

26-6-2: Public Meeting to Hear an Informational Update on California's Carbon Capture, Removal, Utilization, and Storage Program (Senate Bill 905)

SEPTEMBER 24, 2026

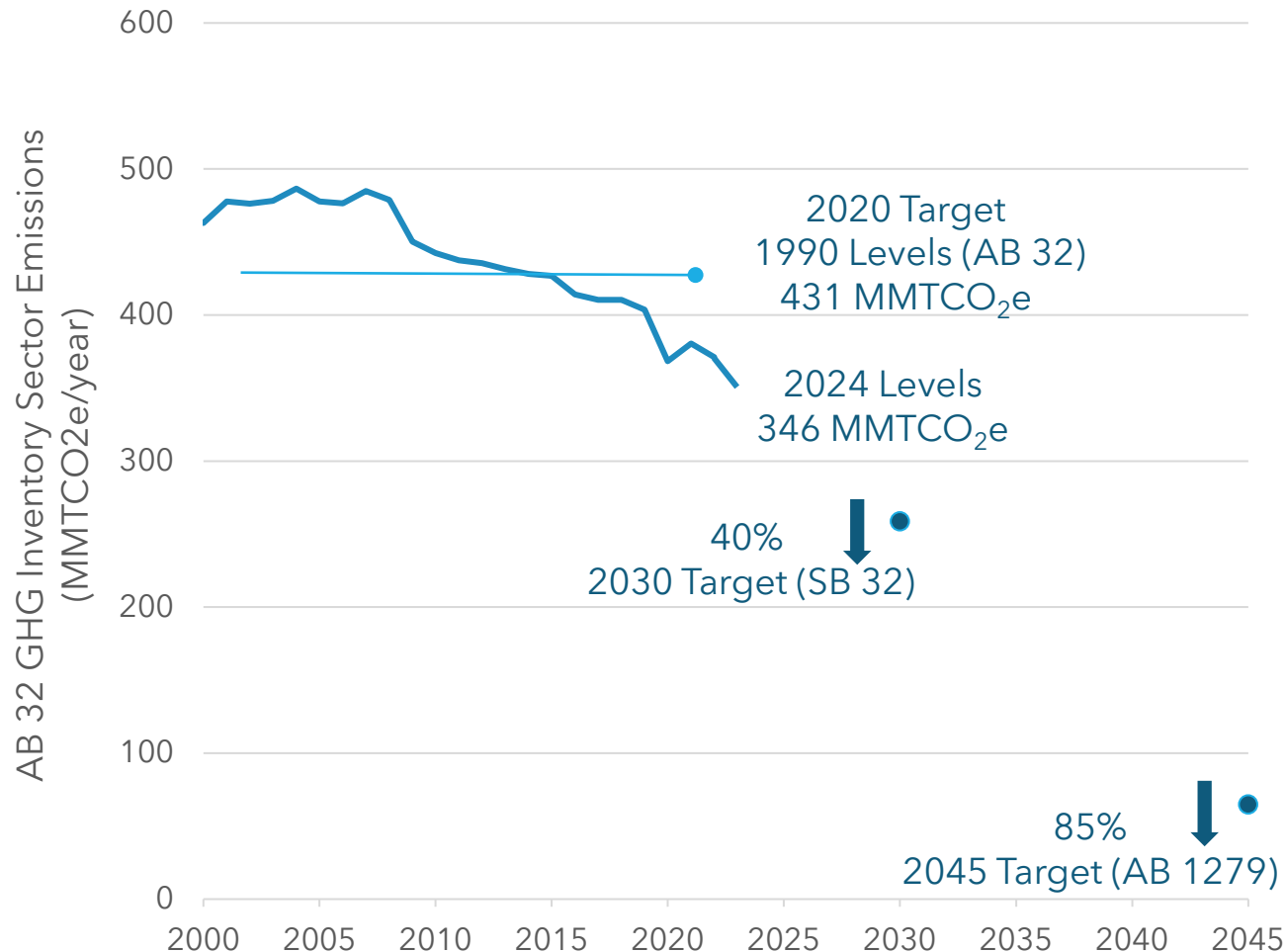


Agenda

1. Background
2. Regulatory oversight in California:
 - i. U.S. EPA
 - ii. Local permitting with Kern County
 - iii. State Water Resources Control Board
 - iv. California Geologic Survey
 - v. California Natural Resources Agency
 - vi. Office of the State Fire Marshall
3. CARB's SB 905 rulemaking update
4. Next Steps

GHG Emissions Reduction Targets

Achieved AB 32 target in 2014 – Portfolio of Policies



ACHIEVING
CARBON
NEUTRALITY
BY **2045**

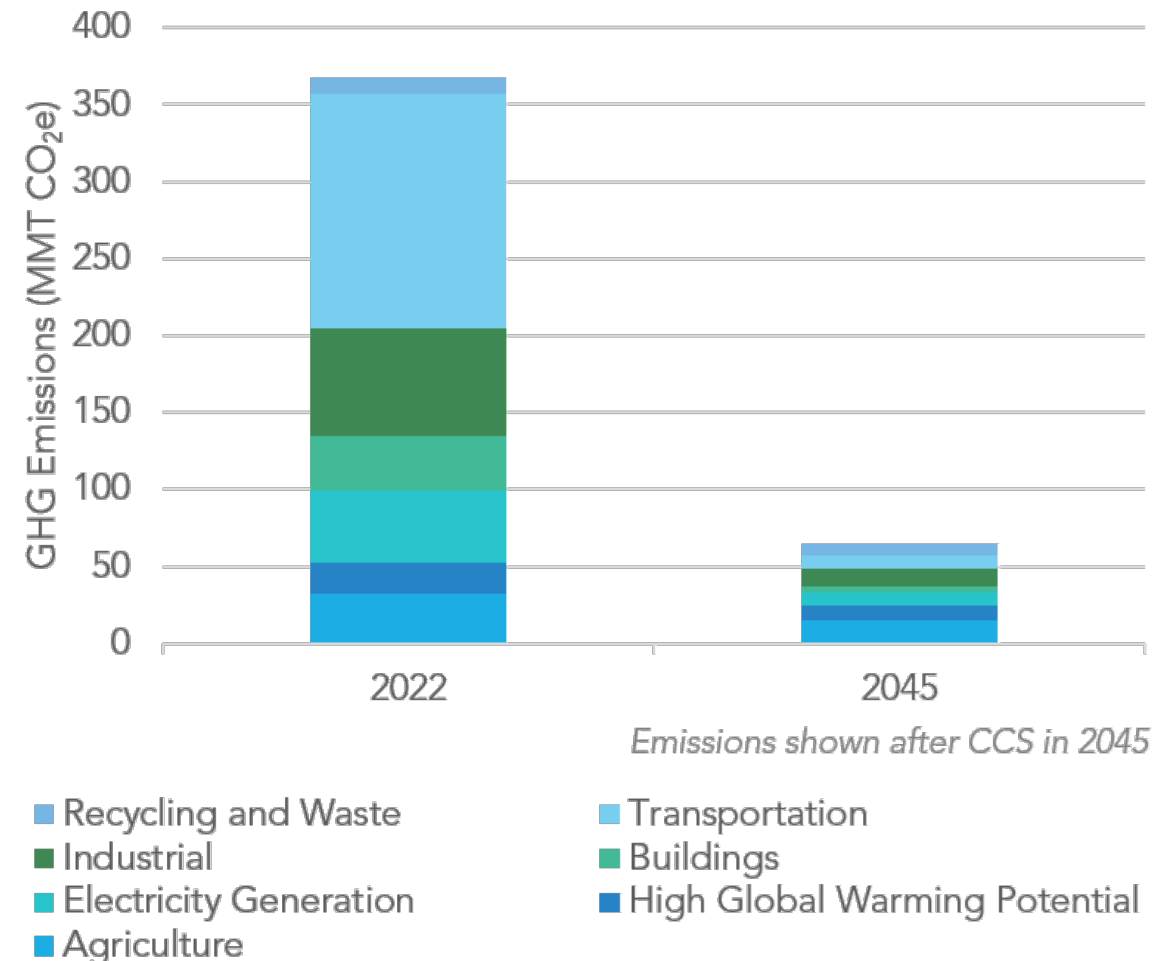
GHGs included in statute: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), nitrogen trifluoride (NF₃).

Anthropogenic GHGs

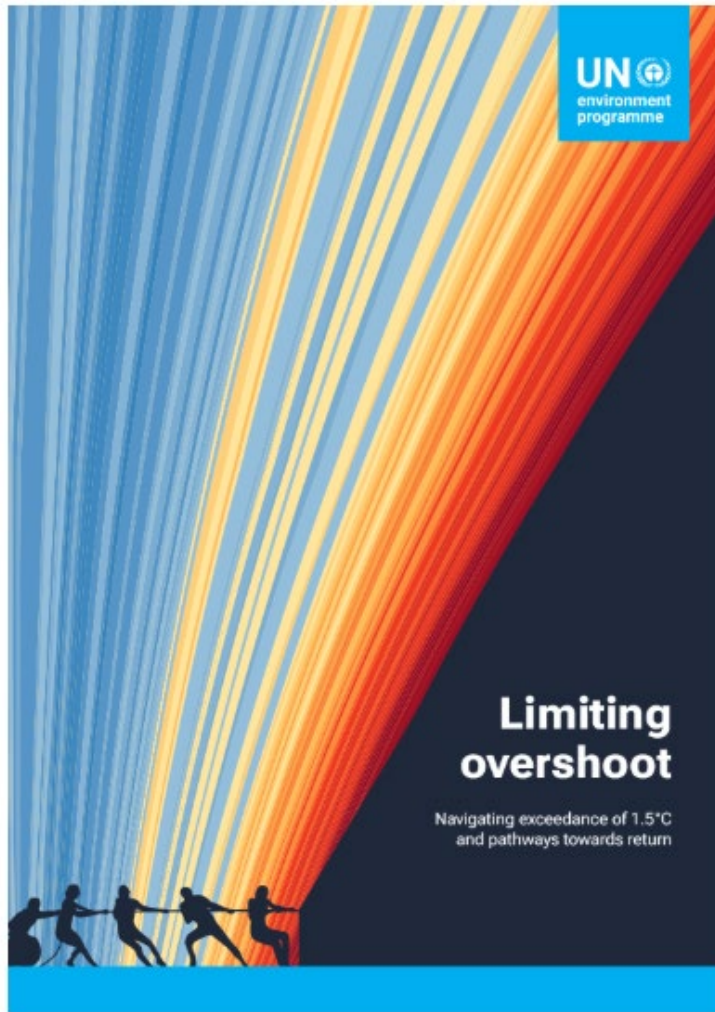
Target 2045: 85% Reduction below 1990

2022 AB 32 Scoping Plan: Unprecedented Deployment of Clean Technology, Energy, and Nature-Based Climate Solutions

- Over 30x as many ZEVs on the road in 2045 relative to 2022
- 4x installed wind/solar generation
- Over 85% reduction in total fossil fuel use
- > 2.5 Million acres of NWL climate action per year



Latest Science: Limiting Overshoot



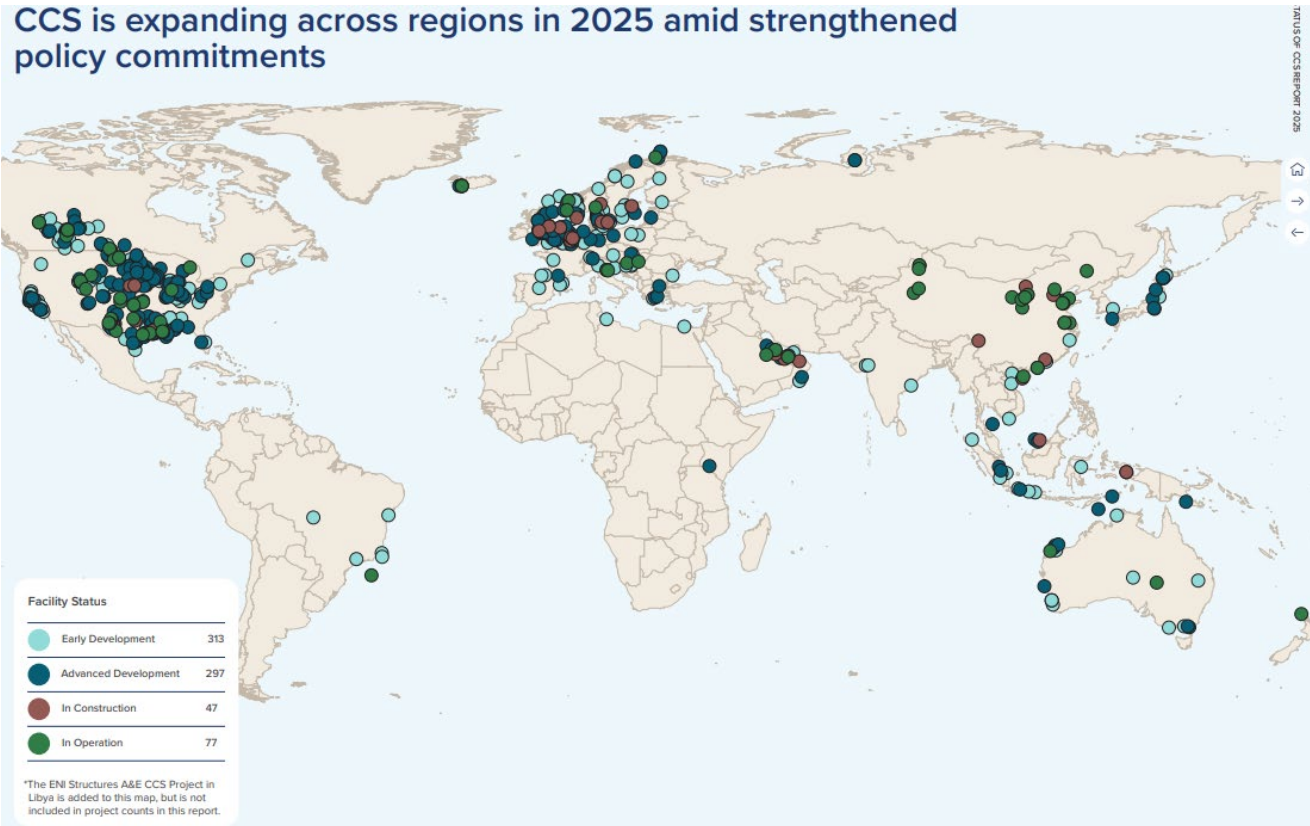
- World expected to exceed 1.5°C (Paris Agreement).
- Going above 1.5°C must not mean abandoning the goal.
- Adaptation and mitigation must happen hand-in-hand.
- Carbon dioxide removal (CDR) is necessary, but it's not a silver bullet. It will be needed in addition to, not instead of, sustained reductions in greenhouse gas emissions.
- Falling temperatures will not bring the world back to "normal".

