

**THE IOWA  
STORED  
ENERGY  
PARK**



**U.S. Department of Energy: Update Conference-2010  
Energy Storage Systems Program ESS  
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# **Iowa Stored Energy Park (ISEP)**

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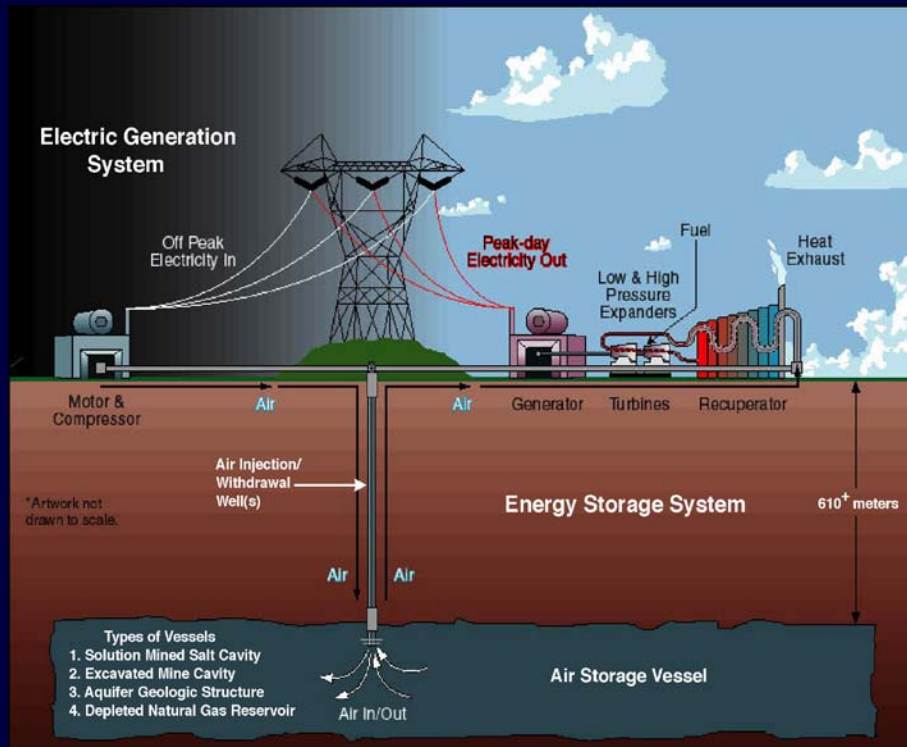
# Goal: Prove Aquifer Storage for CAES

DOE funding started in 2005

Activities funded:

- Project Management
- Marketing & Public Relations
- Seismic Survey & Analysis
- Computer Modeling
- Test Wells
- Economic Analysis

# ISEP CAES Project



## Aquifer Feasibility Analysis

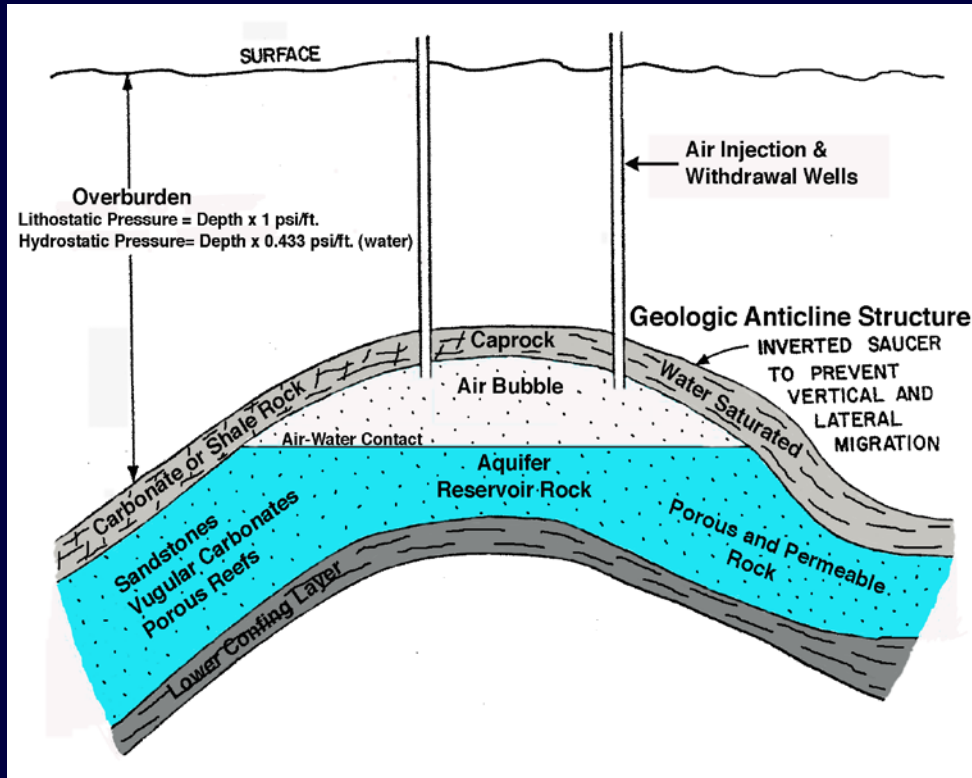
- ✧ Confirm Geologic Structure
- ✧ Determine Aquifer Properties
- ✧ CAES System Performance

