Tri-State CCS Hub

October 29th, 2024

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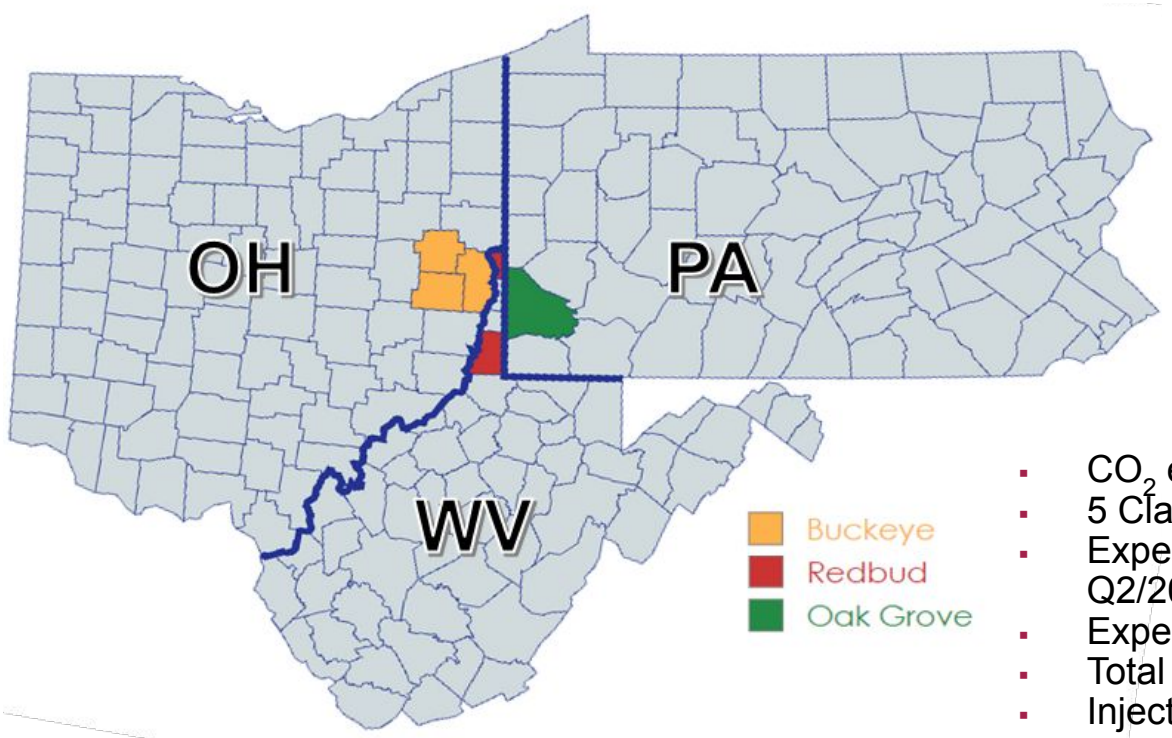
Executive Summary



TRI-STATE CCS HUB

BUCKEYE • REDBUD • OAK GROVE

- CO_2 emissions within 50 miles: 62.5 MTPA
- 5 Class VI submittals: Q2 2024 – Q1 2025
- Expected permit to construct: Q4/2026 – Q2/2027
- Expected auth. to inject: Q1/2029
- Total injection capacity: 5+ MTPA
- Injection wells: 26
- Pore space required: 60,000 Acres
- GR/PR/Local engagement

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Executive Summary

Location, Location, Location	• Strong demand for carbon sequestration services from energy and industrial customers (**60+ MTPA**) • Hydrogen hub awarded in the Tri-state region (**ARCH2 Hub**) • PJM and data center power demand growth
Development Landscape	• Strategically diversified: **6** counties, **3** states, **2** EPA regions • **DOE CarbonSAFE** Phase III Award up to $69 million • Extensive land program - complex geology drives higher well count • Multiple injection formations coordinated around oil and gas production.
Schedule	• Sequenced approach in permitting with **5** Class VI applications • Class VI application submittals: Q2 2024 – Q1 2025 • Permit to construct: Q4 2026 – Q2 2027 • Full injection start: **2030**
Permitting Process	• **1** out of 5 Class VI Permits submitted
Government Support	• Acceptance and **support** for the project at all levels: local, county, state

About Tenaska

Trusted, Experienced Energy Company

- American energy company based in Omaha, Nebraska
- Developed, managed and/or operated approximately 22,000 megawatts of natural gas-fueled and renewable energy generating facilities over the past 35+ years
- Tenaska affiliates among the largest in the U.S. for marketing natural gas and electric power

