

FarmSense CSU Meeting Packet - Team Briefing

Date: February 2026

Meeting: CSU San Luis Valley Research Center Partnership

Purpose: Brief team members/stakeholders on CSU meeting and outcomes

EXECUTIVE SUMMARY

FarmSense met with CSU SLVRC to secure a Letter of Support for our CRD grant application. This partnership is critical for validating our 9-field pilot before the June 29 Water Court Trial. In exchange for CSU's validation, we provide open API access to 1-meter soil data, 4 paid internships, and co-authorship on peer-reviewed papers.

MEETING OBJECTIVES

Primary Goal

Secure Letter of Support from CSU SLVRC by February 14, 2026

Secondary Goals

Establish CSU as third-party validation partner Clarify mutual benefits and expectations
Confirm co-location for lysimeter comparison Setup data access and research collaboration framework

VISUAL SUMMARY

Strategic Timeline

This image illustrates the key phases of our deployment strategy, from initial planning to full-scale implementation. The timeline is crucial for understanding our progress and ensuring we meet critical milestones, such as the June 29 Water Court Trial.

Observation Concept

This image represents the Heavy Edge architecture, which combines physical sensors with dynamic soil mapping and satellite data to provide a comprehensive, forensic-grade view of soil moisture. The concept is central to our approach and will be validated through the CSU partnership.

PILOT OVERVIEW

What We're Deploying

FarmSense Deterministic Farming OS - A "Heavy Edge" sensor network that provides forensic-grade irrigation auditing capable of surviving Water Court cross-examination.

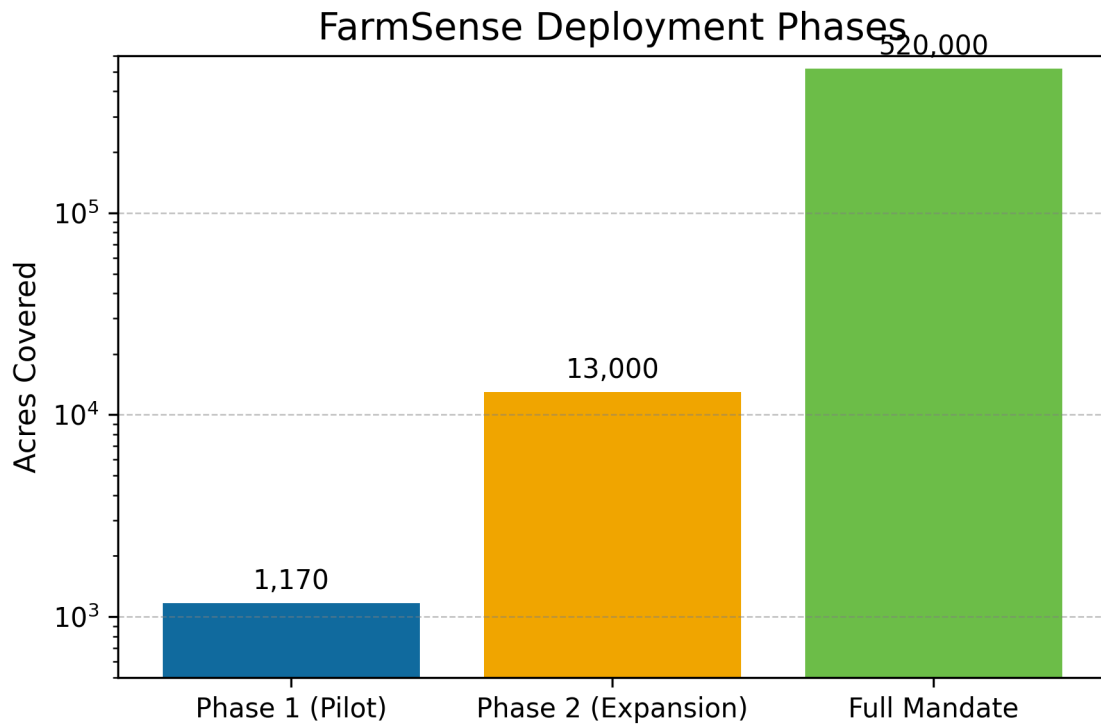


Figure 1: Strategic Timeline

Architecture

- Tier 1: Physical Sensors (Ground Truth)
 - Horizontal blankets: 18" at 12"/18" depths
 - Master vertical nails: 42" (5-depth) or 60" (7-depth)
- Tier 2: Dynamic Soil Mapping
 - Recursive Bayesian filter learns soil texture
- Tier 3: Satellite Multi-Spectral
 - Sentinel-1/2 for NDVI, NDWI, and SAR radar

