



# Energy Council

September 15, 2023

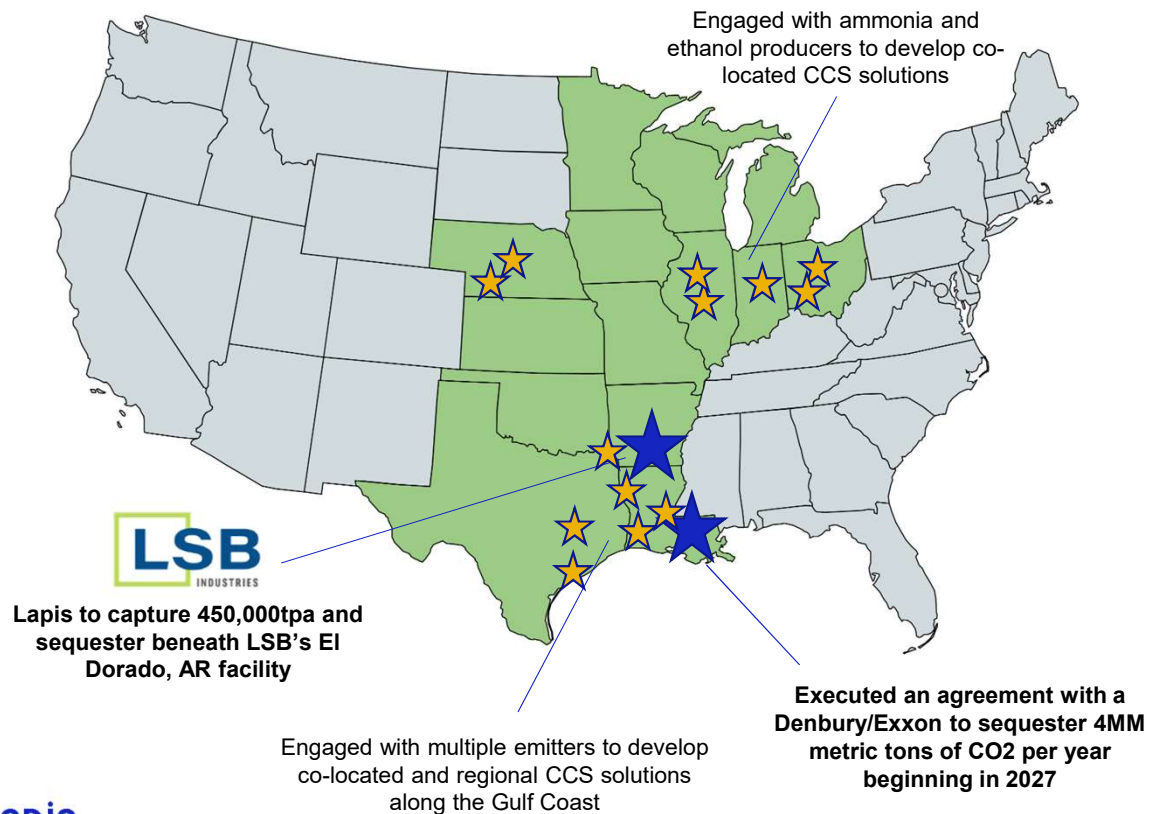
Reg Manhas

CEO, Lapis Energy

# Lapis Energy

Our purpose is enabling industrial decarbonization through CCS

## Current Business Execution



## Lapis value proposition

- World class subsurface technical team
- Up to 100% capital commitment to FID
- Expertise in CCS and energy transition
- Proven capital large scale complex project delivery
- Unburdened by fluctuations in oil price
- Client focused decarbonization
- Cresta financial sponsorship

# Carbon Capture & Storage

A primer on how it works and what the process requires



Lapis' process for Carbon Capture and Storage (CCS) provides single-point responsibility for the management of carbon dioxide emissions