## Project Economics

- ✧ R.W. Beck Analysis

# Aquifer CAES System Design

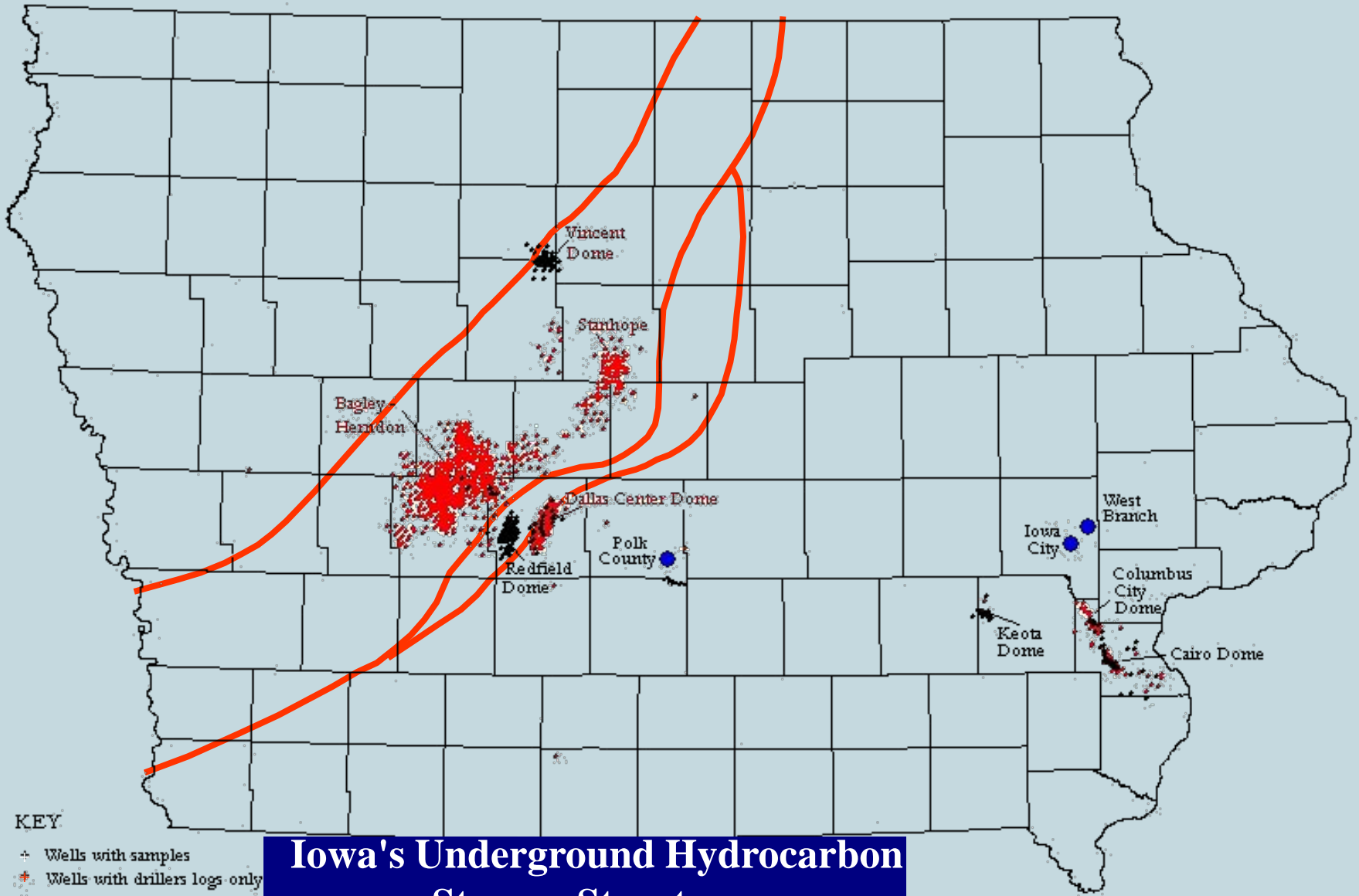
## Problematic: No Data



## DESIGN CRITERIA

- Capacity
