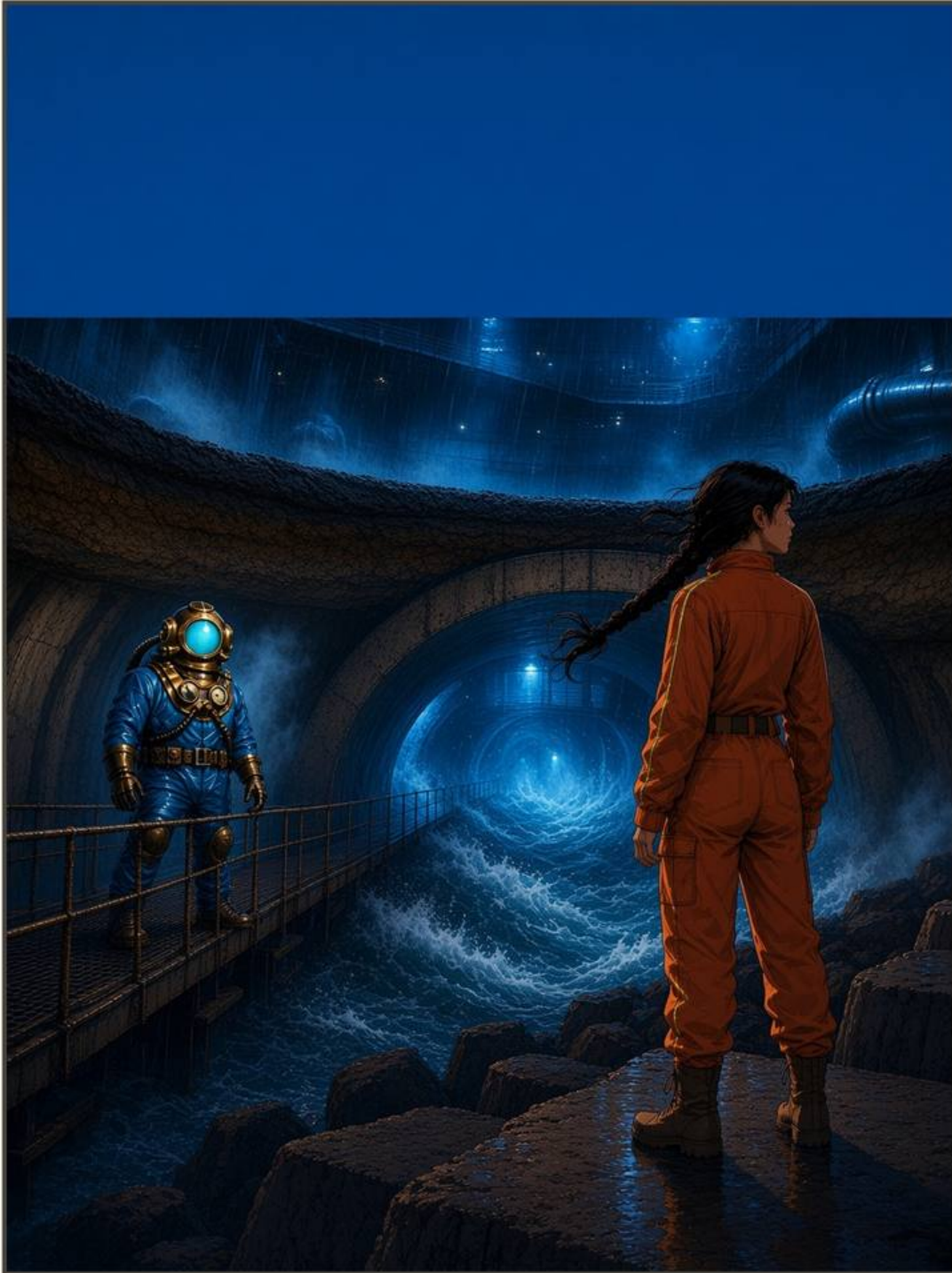


FOLLOW THE WATER

Data Centers #3 · Teens 10-15

with Dess, the Infrastructure Guard and Lena Ashgrove of Channel 5



CREDITS

Follow the Water · Data Centers #3 · Teen edition (ages 10–15)

Story and production: GOTB Consulting, Chicago

Lead: Dess · Heroes: Undertow, The Auditor, Gridline, Commons · On screen: Lena Ashgrove,
Channel 5

AI-GENERATED ART, FICTIONAL CHARACTERS

All characters, the town of Prairie Bend and Channel 5 are fictional. Any resemblance to real people is a coincidence. No real logos are shown. Real institutions are described by role. Every number in this book was checked against public sources before printing; see 'Sources' near the end.