## Capture

Pre and post combustion emissions

## Transport

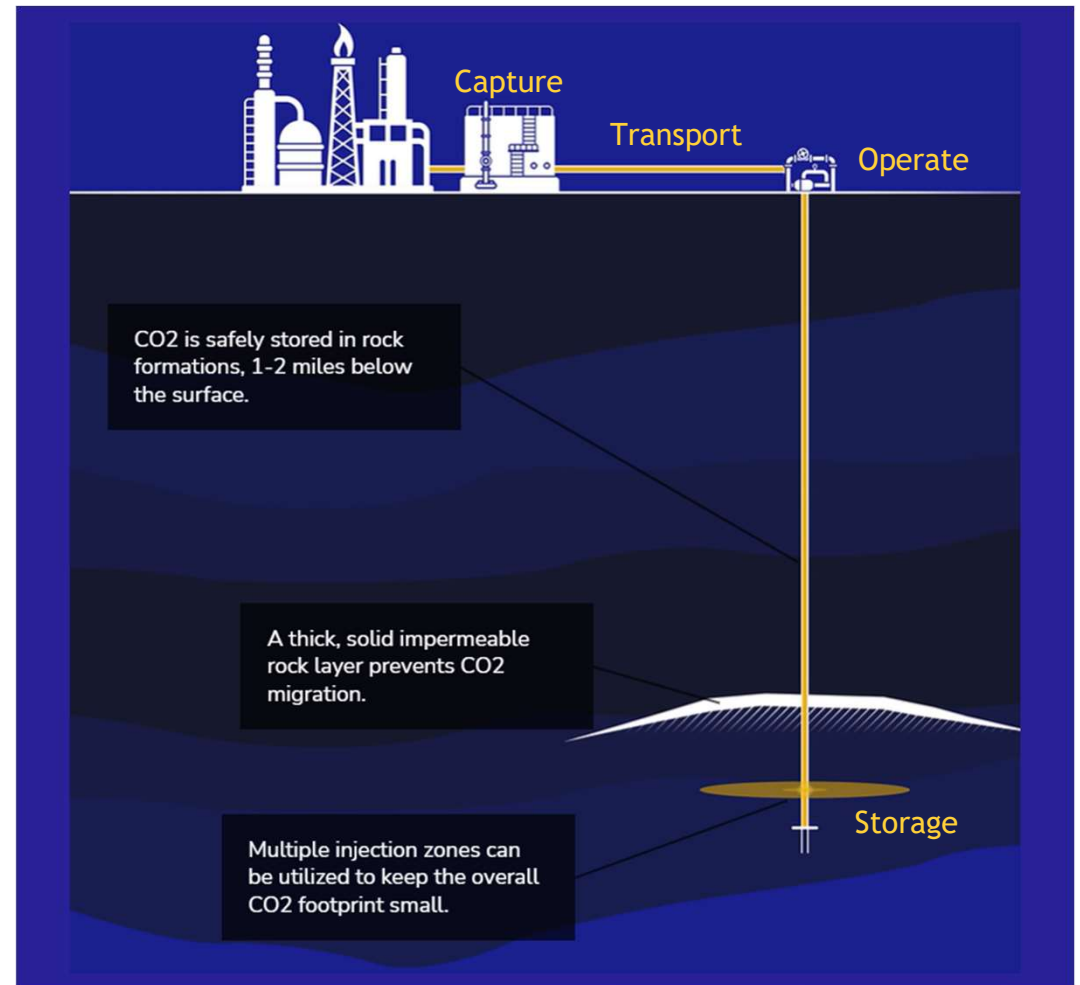
Minimizing pipeline distances

## Storage

Using our subsurface knowledge to minimize plume size

## Operated by Lapis

Fully funded, 20+year projects with full post-injection site care



# Arkansas LSB carbon sequestration project - 450,000tpa

20 years storage solution creates significant value for partnership



*“We are very excited to partner with Lapis and take our first step to becoming a supplier of low carbon or ‘Blue Ammonia’ -- allowing us to participate in what we believe will become a large future market” stated Mark Behrman, President, and Chief Executive Officer of LSB Industries.*

- Class VI permit submitted to EPA Region 6 office in February 2023; Received confirmation of administrative completeness from EPA within three weeks
- Early engagement with local, regional, and state stakeholders