"Following an 'overshoot, peak and decline' pathway is the best remaining option to bring temperatures to or below 1.5°C by the end of the century, which remains the goal, and adapt to unavoidable impacts." September 2026

[Limiting Overshoot - Navigating exceedance of 1.5°C and pathways towards return | UNEP - UN Environment Programme](#)

Not just California and Not New Science

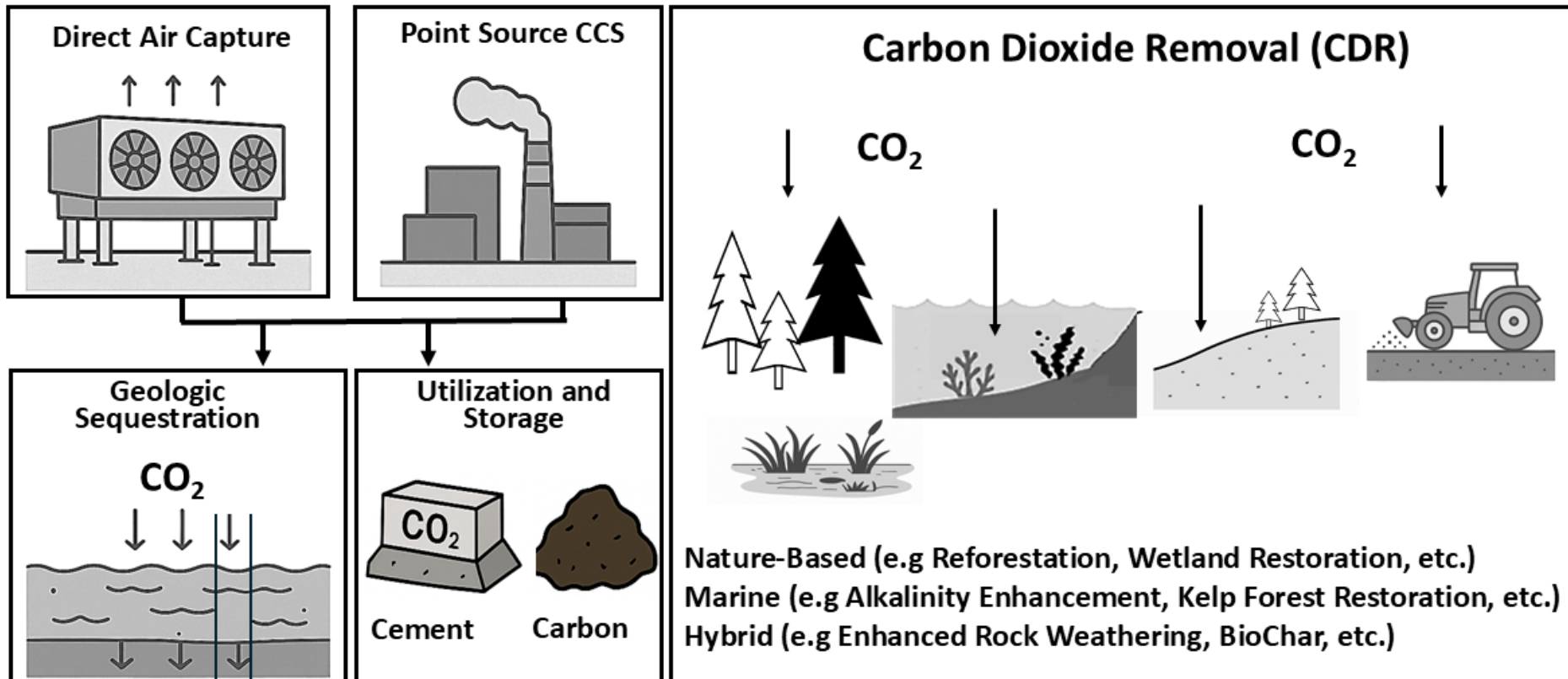
CCS is expanding across regions in 2025 amid strengthened policy commitments



- 77 Operational carbon capture and storage projects in 2025
- Another 47 under construction
- First pilot projects go back over 40 years
- European Union, UK, Canada, Australia, China, Japan, Saudi Arabia, UAE, Qatar, Oman, and other nations have CCS supportive policies

Source: [Global Status of CCS | Global CCS Institute](#)

CCUS and CDR Examples

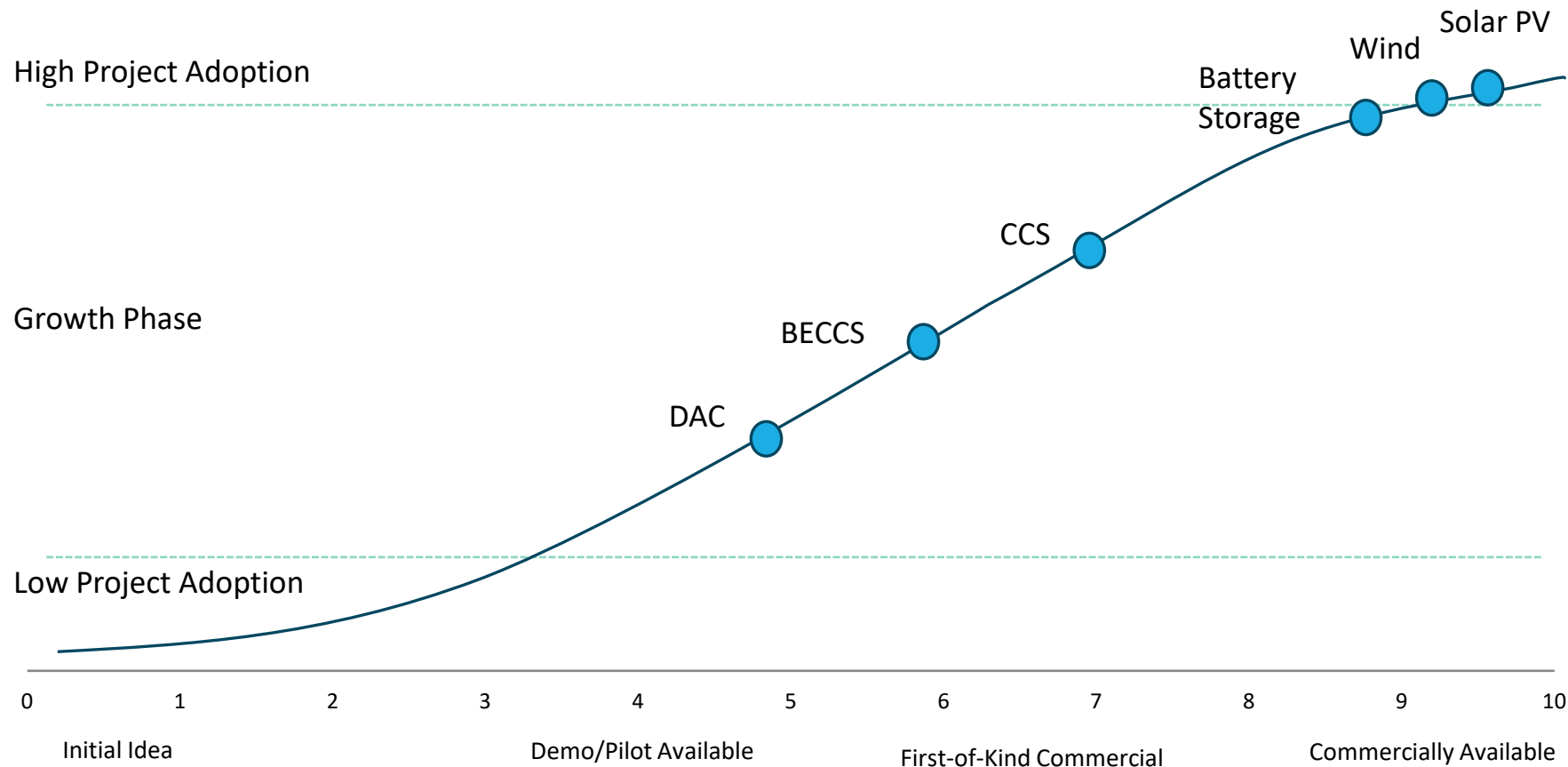


Carbon, capture, utilization and sequestration (CCUS) to prevent emissions into the air

Carbon dioxide removal (CDR) to remove emissions that are in the air through DAC/NBS

Source: [Carbon Dioxide Removal Technology - NEG8 Carbon](#)

Technology Ready to Deploy



- CCUS and CDR in early stages of deployment in California
- Data show scaling requires support until widely deployed

Sources

[EIA Clean Energy Technology Guide](#)

[WIPO \(2026\), Diffusion of clean technologies: patterns, mechanisms, and future challenges](#)

[IPCC AR6, Chapter 12: Cross sectoral perspectives](#)

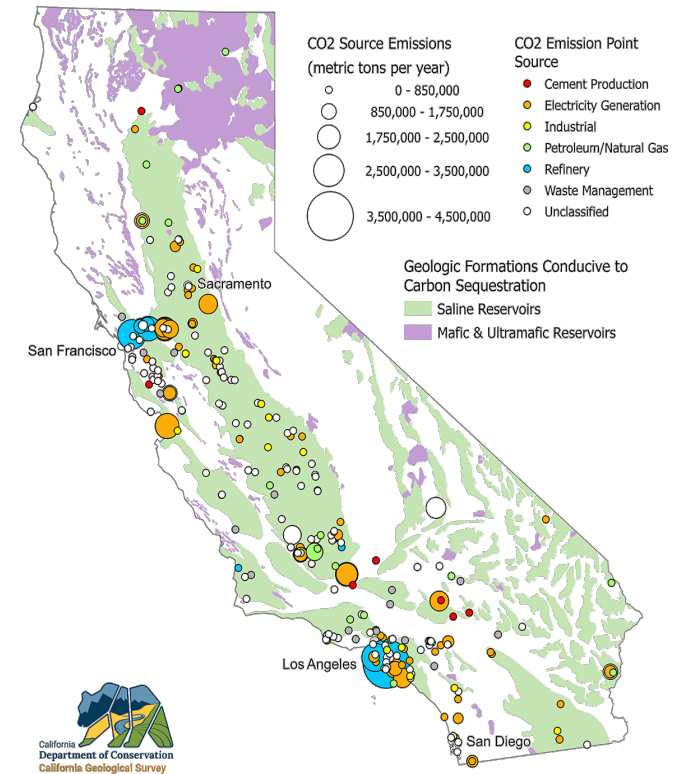
California Carbon Management Status

- Many CCUS and CDR companies active here in CA
- Federal tax credits available to CA projects through 2033
- 42 projects in planning, pilot, or implementation phases in CA
- CA geology has ample storage to accommodate more
 - Estimated 1,000 Billion tons storage potential
 - 100B tons = approx. 1,000 years of capacity at the rate California will require for negative emissions
- Many large CO₂ emission sources are in close proximity to geologic sequestration reservoirs

[CARB CCUS and CDR Project List](#)

[Global CCS Institute, Global Status of CCS 2025 report](#)

California's Geologic Carbon Sequestration Potential

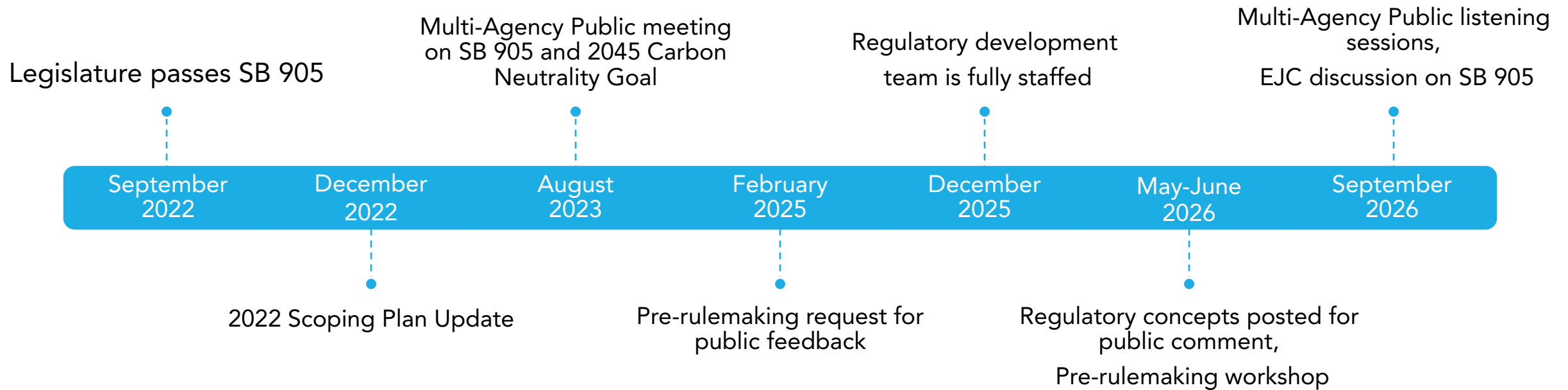


First in Nation Comprehensive Strategy for Carbon Capture, Removal, Utilization, and Storage

- **SB 905** lays out specific direction for several state agencies to ensure coordinated implementation and oversight for safe, effective, and viable carbon dioxide projects.



