

Data Center Task Force Meeting

JUNE 1, 2026

RICK MANNER
URBANA & CHAMPAIGN SANITARY DISTRICT

If 1 to 4 Smaller/Mid-Sized Data Centers Were Added to Champaign Co.

(300,000 gallons per day to 1,000,000 gallons per day, ~ what Kraft uses)

- **If No Action Is Taken to Mitigate Water Use –**
 - The county should continue to use **less** Mahomet Aquifer water than 1990s, since UCSD service area uses so much less water today.
- **If Some Action Is Necessary –**
 - **Cooling towers** using wastewater reuse would drop new-water usage by 80%, to what moderate-sized water-using businesses use.
 - **Chiller systems** drop new-water usage by 99+%, to what an office building uses.
- **Extreme Actions Unnecessary to Protect Mahomet from Urban Uses –**
 - Going further than requiring cooling towers or chiller systems is not protecting the Mahomet any more than banning all new users or new office buildings.

Groundwater Issues and Trends

In East-Central IL, we've been reliant upon the Mahomet Aquifer.

- Prior to 1996, the cone of depression had, similar to much of NE IL, been increasing for many years as urban populations have grown and increased water demand.
- By 2006, water use and the cone of depression had seemed to stabilize.
- In 2011, the trends in UCSD wastewater flows was a 0.1 million gallon per day annual increase at the Southwest Plant and a much smaller rate of increase at Northeast Plant.
- In 2026, urban water usage has declined markedly in the last 15 years.
 - Illinois American Water Company has greatly improved their water use efficiency.
 - Industry and commercial businesses continue to reduce water usage to save \$\$\$.
 - Residential usage continues to decline as low-flow fixtures are now the norm.
 - UCSD Northeast Plant has sharply declined for several reasons.
 - UCSD Southwest Plant increases were interrupted, but now continue to rise.

Why?

- Illinois American is much more efficient in making groundwater.
- As water and sewer rates have climbed, more conservation techniques got done.
 - Low flow fixtures are now more-common than alternatives.
 - Businesses have found water-efficient operations to be cost-effective.
- 2025 was very dry.

Quick Review of Some Large Numbers – Annual Figures

Quick Review of Some Large Numbers – Annual Figures

- About **700 billion gallons** of water falls on Champaign County
 - $\sim 700 \text{ billion} = 998 \text{ sq. mi.} * 640 \text{ ac./sq. mi.} * 325,000 \text{ gal./ac-ft} * 3.33\text{ft}$
 - Long-term average precipitation is $\sim 40''/\text{yr}$.
 - A trivial $0.4''$ change (1%) in the annual precipitation is a 7 billion gallons change.

Quick Review of Some Large Numbers – Annual Figures

- About **700 billion gallons** of water falls on Champaign County
- UCSD treats about **7 billion gallons** of water that was pumped out of the Mahomet (equivalent of ~0.4” change in rain = ~ 1% of the annual rain)
 - Illinois law prohibits returning treated wastewater into the drinking water supplies or to recharge Mahomet.
 - UCSD Northeast Plant flows have decreased by about 2 billion gallons/year in the last decade.

Quick Review of Some Large Numbers – Annual Figures

- About **700 billion gallons** of water falls on Champaign County
- UCSD treats about **7 billion gallons** of water that was pumped out of the Mahomet (~0.4” change in rain)
- Estimate for water usage for a mid-sized data center at **< 0.3 to 0.9 billion gallons:** (~0.02 to 0.05” change in rain)
 - **Cooling Towers - 80% of the water is evaporated, 20% is discharged.**
 - Since they are using water just for cooling, they don't need clean, drinking water.
 - The data center could avoid impacting the Mahomet aquifer by using recycled wastewater for most of this volume. Drinking water would likely still be required to be a back-up supply.
 - **Chillers use almost no new water on a typical day.**
 - The chiller is typically charged with 50% drinking water/50% antifreeze.
 - A complete prohibition of using drinking water would be problematic for even this system.
 - **I think UI's LEEDS Certified Petascale/Supercomputing Center uses almost no new water with their unique system.**

Quick Review of Some Large Numbers – Annual Figures

- About **700 billion gallons** of water falls on Champaign County
- UCSD treats about **7 billion gallons** of water that was pumped out of the Mahomet (~0.4” change in rain)
- Estimate for water usage for a mid-sized data center at:
 - From **< 0.3 to 0.9 billion gallons** per year for a center cooled by cooling towers (~0.02 to 0.05” change in rain).
 - Almost no water on a typical day if a chiller/air-conditioner is used.
 - I think UI’s LEEDS Certified Petascale/Supercomputing Center uses almost no new water with a unique hybrid system.

Why I'd Suggest Using Cooling Towers in Illinois

- I consider cooling towers to be the 'greener' solution in Illinois.
 - Cooling towers systems use less energy to accomplish the necessary cooling.
 - I feel we should minimize, not prohibit, using drinking water or any water from the Mahomet Aquifer.
- I consider cooling towers using wastewater reuse as the 'greenest' solution, in Illinois.
 - As customers of Illinois American Water, we have caused the removal of this water from the Mahomet Aquifer,
 - Excess/unused, treated wastewater is always leaving the county (i.e., we export water daily),
 - Evaporating and reusing the wastewater is getting a second use from the same water, avoiding almost all of the increased demand on the Mahomet Aquifer.
 - I feel we should minimize, not prohibit, using drinking water or any water from the Mahomet Aquifer.
 - We should retain the option to reward/approve good projects that both protect our resources and provide economic benefit.
 - If there is a real need to reduce Mahomet Aquifer drawdown or demand, there are several other ways that are more effective at reducing water usage.