## Benefits for El Dorado and Arkansas



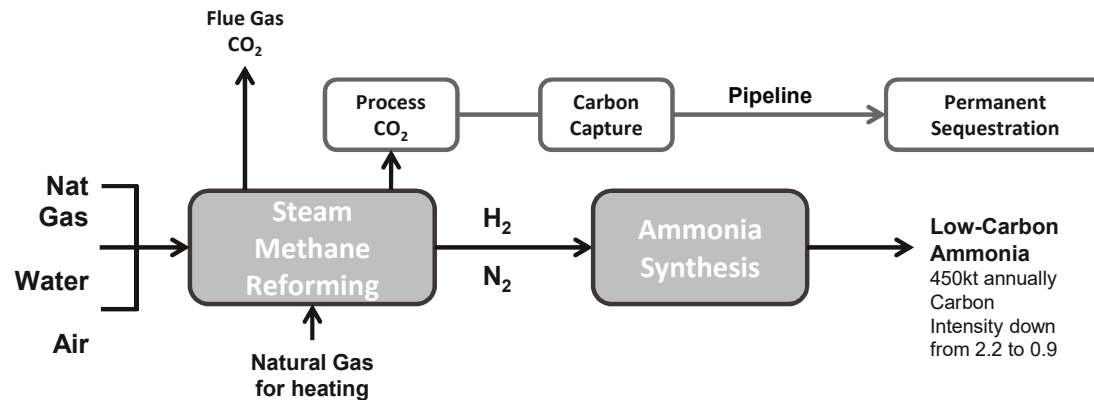
Opportunity for State and El Dorado to demonstrate global leadership in a new & growing industry

Enabling local industry to maintain competitiveness in marketing and sales of “blue ammonia”

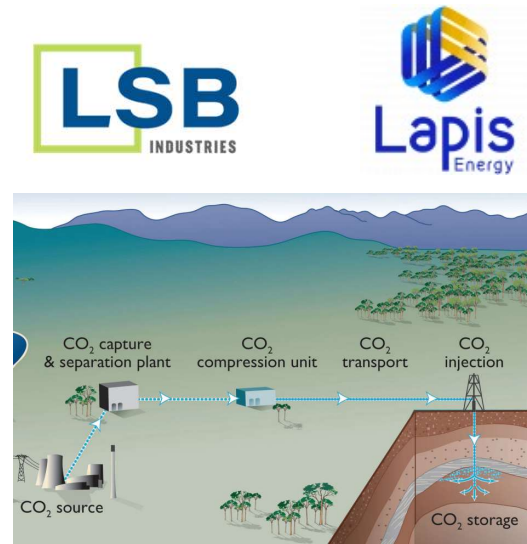


- Capital budget of complete project in excess of \$50 million
- Significant local contractor needs re: onsite construction, installation and operation
- Increased local tax base from higher employment and hotel/restaurant usage during construction
- Local pore space lease payments (signing bonuses and CO2 injection payments)