Multi-year Public Process



Community Listening Sessions: Key Themes

Concerns around technology/industry:

- Transparency and public information access on projects
- Financial liability if a project fails or is abandoned
- Doubt that CCS reduces emissions/improves air quality
- Siting of projects in already-overburdened communities
- Distrust of industry at large/historical track record

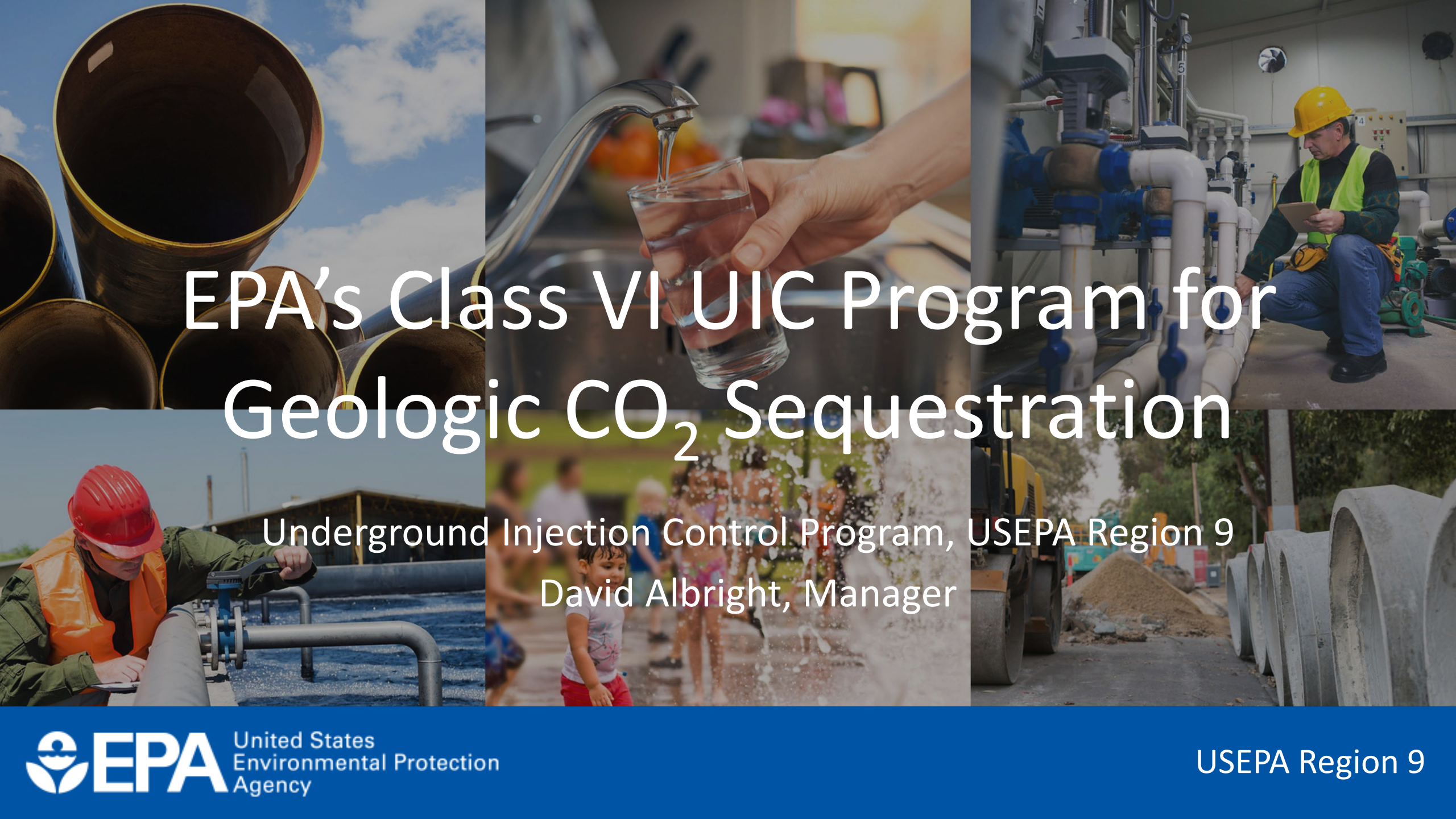
Regulatory clarity:

- Predictable, streamlined permitting for projects
- Project eligibility types that reflect technological diversity of the industry
- Strong but workable guardrails for project developers

Support for the technology/industry:

- Economic development and jobs from projects
- Necessary technology to reach our climate goals
- Co-benefits to the environment, air quality, and other goals
- Not a new technology, just a growing industry

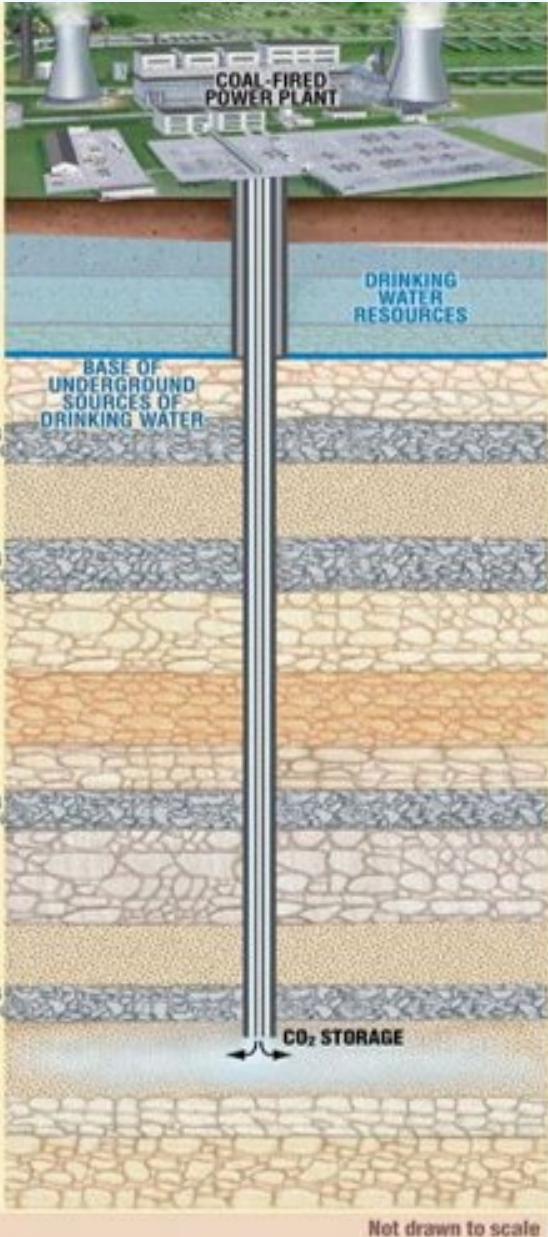
Guest Speakers



EPA's Class VI UIC Program for Geologic CO₂ Sequestration

Underground Injection Control Program, USEPA Region 9

David Albright, Manager



Background: SDWA and the UIC Program

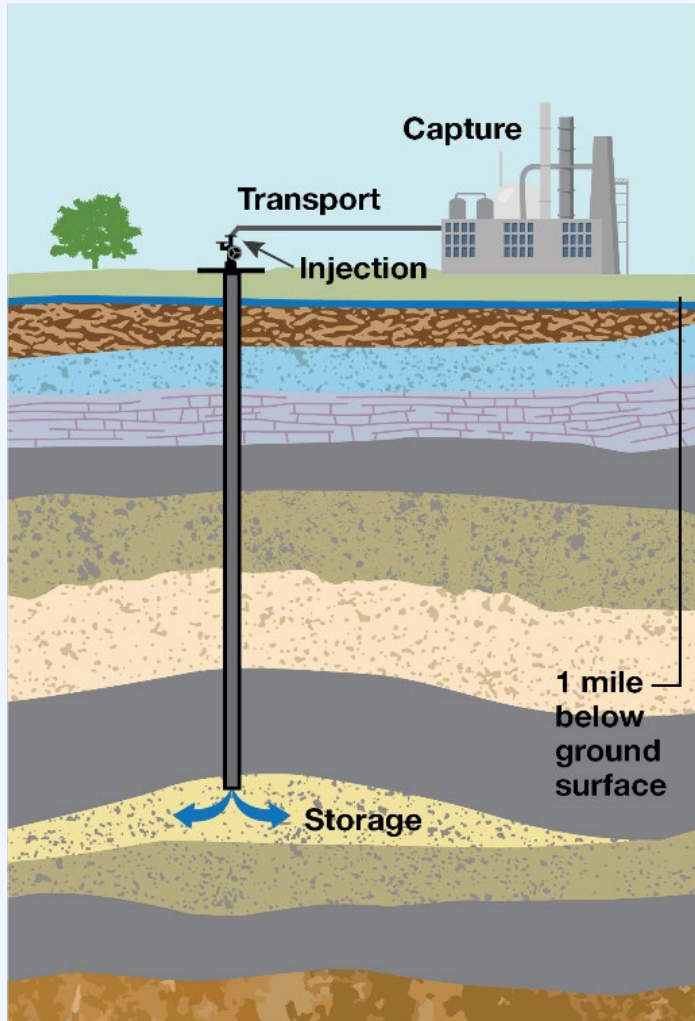
The Safe Drinking Water Act (SDWA):

- protects public health by regulating the nation's public drinking water supply.
- protects both surface and underground sources of drinking water.

The Underground Injection Control (UIC) program:

- is regulated under SDWA.
- protects underground sources of drinking water (USDWs) from contamination from injection of fluids into the subsurface for disposal or storage.
 - USDWs are aquifers or parts of aquifers that currently are, or in the future could be, a drinking water source.
 - Injection fluids include water, wastewater, brines produced during oil and gas production, and carbon dioxide (CO₂).

Geologic Sequestration and UIC Class VI Regulations



What are Class VI GS wells?

- Class VI wells are used to inject CO₂ into deep rock formations for geologic sequestration (GS).
- GS is part of the process often referred to as carbon capture and sequestration (CCS).
- EPA has issued permits for 20 Class VI injection wells; 4 are in California.

UIC Regulations Cover a GS Project from Start to Finish

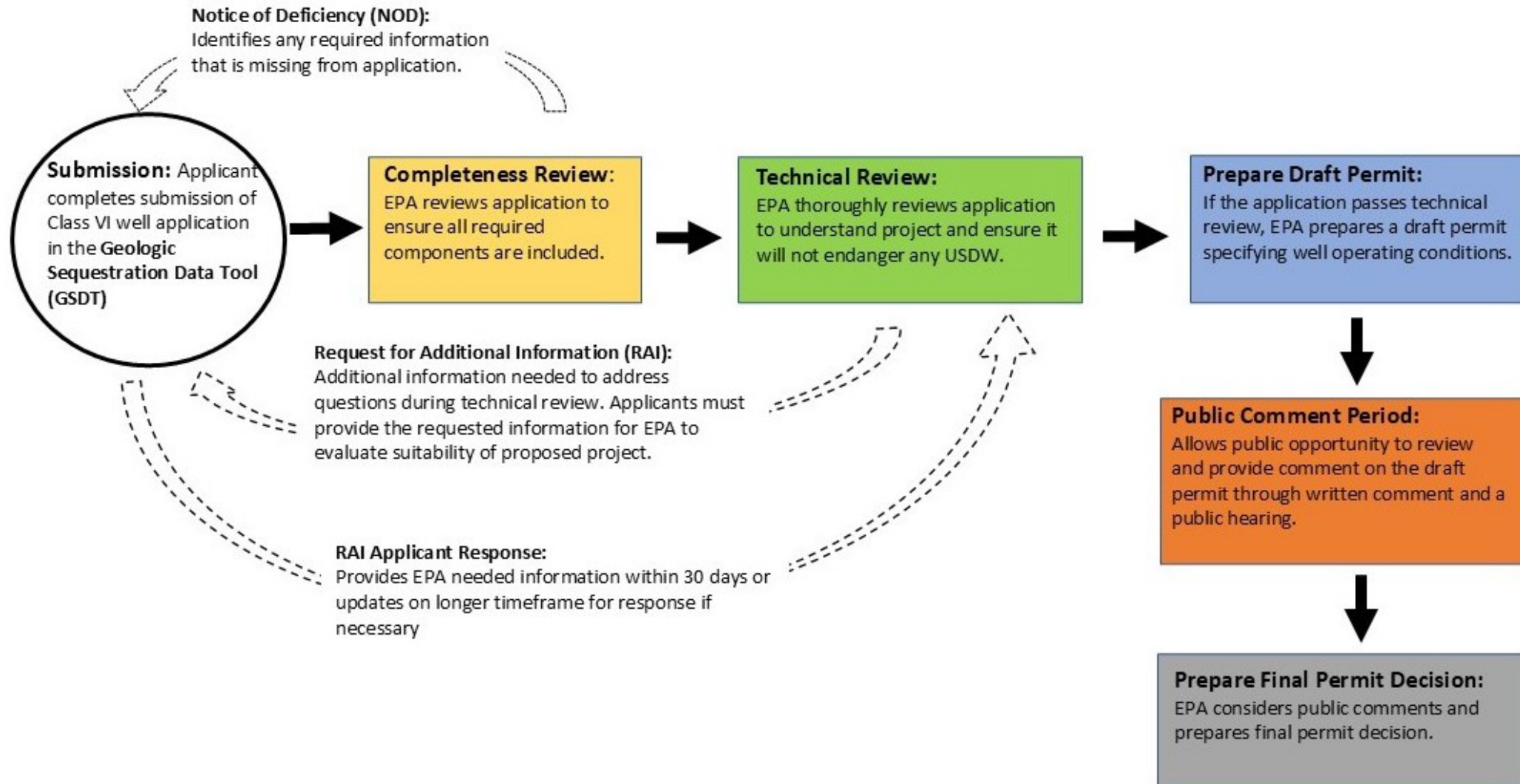
- Siting (selection of location)
- Permitting
- Well Construction
- Operations
- Well and Site Closure

UIC Class VI regulations are designed to protect USDWs by preventing movement of CO₂ out of the injection zone.

Protective aspects of UIC Class VI regulations include:

- Multiple safeguards to protect USDWs from the risks associated with GS.
- Tracking the movement of the “plume” of CO₂ and any other potential changes in the subsurface.
- Development of written plans for operating a GS project based on EPA technical guidance.
- Adaptable and evolving - revisions made to plans if new data indicate the need.