Every Jetson Nano is matched with a dedicated gateway hub (LoRa + 5GHz mesh), so the per-field hardware budget covers both pieces of hardware.

Pilot Specifications

Component	Value
Fields	9 (hub-and-spoke topology)
Acreage	~1,170 acres
Sensors	~108 total
- ~99 horizontal blankets (18", 2-depth)	
- 9 master vertical nails (42" OR 60")	
Measurement points	~270
Primary compute	1× NVIDIA Jetson Nano

Component	Value
Backup Gateway hubs	Hosted cloud + cold spare on-site Each Jetson Nano pairs with its own gateway hub (LoRa + 5GHz mesh), which increases the per-field hardware cost
Update interval	15 minutes
Spatial resolution	1-meter virtual grid

THE CSU PARTNERSHIP

What We Need from CSU

Requirement	Timeline	Status
Letter of Support	February 14, 2026	Pending
Co-location approval	April 2026	Pending
Research collaboration	Ongoing	Discussed

What CSU Receives

Benefit	Detail	Value to CSU
Data access	Open API to 1m-resolution soil moisture	Research infrastructure
Internships	2 Ag-Eng + 2 Data Science (paid)	Student development
Co-authorship	Credit on peer-reviewed papers	Academic recognition
Verification	Direct comparison to lysimeter measurements	Methodology validation

THE JUNE 29 TRIAL

Why This Date Matters

The June 29, 2026 Water Court Trial is **IMMUTABLE** - it cannot be moved or postponed. This trial will determine whether FarmSense's forensic-grade data can survive legal cross-examination regarding aquifer depletion in Subdistrict 1.

What We Must Prove

Requirement	Our Solution
Physical ground truth	Sensor residuals with SHA-256 hashing
Automated compliance	No manual data manipulation

Requirement	Our Solution
Immutable audit trail	Cryptographic signing at well-head
Third-party validation	CSU SLVRC partnership

Timeline to Trial

Date	Milestone	Status
February 14	CSU Letter of Support due	Pending this meeting
February 28	Grant award notification	Awaiting award
April 15 - May 15	Field installation (9 fields)	Planned
June 1	Full operations begin	Planned
June 29	Water Court Trial	Critical deadline

SCALING STRATEGY

Phase 1: Pilot (Spring 2026) Current Focus

- 9 fields, ~1,170 acres
- Validate forensic integrity
- Demonstrate automated compliance
- Secure Water Court acceptance

Phase 2: Expansion (Fall 2026)

- 100 fields (~13,000 acres)
- ~12 Jetson Nanos
- Distributed architecture
- Validated cost model

Phase 3: Full Mandate (2027+)

- 520,000 acres (~4,000 fields)
- ~48,000 sensors
- ~110,000 measurement points
- ~445 Jetson Nanos
- **Economic impact: \$25M-\$50M annually**

COMPETITIVE ADVANTAGE

Feature	FarmSense	Traditional Solutions
Physical residuals	2-depth + 5/7-depth sensors	Satellite-only estimates
Update frequency	15 minutes	Weekly or monthly
Spatial resolution	1-meter grid	30-meter satellite pixels
Processing	Heavy Edge (on-field)	Cloud-dependent

Feature	FarmSense	Traditional Solutions
Compliance	Automated forensic reports	Manual compilation
Failover	Triple redundancy	Single point of failure
Court admissible	Yes, forensic-grade	No, estimates only

BUDGET OVERVIEW

Grant Application (CRD)

- **Requested:** \$149,500
- **Total project value:** \$1,000,000
- **Leveraged funding:** \$850,500