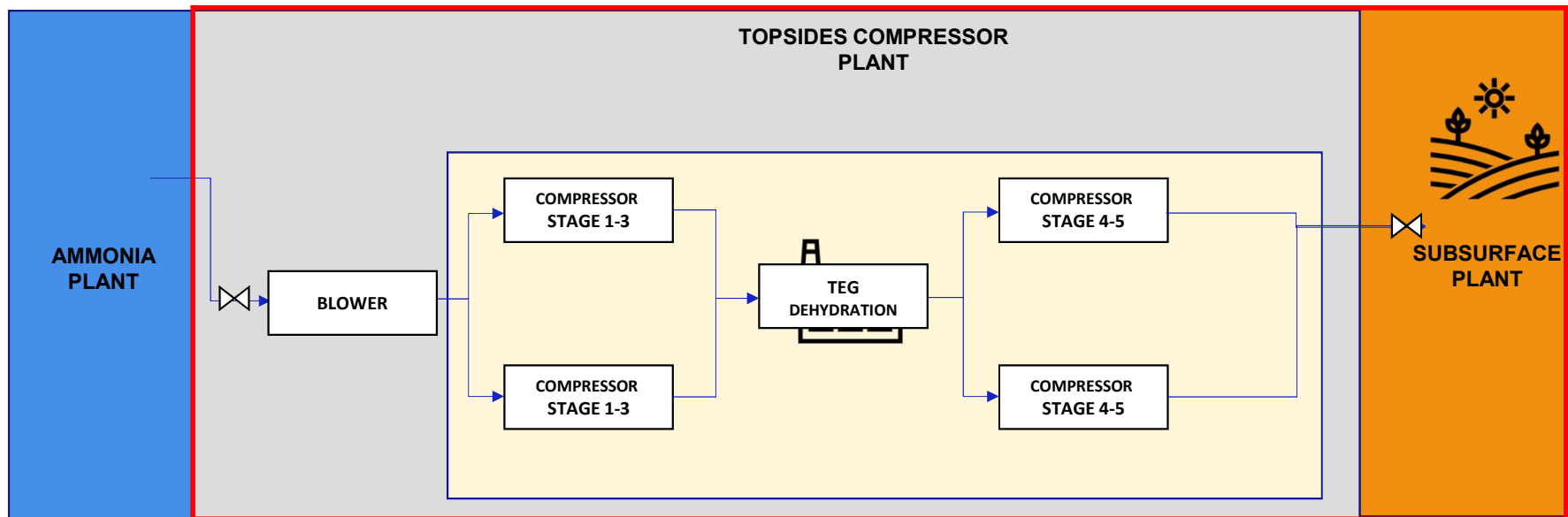
# Producing low carbon ammonia at El Dorado



- Agreement with Lapis Energy to develop the CO<sub>2</sub> capture and sequestration (CCS) project
- Project will receive 45Q tax credits of \$85 per metric ton of CO<sub>2</sub> sequestered for the first 12 years of operation
- Project operations expected to begin by mid 2025, subject to Class VI EPA permitting
- Permanently sequestering >450k metric tons of CO<sub>2</sub> in saline formations directly under the facility. The sequestered CO<sub>2</sub> will reduce the company's scope 1 GHG emissions by ~25% from current levels

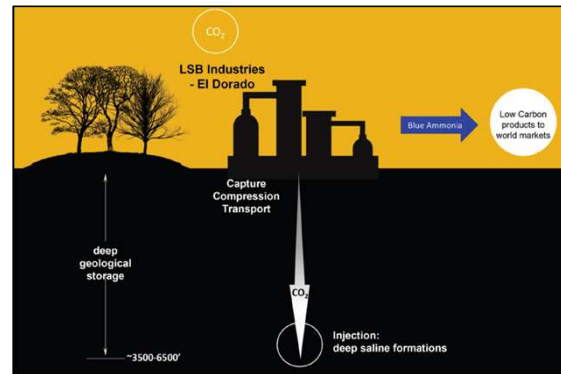
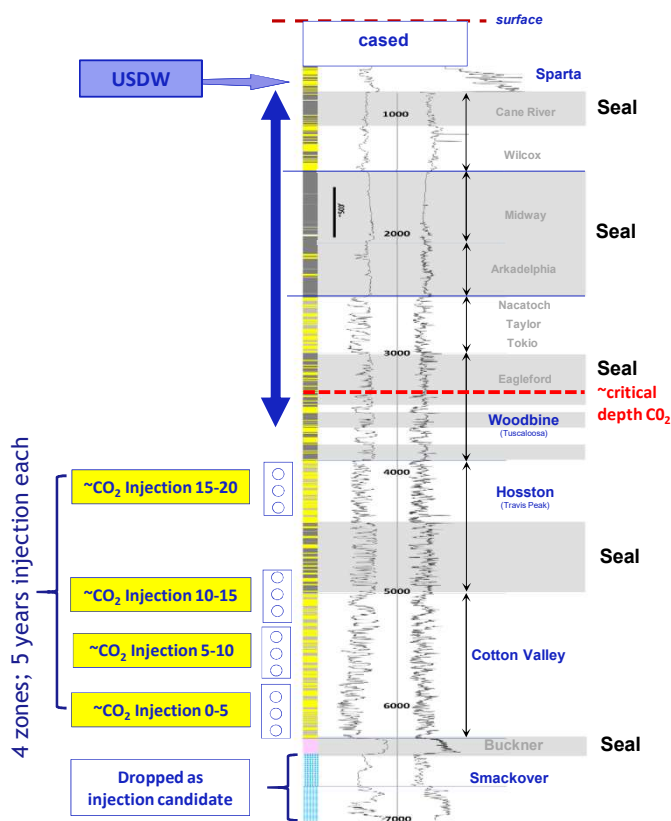