- Integrity of Vessel
- Fluid Deliverability

Air Storage Vessel

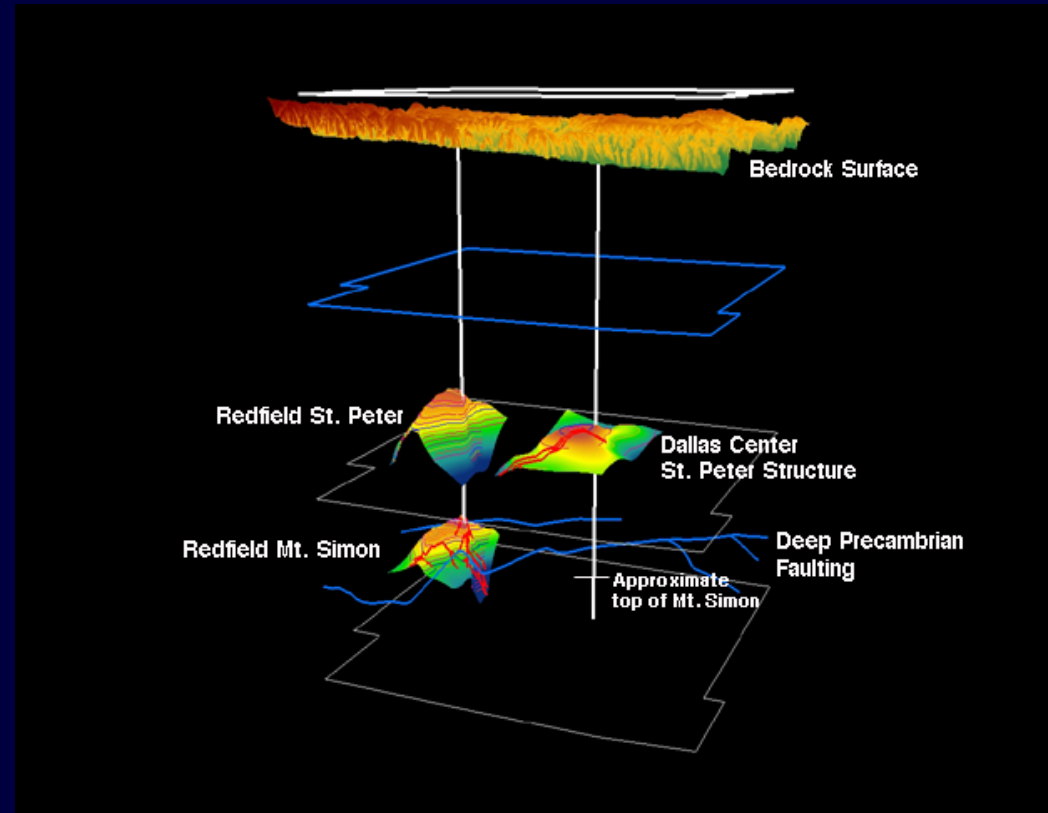


**Iowa's Underground