3 Improbable, but Possible Threats to Mahomet Aquifer:

- Mega-scale data centers or several mid-sized data centers being approved
 - The discussions today refer to typical data centers covering tens of acres, not hundreds.
- Many farmers turning to irrigation systems.
 - 5% of the farms in the County irrigating 12"/year = water pumping of UCSD (150,000 pop.)
- A sustained change in annual rainfall.
 - 1% change in annual rainfall = water pumping of UCSD (150,000 pop.)
 - Of course, if rain is less reliable, irrigation becomes more economically important.

UI Petascale Provides 18 Years of Good Results

- Gold Level LEED certified
 - Built to conserve water and energy.
 - A unique system with large above-ground cooling tank.
- This was a positive \$200 M investment in the community.
 - If we had 3 more of these in the county that actively paid taxes....

Closed Loop Chillers

- Closed loop chiller systems are extra-large air conditioners.
 - Air conditioners use energy to cool to inside air, heat goes to outside air.
 - Closed loop systems get their name because the fluid moves in a loop.
 - They are the most-common solution when the cooling demand is low or where water is not readily available.

Cooling Towers

- Cooling towers manage cooling by evaporating water.
 - When there is a very-large cooling demand businesses pay the cost for a cooling tower, to avoid the higher energy costs of a chiller.
 - Common uses are at hospitals, large office buildings, and industries with large heat sources
 - Most cooling towers evaporate drinking water.
 - When there is a huge cooling demand businesses pay for the complexity of piping a cheaper water supply on-site instead of drinking water.
 - Wastewater reuse is a great solution when a sewage treatment plant is within a reasonable distance of the business.
 - In Champaign County wastewater reuse avoids stressing the Mahomet Aquifer.

Chillers vs. Cooling Towers

- Use energy vs. use evaporation of water
- If you feel our economy has set a fair price for energy and water, we have seen:
 - Most businesses with moderate cooling needs use chillers,
 - Larger businesses use cooling towers, and
 - Selected businesses might reuse wastewater in cooling towers.
- Nuclear power plants use a variety of solutions to dump their waste heat:
 - Huge, hour-glass shaped, cooling towers,
 - Large ponds that are partially cooled by increased evaporation of warmer water, or
 - Dump hot water into ocean or large lakes.

Reuse Makes Sense, But Hurdles Exist

- USEPA just released Water Reuse Action Plan 2.0
 - EPA considers reusing water in data centers to be a key initiative as it preserves groundwater resources while still satisfying this growing demand.
- We have drinking water lines, sanitary sewer lines, storm sewer lines, who pays for reuse lines voluntarily?
 - If drinking water is cheap and readily available, customers will rationally reject spending more money for the lower-quality product of treated sewage/reuse.
 - Two possible exceptions
 - Very large users who may find the small price difference enough to justify the expense of a pipeline.
 - Some users may find it politically expedient to not use the drinking water system.
- Cheap and plentiful clean water prevent reuse infrastructure from being economical
 - Users must pay for a drinking water pipeline and connection, who can afford a 2nd option?
 - Very large users can find it worthwhile to build a more-complex system to save operating costs.

Quick Answers to Forwarded Discussion Points

- Where the water goes in a closed loop cooling system
 - Around in the loop for 99.99% of the time. Once in blue moon, it is emptied and refilled.
- What pre-treatment or treatment needs might look like
 - Theoretically, none, water is great at moving heat around. Practically, the cleaning done at UCSD works.
- Drainage and stormwater
 - I'm not sure how Data Centers have any different concerns as far as these topics.
- What happens during drought?
 - Less water is generally available, which is why utilities and businesses must have back-up plans.
- Generally, wastewater
- Evaporative cooling,
- water sourcing, and
- of course, a lot of focus on the Mahomet Aquifer.

- As far as water availability, I've got good news.
 - Using wastewater re-use we can avoid tapping the Mahomet Aquifer to any meaningful extent.
 - On a typical day, the creeks in Champaign County are primarily driven by regular precipitation.
-
-
- We operate 2 treatment plants. Our flows are strongly effected by water use and rainfall in any given year. You need to look at flows over the course of decades to detect lasting flow trends.
 - Looking at the Southwest Plant, since it was constructed, we've seen 55 years of increased flow. A reasonable approximation is that the flow has increased by 1 million gallons per day, per decade. Current flows are about 6 MGD. Because we need to plan for the future, we are currently expanding that plant's capacity to discharge 9.2 MGD.
 - At NEP, over those 55 years that the SWP has existed, we saw less growth for a decade or two, then no net growth for a decade or two, and now we are seeing marked decrease in flows. In the early 2000s we saw leveling we saw significantly decreased the flow of wastewater treated and discharged. This decrease has been seen exclusively at the NEP
-
-
- Chris' question about approval of sales.