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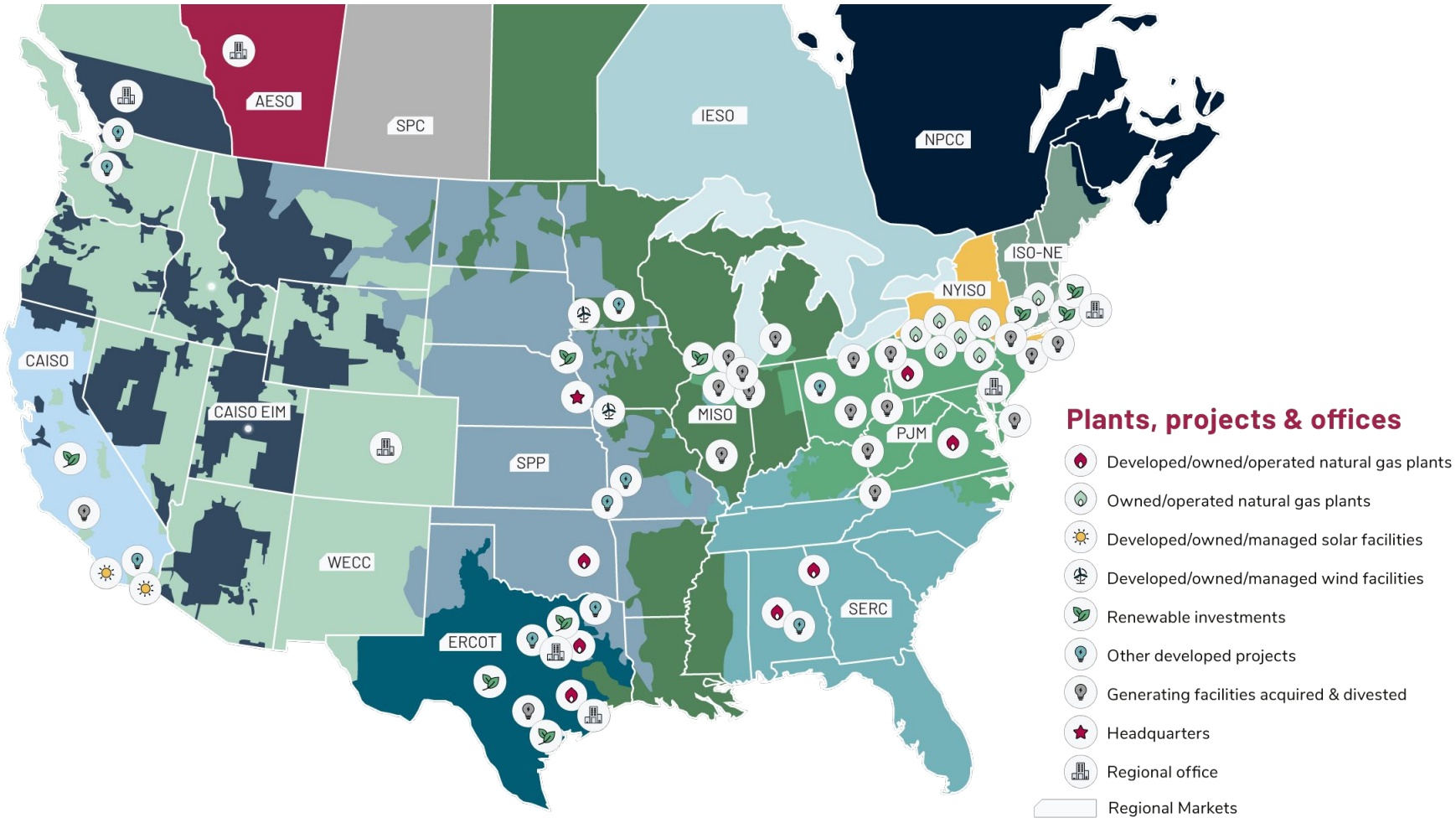
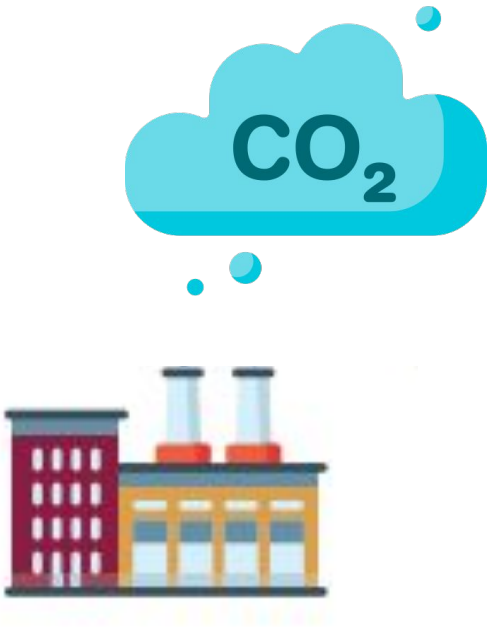
Tenaska Plants, Projects & Offices



