# Heartland Greenway

## A Navigator $CO_2$ Ventures LLC Project

www.heartlandgreenway.com

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GREENWAY

# Agenda

# About Navigator

Navigator Heartland Greenway LLC (a wholly-owned subsidiary of Navigator $CO_2$ Ventures LLC) is committed to building a more sustainable future while putting the communities and states we operate in on an accelerated path toward decarbonization.

**Matt Vining**
CEO

**David Giles**
COO

**Laura McGlothlin**
EVP & CCO

**Stephen Lee**
EVP, Engineering

**Vidal Rosa**
EVP, Operations

**Jeff Allen**
EVP & CFO

**Kevin Strehlow**
EVP & General Counsel

**Elizabeth Burns-Thompson**
VP, Government & Public Affairs

**Monica Howard**
Senior Director,
Environmental & Regulatory

**Ann Welshans**
Director, Right-of-Way

## Navigator's Track Record

- $1.3B Capital Deployed
- >1,000 Miles of Pipeline Built Since 2012
- 215 Years of Combined Experience
- Strong, Proven Partnership with BlackRock
- Third Midstream Infrastructure Venture

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# Project Overview

- ~1,300 miles of new liquid $CO_2$ pipeline
  - ~900 miles in Iowa
  - 36 Iowa counties
- Permanent storage in Illinois
- Up to 15 million metric tons/year
- ~20 receipt points: ethanol and fertilizer processors
  - Commercially anchored by Valero
- Financially backed by BlackRock

**One of the most economical and actionable approaches to carbon capture and storage.**

# What is Carbon Capture and Storage?


## PRODUCTION

$CO_2$ is produced as a byproduct of the manufacturing process

Industrial processes are responsible for ~25% of energy-related $CO_2$ emissions

## CAPTURE

$CO_2$ is captured, dehydrated, and compressed into a liquid using equipment that can be added onto the facility without interrupting normal manufacturing operations

## TRANSPORTATION

Liquid $CO_2$ is gathered from connected facilities and transported in a steel pipeline to the storage site

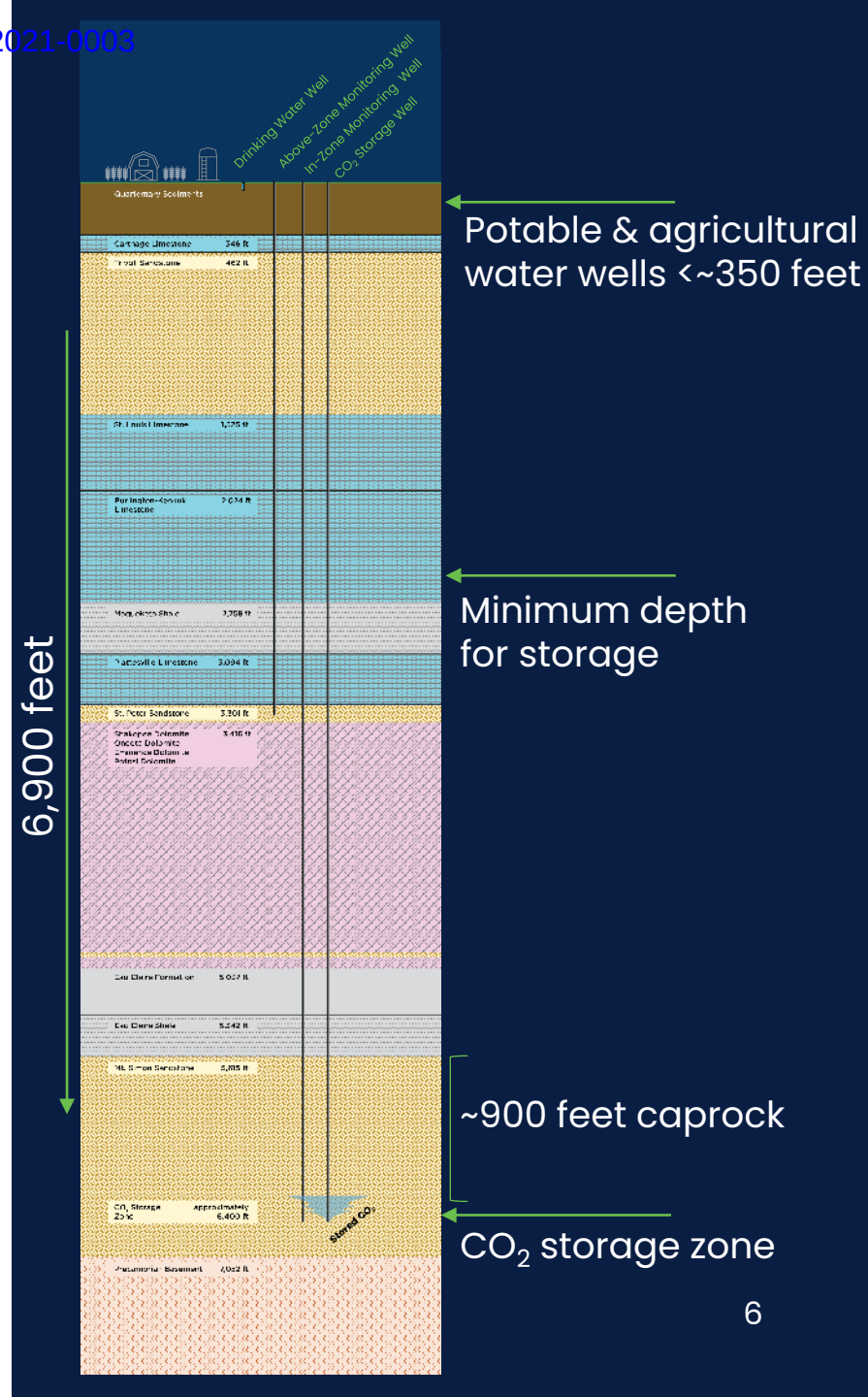
Pipelines are amongst the safest, most environmentally friendly and reliable methods of transporting the energy we use today