Class VI Permitting Process



Resources for Applicants

Resources available on our website include:

- Guidance documents
- GSDT factsheet & tutorials
- Class VI Permit Application Templates
- Class VI Application Completeness Tool

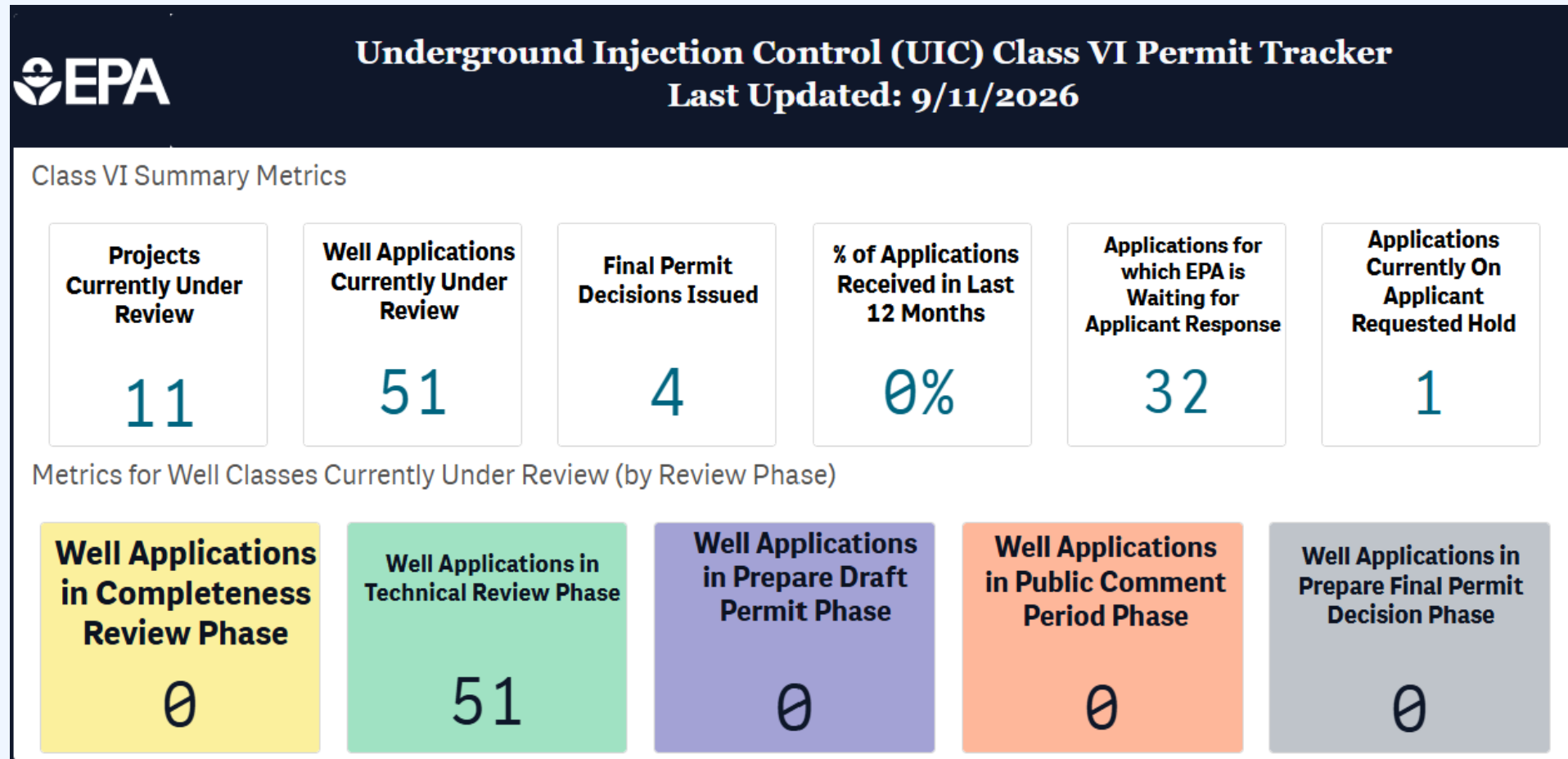
Class VI (Geologic Sequestration) Permit Application and Permitting Tools

On this page:

- [Class VI Permit Application Completeness Tool](#)
- [Rules and Tools Crosswalk Report](#)
- [Class VI Permit Application Outline](#)
- [Additional Information](#)

<https://www.epa.gov/uic/class-vi-geologic-sequestration-permit-application-and-permitting-tools>

EPA's Class VI Permit Tracker



Visit EPA's UIC Webpages for Additional Information
<https://www.epa.gov/uic>

Environmental Topics ▾

Laws & Regulations ▾

Report a Violation ▾

About EPA ▾

Protecting Underground Sources of Drinking Water from Underground Injection (UIC)



Underground Injection

EPA regulates the construction, operation, permitting, and closure of injection wells used to place fluids underground for storage or disposal. [Learn more about injection well types.](#)

Kern County Local Land Use Permitting & Carbon Sequestration

Craig M. Murphy, Director

Kern County Planning & Natural Resources Department

September 24, 2026

TERMINOLOGY

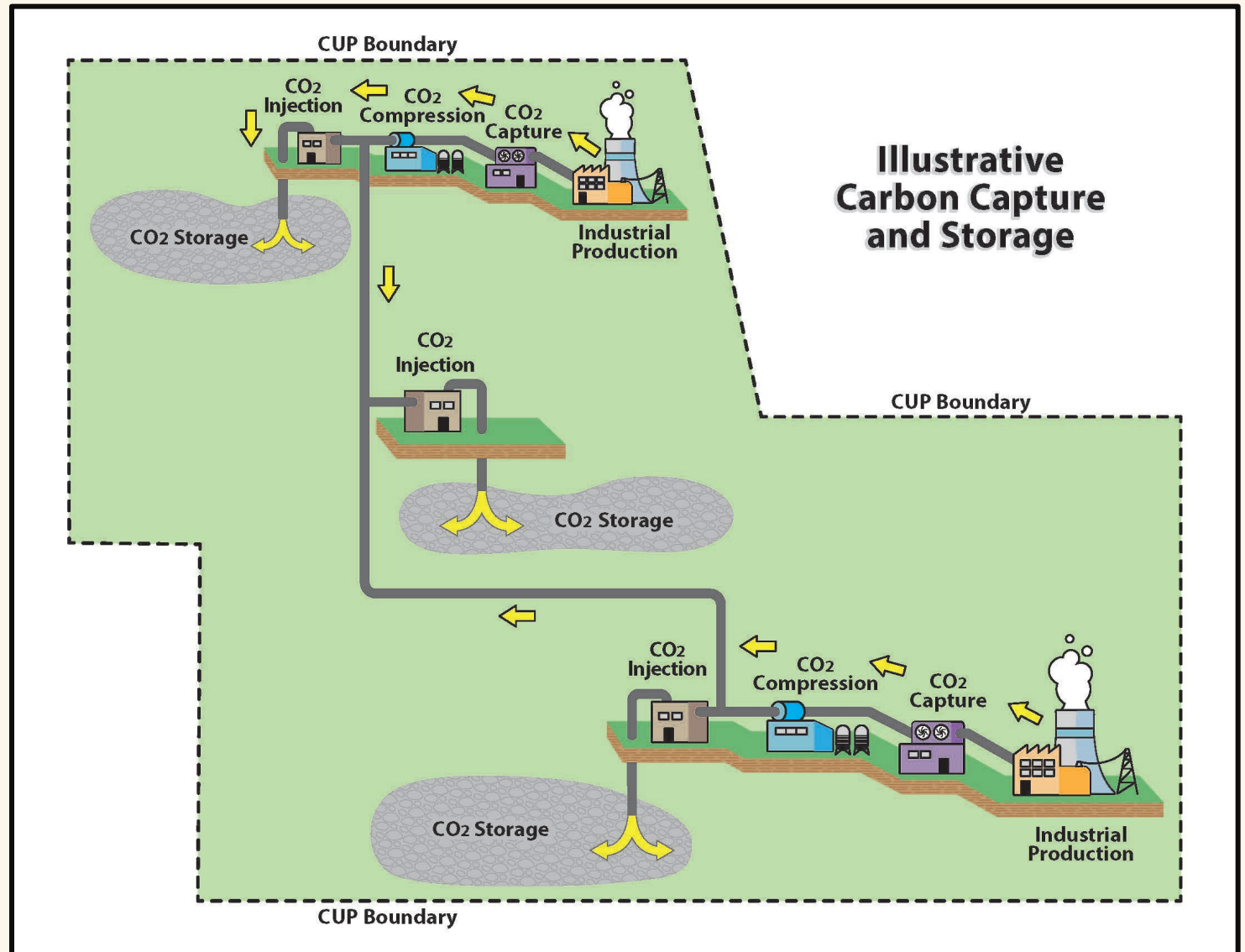
- **CCS Surface Land Area** – This is the area on the surface within the boundaries of the Conditional Use Permit (adopted legal description).
- **CCS Underground Pore Space** – This is the area underground where the injected CO₂ will permanently be stored until it becomes part of the geological rock. According to State law, this empty space between the rocks belongs to the surface owner, not the mineral owner.
- **Carbon Capture Facility** – This is the actual building and equipment that includes the process used to capture CO₂ from a source. This is not normally located next to the Class VI injection wells, but some distance away. CO₂ is then sent to the injection site through dedicated CO₂ pipelines.
- **Facility CO₂ Pipeline** – Dedicated pipeline used to transport captured CO₂.
- **Class VI Injection Wells and CO₂ Pipelines** – Specific equipment and wells where the highest potential for leakage of CO₂ may occur.

Adopted Conditional Use Permit represents the administrative permitting boundary, which is covered by the proposed project and subsequent environmental analysis. Also known as the CCS Surface Land Area

CCS Underground Pore Space is located within the administrative boundaries of the Conditional Use Permit and does not exceed beyond the adopted CUP boundary.

CCS Surface Land Area is subject to local land use permitting authority, underground injection is subject to US EPA and CalGEM regulatory permitting authority.

For Carbon TerraVault I, the project applicant had full ownership and control of the surface, the pore space and the mineral resources. This may not be the case in other areas of California.



California Environmental Quality Act (CEQA)

Overview & Consideration Process

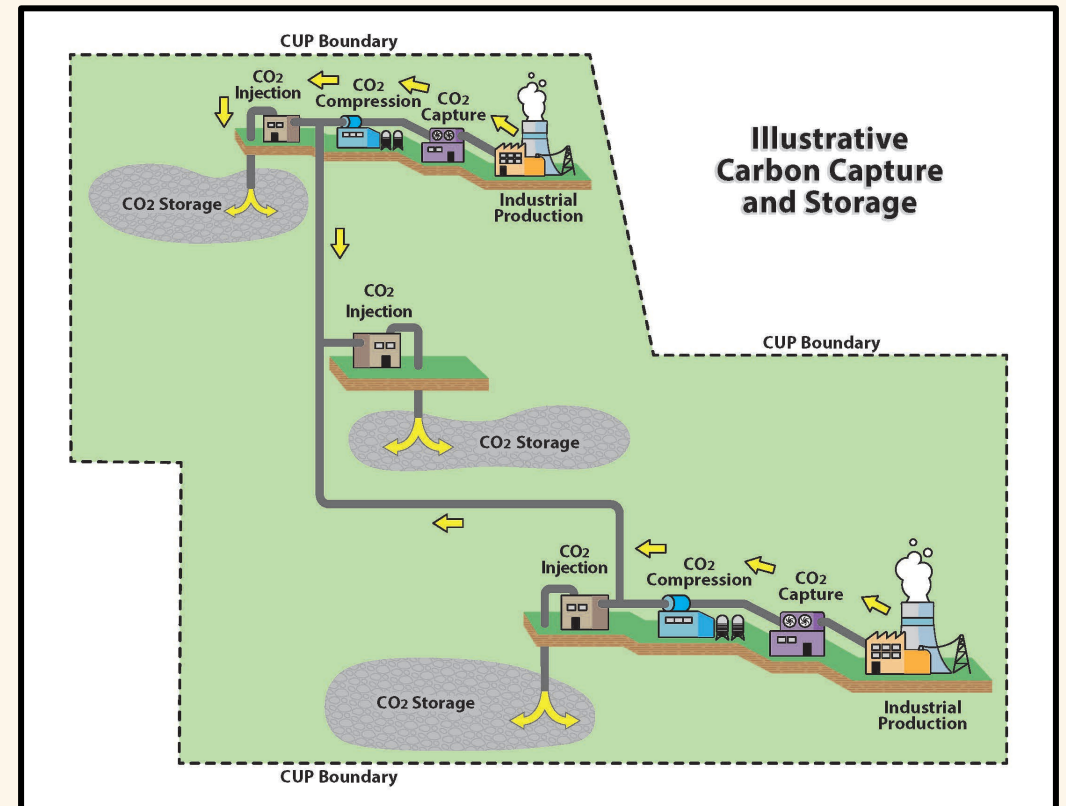
- To INFORM decision makers about significant environmental effects
 - To IDENTIFY ways environmental damage can be avoided
 - To PREVENT avoidable environmental damage
 - To DISCLOSE to the public why a project is approved even if there are identified environmental impacts.
-
- ☐ Notice of Preparation
 - ☐ Release of the Draft Environmental Impact Report
 - ☐ Preparation and Release of Response to Comments
 - ☐ Consideration of the Final EIR and proposed project by Elected Officials
-
- ❖ Possible Litigation (Ultimate Public Oversight Tool)