Carbon Capture and Storage (CCS) 101

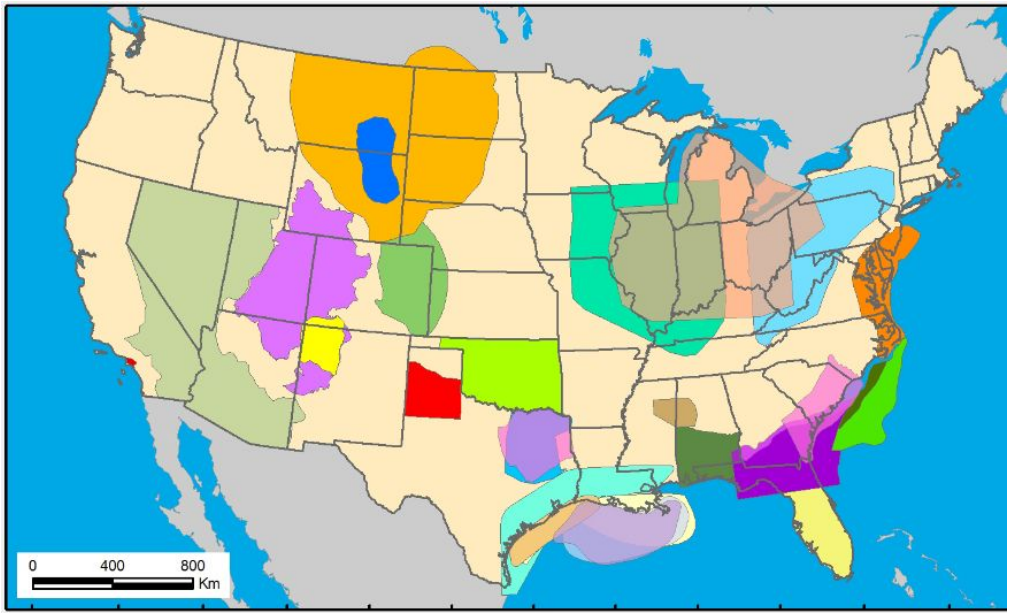
What is CO_2?

- Carbon dioxide (CO_2) is an inert gas that occurs both naturally and as a byproduct of industrial processes such as:
  - Production of ethanol and hydrogen
  - Combustion of coal, natural gas, gasoline and other carbon-based fuels
- CO_2 is being emitted into the atmosphere at record levels – contributing to climate change
- CO_2 is non-flammable and non-combustible



Ideal CCS Locations

- There are a number of factors that Tenaska considers when siting a CCS project, including:
  - Geology that provides access to safe and secure CO_2 storage
  - Regions that have a high concentration of emissions sources
  - Communities that are welcoming to the economic benefits



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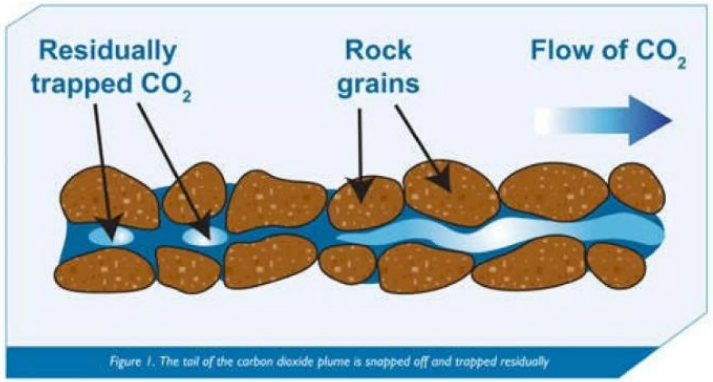
What is Pore Space?

- Pore space is the empty space within and between rocks, similar to holes in a sponge
- When we consider the appropriate geology for a CCS project, we look for porosity and permeability of the pore space