## STORAGE

$CO_2$ is injected more than a mile below the ground, far below water resources used by communities and farms, for permanent storage

# Storage Footprint

- **Industry leaders** helping develop the storage field in Central Illinois, where similar projects are safely operating and planned because of region's favorable geological properties
- Extensive geologic tests confirm the Mt. Simon sandstone formation will allow for **safe, secure, and permanent $CO_2$ storage**
- Pore space will cover approximately **30,000 acres** and include construction of **five injection wells and 15 monitoring wells**
- Once operational, non-stop monitoring will ensure the **long-term safety and integrity** of the storage field



# Why CCS?

## $CO_2$ Emissions

- Our **customers** produce some of the purest quality $CO_2$, making them great partners for CCS
- We capture $CO_2$ that otherwise would've been emitted and store it **safely and permanently**

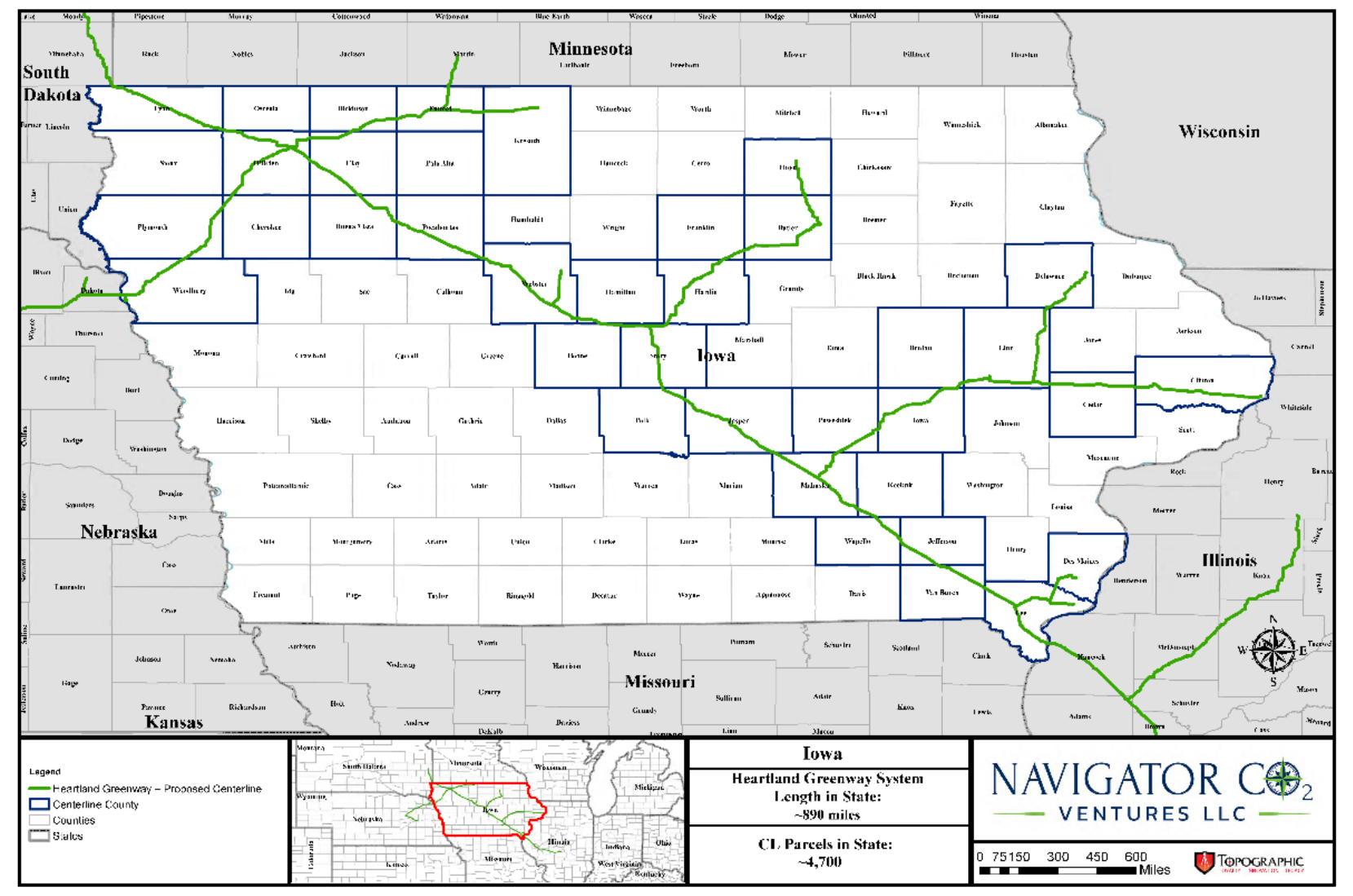
## Commercial Model

- A simple fee-based common carrier model
- Economic incentives for emissions reductions remain with your **local plants**:
  - 45Q Tax Credit
  - Low carbon fuel programs
  - Emission offsets

## Unique Geology

- Only certain areas across the corn belt have the geology necessary for this type of storage
- The pipeline model is best suited to connect our **partner facilities** with these areas that have storage capacity