MITIGATION HIGHLIGHTS

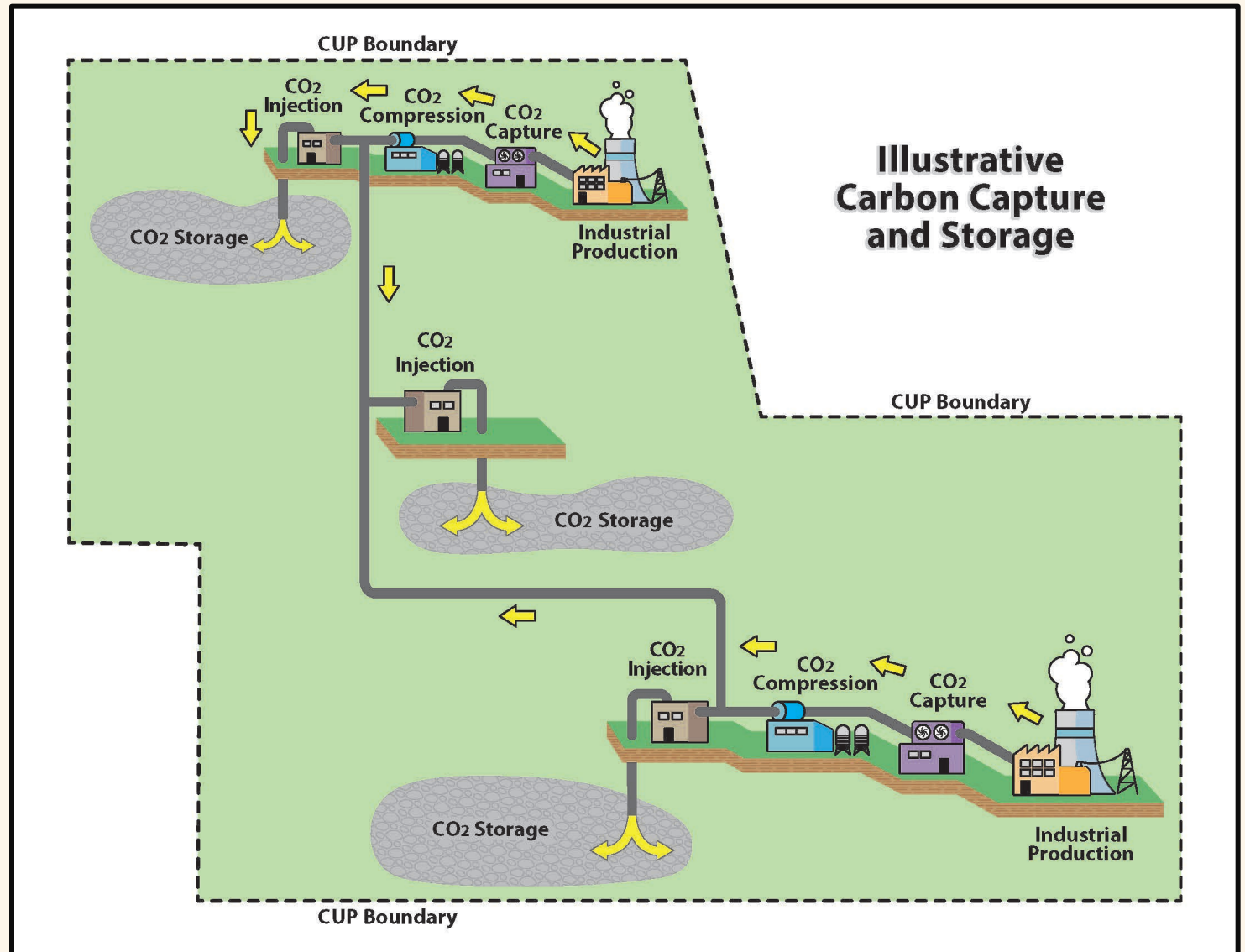
- **Project Boundary & Signage Plan**
- **Agricultural Conversion Plan**
- **Developer Mitigation Agreement (VERA)**
- **4,000-foot buffer to sensitive receptors for Class VI and Class II Injection Wells**
- **Fenceline Air Monitoring Plan**
- **500-Foot Wildlife Buffer from Class VI Injection Wells**
- **Energy Usage Annual Report**
- **Seismic Activity Monitoring Plan**
- **CO2 Monitoring Plan**
- **Quarterly Injection Report**
- **Cap & Trade Requirements**
- **GHG off-sets not covered by Cap & Trade**
- **New CO2 pipelines require a CUP & must be 1,367 feet from boundary line**
- **Maximum 50-foot spacing for shut off valves and use of infra red cameras for monitoring in pipelines**
- **Required issuance of a US EPA UIC Permit**
- **CO2 Source Disclosure**
- **Notice of Operation Mailing to School Agencies**

MITIGATION HIGHLIGHTS – Cont.

- Emergency Incident Response Plan
- Restricted Equipment
- Closed Loop Drilling System
- No Class VI Injection activity that discharges into beneficial groundwater
- Limited surface land uses – Agricultural Cultivation, Solar & Energy Storage, Conservation and Oil & Gas Exploration
- Capture of Sales & Use Tax
- Cumulative Impact Oil & Gas Reservoir Pore Space Charge
- Fire Department Annual Training & Equipment
- Closure Funding & Annual Monitoring Payment



CONCLUSION & QUESTIONS



Water Boards' Role in Implementing SB 905

Annalisa Kihara, Assistant Deputy Director



September 2026

State Water Resources Control Board and Nine Regional Water Quality Control Boards (Collectively Water Boards)



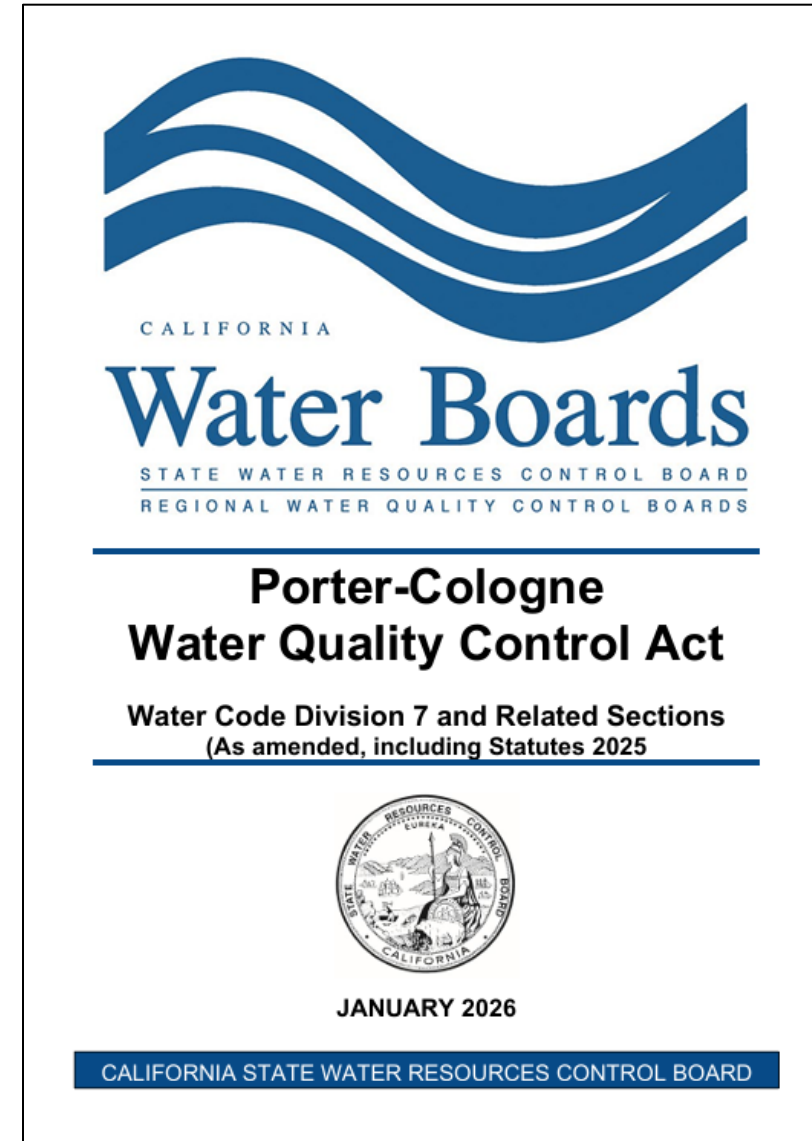
Class VI Underground Injection Control

- Permitted by United States Environmental Protection Agency.
- Water Boards' role:
 - Evaluate containment of CO₂.
 - Evaluate potential impacts to beneficial use waters.
 - Review, and provide support, on groundwater monitoring plans.



Permitting CCUS Projects

- Size, scope, location, and existing infrastructure determines permitting needs.
- Current CCUS projects that may be covered by existing permits.
 - Industrial General Permit
 - Waste Discharge Requirements
- Expansion of CCUS technologies could require additional provisions under the Water Code.
 - Construction General Permit
 - Discharges of dredge or fill material (Waste Discharge Requirements/Water Quality Certification).
 - Other



Statewide General Permits

Industrial General Permit

- Required for industrial projects where stormwater runoff discharges offsite.



[Industrial Stormwater Program | California State Water Resources Control Board](#)

Construction General Permit

- Required for projects requiring construction that disturbs one-acre, or more, of land.



[Construction Stormwater Program | California State Water Resources Control Board](#)

Waste Discharge Requirements



Required for projects that will discharge wastewater to land or groundwater.

[Waste Discharge Requirements Program | California State Water Resources Control Board](#)



Required if a project discharges dredge or fill material to waters of the state.

[401 Water Quality Certification and Wetlands Program | California State Water Resources Control Board](#)

The California Geological Survey And The SB905 Geologic Carbon Sequestration Group

Jeremy Lancaster PG CEG
Director and State Geologist
California Geological Survey

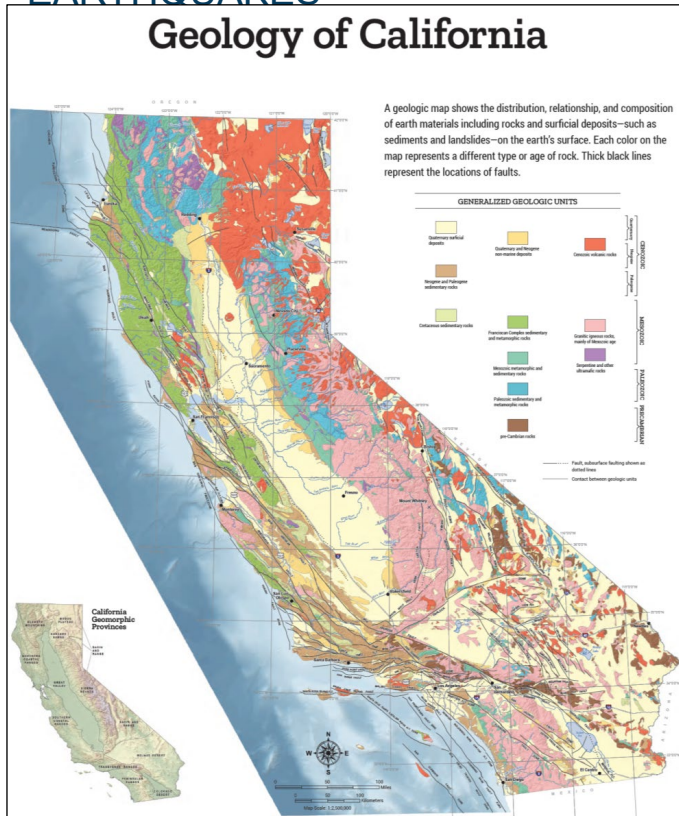


California
**Department of
Conservation**
California Geological Survey

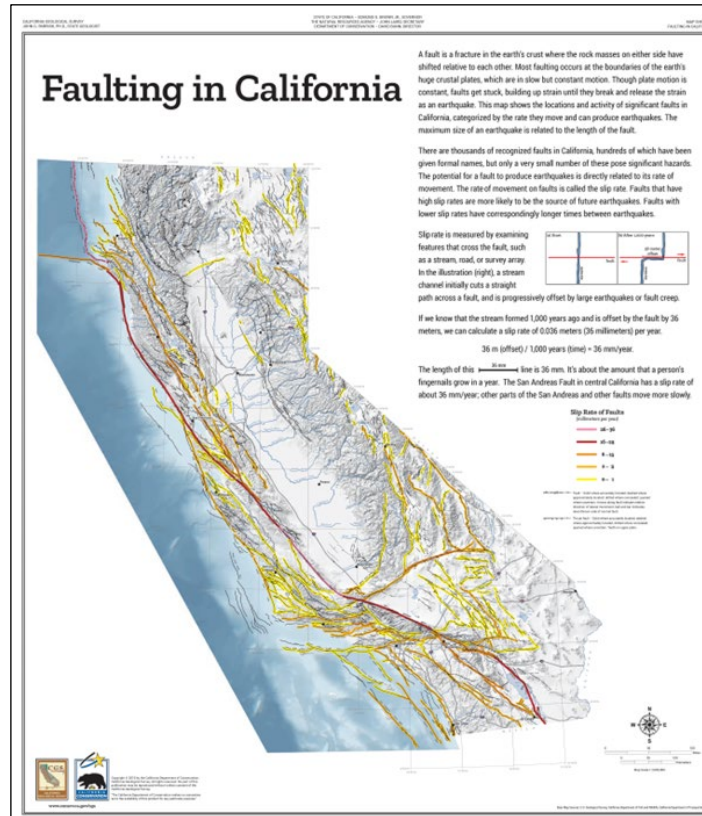
The California Geological Survey

CGS provides scientific products and services about the state's geology, seismicity, watersheds, minerals, and their related hazards that affect the health, safety, and business interests of the people of California