Porosity: how many spaces are in the rock and how big are those spaces

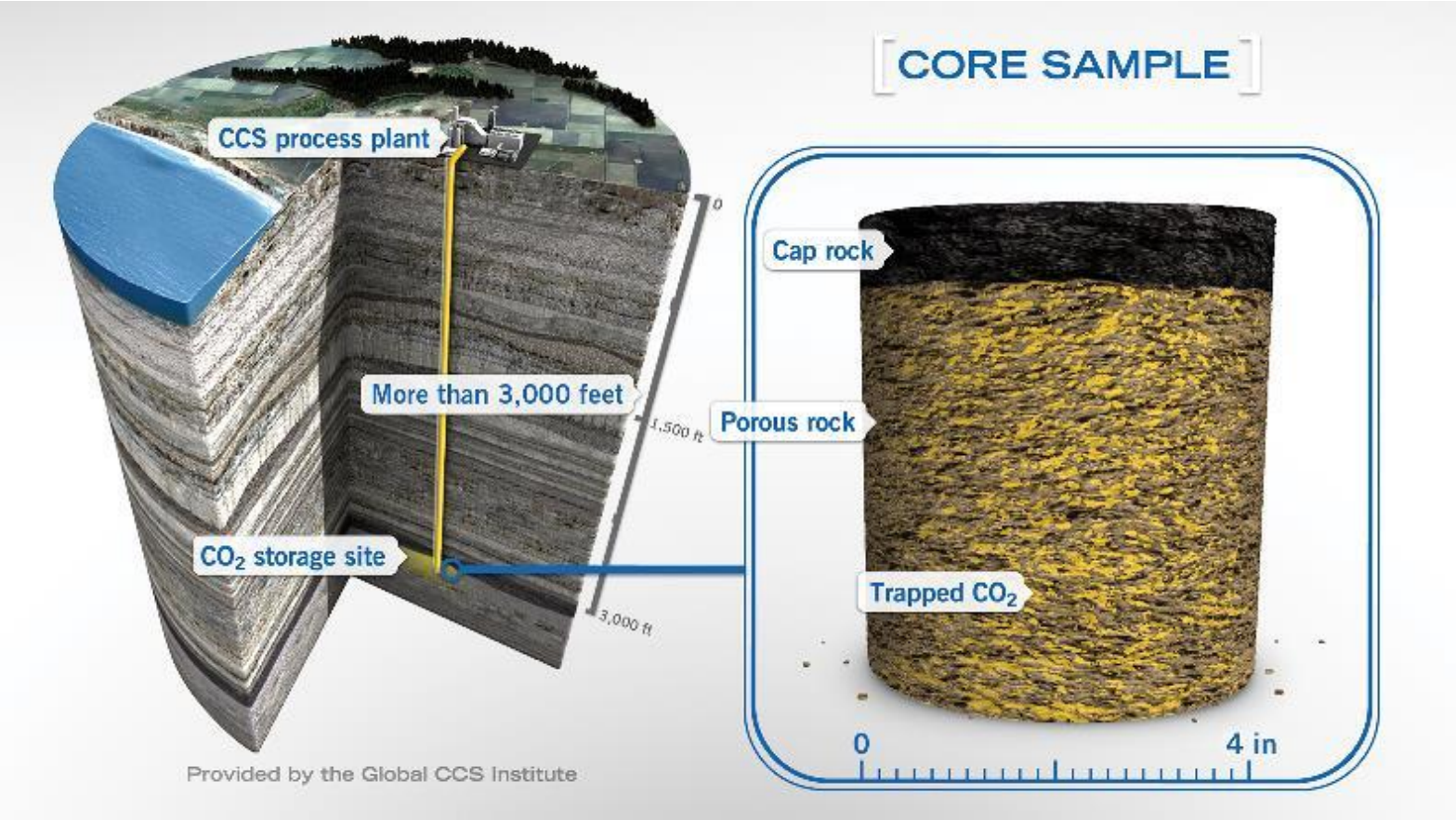
Permeability: how these spaces connect and allow for the flow of CO_2



urces: *Storing CO2 Underground by* IEA Greenhouse Gas R&D Programme

Where is the Pore Space?

- Liquefied CO_2 is deposited into “pore space” in the geologic formations deep, deep underground



The CCS Solution

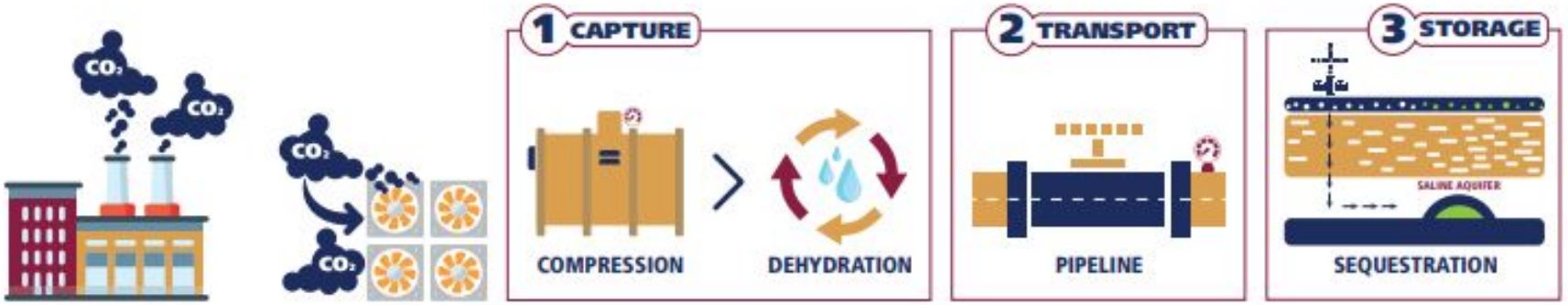
CCS has been in use around the world for decades