# Iowa Proposed Project Map



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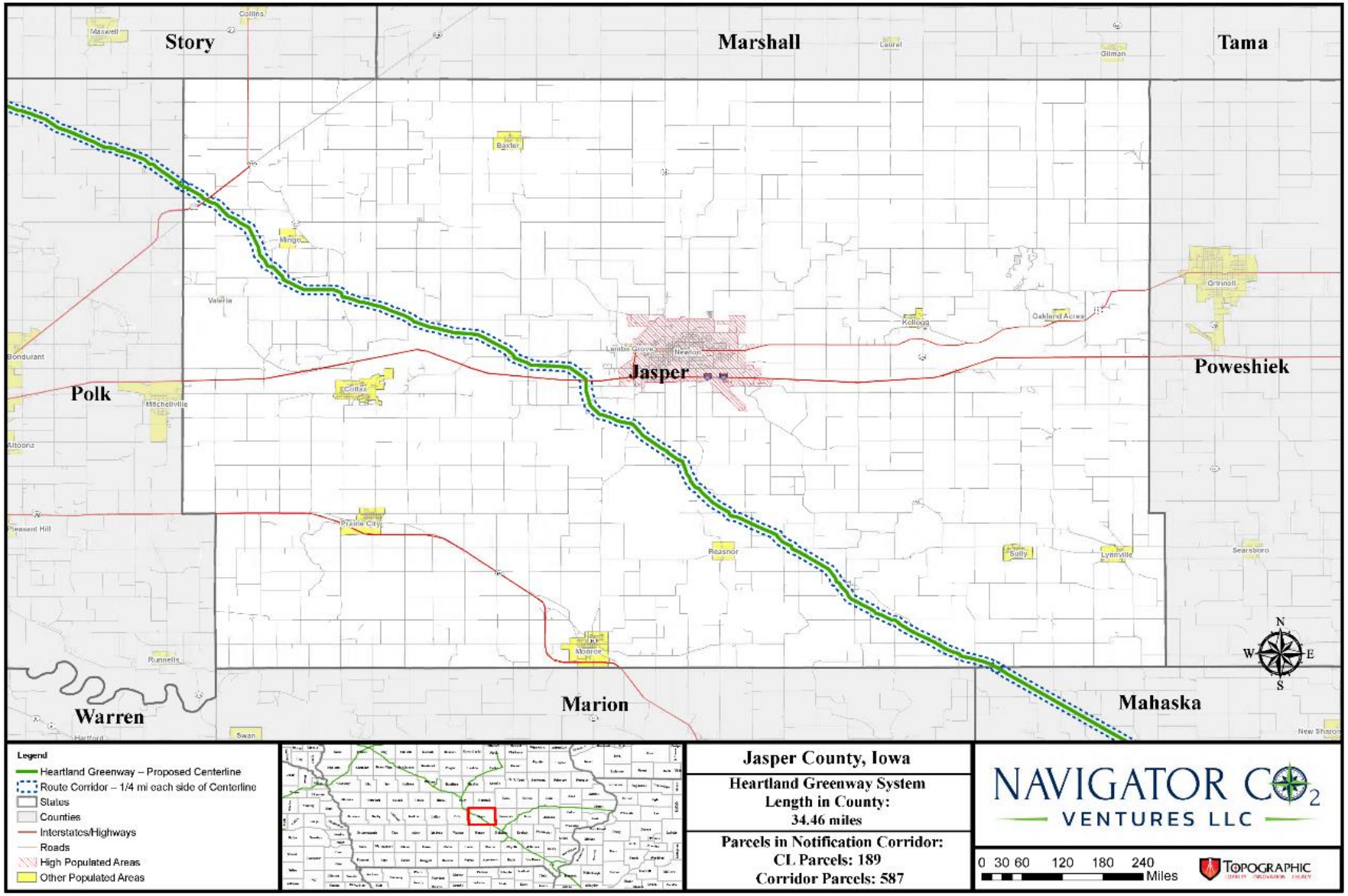


# Jasper County Proposed Route

# Economic Benefits of Heartland Greenway

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**$1.6 Billion**
investment in the state of Iowa

| | Property Tax Revenue | Permanent Jobs | Construction Jobs |
|---|---|---|---|
| **Iowa Totals** | **~$25M** | **50** | **5,000** |
| **Project Totals** | **~$43M** | **80** | **8,000** |

# Environmental Benefits

The carbon offset of the Heartland Greenway once fully expanded is equivalent to:

GHG emissions from
**3.2 Million Vehicles**
driven annually

$CO_2$ emissions from
**34.7 Million**
barrels of oil consumed


**15 Million**
metric tons of $CO_2$
captured annually

Annual $CO_2$ emissions from
**1.8 Million**
homes' energy use

Annual carbon stored by
**18.3 Million Acres**
of U.S. forests

*Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

# Anticipated Projected Timeline

**October 2020 – October 2021**

Route development and optimization

**October 2021 – February 2022**

Landowner outreach for survey authorization

**November 2021 – January 2022**

IUB Informational Meetings

**Q2 2022 – Q3 2022**

Constructability and environmental surveys

**Q2 2022 – Q1 2023**

Route adjustments from landowners and stakeholder feedback, ROW easement acquisition

**May 2022**

Projected IUB petition file date

**Q3 2022 – Q4 2022**

Federal permit applications and inter-agency consultations (USACE/USFWS/SHPO)