Hydrocarbon Storage Structures**

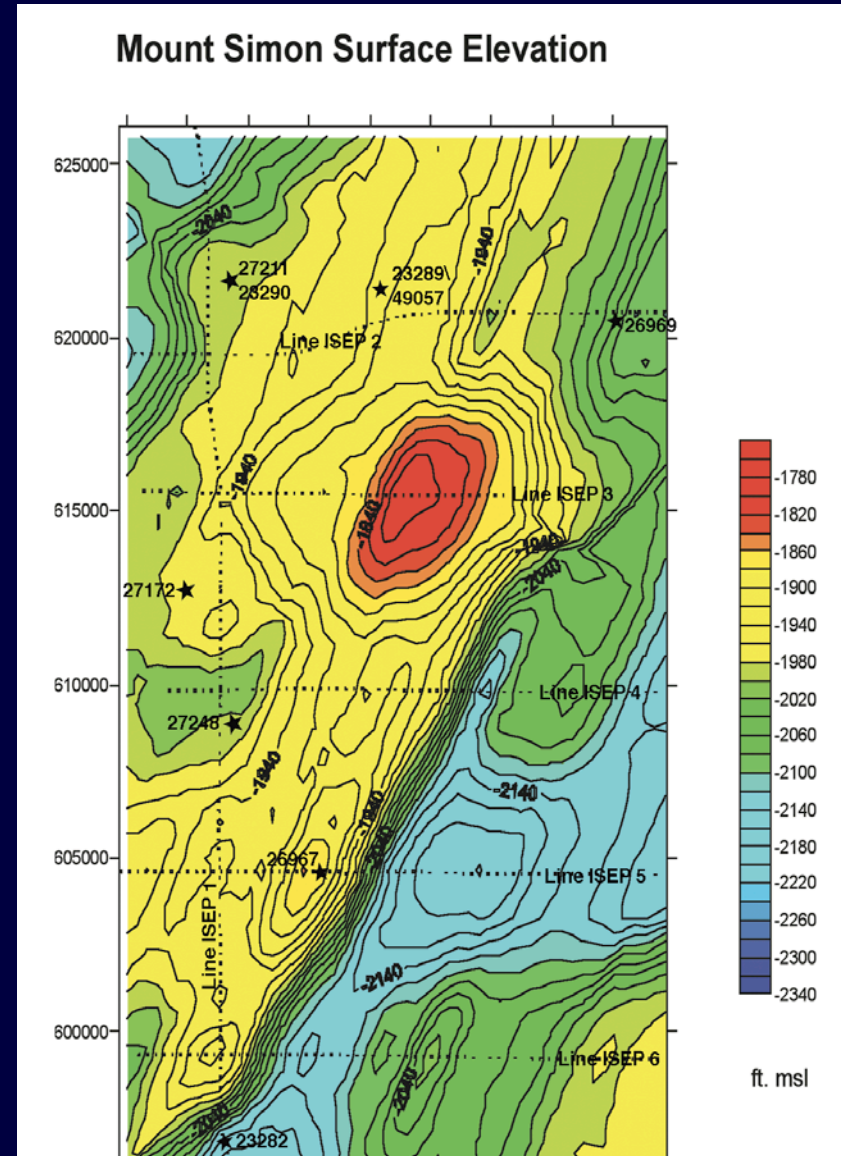
- KEY
- ✦ Wells with samples
  - ★ Wells with drillers logs only
  - LPG Storage