Safety: never enter water intakes, plant basins or open trenches. Stay back from work zones.

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THE CREW



DESS

Our lead. Follows the water and asks who keeps it running.



UNDERTOW

Water guard (FLOW READ). Knows every tunnel and main.



THE AUDITOR

Sees and reports. Cannot fix it alone.



COMMONS

Hero of neighbors and night crews. Lantern up.

LAKEFRONT · DUSK



DESS

POWER WAS THE FIRST WIRE. WATER IS THE SECOND. IT STARTS OUT THERE, TWO MILES INTO THE LAKE.

FACT FILE

Lake Michigan water enters at cribs about 2 miles out in the lake and flows through tunnels about 200 ft under the lake bed.

Source: City of Chicago DWM, "Water Supply"; City of Chicago DWM, "Suburban Customers & Regional Partnerships"



UNDER THE LAKE BED

UNDERTOW

TUNNELS ABOUT 200 FEET UNDER THE LAKE BED CARRY IT TO TWO PLANTS. TOGETHER THEY CAN MAKE ABOUT 2.1 BILLION GALLONS A DAY.

FACT FILE

Lake Michigan water enters at cribs about 2 miles out in the lake and flows through tunnels about 200 ft under the lake bed. About 750 million gallons a day delivered; the two plants can make about 2.1 billion gallons a day.

Source: City of Chicago DWM, "Water Supply"; City of Chicago DWM, "Suburban Customers & Regional Partnerships"

THE BIG PLANT · NIGHT



UNDERTOW

SCREENS, CHLORINE, ALUM TO CLUMP THE GRIT, SETTLING TANKS THAT DROP ABOUT 90% OF IT, THEN 96 SAND FILTERS.

FACT FILE

Steps: rotating screens catch fish and debris; chlorine kills microbes; alum makes tiny particles clump ("floc"); settling tanks remove ~90% of particles; 96 swimming-pool-sized sand-and-gravel filters finish the job.

Source: ENR, "The 10 Largest Drinking-Water Treatment Plants in the World" (Nov 7, 2017; dated)



BUS SHELTER SCREEN

LENA (ON SCREEN)

VERIFIED

CHICAGO DELIVERS ABOUT 750 MILLION GALLONS A DAY THROUGH 4,300 MILES OF MAINS TO MORE THAN 5 MILLION PEOPLE.

FACT FILE

About 750 million gallons a day delivered; the two plants can make about 2.1 billion gallons a day. 65 miles of tunnels, 12 pumping stations, 4,300 miles of water mains; serves more than 5 million people in Chicago and suburbs.

Source: City of Chicago DWM, "Water Supply"; City of Chicago DWM, "Suburban Customers & Regional Partnerships"



DESS

GRAVITY GETS IT TO 12 PUMPING STATIONS. THEY PUSH IT INTO THE MAINS. NO PUMPS, NO PRESSURE, NO SHOWER.

FACT FILE

Gravity carries treated water to 12 pumping stations, which pressurize it into the mains to your tap.

Source: City of Chicago DWM, "Water Supply"; City of Chicago DWM, "Suburban Customers & Regional Partnerships"



LAB · 3:00 AM

THE AUDITOR

LABS CHECK IT 24/7. OPERATORS NEED A STATE LICENSE. ABOUT 131,000 OF THEM NATIONWIDE, MEDIAN \$60K. A THIRD OF THE WATER WORKFORCE CAN RETIRE THIS DECADE.