CCS is growing as a solution for manufacturers, industrial processors and power generating facilities in response to climate mandates and environmental regulations

An emissions solution is key to ensuring these businesses remain stable regional employers and taxpayers, as well as to attract new economic development opportunities to the region

How CCS Works

- CCS captures CO_2 emissions produced by manufacturers and industrial facilities before they enter the atmosphere
- Captured CO_2 is liquified, transported and permanently stored deep underground beneath a thick layer of impermeable cap rock
- CO_2 then naturally mineralizes and dissolves over time



Small Above-ground Footprint

- CCS facilities are comprised of :
  - Several above-ground injection and monitoring wells that take up less than an acre
  - Pore space deep underground
  - Small pipeline network that connects the storage field to the CO_2 sources

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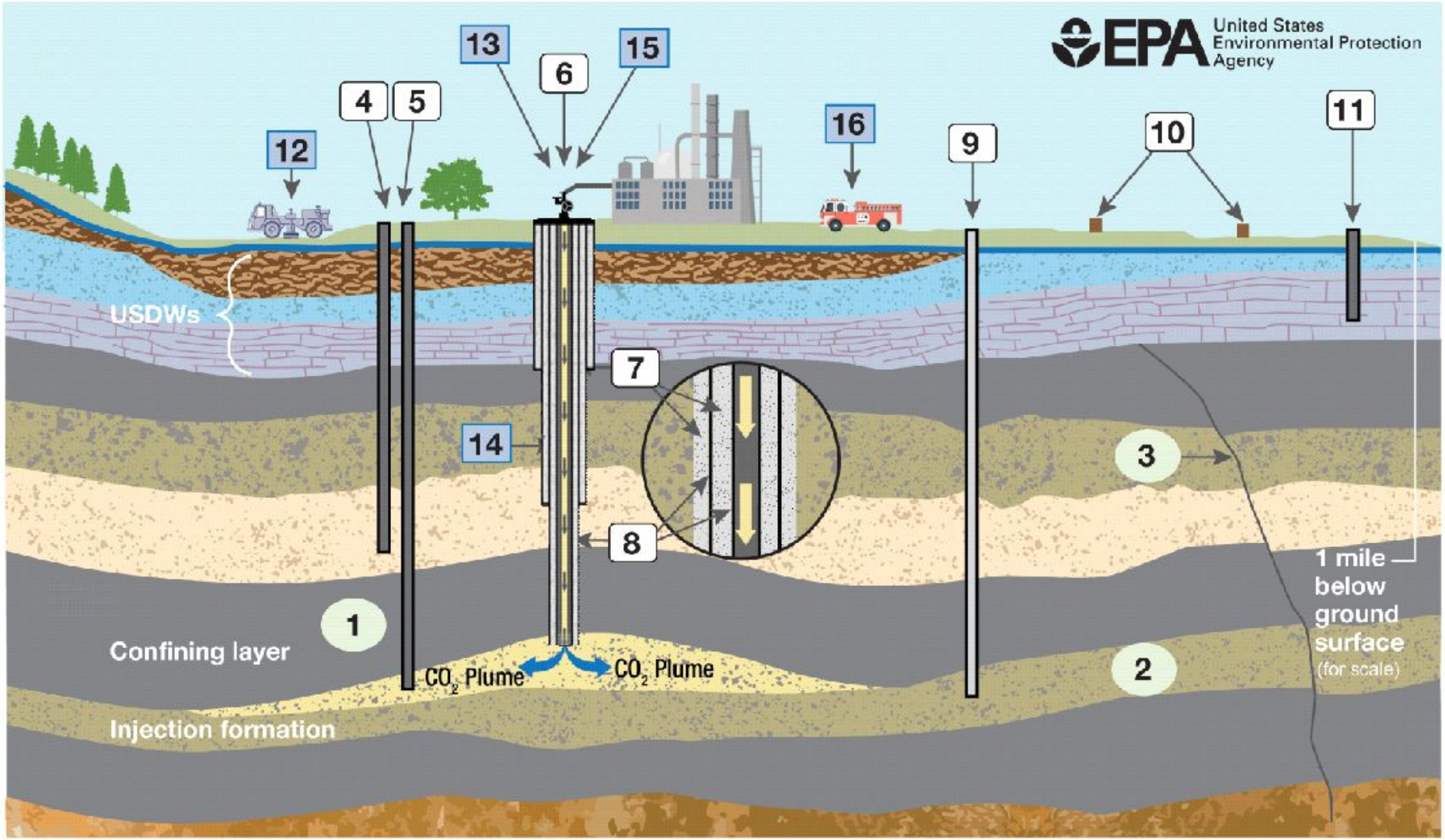