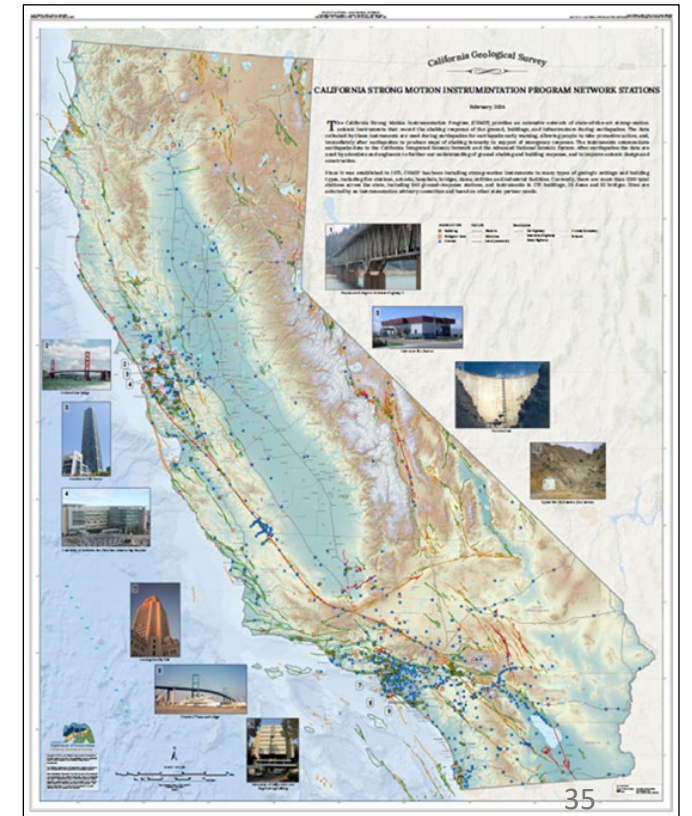
MAPPING EARTHQUAKES



ASSESS HAZARDS



MONITORING



Earthquake Response and Recovery

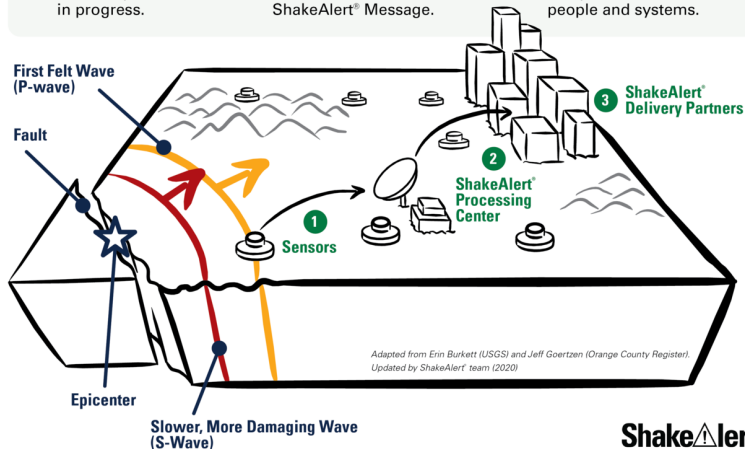


California Integrated Seismic Network
California's Partner to the Advanced National Seismic System

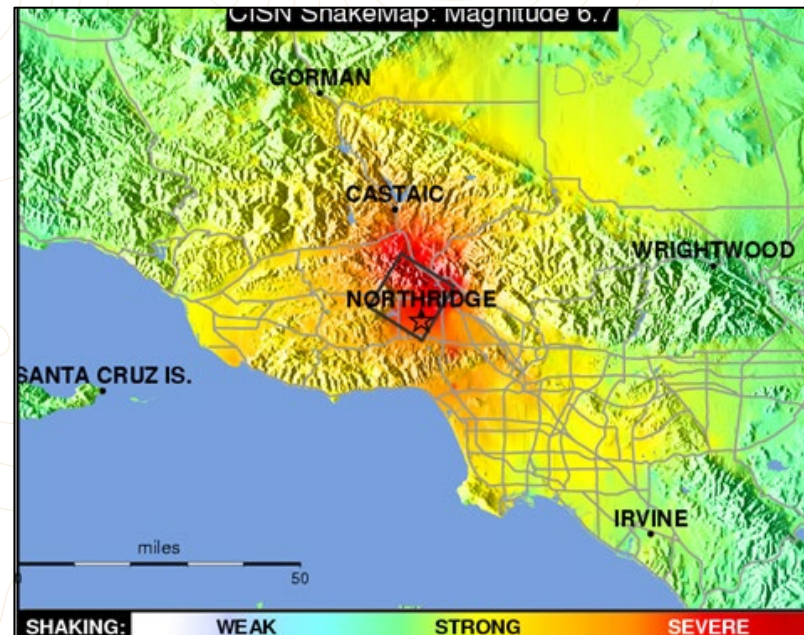
SHAKEALERT

ShakeAlert® Is Not Earthquake Prediction

- 1 ShakeAlert® sensors rapidly detect an earthquake in progress.
- 2 ShakeAlert® processing centers estimate earthquake characteristics and issue a ShakeAlert® Message.
- 3 Delivery partners pick up the ShakeAlert® Message and produce an alert for people and systems.



SHAKEMAP



PUBLIC DATA

Center for Engineering Strong Motion Data

CESMD - A Cooperative Effort



About CESMD

Data for Latest Earthquakes
Internet Quick Reports (IQR)

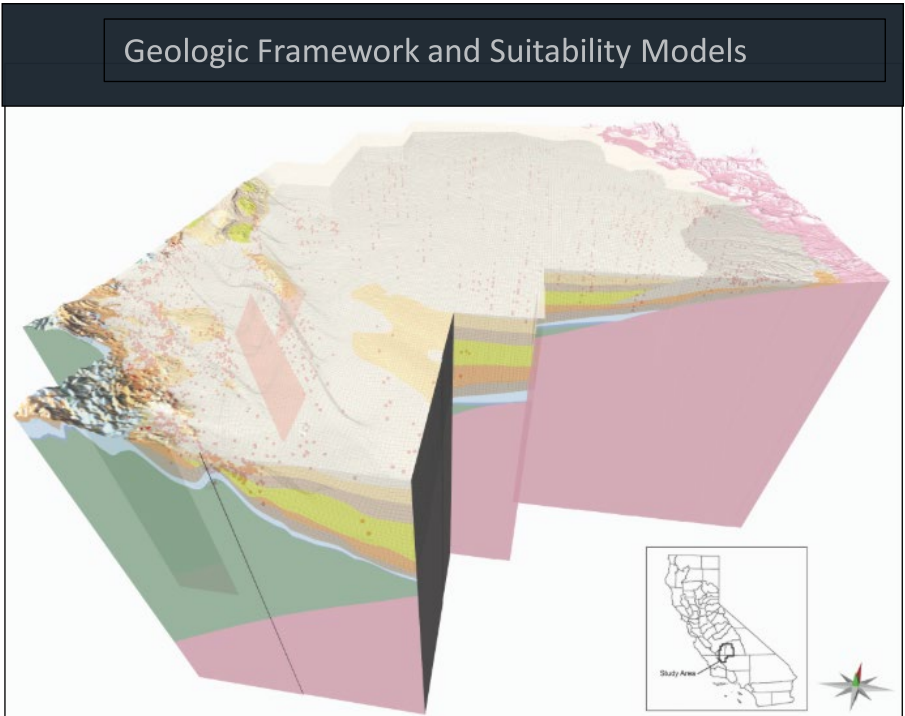
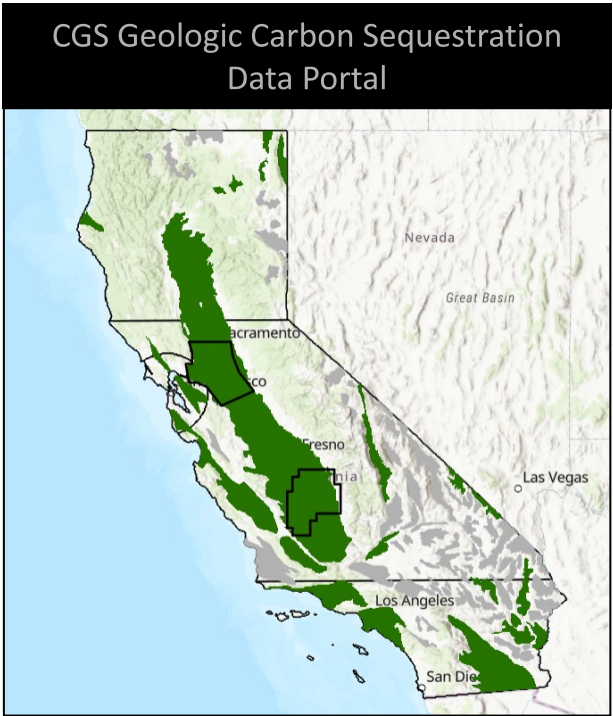
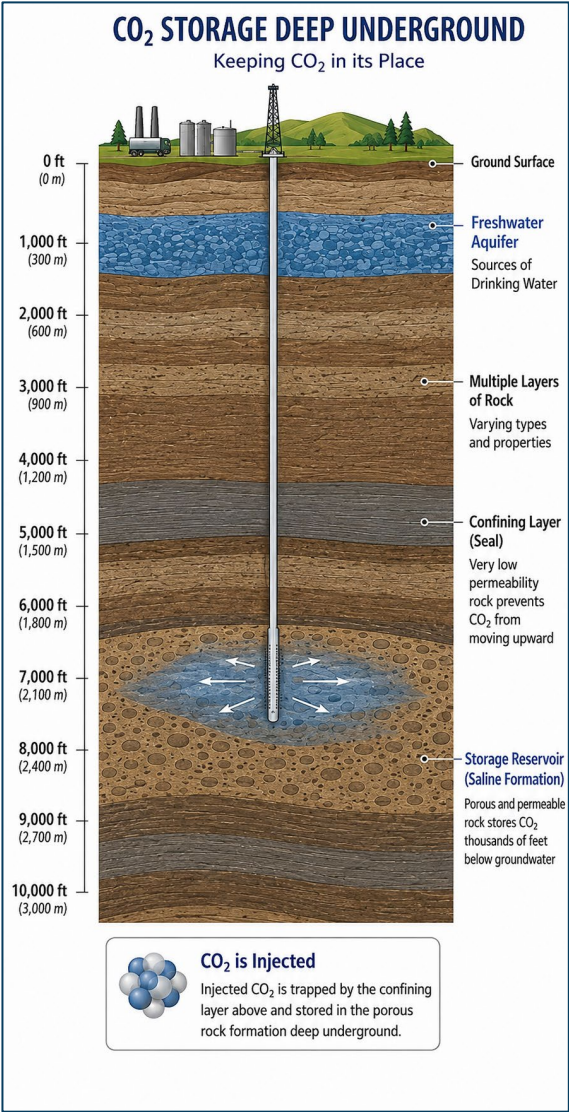
Archive

Search for Data
from Specific Stations or Structure Types

CISN AEIC PNSN IMW CEUS IRIS COSMOS

Geologic Carbon Sequestration Group

1) High quality, suitable locations



Geologic Carbon Sequestration Group

Independent expertise and regulatory guidance to CARB, including, but not limited to the assessment of (PRC 2213(a)) :

2) Identification of appropriate subsurface monitoring

3) Identification of hazards that may require the suspension of carbon dioxide injections

4) State Geologist shall report seismic activity or [subsurface] leakage of carbon dioxide from a carbon dioxide capture, removal, or sequestration project to the state board and may recommend changes in the operations of the project to the state board. (PRC 71463)

