style-type: none"><li>■ Variable component: purchased utility and fuel costs (e.g. natural gas, coal and purchased electricity)</li><li>■ Fixed component: labor, materials, and contracts</li></ul></li><li>■ Pass-through of O&amp;M expenses; specifics and limitations to be finalized in the Concession Agreement</li></ul>
<b>3</b> Return On Capex	<ul style="list-style-type: none"><li>■ The University will compensate the Concessionaire for any approved capital spending incurred during the Concession term for the purposes of repairing, replacing and / or improving the Utility System or any portion of it</li><li>■ Three components to capex revenue:<ul style="list-style-type: none"><li>■ The capital recovery amount which is based on the capex from all prior capital expenditures that have not been fully recovered;</li><li>■ The return earned on any unrecovered capex balances; and</li><li>■ The return of the terminal unrecovered capex balance at the end of the concession term</li></ul></li></ul>

# Approach and Assumptions: Return on Capital Expenditures

## Capex Components

Capital Recovery Amount

Return on Unrecovered Capex

Terminal Unrecovered Capex

## Illustrative Example

# Concession Agreement Overview

Term	Description
<b>Transaction Structure</b>	<ul style="list-style-type: none"> <li>▪ University leases its Utility System to the Concessionaire who is in turn responsible for operating and managing the assets</li> </ul>
<b>Length of Term</b>	<ul style="list-style-type: none"> <li>▪ 50 years</li> </ul>
<b>Payment</b>	<ul style="list-style-type: none"> <li>▪ Concessionaire makes a one-time upfront payment of to the University for the Concession</li> <li>▪ The University will pay the annual utility fee in equal monthly installments to the Concessionaire in return for services rendered           <ul style="list-style-type: none"> <li>▪ Utility fee is comprised of Fixed Fee, O&amp;M Recovery payments, and Recovery of Capital Expenditures</li> </ul> </li> </ul>
<b>Concessionaire Structure</b>	<ul style="list-style-type: none"> <li>▪ The Concessionaire will be a single-purpose entity and will only be permitted to issue debt secured by the leasehold interest if such debt receives an investment-grade credit rating           <ul style="list-style-type: none"> <li>▪ The Concessionaire is not permitted to pursue other revenue opportunities, including servicing third parties, unless approved by the University</li> </ul> </li> </ul>
<b>Concession Compensation / KPI Payments</b>	<ul style="list-style-type: none"> <li>▪ If the University takes certain actions / fails to perform certain activities, then it will owe the Concessionaire "Concession Compensation" sufficient to make the Concessionaire economically whole           <ul style="list-style-type: none"> <li>▪ Examples of University failures to act that could lead to Concession Compensation are the failure to timely renew or maintain in good standing any authorization from the University requested by the Concessionaire that is required for compliance with applicable laws and, generally, any delay caused by the University's failure to perform or observe any obligations or covenants under the Concession Agreement</li> </ul> </li> </ul>
<b>Operator</b>	<ul style="list-style-type: none"> <li>▪ The Concessionaire will engage a qualified operator approved by the University to perform all operations with respect to the Utility System</li> </ul>
<b>Capital Improvements</b>	<ul style="list-style-type: none"> <li>▪ The Concessionaire will be responsible for all capital improvements to the Utility System, and the University shall approve all capital improvements before they are commenced</li> </ul>
<b>Fixed Fee</b>	<ul style="list-style-type: none"> <li>▪ Flat, non-negotiable annual amount paid by the University to the Concessionaire, to be set on an agreed upon rate for the first year of operation (2020E)</li> <li>▪ Fixed fee will escalate at 1.5% per year; escalation will begin in 2021 or 2025 as agreed to by the University and the Concessionaire</li> </ul>
<b>O&amp;M Recovery</b>	<ul style="list-style-type: none"> <li>▪ Pass through of Variable (Fuel and Purchased Electricity) and Fixed (Labor, Materials, and Contracts) expenses to the University as part of the utility fee, subject to specific limitations. The University intends to purchase and maintain insurance coverage on the Utility System and so will not be included in the O&amp;M Recovery</li> </ul>
<b>Recovery of Capital Expenditures</b>	<ul style="list-style-type: none"> <li>▪ Recovery of capital expenditures incurred in previous fiscal year over a 20 year period plus return on unrecovered capex</li> </ul>
<b>Terminal Capital Expenditure Recovery</b>	<ul style="list-style-type: none"> <li>▪ The remaining balance on the total unrecovered capital expenditures will be paid out to the Concessionaire at the end of the concession term based on an agreed upon formula</li> </ul>
<b>Existing Utility System Employees</b>	<ul style="list-style-type: none"> <li>▪ Recognizing that current utility employees are critical for ongoing system operation and reliability, Concessionaire will provide an attractive employment package to maximize the number of employees who are offered and accept positions with the Concessionaire</li> </ul>