# Topsides Plant



# How is CO2 captured and stored?

Injected into deep reservoirs, permanently containing the CO<sub>2</sub> and avoiding atmospheric release



- The reservoirs holding the CO<sub>2</sub> are approximately 3500-6500 ft below the surface and 3000 ft below the area drinking water supply.
- A 1000 ft thick, impermeable layer of shale separates the injection zone and the area drinking water and prevents any upward migration of CO<sub>2</sub>
- A stringent set of safety requirements will need to be satisfied before the U.S. Environmental Protection Agency (EPA) will give permission to start CO<sub>2</sub> injection
- CO<sub>2</sub> injection pressures will be very carefully monitored by monitoring wells installed to further ensure integrity
- Increasing the number of possible injection zones will reduce the plume size significantly, and thus the need for private pore space rights



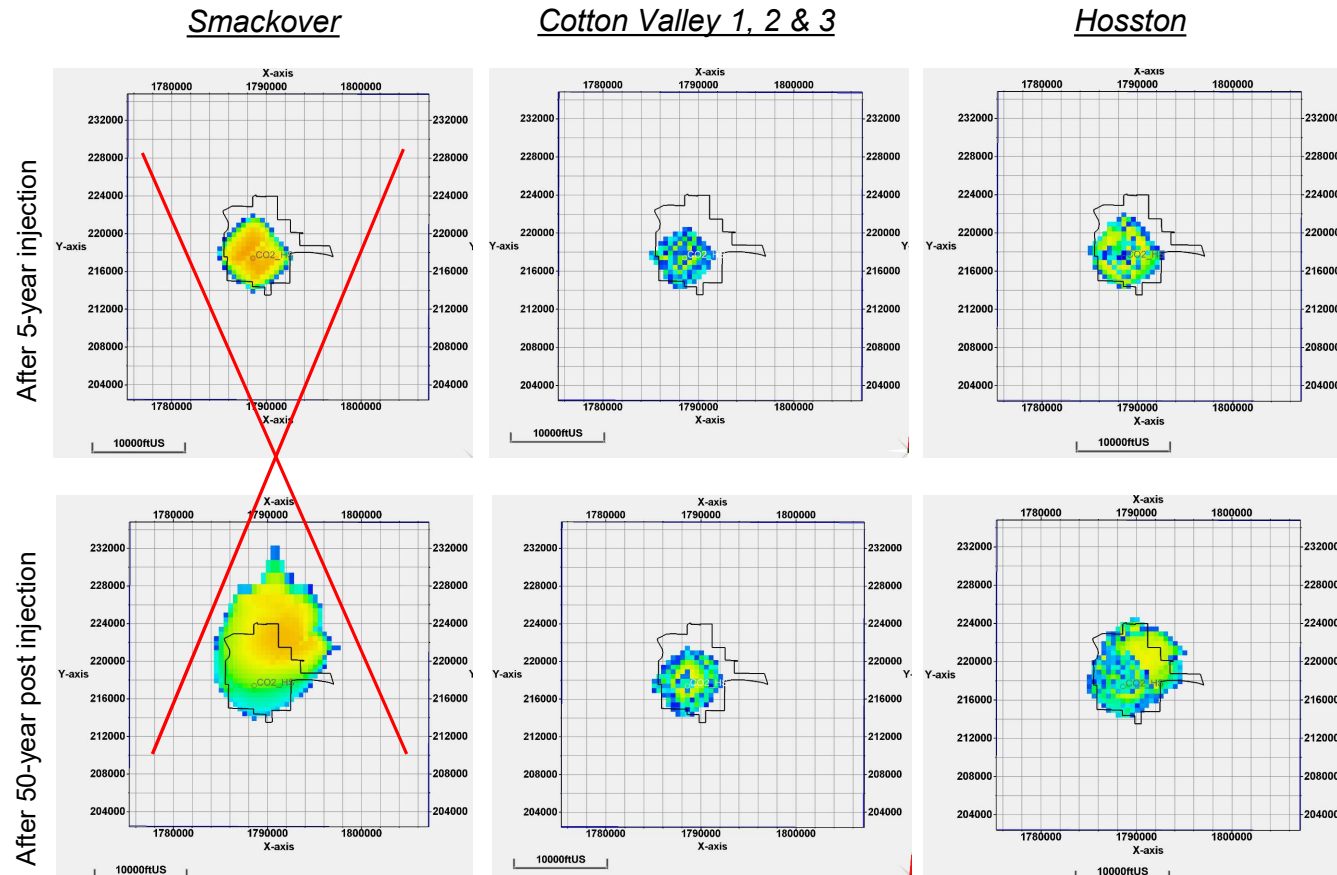
# Managing the CO2 plume for 50 years post injection