Through the Underground Injection Control (UIC) program, EPA protects underground sources of drinking water (USDWs) by regulating the construction, operation, permitting, and closure of injection wells that are used for the underground storage or disposal of fluids. Class VI wells are specifically used to inject carbon dioxide (CO_2) into deep rock formations. The UIC permitting authority reviews Class VI permit applications to ensure that injected CO_2 will remain within deep, isolated formations, protecting human health and the environment.

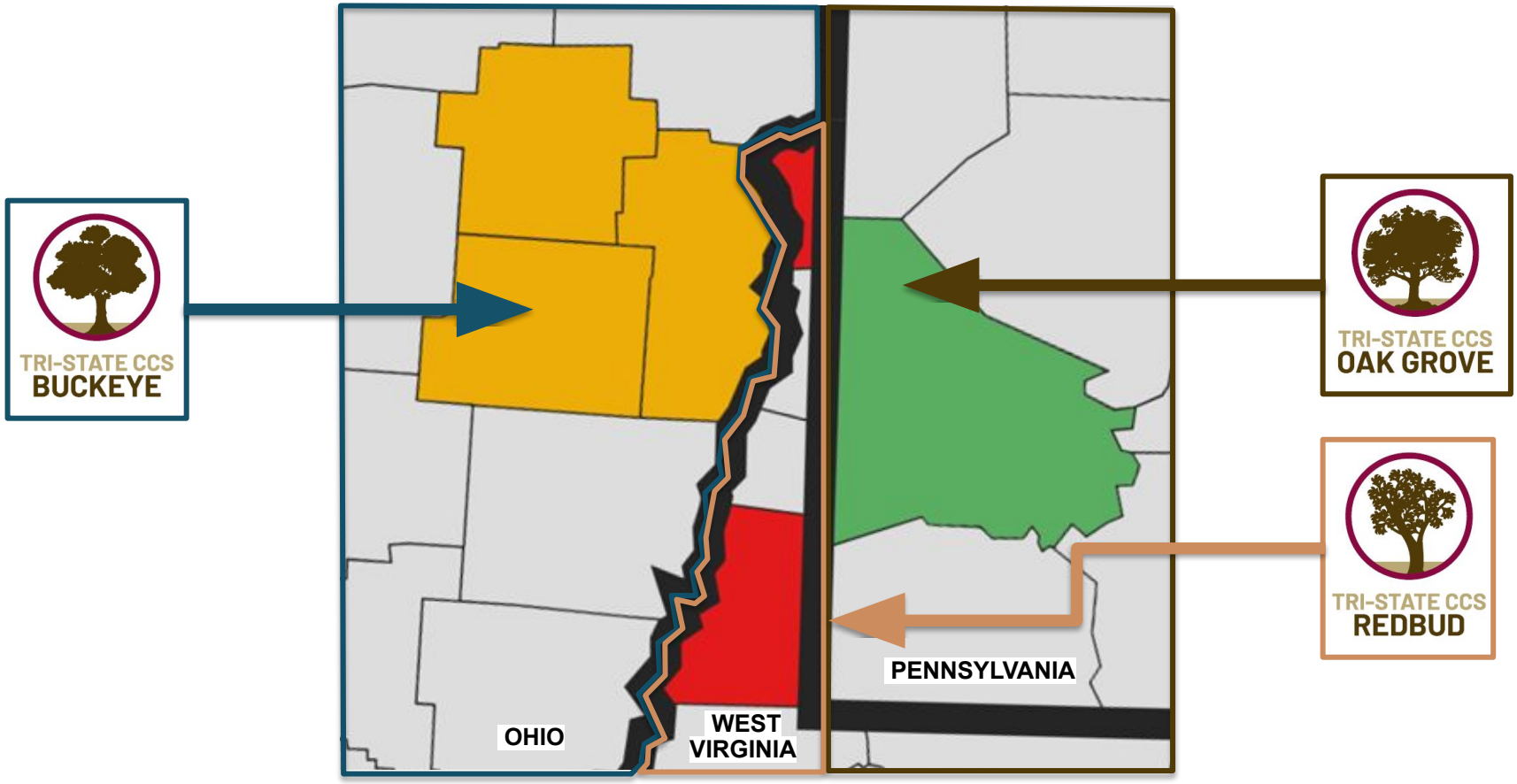
KEY

- Site geology
- Injection, monitoring, and other wells
- Drinking water resource protection practices
- Water table