FACT FILE

Labs monitor water quality 24/7, 365 days a year. About one-third of the water workforce eligible to retire within the decade (EPA, 2020). Plants run 24/7; operators add chlorine, test samples and watch gauges; a state license is usually required. Also: ~131,000 water/wastewater operator jobs (2025); median pay \$60,020; ~10,000 openings a year despite a projected 6% decline.

Source: City of Chicago DWM, "Water Supply"; City of Chicago DWM, "Suburban Customers & Regional Partnerships"; ASCE 2025 Report Card, "Drinking Water"; U.S. BLS



THE AUDITOR

THERE ARE 9.2 MILLION LEAD SERVICE LINES IN THE U.S. THE GOAL IS TO REPLACE THEM ALL WITHIN 10 YEARS. CHICAGO COATS ITS PIPES TO HELP MEANWHILE.

FACT FILE

Polyphosphate coats the inside of pipes to help keep lead in old plumbing out of the water. EPA found 9.2 million lead service lines (2023); federal goal set in 2024 to remove all within 10 years (as reported by ASCE; current federal status not rechecked).

Source: ENR, "The 10 Largest Drinking-Water Treatment Plants in the World" (Nov 7, 2017; dated); ASCE 2025 Report Card, "Drinking Water"



UNDERTOW

U.S. DATA CENTERS USED ABOUT 66 BILLION LITERS ON-SITE IN 2023.
THE POWER PLANTS BEHIND THEM USED FAR MORE, ABOUT 800
BILLION.

FACT FILE

U.S. data centers' on-site water use $\approx$ 66 billion liters in 2023. Also: $\approx$ 800 billion liters indirectly through power plants.

Source: Lawrence Berkeley National Laboratory; U.S. Data Center Energy Usage Report (2024)

TOWER VS. LOOP



UNDERTOW

REPORTED

SOME BIG SITES CAN USE MILLIONS OF GALLONS A DAY. MOST USE ABOUT WHAT AN OFFICE BUILDING DOES. CLOSED LOOPS SAVE WATER BUT COST POWER.

FACT FILE

Large sites up to 5 million gallons/day. Most Virginia data centers use about what a large office building uses or less. Also: ~80% of withdrawn cooling water evaporates; closed loops cut freshwater use (up to 70%) but can cost more power.

Source: Environmental and Energy Study Institute; Virginia JLARC; Data Centers in Virginia (2024)



COMMONS

ABOUT 240,000 MAIN BREAKS A YEAR IN THE U.S. CREWS DIG IN AT NIGHT SO THE CITY WAKES UP WITH WATER.

FACT FILE

About 240,000 water main breaks a year (~\$2.6B in repairs), down from an estimated 250,000–300,000 in 2018.

Source: ASCE 2025 Report Card, "Drinking Water"

THE PIPE MAP



THE AUDITOR

NEARLY 20% OF U.S. WATER MAINS ARE PAST THEIR USEFUL LIFE. THE EPA PUTS THE 20-YEAR NEED AT \$625 BILLION.

FACT FILE

Nearly 20% of water mains (450,000+ miles) are past their useful lives. EPA (2023): \$625 billion needed over 20 years.

Source: ASCE 2025 Report Card, "Drinking Water"



KITCHEN TABLE

LENA (ON PHONE)

AVERAGE HOUSEHOLD WATER BILL: ABOUT \$51 A MONTH, UP ABOUT 64% SINCE 2012. SOMEONE PAYS FOR NEW PIPES.

FACT FILE

Average household water bill ~\$51/month, up ~64% from 2012 to 2023.

Source: ASCE 2025 Report Card, "Drinking Water"