## Plume models - base case 5-year injection per zone

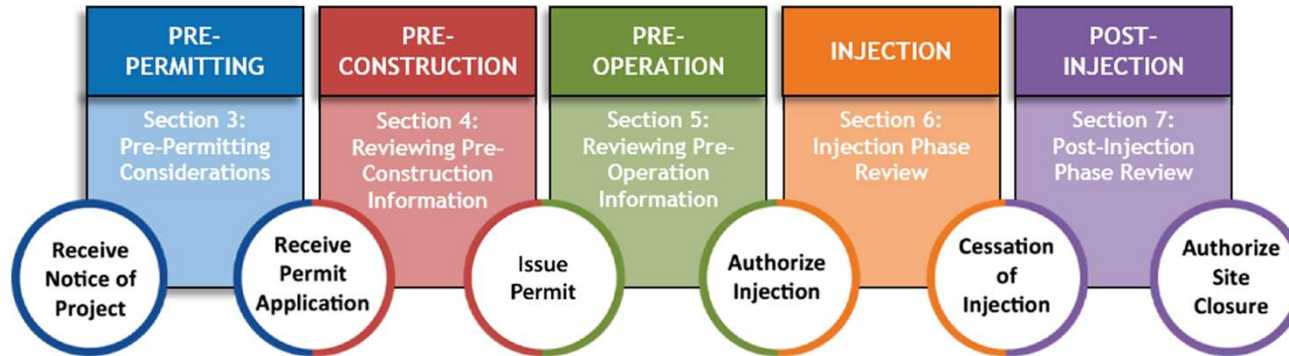
- Models include dissolution, but not hysteresis (models after inclusion of injection well core data will probably reduce further)
- 4 injection intervals provide redundancy if one or two zones are not connected to enough pore volume, or the plume expands too aggressively
- Consider injecting longer (5-10 years) in some of the Cotton Valley intervals if zone is well connected and permitted volumes per zone have need been reached yet
- Smackover has a large plume size because of high permeabilities, salinities & Kv/Kh - **excluded**

	simulation phasing									
	Av. 5 year injection per zone				50-year post injection					
Completion	5	5	5	5	10	10	10	10	10	10
Lower Hosston										
Cotton Valley 3										
Cotton Valley 2										
Cotton Valley 1										



# EPA class VI approval process

Close involvement of the EPA in all aspects of the CCUS project from inception to closure



Class VI Permitting Preparations  
Permit Applicant Engagement  
Communication and Outreach  
Other Pre-Permitting Considerations