1. Thick, impermeable confining layer prevents CO_2 from leaking upward
2. Permeable injection formation will hold injected CO_2
3. Testing shows that the fault is inactive and sealed against movement of CO_2
4. Water quality is tracked in the permeable formation above the confining layer using a monitoring well
5. Pressure and CO_2 in the injection formation are tracked using a monitoring well
6. CO_2 injection well is permitted for safe operation with many safeguards
7. Cementing prevents CO_2 from moving outside of the well
8. Well materials are corrosion-resistant
9. Properly plugged and abandoned well prevents CO_2 movement between formations
10. Seismic activity is monitored using surface equipment as needed
11. Shallow groundwater well is isolated from the injection formation by multiple impermeable layers
12. Seismic surveys are used to study the geology and track the location of CO_2 through images of the subsurface
13. Safe CO_2 injection pressure avoids damaging the injection formation
14. Regular testing confirms the physical integrity of the well
15. Injection pressure and flow are continually monitored
16. Emergency response plan is in place and ready to be implemented

Tri-State CCS Project

Geographic Locations



28 well locations under option contract, 6 under negotiation.

Approximately 5,000 acres of pore space under option contract.

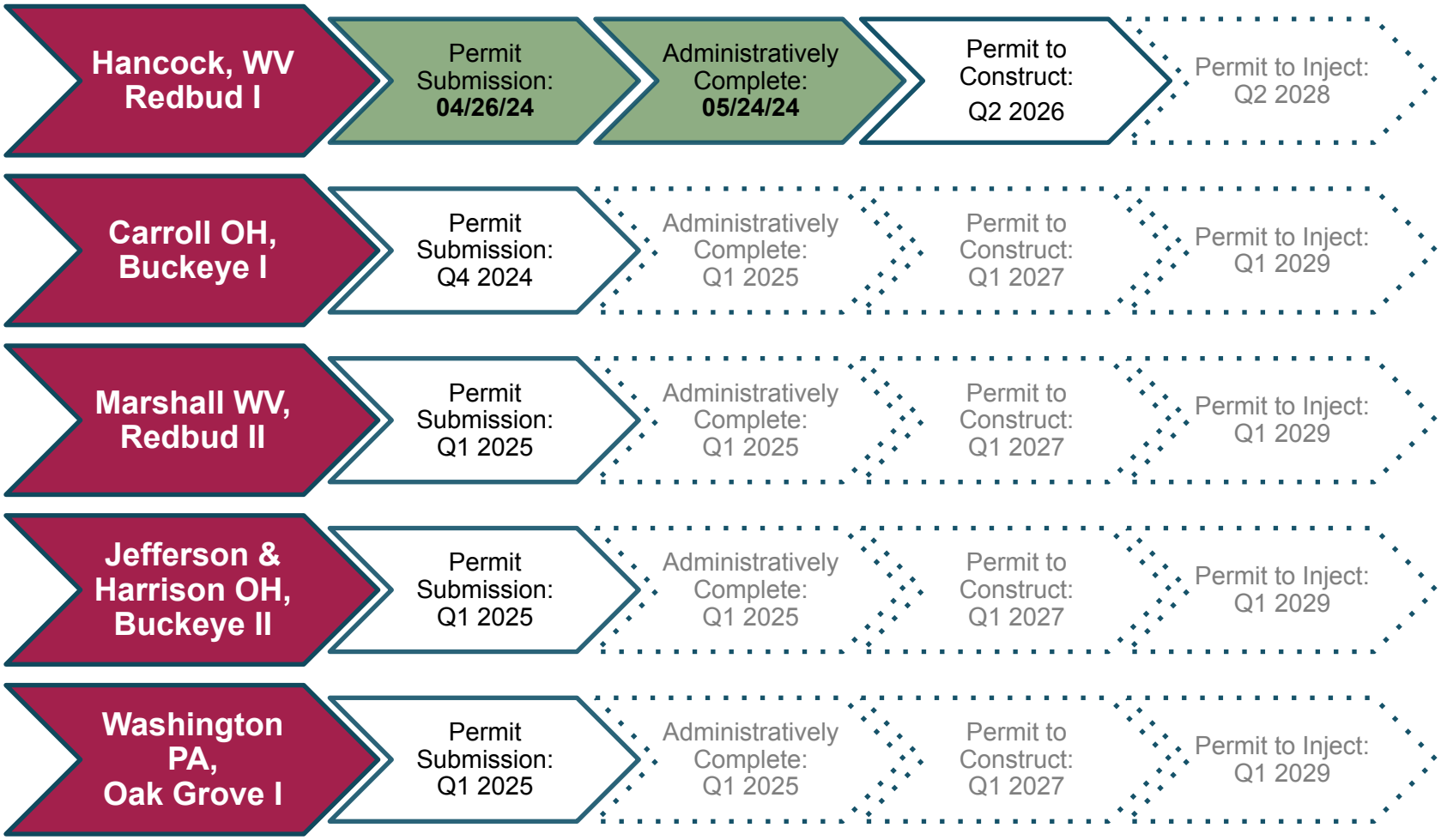
Pore space and pipeline contracts continue past Class VI submission.