Note: Assumed transaction close date of 12/31/2019

# KPIs and Related Compensation

## KPI Overview

- The reliability, safety, and efficiency of the University's utility operations are of paramount importance
- Certain aspects of these operations are so important as to be Key Performance Indicators ("KPIs")
- The University anticipates establishing KPIs that will have specific metrics/targets with established monitoring intervals
- Should the Concessionaire fail to meet any KPI target then KPI compensation payments to the University will be due

## KPI Ranking and Determination

- The University anticipates establishing KPI rankings based on level of importance
- It is anticipated that the amount of the agreed upon KPI Compensation payment will be related to
  - The ranking of the KPI
  - The severity by which the KPI target was missed
  - The number of times the KPI target was missed in the evaluation period
  - Consecutive misses of the KPI target (if any)
- It is anticipated that in the most severe circumstances, a major miss of a critical KPI target, or a pattern of misses could be deemed a failure to meet a material performance standard leading to the removal of the Concessionaire's operator



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## Financial Overview

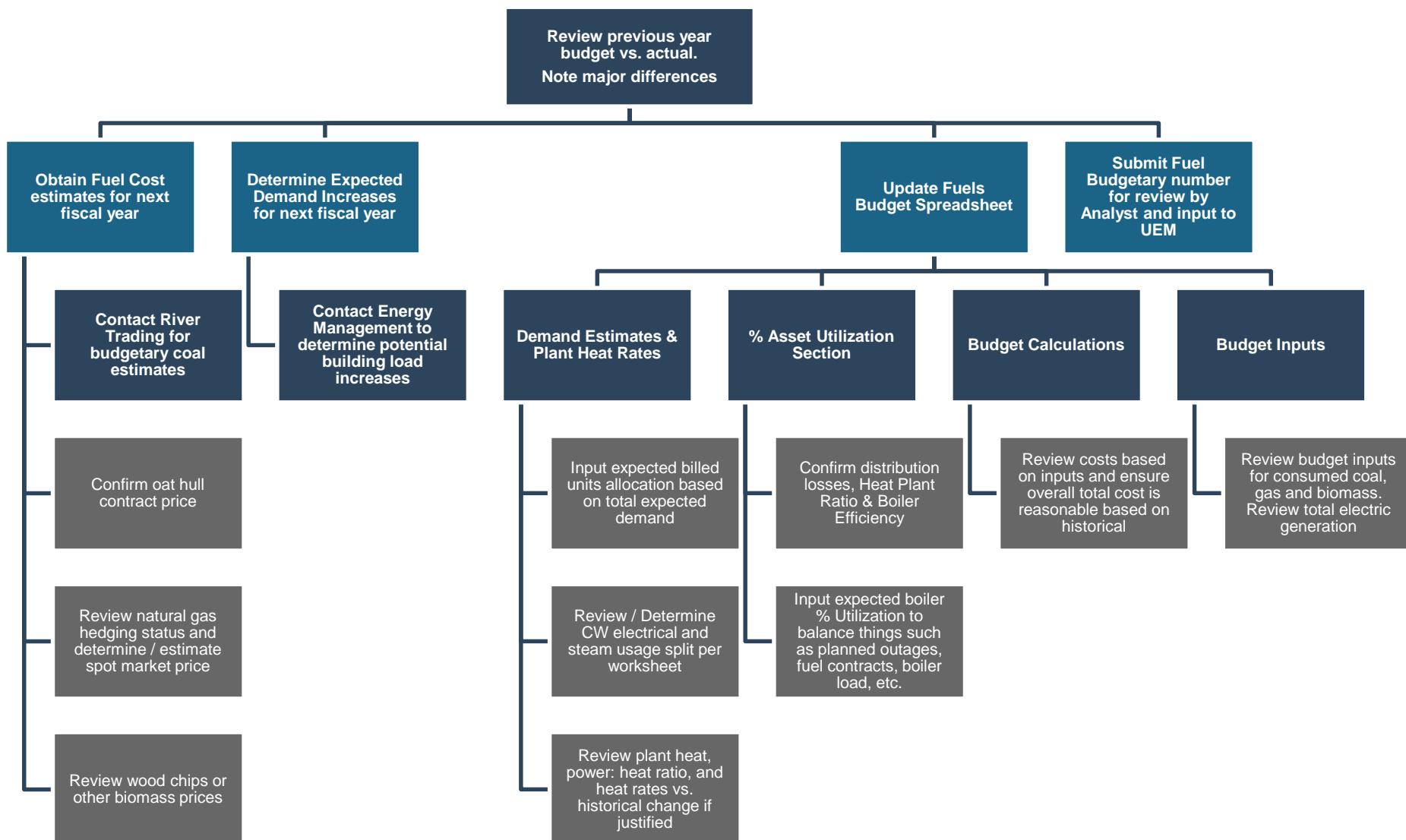
# Load Assumptions

## Load Assumptions

- The University's budgeting process begins by estimating consumption needs for the upcoming year, taking into account:
  - Efficiency projects;
  - New buildings;
  - Historical consumption; and
  - Prior year's utility budget
- Steam and chilled water consumption projections may rely on additional engineering modeling to determine the projected intake of fuels and other energy sources used
- After obtaining fuel cost estimates for the upcoming year, the University then determines the expected increases in demand, and updates its fuel budget accordingly
- Once the budget is reviewed and finalized, it is used to determine the rates charged to campus users
- Please refer to the following slide for a detailed flow-chart documenting this process

# Load Assumptions (Continued)

## Fuels and Purchased Electricity Budgeting Process

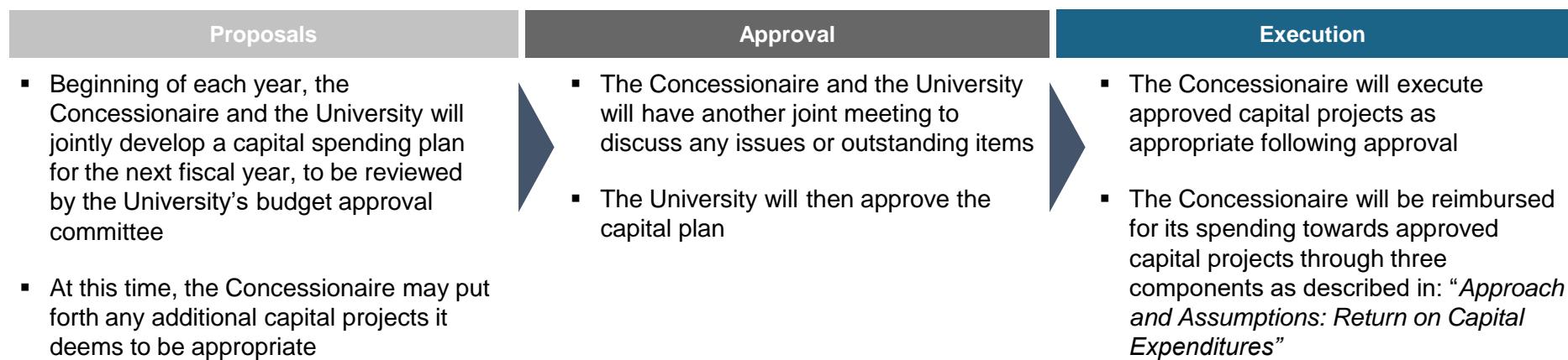


# Utility System Capital Planning and Budget Approval Process

## Utility System Capital Planning Process

- It is anticipated that the University and the Concessionaire will work collaboratively to establish the operating and capital budgets of the utility system
- The University anticipates establishing a process whereby the Concessionaire receives annual approval for its detailed one year and five year operating and capital expenditure plans

## Capital Approval Process



## Illustrative Calculation of Free Cash Flow



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## Transaction Timeline

# Proposed Timeline