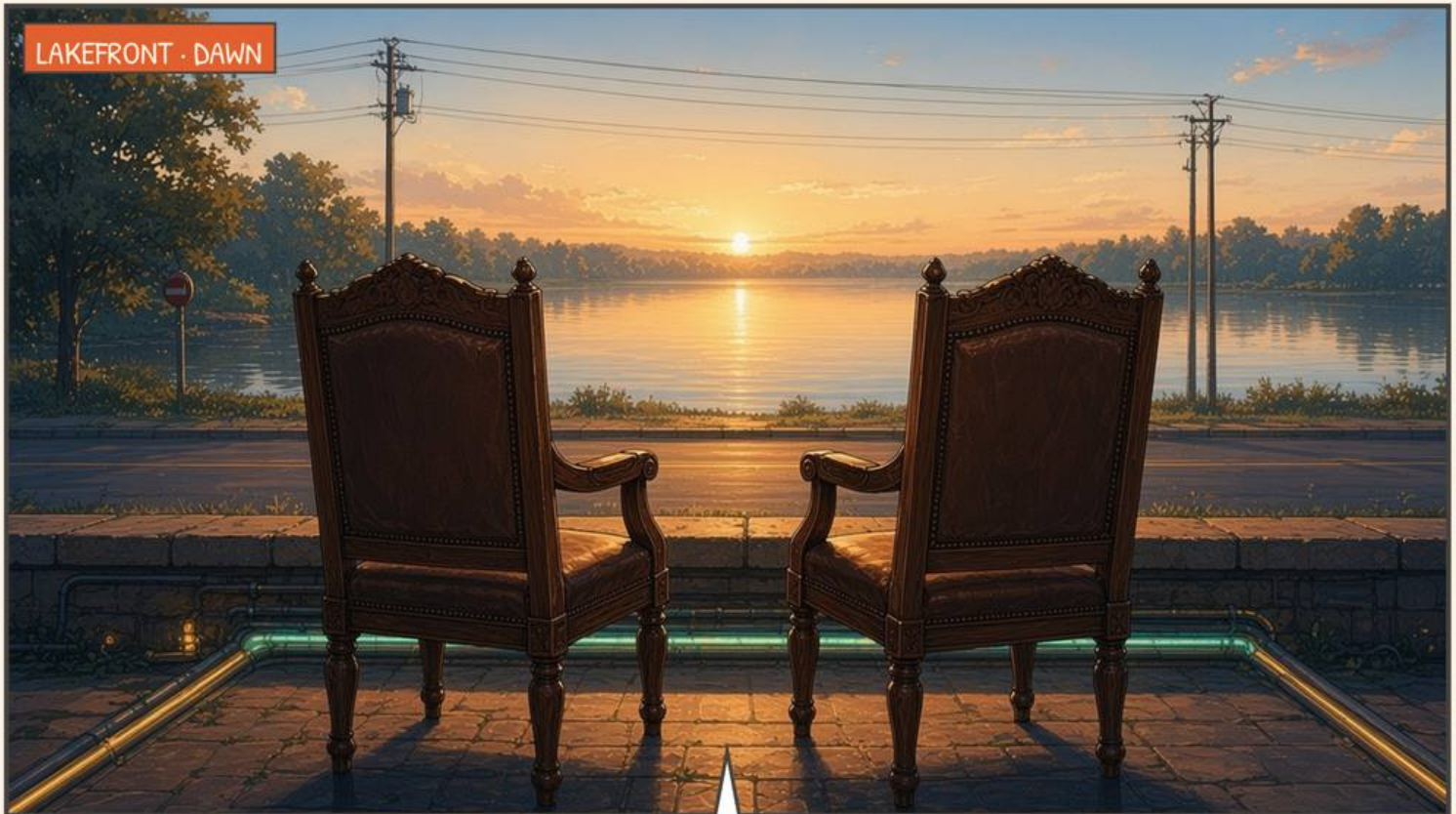
DESS

SOME SAY FIX EVERY PIPE NOW. SOME SAY KEEP BILLS LOW. MOST U.S. SYSTEMS PASS HEALTH STANDARDS; ONLY 4% HAD A VIOLATION IN 2022. BOTH SIDES HAVE A POINT.

FACT FILE

Average household water bill ~\$51/month, up ~64% from 2012 to 2023. In 2022 only 4% of public water systems reported a health-based violation.

Source: ASCE 2025 Report Card, "Drinking Water"



DESS

LAKE, TUNNEL, PLANT, PUMP, PIPE, TAP. EVERY STEP HAS A CREW. ASK WHO KEEPS IT RUNNING.

GOTB Consulting works on the infrastructure and procurement behind projects like these.