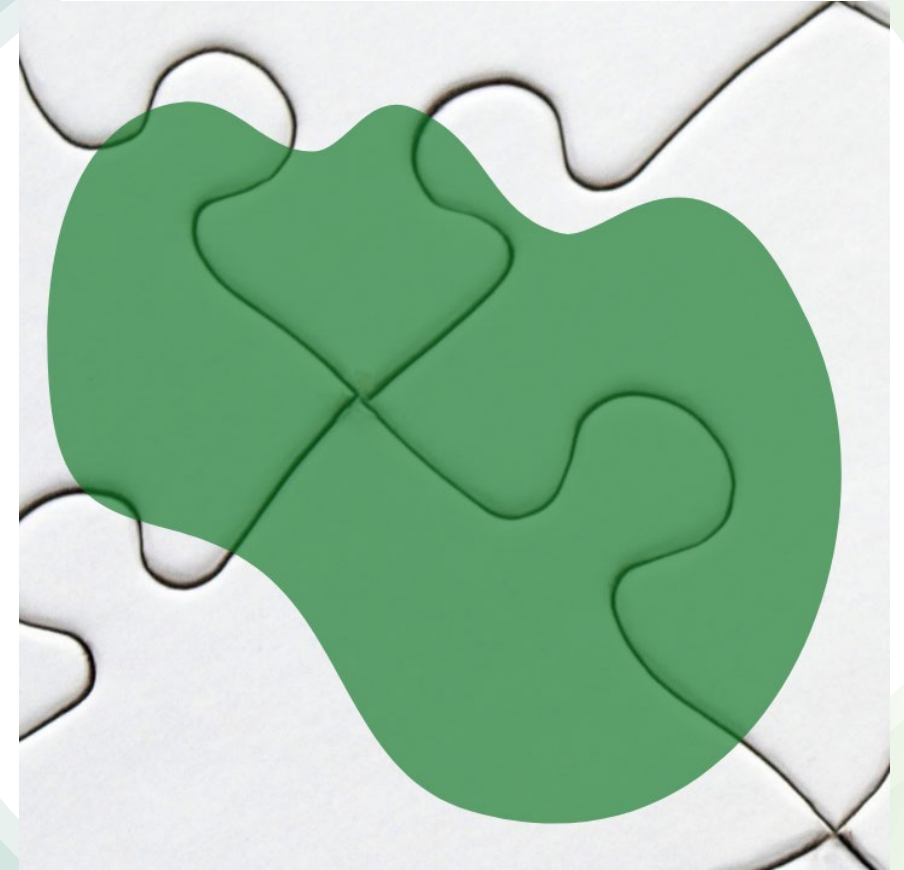


Proposed Draft Framework for CCUS Pore Space Unitization

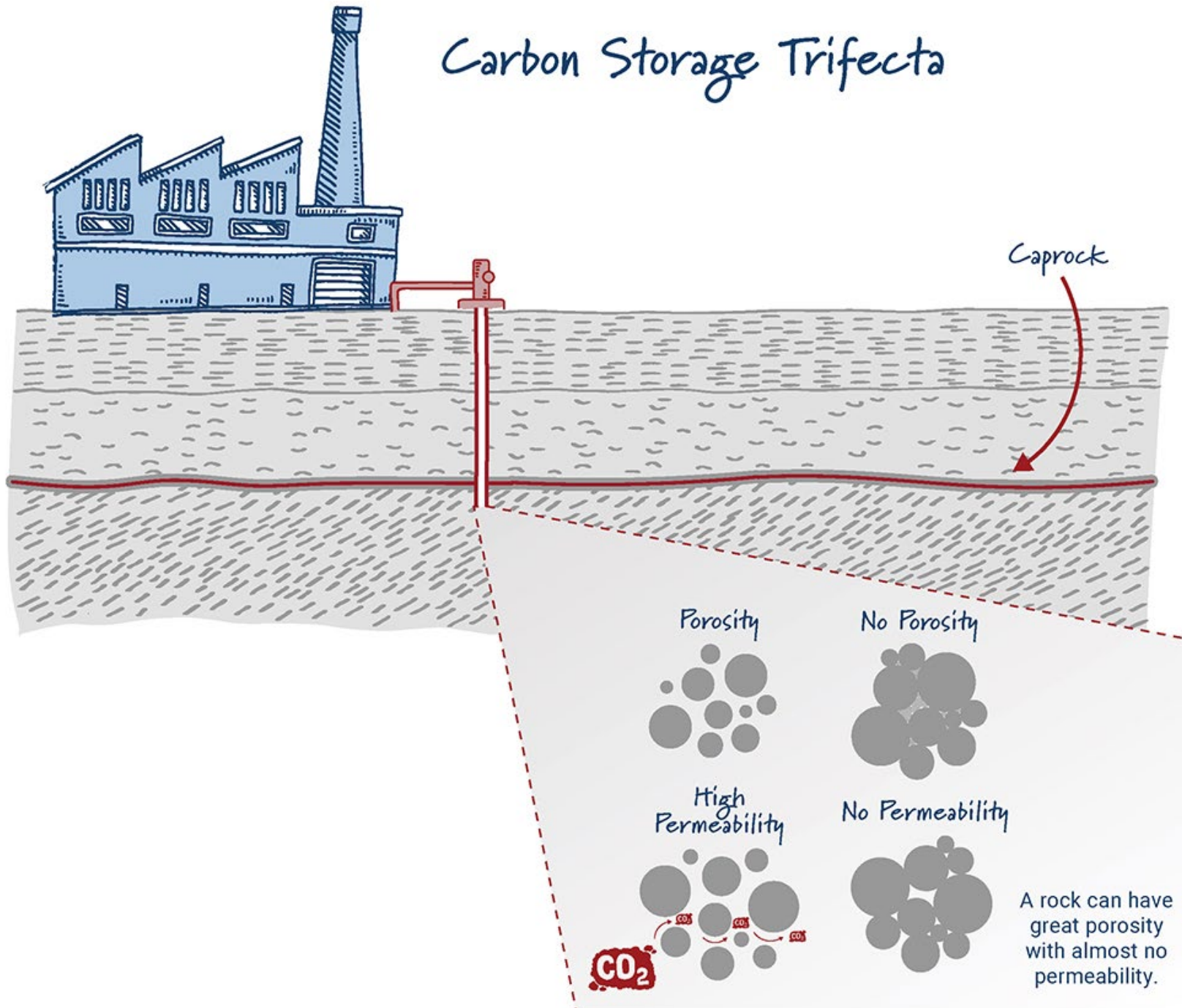
On behalf of
The California Natural Resources Agency
By
Seth Blackmon

What is Unitization?

Unitization is the process of combining separate tracts of land or lease blocks over a carbon reservoir into one unified development plan.



Carbon Storage Trifecta



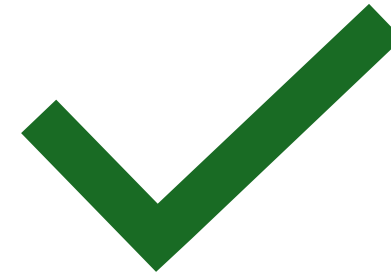
What is Pore Space?

- The microscopic empty volume or void between grains of underground rock, sand, and sediment where captured carbon dioxide (CO₂) is permanently stored.

SB 905 Directs CNRA to Make Recommendations For Unitization Agreements



Public Resources Code section 71461 lays out the “requirements for the submission of governing agreements to, and the review, approval, or denial of these agreements by, an authorized state agency.”



The draft framework provides nine general recommendations of what should be included within a unitization agreement for storage reservoirs that will be used by CCS projects



Recommendations

1. (a) Assign the Department of Conservation (DOC) to be the Reviewing Agency
(b) Notice of Proposed Unitization Agreement and Public Hearings
2. Proponents must show at least 75% of impacted estates consent
3. Oversight will help with transaction transparency, fairness, and accessibility.
4. DOC to verify good faith offers of compensation were made to impacted land holders.
5. Surface-site access for post-injection monitoring should be clearly articulated in the submitted unitization agreement
6. Unitization agreements should clearly allocate a potential operation's liability between the operator and the surface estate
7. Unitization agreements should incorporate applicable regulatory and/or permitting requirements for financial assurances
8. Injection payments to non-consenting owners should be comparable to those negotiated in arms-lengths agreements
9. Other considerations



CAL FIRE

Office of the State Fire Marshal

Pipeline Safety Division

Carbon Dioxide Pipeline Regulations

Doug Allen, Supervising Pipeline Safety Engineer

What we regulate

- Safety of over 5,000 miles of intrastate hazardous liquid transportation pipelines.
- Pipelines between the production and distribution networks in public area, including offshore pipelines.
 - Crude, gasoline, diesel, jet fuel, highly volatile liquids, ethanol, CO₂

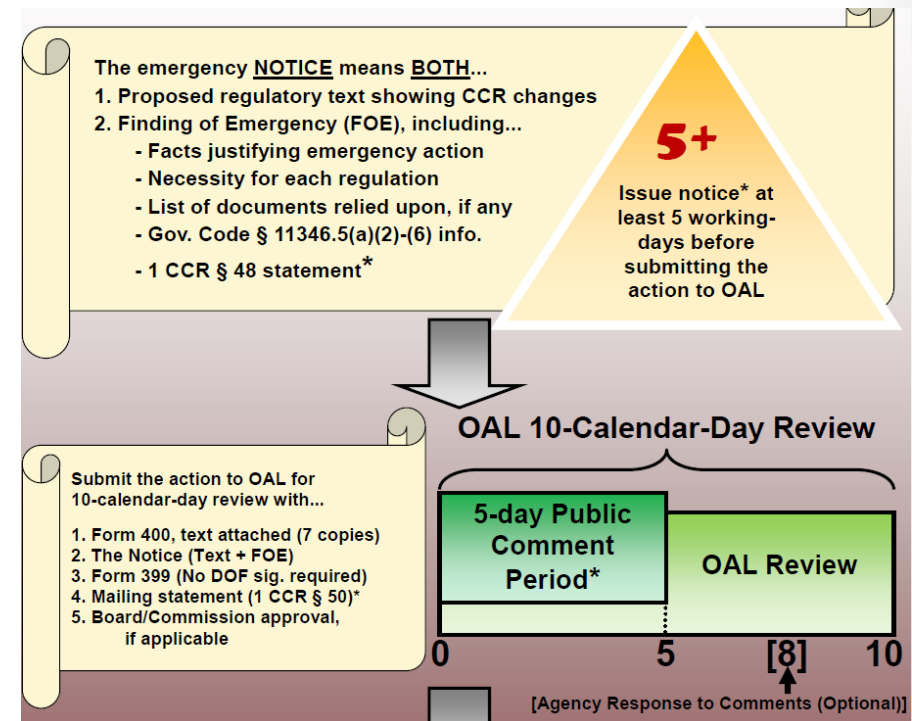
Background

- January 10, 2025 - US DOT PHMSA drafted minimum federal safety standards for transportation of CO2 by pipeline (RIN 2137-AF60).
 - These regulations were never adopted.
- SB 614 - OSFM to adopt CO2 Pipeline regulations by July 1, 2026
 - These are emergency regulations, which are different than the typical regulatory process.

OSFM CARBON DIOXIDE PIPELINE REGULATION

Emergency Rulemaking Adoption Timeline

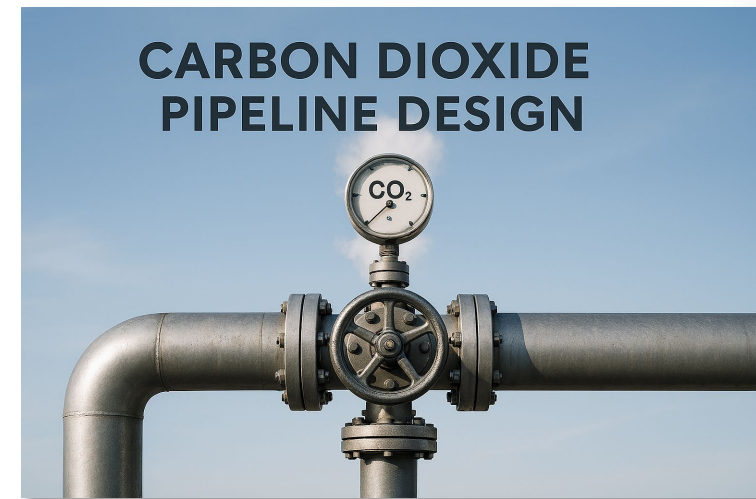
- January 2026:
 - CO2 Workgroup Kickoff Meeting
- February 2026:
 - Pipeline Safety Advisory Committee Meeting
- June 2026:
 - Submission of Emergency Notice Package to OAL
- July 1, 2026:
 - Adopt Regulations



CO2 Pipeline Regulations

Design Requirements

- All new material
- Material toughness
- Leak detection (CPM and a continuous externally based LDS)
- Fixed vapor detection, alarm systems



CO2 Pipeline Regulations

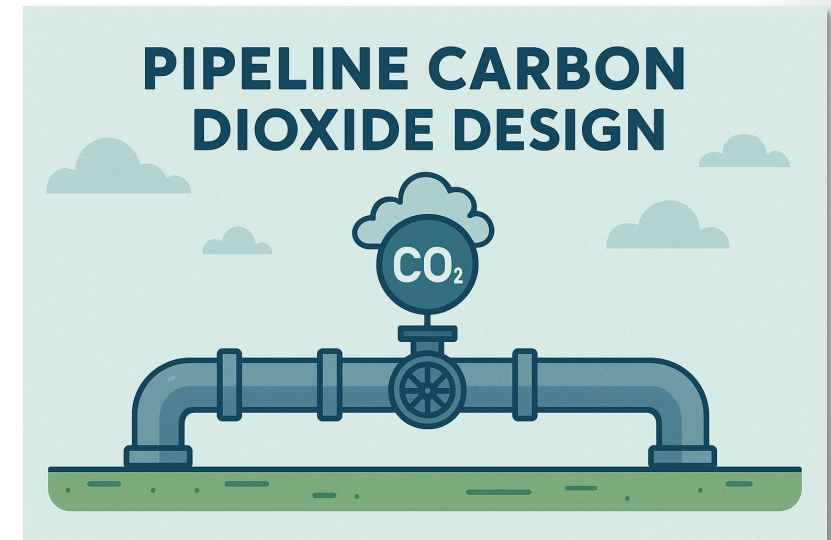
Construction Requirements

- Geotechnical analysis
- Min. 48” of cover
- Avoid sensitive receptors – As far as practicable
 - Vapor dispersion analysis
 - Training services
 - Emergency preparedness materials



Additional Requirements

- Emergency Response Training
- Land Movement
- Depth of Cover Survey
- Internal Corrosion Control



CO2 Pipeline Regulations

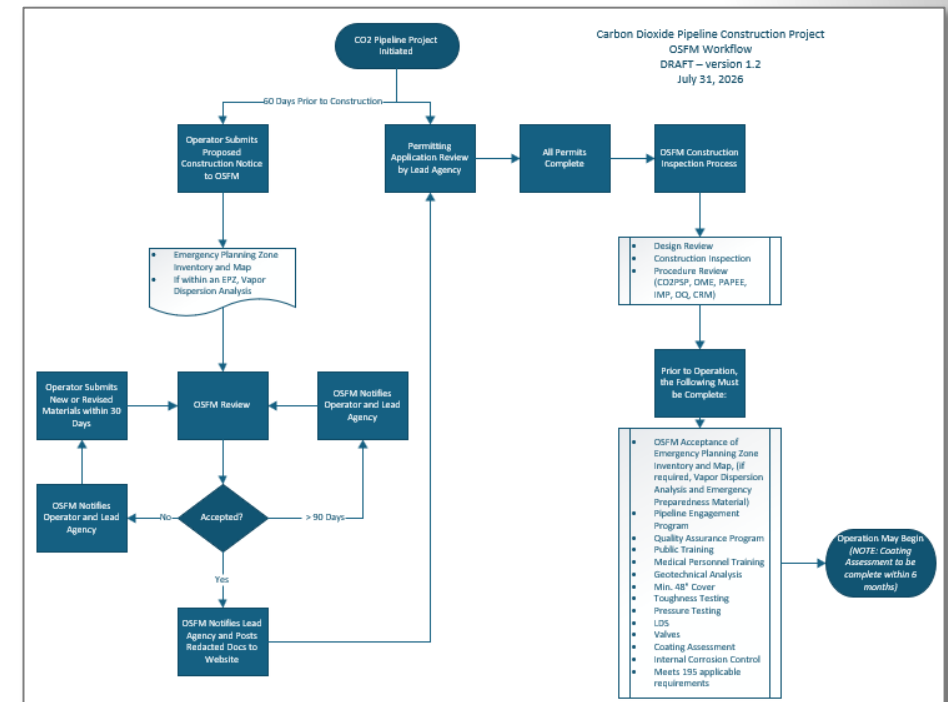
[Article 9. Carbon Dioxide Pipelines](#)

- Differences between the 2025 PHMSA draft regulations and the OSFM CO2 Pipeline regulations.
 - Phase for CO2 Transport
 - All new pipelines
 - Focus on protecting sensitive receptors
 - Requires extra cover over buried pipelines
 - Two types of leak detection systems
 - Pipeline Engagement Program

OSFM CARBON DIOXIDE PIPELINE REGULATION

OSFM Inspection Process

- Construction Notice
- Review Emergency Planning Zone Inventory and Map
- Coordinate with Lead Permitting Agency
- Conduct Construction and Safety Program Inspections