## Reviewing the Permit Application

- Site Characterization
- AoR and Corrective Action
- Financial Responsibility
- Injection Well Construction
- Pre-Operational Testing
- Proposed Operating Conditions
- Testing and Monitoring
- Injection Well Plugging
- PISC and Site Closure
- Emergency and Remedial Response
- Injection Depth Waivers
- Aquifer Exemption Expansions

## Preparing the Permit

Planning for the Pre-Operation Review

## Evaluation of Pre-Operational Information

- Site Characterization
- AoR and Corrective Action
- Financial Responsibility
- Injection Well Construction
- Operating Conditions
- Testing and Monitoring
- Injection Well Plugging
- PISC and Site Closure
- Emergency and Remedial Response
- Injection Depth Waivers

## Authorizing Injection

Planning for the Injection Phase Review

Testing and Monitoring  
AoR Reevaluations  
Project Plan Updates  
Financial Responsibility Updates  
Occasional Injection-Phase Reviews  
Planning for the Post-Injection Phase

Injection Well Plugging  
Reviewing PISC Information  
AoR Reevaluations  
Project Plan Updates  
Emergency and Remedial Response  
Non-Endangerment Demonstrations  
Site Closure

# Public Participation - Project Goals



## Goals:

- Determine the level of public interest and concerns in the permitting and operation of the Class VI well
- Providing early, effective and inclusive public involvement in the permitting process
- Incorporate environmental justice into our public outreach efforts

## Ensure completeness of message:

- Monitoring of any public comment sessions, where possible
- Incorporating feedback from civic, industry, community and environmental groups
- Established project website, email and contact number

## Testing Communication Effectiveness:

- Tracking requests for information
- Surveys at community events
- Monitoring project email and phone number
- Revise and refine public participation plan and messaging based on stakeholder and community feedback

# Phase 1

Q3 and Q4 2023



## Key Stakeholders:

- Government leaders, civic groups, industry, landowners, labor groups within El Dorado and surrounding area (Union County) including the Union County Water Conservation Board

## Primary Message:

- Lapis and LSB have the expertise to deliver the project
- Responsible project management (local trusted plant representatives)
- Focus on proactive and transparent engagement

## Secondary Message:

- Education on the geologic sequestration industry
- Describe geologic sequestration technology
- CO2 injection safety and protection of the USDW
- Local economic and health benefits
- General timeline of the work

# Phase 1

Q3 and Q4 2023



## Communication Methods:

- LSB and Lapis participation in and sponsorship of local events - outdoor expo, LGPA golf tournament, music festival
  - Media coverage includes TV (for events)
  - Community reach is up to 7000 people (music festival) from Union county and attracts 400-500 local volunteers (LGPA golf tournament)
- Public announcements of Class VI permitting actions through media channels
- Public meetings
  - Community townhalls
  - Chemical industry meeting (El Dorado Chamber of Commerce)
  - Union County Water Board
  - Kiwanis/Rotary/Civitan
  - City Council
  - Union County Quorum Court
- Direct outreach to stakeholders (landowners) & use of social media (LinkedIn)