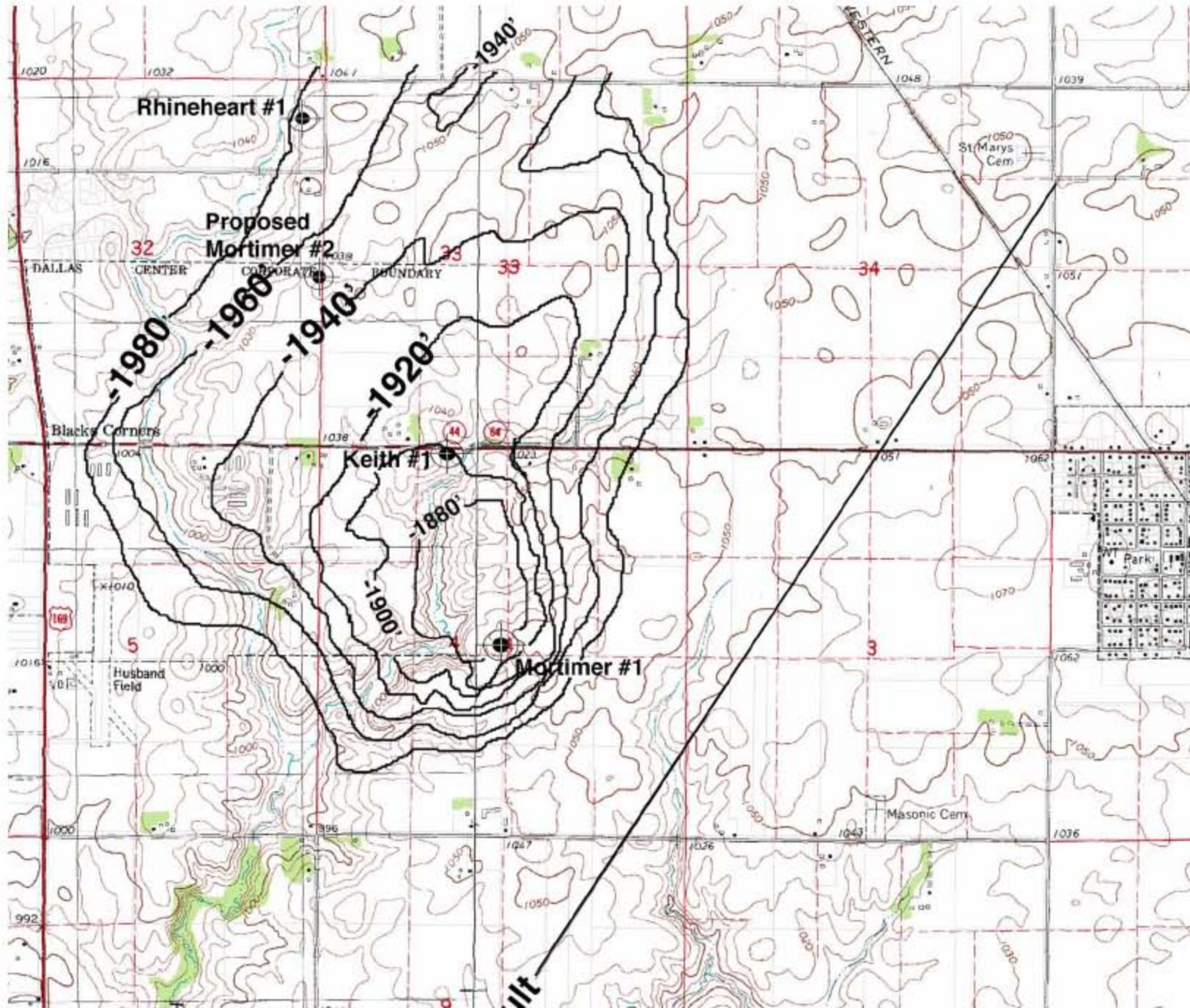
# ISEP Exploratory Geology Program

- Site, lease and permit
- Geophysical Surveying
- Exploratory Drill and Coring
- Laboratory Core Analysis
- Redefine Structure
- Reservoir Simulation Analysis