Budget Allocation

Category	Amount	Purpose
Sensor fabrication	\$60,000	~108 sensors
Compute hardware	\$15,000	Jetson Nano, gateways, cold spare
Installation & labor	\$30,000	Field deployment, calibration
Data infrastructure	\$20,000	Hosted cloud, API development
Project management	\$15,000	Coordination, compliance reporting
Contingency	\$9,500	10% buffer

KEY TEAM CONTACTS

FarmSense Team

- **Lead Architect:** Jeremy Beebe
- **Email:** getfarmsense@gmail.com
- **Phone:** 7198508651
- **Role:** Technical lead, CSU relationship management

CSU SLVRC Contacts

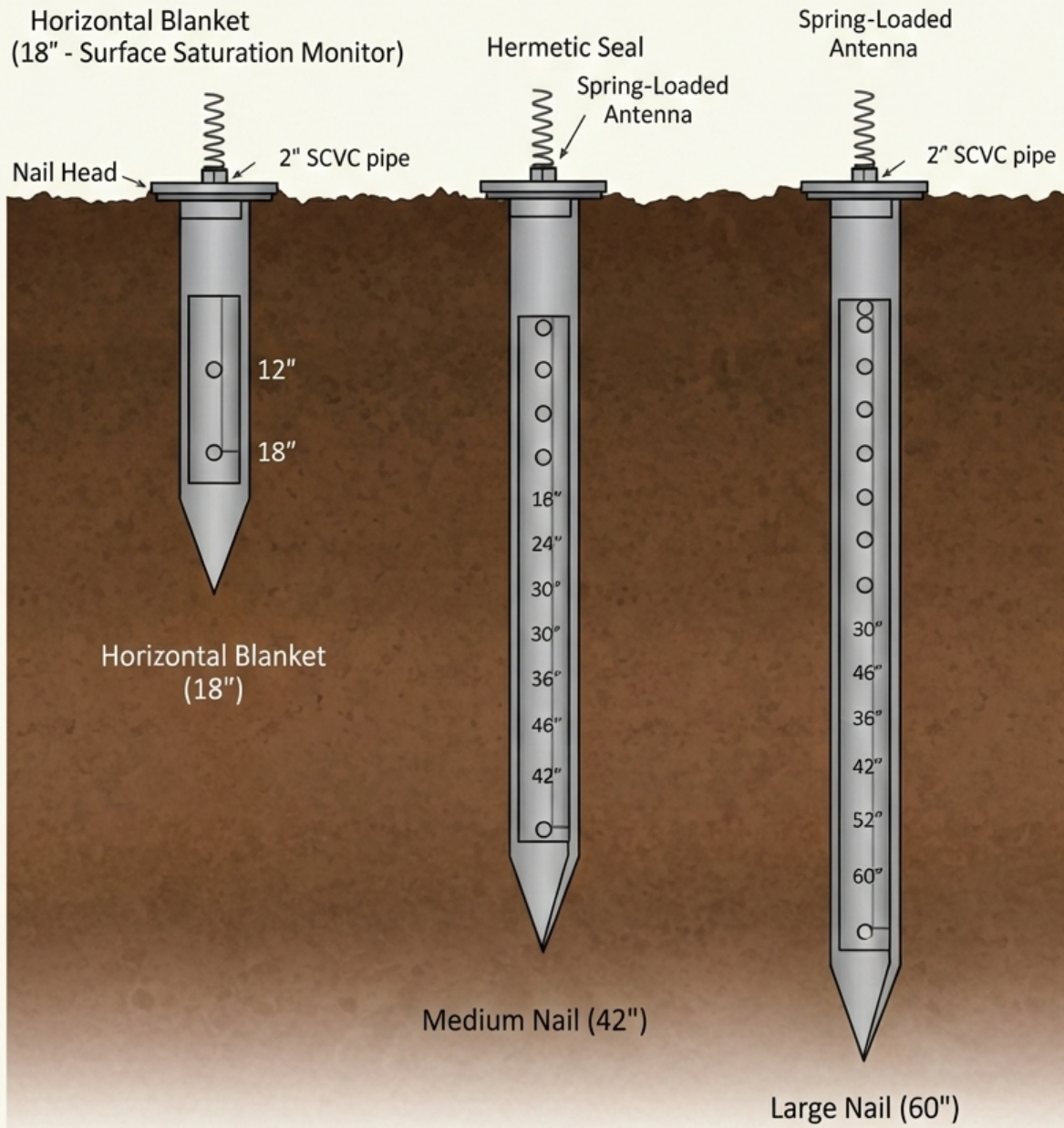
- **[Name]:** [Title]
- **Email:** [Their email]
- **Role:** [Their role]