Project Timeline

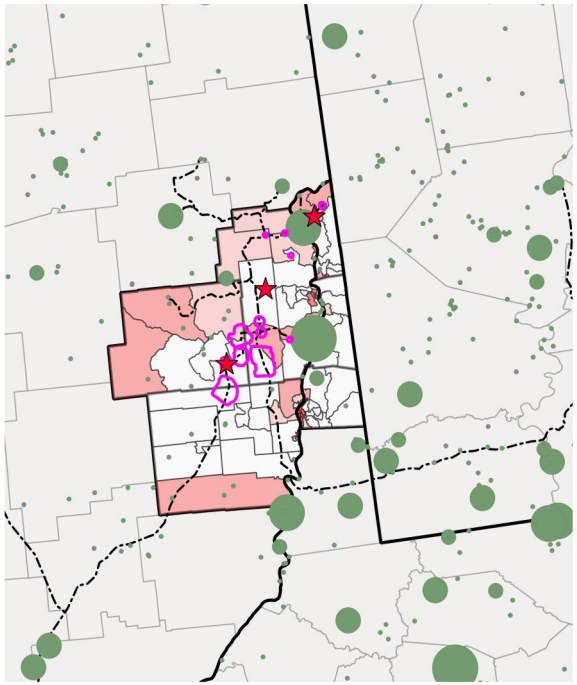
PRE- DEVELOPMENT (Ongoing Geologic Study)	DEVELOPMENT	CONSTRUCTION	OPERATION	LONG-TERM STORAGE
3-5 years	1 year	2-4 years	30+ years	Indefinite

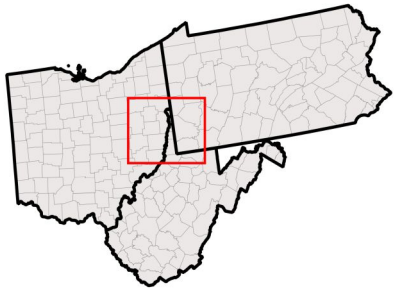
- **Goal: Operational Project in 2030**
- **Current priorities**
  - Secure remaining well sites
  - Obtain pore space rights with landowners
  - Continue geologic study and evaluations
  - Submit Class VI application
  - Finalize contracts with emitters
  - Public education and stakeholder engagement, including initial discussions with emergency responders

Class VI EPA Permitting Schedule



Department of Energy - CarbonSAFE Phase III





CO_2 Plume Dimensions
Phase III - Test Well Locations
CO_2 Pipelines - CarbonSAFE and Expansion
Regional Emitters (Tons GHG_e Annually)
0 - 474,962
474,962 - 1,607,636
1,607,636 - 4,008,604
4,008,604 - 7,448,325

Award for **up to $69 million** includes:

- Site Characterization & Permitting
- Legal & Title for Contracts
- Community Benefits, Training
- Multiple CO_2 Pipeline FEED Studies
- Multiple Source Feasibility Studies
- Awarded **October 1st, 2024**

Economic Benefits for Region

	Number of Well Sites	Construction Spending	Construction Employment	Operation Spending	Operation Employment
OHIO	12	$585M	1,080 jobs; $218M in salaries	$11.6M annually	27 jobs; $2M in salaries
WEST VIRGINIA	7	$250M	372 jobs; $75M in salaries	$6.3M annually	14 jobs; $1M in salaries
PENN-SYL VANIA	3	$145M	265 jobs; $60M in salaries	$3.1M annually	8 jobs; $0.8M in salaries

Source: Economic impact study from West Virginia University, John Chambers College of Business and Economics, Bureau of Business and Economic Research, Fall 2023.

Community Snapshot

- County commission and landowner presentations
- Stakeholder Outreach
  - Met with OH/PA/WV legislators, emergency management directors, economic development/chambers of commerce
  - Coordination with industry groups
- Local representative hired
- Local offices opened in each state
  - Cadiz, OH
  - Weirton, WV
  - Burgettstown, PA
- Frequent conference speaking requests to provide local industry education

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More Information

Website: https://TriStateCCS.com/