## Communication Materials:

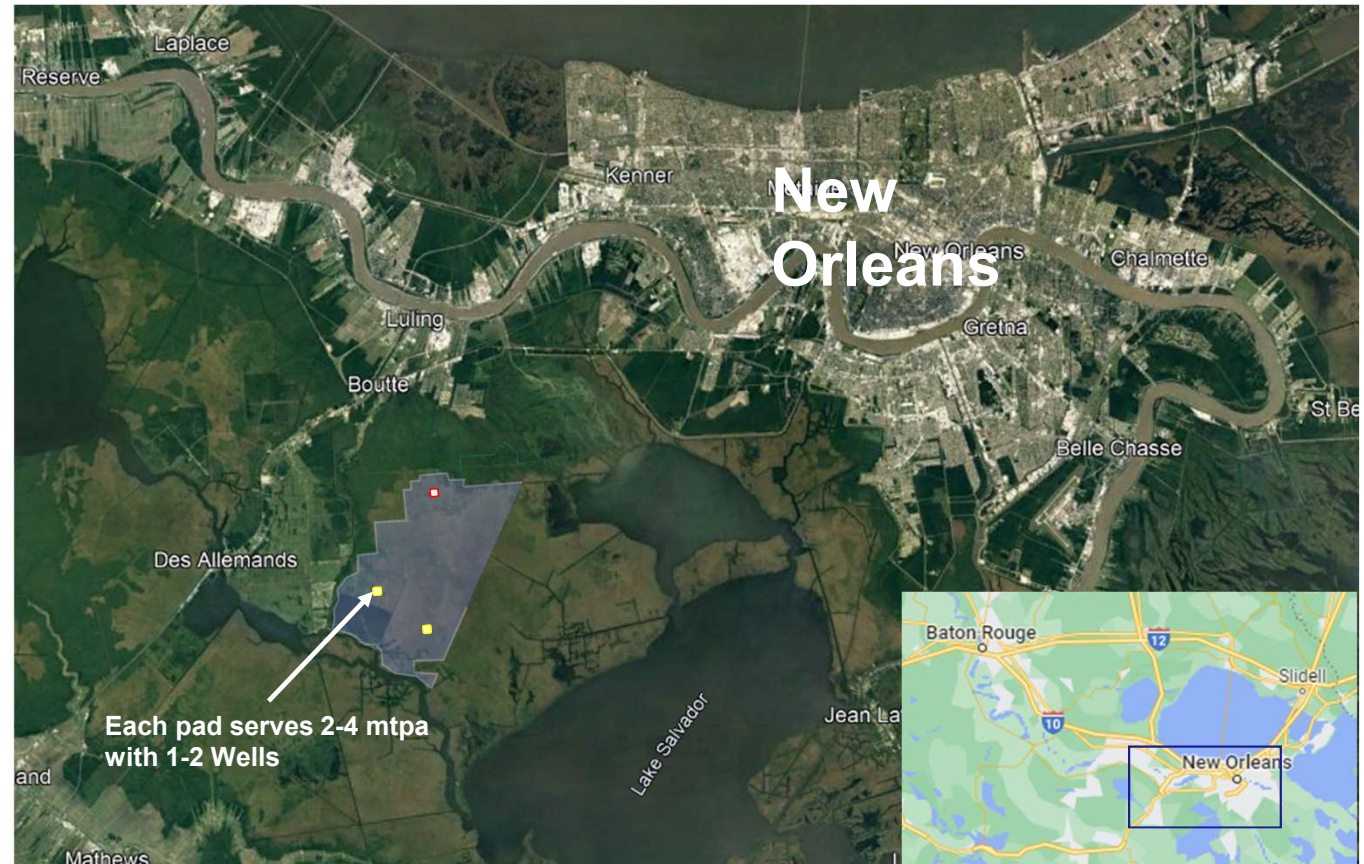
- Lapis brochure and fact sheets
- Press releases
- Illustration of geologic sequestration
- Links provided to website and project information

# Project Libra: 14,000 acres of Pore Space Leased

Project delivers a local solution which offers a commercially attractive advantage



- Executed agreement for 4MTPA into facility within 12 months of lease start-up
- Operational Startup in 2027
- Multiple wells currently in Class VI permitting process
- Lapis planning project redundancy with several pads to guarantee storage and operational continuity
- Currently negotiating additional pore space in greater region



## Recent Developments

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- Louisiana State Class VI primacy process nearing completion?
- Arkansas legislature passed amendments to the Gas Storage Act, giving Arkansas Energy & Environment authority to regulate carbon sequestration and to apply for Class VI primacy
- Texas Class VI primacy application in process
- DOE Hydrogen Hub decision coming this month? Lapis and LSB are active participants in the “HALO” Hub (Hydrogen Arkansas Louisiana Oklahoma)
- Midwest CO2 pipeline projects (Navigator, Summit) suffering from stakeholder pushback
- EPA has just released “Environmental Justice” guidance for Class VI permitting: focus is on risk assessment, as well as early and transparent public engagement