FACT FILE

Lake Michigan water enters at cribs about 2 miles out in the lake and flows through tunnels about 200 ft under the lake bed. 65 miles of tunnels, 12 pumping stations, 4,300 miles of water mains; serves more than 5 million people in Chicago and suburbs. Two purification plants: the north-side plant (north side) and the south-side plant (south side). the north-side plant is the largest conventional water treatment plant in the world (city's description). Gravity carries treated water to 12 pumping stations, which pressurize it into the mains to your tap.

Source: City of Chicago DWM, "Water Supply"; City of Chicago DWM, "Suburban Customers & Regional Partnerships"

BY THE NUMBERS

2 MILES • 200 FEET

Intake cribs about 2 miles out; tunnels about 200 ft under the lake bed. (City water dept.)

2.1 BILLION • 750 MILLION

Gallons a day the two plants can make vs. deliver; 4,300 miles of mains; 5M+ people. (City water dept.)

240,000 • 20% • \$625B

U.S. main breaks a year; share of mains past useful life; EPA 20-year need. (ASCE 2025)

9.2 MILLION

Lead service lines found by EPA (2023); 2024 goal: all out within 10 years. (ASCE)

66B VS 800B LITERS

U.S. data center water on-site vs. through power plants, 2023. (LBNL)

\$51/MONTH • +64%

Average household water bill and rise since 2012. (ASCE)

TWO SIDES

The strongest case on each side, labeled. Nonpartisan.

FIX IT NOW

Old mains break about 240,000 times a year and lead lines remain. Waiting raises the bill later.

KEEP BILLS FAIR

Bills already rose about 64% since 2012. Grants, phasing and who-pays rules matter.

DATA CENTERS: REPORTED HIGH

Advocates cite large sites using up to 5 million gallons a day (Reported).

DATA CENTERS: VERIFIED TYPICAL

State auditors found most sites use about what an office building does; closed loops save water but use more power.

YOUR TURN

What would you ask your water utility? _____

WATER WORDS

CRIB

An intake structure out in the lake where water enters the tunnels.

FLOC

Clumps formed when alum makes tiny particles stick together so they settle out.

SAND FILTER

A bed of sand over gravel that strains out what settling missed.

WATER MAIN

A large pipe under the street that carries treated water.

LEAD SERVICE LINE

An old pipe from the main to a building, made of lead.

CLOSED LOOP

Cooling that recirculates the same water instead of evaporating it.

QUICK QUIZ

1. WHERE DOES THE CITY'S WATER ENTER?

a) Wells b) Cribs about 2 miles out in the lake c) A river

2. WHAT DOES ALUM DO?

a) Adds flavor b) Makes particles clump so they settle c) Heats water

3. WHERE IS MOST OF A DATA CENTER'S WATER FOOTPRINT?

a) On-site b) Through the power plants behind it

4. U.S. MAIN BREAKS PER YEAR?

a) About 2,400 b) About 240,000 c) About 24 million

ANSWERS

1 b · 2 b · 3 b · 4 b

SOURCES

Full list with fact IDs: FACT_BASE.md and NUMBER_CHECK.md (GOTB internal).

CITY OF CHICAGO DWM

City of Chicago DWM, "Water Supply"

CITY OF CHICAGO DWM

City of Chicago DWM, "Suburban Customers & Regional Partnerships"

ENR

ENR, "The 10 Largest Drinking-Water Treatment Plants in the World" (Nov 7, 2017; dated)

ASCE 2025 REPORT CARD

ASCE 2025 Report Card, "Drinking Water"

U.S. BLS OOH

U.S. BLS OOH, "Water and Wastewater Treatment Plant and System Operators" (modified Aug 27, 2026)

ABOUT GOTB CONSULTING

WHO WE ARE

A Chicago firm working on infrastructure and procurement for the systems communities depend on.

DATA CENTERS

Siting, delivery and community questions.

POWER

Grid connections, substations and lines.

WATER

Supply, treatment and cooling.

PUBLIC WORKS

Roads, pipes and public spaces.

THE END



LAKE, TUNNEL, PLANT, PUMP, PIPE, TAP.

Next time: more from the Infrastructure Guard.

GOTB CONSULTING • CHICAGO

Data centers • Power • Water • Public works

AI-generated art, fictional characters