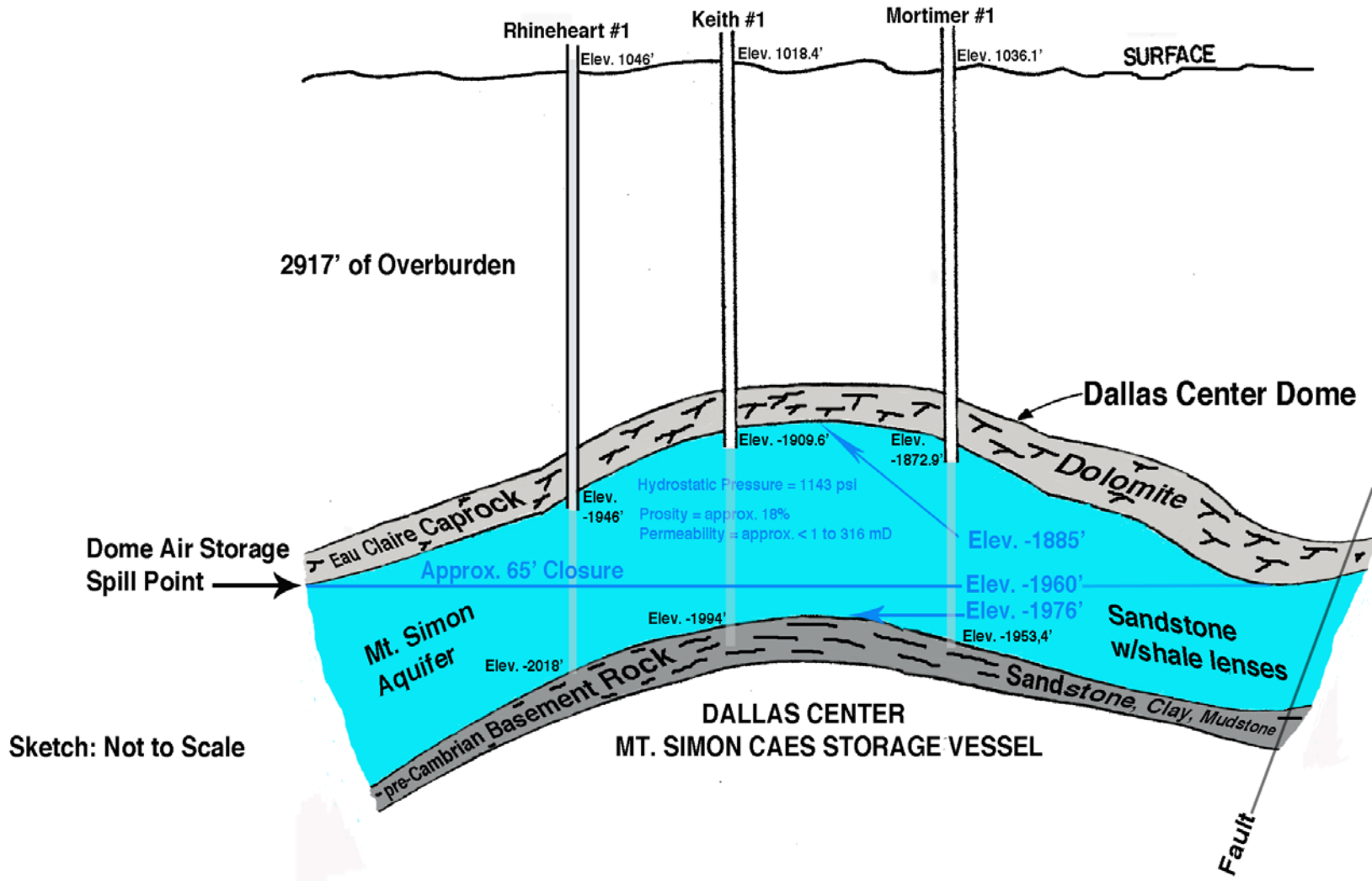
# Dallas Center Mt. Simon Structure





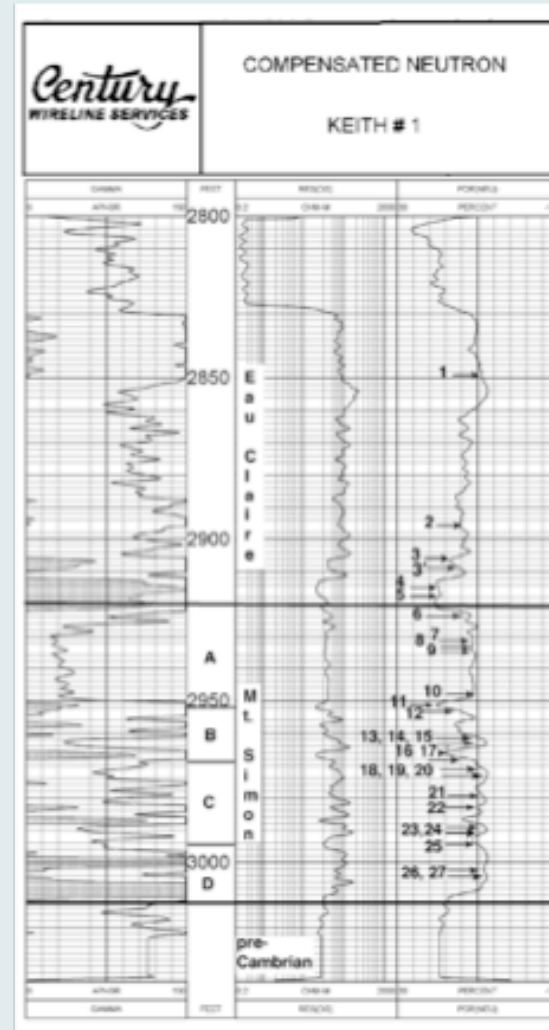


# Dallas Center CAES Aquifer Storage Vessel



# Keith #1 Well Core Analysis

Formation	Mt. Simon Zone	Contact Depth (ft.)	Depth	Log Interval No.	Porosity		Permeability	
					φ(%)	φ(V)	φ( mD)	V( mD)
Eau Claire			2849.41	1	0.04		0.006479	
			2856.2V	2		0.17		
			2856.7V			0.04		
			2906.11	3	0.05		0.955905	
			2909.95V	3'		0.22		
			2915.52V	4		0.07		
Mt. Simon	A	2921	2918.54	5	0.07		0.000101	
			2923.81	6	0.17		55.04	
			2931.25 A	7		0.16		290.5305
			2931.25 B			0.15		
			2931.53 A			0.16		316.2245
			2931.53 B			0.15		266.0028
			2931.9 A			0.16		111.786
			2931.9 B			0.16		133.5664
			2932.29 A	8	0.17		171.4658	
			2932.29 B		0.16		220.4375	
			2932.72H		0.16			
	2933.25A	9	0.16		280.3858			
	2933.25B		0.16		240.8311			
	2948.61H	10	0.14	0.14	136.4427	136.4427		
	2951.79 H	11	0.15	0.14	135.4712	4.6741		
	B	2952	2953.46 H	12	0.25	0.21	88.4974	0.179
			2961.31 A	13		0.17		78.3185
			2961.31 B			0.17		98.6218
			2962.03 H	14	0.19	0.19	89.7312	0.3171
			2963.23 H	15	0.12		39.2258	
			2963.43 H		0.18		9.9667	