**Second Half 2023**

Anticipated receipt of State and Federal Permits

**First Half 2024**

Construction commences

**Q4 2024 – Q2 2025**

Phased start up and commissioning

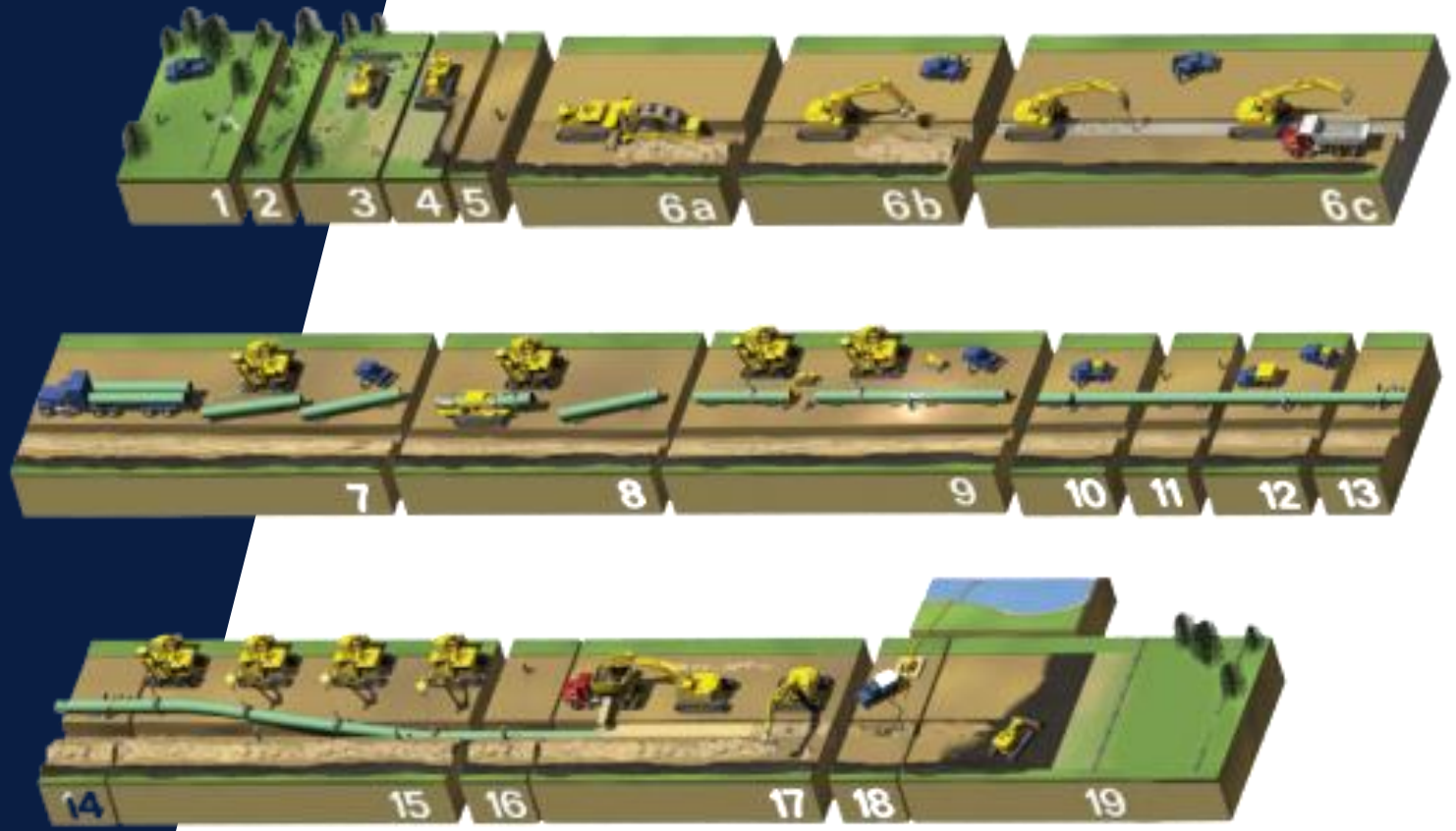
# Project Development and Execution Process

**Planning** begins years before any construction commences by determining commercial need and preliminary system options

**Preparation and Permitting**
Landowners and regulator engagement, robust analyses, design, permitting, and ROW acquisition