MEETING OUTCOMES

Confirmed

- CSU understands project scope and timeline

FARMSENSE SOIL MOISTURE HARDWARE - VERTICAL STAKES



Material: 3/16\" Stainless Steel
Casing: 2-inch SCH40 PVC
Lifespan: 20+ Years

Figure 2: Observation Concept

- Partnership benefits are mutually beneficial
- Letter of Support template will be provided
- Co-location with lysimeters approved in principle

Pending

- Letter of Support signature (due February 14)
- Formal MOU for data access and co-location
- Kickoff call scheduling (target: March 1)
- Internship candidate identification

Action Items

Task	Owner	Due Date
Email LOS template	Jeremy	Today (after meeting)
Follow-up summary email	Jeremy	Within 24 hours
Schedule kickoff call	CSU	By February 20
Identify internship candidates	CSU	By March 1
Formalize data access MOU	Both	By March 15

FREQUENTLY ASKED QUESTIONS

Q: Why is CSU's Letter of Support so important?

A: Third-party validation from a respected research institution provides credibility for the grant application and demonstrates that FarmSense has been reviewed and endorsed by water research experts.

Q: What happens if CSU doesn't provide the Letter of Support?

A: We have alternative validators identified (local ag consultants, pivot manufacturers), but CSU is our preferred partner due to their research credibility and lysimeter infrastructure.

Q: Why the rush for February 14?

A: This is the CRD grant deadline. Missing this date means we lose the \$149,500 funding and cannot proceed with the pilot before the June 29 trial.

Q: What if the trial is delayed?

A: The trial date is set by the Water Court and is immovable. We must be ready with validated forensic data by June 29.

Q: How does the CSU partnership help long-term?

A: Beyond immediate grant support, CSU collaboration provides:

- Ongoing research credibility

- Peer-reviewed publications
 - Access to student talent pipeline
 - Validation infrastructure for future deployments
-

NEXT STEPS FOR TEAM

Immediate (This Week)

- Review meeting outcomes
- Confirm understanding of partnership terms
- Prepare for grant award notification (February 28)

Short-term (February - March)

- Finalize MOU with CSU
- Begin sensor fabrication
- Identify and contact 9 field locations
- Prepare installation documentation

Medium-term (April - June)

- Execute field installation (April 15 - May 15)
 - System calibration and testing (May 15 - June 1)
 - Collect 4 weeks of operational data (June 1 - June 29)
 - Prepare Water Court testimony materials
-

RESOURCES

Documentation

- Project FarmSense: Master Documentation (v3.9)
- Software Technical Specification (v3.9)
- Internal System Specifications (v3.9)
- CSU Meeting Brief: Executive Summary (v3.9)
- Grant Application: CRD Community Funding Partnership (v3.9)

Technical References

- Deterministic Farming OS Metrics Framework (v3.9)
 - Strategic Analysis: Gap & Risk Assessment (v3.9)
 - FarmSense Meeting Guide: Track & Talking Points (v3.9)
-

SUCCESS METRICS

Pilot Phase Success Criteria

- 15-20% pumping reduction vs. baseline

- Zero deep percolation events at 42"/60" horizons
- 100% Water Court data admissibility
- Forensic data integrity verified
- CSU Letter of Support secured

Long-term Success Criteria

- 520,000 acres under deterministic management
- 15% district-wide pumping reduction
- \$25M-\$50M annual economic impact
- 48,000+ sensors deployed
- 445+ Jetson Nanos operational

Document Version: 3.9 (Canonical)

Date: February 2026

Prepared by: FarmSense Team