Nicor Gas

To learn more about safety of our storage facilities and the reliability they provide, scan the qrcode above.

Nicor Gas

Underground **Storage**

What started as a small utility company in 1954 has evolved into the largest natural gas provider in Illinois and one of the largest in the nation. Today, Nicor Gas serves more than two million residential, commercial and industrial customers living and working in over 650 communities. Nicor Gas is recognized for providing safe and reliable natural gas service to its customers. The company is also well known for its extensive underground storage capabilities, a reputation we have been instrumental in establishing.
As our customer base grows and new uses for natural gas emerge, we will depend on our underground storage facilities to guide our progress into the future.

Underground **Storage**

It's no secret that northern Illinois weather includes extreme seasonal contrasts. When the temperature drops in the winter, our customers rely on Nicor Gas to provide natural gas to heat their homes and businesses. In the summer, that demand drops. No matter what the season, we must meet our customers' natural gas needs and do so at a reasonable cost. How does Nicor Gas balance all these variables? By purchasing natural gas from our suppliers at a consistent volume throughout the year and temporarily holding unused supplies in underground storage.

Towers at Troy Grove

Facilities at the Troy Grove Storage Field

The Beginning of **Underground Storage**

Nicor Gas was formed in 1954 from several smaller companies with origins tracing back to Ottawa, Illinois. As a young company during the postwar boom, we served 460,000 customers. That number grew rapidly, and the volume of gas we received from transmission pipelines wasn't enough. At times, as many as 100,000 customers were on a waiting list for residential heating service. Nicor Gas handled this situation in two ways: by using early gas storage methods and through interruptible sales—agreements with large customers who could switch to another fuel when demand for natural gas was high.

The early gas storage methods used by Nicor Gas were low-pressure, above-ground storage holders and interconnected high-pressure cylinders buried a few feet deep. Other natural gas utility companies stored natural gas in hollowed out, salt domes, depleted oil and gas fields and refrigerated tanks holding liquefied natural gas.

In 1954, one of Nicor Gas' pipeline suppliers developed Illinois' first practical underground storage facility (called an aquifer) near Herscher, southwest of Kankakee. An underground aquifer reservoir is a natural underground formation that consists of water-filled, porous sandstone layers covered by a solid dome-shaped caprock. Through wells, natural gas is injected into the reservoir, displacing the water and making the gas available for withdrawal later.

As a customer of the pipeline, Nicor Gas shared a portion of Herscher's capacity, but our needs continued to grow. By 1956, our annual deliveries had reached 123 billion cubic feet (Bcf) to more than 546,000 customers. As these numbers increased, we began looking for our own storage fields.

Nicor Gas' Underground **Storage System**

With the help of a geologist, we began our field search in 1957. A review of geological studies showed the presence of a dome-shaped structure near Troy Grove, a small community northwest of Ottawa. We secured the appropriate oil and gas leases from landowners and started testing. Test wells were drilled to depths up to 3,560 feet. The goal was two-fold: ensure that the dome-shaped caprock had the integrity to confine the gas in the underground reservoir and that the water-bearing sandstone was reasonably uniform. Tests also helped locate several possible well sites. In June 1957, Nicor Gas received permission from the Illinois Commerce Commission to further test and develop the Troy Grove aquifer reservoir.

On July 23, 1958, after approximately one year of tests, construction of facilities and installation of equipment, the first cubic foot of natural gas was injected. Initially, one million cubic feet (MMcf) of gas per day was injected, and that rate steadily increased. Our goal was to provide reserves for the 1960-61 heating season. As the injection process progressed, construction began on a 30-inch pipeline to connect the Troy Grove field to our distribution system. By 1960, test withdrawals of up to 100 million cubic feet (MMcf) of natural gas per day became a reality. The Troy Grove experiment was a success.

As our customer base and service territory grew, we continued to develop new storage fields. In 1962, we discovered the Ancona field. Ancona became operational in 1965 and is our largest storage field in terms of both acreage and storage capacity and the largest aquifer in the U.S. While still hard at work on Ancona in 1964, development began at our Pontiac storage field. Pontiac began operation in 1967. In subsequent years, storage fields at Pecatonica, Lake Bloomington, Hudson, Pontiac/Galesville and Lexington also became operational.

The discovery and development of underground aquifer storage involved significant investments of time and resources. Engineers and geologists with an understanding of each field's outer perimeter and the caprock's structural integrity were needed to determine potential capacity. Once the field's geological characteristics were determined, wells were drilled to verify the reservoir structure before injection started. In the end, we had seven storage locations which delivered approximately 135 billion cubic feet of natural gas in an average winter heating season. Today, engineers continue to test, monitor and manage the storage fields to optimize performance.