SB 905 CARB Staff Concepts

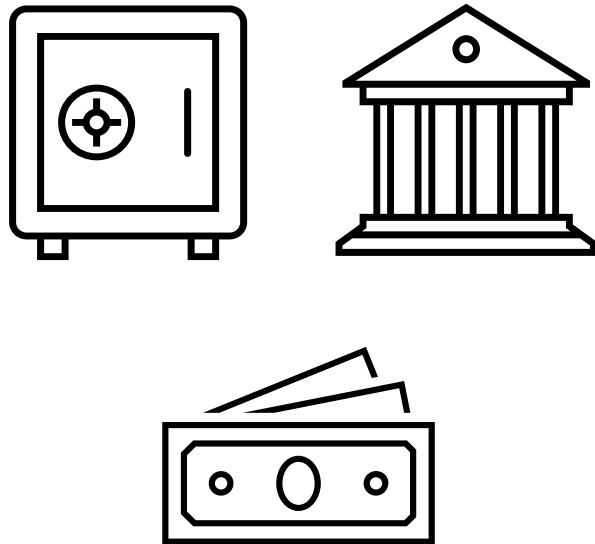
Key Principles for CARB Implementation of SB 905

- Support deployment of carbon management technologies in furtherance of achieving the state's climate targets
- Support the efficacy, safety, and viability of projects
- Complement existing federal, state, and local permitting requirements and avoid creating duplicative requirements
- Increase public transparency on projects
- Support alignment and integration with existing programs
- No part of SB 905 removes or reduces existing public safety or environmental protections that exist at federal, state, and local levels

SB 905 Regulations for Safe, Effective, and Viable CCUS/CDR Deployment

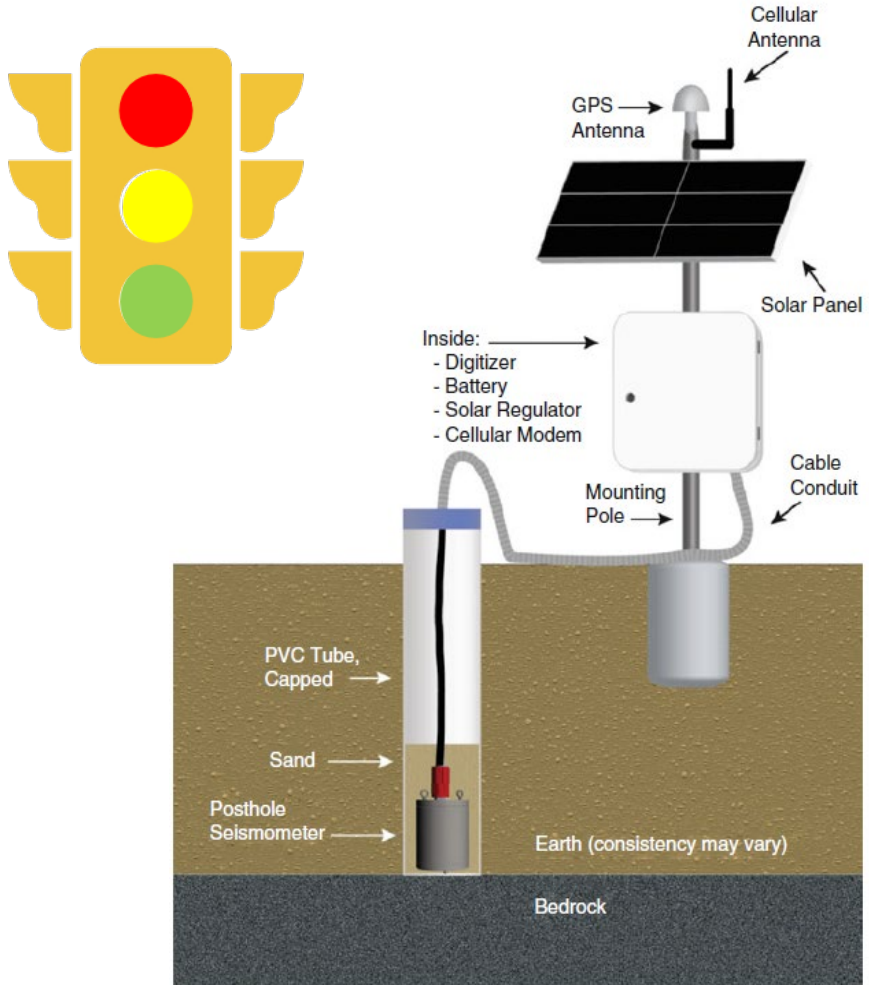
- Current scope for CARB SB 905 rulemaking efforts:
 - Financial Responsibility
 - Environmental and Seismic Monitoring and Mitigation
 - Public Disclosure
 - CCUS and CDR Project Protocols and alignment/integration with other climate programs
- Future regulation:
 - Voluntary-use unified permit portal

Financial Responsibility



- **Purpose:** Ensure operators cover long term costs for geologic carbon sequestration (GCS) sites
- **Existing requirements:** Certain activities covered for up to 50 years post injection under federal Class VI permits
- **Staff concept:**
 - Expand scope coverage for additional emergency response and monitoring costs
 - SB 905 extends time frame for responsibility to 100 years after injection ends

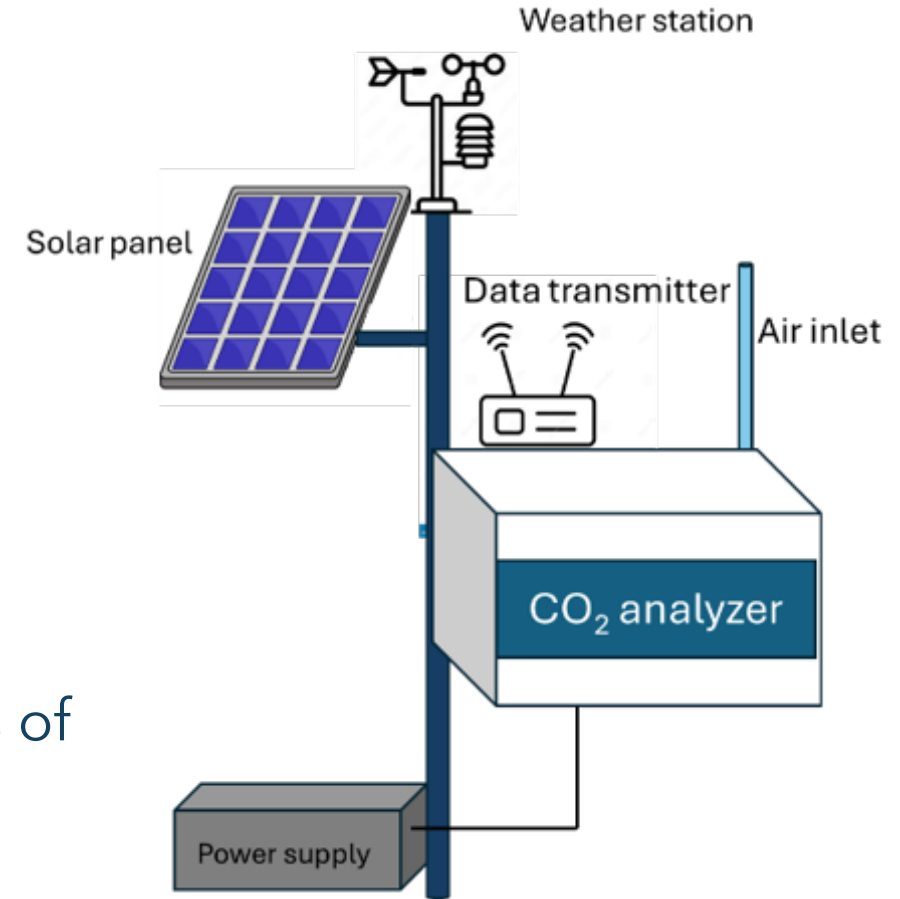
Seismic Monitoring



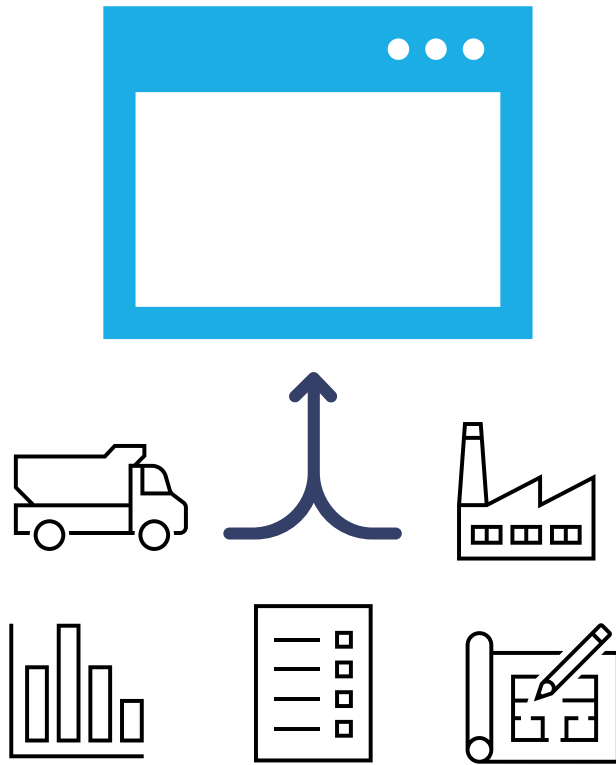
- **Purpose:** Ensure safety of GCS sites by monitoring seismicity
- **Existing requirements:**
 - Only required at the discretion of the U.S. EPA director
 - Maximum 50 years after injection ends
- **Staff concept developed in coordination with Geologic Survey:**
 - Require seismic monitoring across the storage complex and pressure front for all projects
 - Required for at least 100 years after injection ends
 - Seismic risk assessment, emergency and remedial response plan, traffic light system of thresholds – including no more injection under specific conditions

Surface and Near Surface CO₂ Monitoring

- **Purpose:** Ensure GCS sites monitor for CO₂ leakage across the storage complex
- **Existing Requirements:** Only required at the discretion of the U.S. EPA director
- **Staff concept:**
 - Continuous CO₂ monitoring
 - Focused on potential surface leakage pathways
 - Prompt mitigation if leakage is detected
 - Low concentration leaks unlike high concentrations of CO₂ conveyed through pipeline



Public Transparency



- **Purpose:** Increase public access to CCUS/CDR project information
- **Existing Requirements:** Information scattered across agencies (U.S. EPA, water boards, local air districts, CEQA lead agency, etc.)
- **Staff concept:**
 - Operators maintain a project webpage as a one-stop-shop for regulatory and permitting documents for each project, links would be on CARB website for each project page
 - Disclose monitoring and mitigation activities
 - Compliance status and project information

Integration into CARB Programs

- **Purpose:** Support pathways for operators to voluntarily deploy carbon management projects
- **Existing integration:** DAC and CCS under CARB's Low Carbon Fuel Standard (LCFS)
- **Staff concept:**
 - Identifying ways to further integrate CDR (DAC, NBS, mCDR, etc.) and CCUS strategies into Cap-and-Invest
 - Projects would be subject to long-standing complementary policy to support compliance across state programs



Cap-and-Invest

LCFS

CCUS
Program

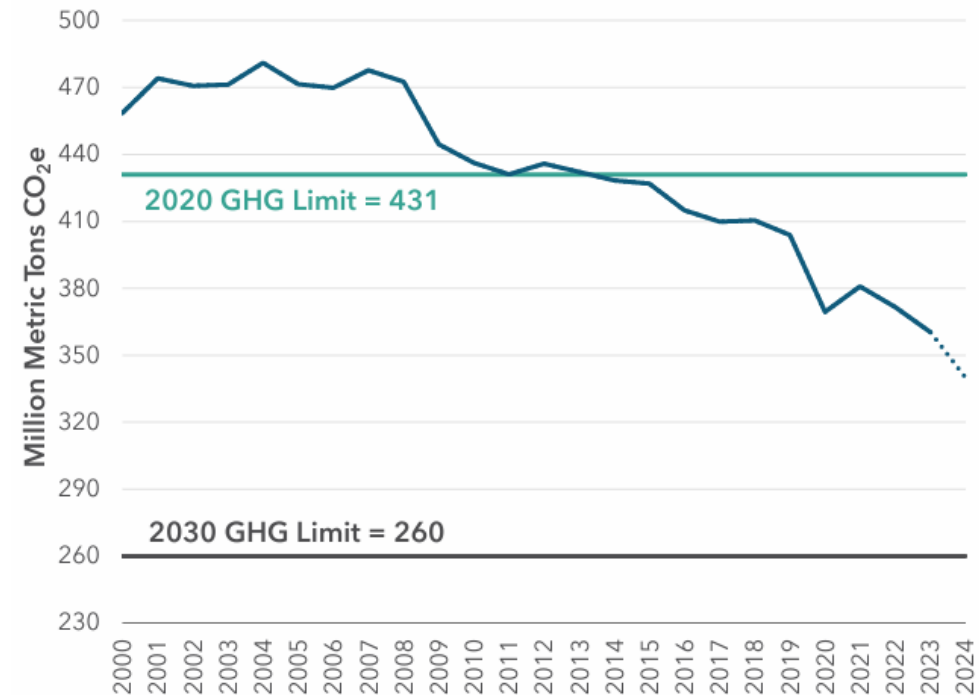
Key Implementation Considerations

Tracking Progress Towards State Climate Targets

(e) In tracking progress toward the state's climate targets, the state board shall prevent the double counting of emissions reductions associated with utilizing carbon dioxide that is captured or removed from the atmosphere. – SB 905

Annual AB 32 GHG Inventory

- Aligned with international accounting methods
- Primary data source – Mandatory GHG Reporting Program
- Supplemented by other state and federal agency data
- If CCUS/DAC is used for compliance across more than one state program, it is never double counted in the inventory



Oversight and Enforcement

- Projects would be subject to oversight and enforcement under existing regulations at the federal, state, and local level
- New regulations promulgated under SB 905 and related statutes would be subject to existing applicable oversight and enforcement authority
- Any recognition of CCUS/DAC for compliance purposes would be subject to additional oversight and enforcement under any applicable greenhouse gas reduction program
- SB 905 preserves existing health and public safety protections

Next Steps

- Continued engagement with:
 - Environmental Justice Advisory Committee
 - Sister agencies
 - Industry
 - Interested stakeholders
- Release of Proposed Rulemaking – **Fall 2026**
- Board Consideration of Rulemaking – **Winter 2026**