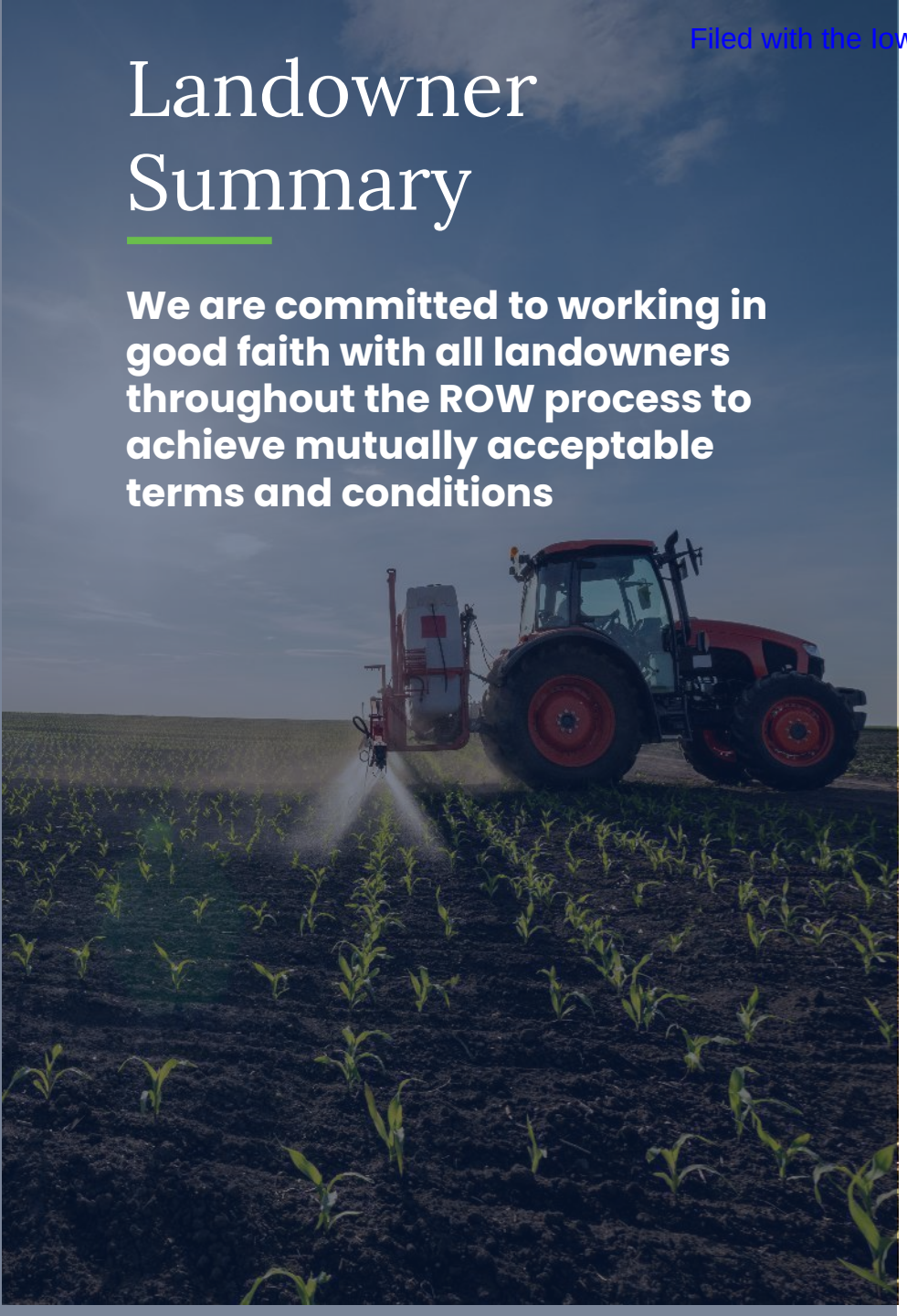
**Construction**
Survey, clearing, welding, x-ray, trenching, drain tile and irrigation measures, backfilling, erosion control installation

**Inspection and Restoration**
Third party and stakeholder inspection, topsoil replacement, final restoration



# Landowner Summary

**We are committed to working in good faith with all landowners throughout the ROW process to achieve mutually acceptable terms and conditions**



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## Right-of-Way (ROW) Process Explained:

- Mailed landowner information packet
- Phone call from ROW agents/company representatives, who are responsible for:
  - Answering all landowner questions to the best of our ability
  - Gathering and accounting for information specific to each landowner, tenant, tract
  - Seeking voluntary survey permissions
- Mailed notification of surveys
  - Conduct surveys in a manner to avoid/minimize impacts; repair, replace, or compensate for damages
- Utilize detailed market study to make easement offers based on regional, county, and township market values
- Account for unique landowner and tenant circumstances

# Easement Options

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## Easement Configurations

- Expressly for $CO_2$ transportation
- Non-exclusive permanent easement
- 50′ Permanent
- 50′–75′ Temporary construction corridor

## Easement Valuation

- Utilizing local/regional real estate market studies
- Negotiate terms of easement with an option
- 20% Paid after signing
- 80% Paid prior to construction

## *Cancelation Terms

(IA Code 479B.24)

- 7 business days to cancel after signed
- Form provided to all landowners
- Written, certified letter from date of signature

# Land Use Compensation

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## Local/Regional Agricultural Market Studies

- Utilize USDA National Agricultural Statistics Services data
- Identify crop types and percentage of land used for crops
- Account for CSR2 values for tillable acres and soil quality/productivity
- Current/historical crop yields
- Work with each landowner and tenant to address unique farming/ranching operations

## 3-Year Yield Loss Compensation Calculation

- Year 1 - **100% Yield**
- Year 2 – **80% Yield**
- Year 3 – **60% Yield**

## Paid Prior to Construction

# Drain Tile Management

We understand and appreciate the importance of maintaining the integrity of drain tile systems and are committed to mitigating the impacts to agricultural fields across the project.

## 01 Locate and Identify

- Locate drain tile and identify type of system
- Landowner discussions
- Local/Regional subject matter expert
- Design 1'–2' of separation from $CO_2$ pipeline

## 02 Proactive Solutions

- Install headers pre-construction to maintain field drainage
- Minimize damage to tile during construction
- Third party agricultural and county monitors to ensure compliance

## 03 Restore to Previous Condition

- Use local contractor or landowner's choice
- Remove headers, reconnect to original system, restore gradient and alignment
- Tile disturbed or damaged will be repaired and tied back into the system

# Construction Mitigation & Restoration

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- Minimize impacts from surveys and construction
- Repair, replace, or compensate for all damages
- Protect and restore all affected lands
- Account for the unique conditions of regional landscapes and land use practices
- Retain specialized restoration companies to develop and execute construction mitigation and restoration plan
- Topsoil stripping, segregation, protection, and decompaction
- Restore land use and production as quickly as practical
- Implement NRCS recommendations and landowner preferences
- Address each landowner's specific requirements from easement documents
- Robust monitoring and inspection program, 3rd party and county inspection

**We are committed to ensuring impacts are temporary and returning the land to its pre-construction conditions or better**

# Pipeline Specifications

- **Design**: steel pipe expressly for liquid $CO_2$
- **Federal Regulation**: design, construct, operate to meet or exceed 49 CFR Part 195
- **Normal Operating Pressure**: 1,300 -2,100 psig (MOP by design: 2,200 psig or ANSI 900)
- **Pipe Depth**: nominal 5', 18-24" separation from existing lines/utilities
- **Pipe Diameter**: 6" – 24" outside diameter

- **Operating Temperature**: Pipeline: 40-80°F
- **Mainline Valves**: nominal 30' x 70', strategically located
- **Booster Stations**: 3-4, 10-acre mainline booster stations, location TBD

# Pipeline Safety and Operations

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## Operational Philosophy

- 24/7 remote monitoring
- SCADA analyzing pressure, temperature, flow rate
- Redundant communications to avoid outages
- Cathodic protection equipment and monitoring

## Pre-Commissioning

- Hydrostatic testing above max operating pressure
- Coordination with local first responders
- System-wide pre-startup and safety review

## Damage Prevention & Public Awareness

- Weekly aerial surveillance, weather permitting
- #811 public awareness and damage prevention
- Meetings, training drills, and communication with local liaisons

## Maintenance & Response

- Routine pipeline testing, calibration, and inspection
- Annual desktop & biannual field response simulations
- Contract with private responders located along route

# Thank You

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NAVIGATOR $CO_2$ VENTURES LLC

## Contact Us

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