1- Troy Grove (1959)

2 - Ancona (1965)

3 - Pontiac Mt Simon (1967)

4 - Pecatonica (1969)

5 - Lake Bloomington (1970)

6 - Hudson (1971)

7 - Lexington (1972)

8 - Pontiac Galesville (1977)

Key/Legend

- Nicor Gas Service Territory
- Major Gas Main
- Underground Storage Field
- Major Cities

Interstate Pipeline Transporters

- Natural Gas Pipeline Company of America
- Northern Natural Gas Company
- Midwestern Gas Transmission Company
- Panhandle Eastern Pipe Line Company
- ANR Pipeline
- Alliance Pipeline
- Northern Border

Intrastate Pipeline Transporters

- Horizon

Did you **know?**

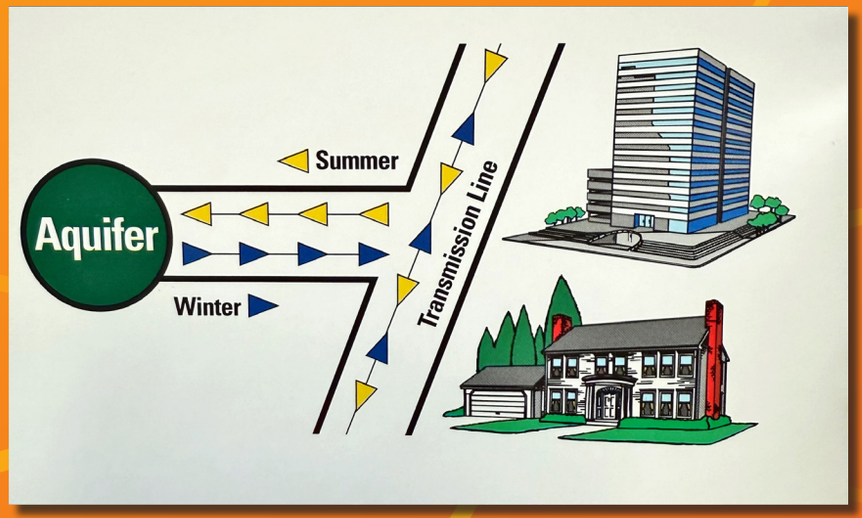
The Mt. Simon Sandstone—a major geologic formation found across parts of the Midwestern United States, including Illinois, Wisconsin, Indiana and Minnesota—plays a big role in how we store natural gas underground. In Illinois, these sandstone formations grow progressively deeper as you move south across the state, meaning our southern storage fields naturally have higher reservoir pressures than those in the north.

Facilities at the Troy Grove Storage Field.

Injection

Natural gas is metered as it enters the storage station from our natural gas pipeline suppliers. Then the gas is filtered and compressed. We compress the gas to increase its pressure to levels greater than the reservoir's original pressure. This allows us to pump it into the underground reservoir. As the natural gas enters the aquifer reservoir, water is displaced from the sandstone. The displaced water provides the pressure needed for Nicor Gas to withdraw the gas later.

Gas stored in the aquifer falls into two main categories: base gas and working storage gas. Base gas acts as a cushion for the working storage gas and helps to support pressure in the reservoir, making the working storage gas available for withdrawal.



Reboilers at Troy Grove Storage Field

Withdrawal

Aquifer reservoir pressures vary from field to field. This variance creates a difference in the way gas is withdrawn. Gas in storage must be at higher pressures than the transmission pipeline before it will flow into the system. Fields that contain natural gas at pressures higher than transmission line pressure are able to flow without compression. In lower pressure fields, natural gas must be withdrawn out of storage and into the transmission line. The storage fields use the same transmission system for injecting and withdrawing natural gas.

A significant amount of moisture accompanies the gas as its withdrawn from the aquifer. The gas from storage must undergo a dehydration process before it enters our distribution system.

Storage **Benefits**

For more than 160 years, Nicor Gas has been serving Illinois customers with clean, safe, reliable and affordable natural gas. As the state's largest natural gas distributor, and owner and operator of one of the largest natural gas reservoir storage systems in North America, we deliver the comfort and convenience of natural gas to 2.3 million residential, public sector and business customers in more than 650 communities throughout northern Illinois.

Nicor Gas began to develop its storage capabilities in the 1950s and today operates eight storage fields that have the capacity to store 135 billion cubic feet (BCF) of natural gas. Underground storage facilities are a safe and widespread practice. The United States Energy Information Administration (EIA) reports that throughout the U.S. there are currently more than 400 such facilities ready to meet demand.

During extreme winter events such as polar vortexes and arctic blasts, natural gas delivered from Nicor Gas' storage fields accounted for approximately 50% of the energy distributed. These incredible engineering feats are only possible through the use of storage facilities. Without these critical reserves, it would be impossible to continue providing safe and reliable natural gas service to those who depend on it year-round.

Well at the Troy Grove Storage Field

Delivering Energy and Heat When You Need It

Keeping natural gas safe, affordable and reliable is our focus at Nicor Gas every day. We purchase natural gas for storage in the summer months when prices are less volatile and store it for use throughout the year, providing our customers with more consistent and stable pricing. This helps keep winter heating costs down and our year-round supply up. These purchasing strategies, coupled with our underground storage facilities, ensure that our 2.3 million customers receive competitively priced service and dependable energy and heat.

We ensure reliable service for our customers—even during periods of extreme demand like severe winter weather. During the 2019 Polar Vortex, Nicor Gas delivered more than 4.8 billion cubic feet of natural gas — ensuring that every customer stayed warm Without the added capacity of our underground storage, hundreds of thousands of homes and businesses stayed warm through dangerously cold temperatures.

Buying pipeline capacity and supply to replace storage would be costly, opening customers to more pricing volatility and being more susceptible to upstream supplier operational issues. These purchasing strategies, coupled with our underground storage facilities, help ensure that our 2.3 million customers receive competitively priced service and dependable energy and heat.

Ancona Storage Field

Almost 40% of the natural gas delivered by Nicor Gas on the coldest days of the year are from Troy Grove and Ancona.

Without these two critical storage facilities, 825,000 customers would be without heat.