			2964.69 H	16	0.04		14.91838	
	C	2968	2967.05 H	17	0.06	0.06	1.3415	0.0184
			2968.12 H	18	0.17	0.17	9.042	0.0206
			2968.42 A			0.21		0.0204
			2968.42 B			0.21		0.0225
			2968.69 A			0.2		0.0551
2968.69B					0.18		316.22	
2971.24 H			19	0.11	0.18	67.1595	1.9195	
2974.68 H			20	0.09		106.4532		
2979.2			21	0.17		0.006491		
2983.12 H			22	0.01	0.01	0.0089	0.002	
D	2994	2989.25 H	23	0.04	0.06	0.0006		
		2990.71 H	24	0.22	0.04	0.5169		
		2995.76 H	25	0.13	0.17			
		2995.76 H		0.12		110.5727		
		3003.11 H	26	0.04		0.5361		
3004.76 H	27	0.09	0.09		0.0118			



# RW Beck - Economic Analysis

Results due November 2010

## Parameters of Analysis:

- Construction Costs
- Operating Costs
- Lifetime Economic Analysis
- Ancillary Services
- Comparison to Combined and Simple Cycle Units

## Completed Work Activities

- Dallas Center Site Selected
- Geophysical Surveying
- Drilled Two Exploratory Wells
- Draft Economic Analysis

## Current Work Activities

- Complete Laboratory Core Analysis
- Drill Third Test Well
- Perform CAES Reservoir Simulation Analysis
- Complete Economic Analysis

**“GO” OR “NO GO” DECISION**

# ISEP Program Summary

