

Reno Creek Update

February 16, 2011

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- AUC Participants
- Meteorological issues
- Cultural resources
- Update on geology & hydrology
- Questions from NRC & public
- Questions from AUC to NRC

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Participants

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- Jim Viellenave – President
- Dan Dowers – Chief Geologist
- Leland Huffman – ISR Engineering and Operations Manager
- Phil Cavendor – Environmental Manager
- Ken Schlieper – Consultant from Petrotek

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Meteorological Issues

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- AUC has onsite met station and secondary anemometer at other end of permit area
- Procedure to establish representativeness of short term monitoring (~1 year) at onsite station
 - Strategy for statistical evaluation
 - Procedure for air monitor siting

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Statistical Evaluation

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- Objective: determine the stability of wind roses at multiple regional sites
 - Calculate mean and standard deviation of the frequency at each wind direction over multiple years
 - Determine if the variance in the frequency for each direction is significant enough to cause inaccurate siting of down wind air monitors if a single year is used

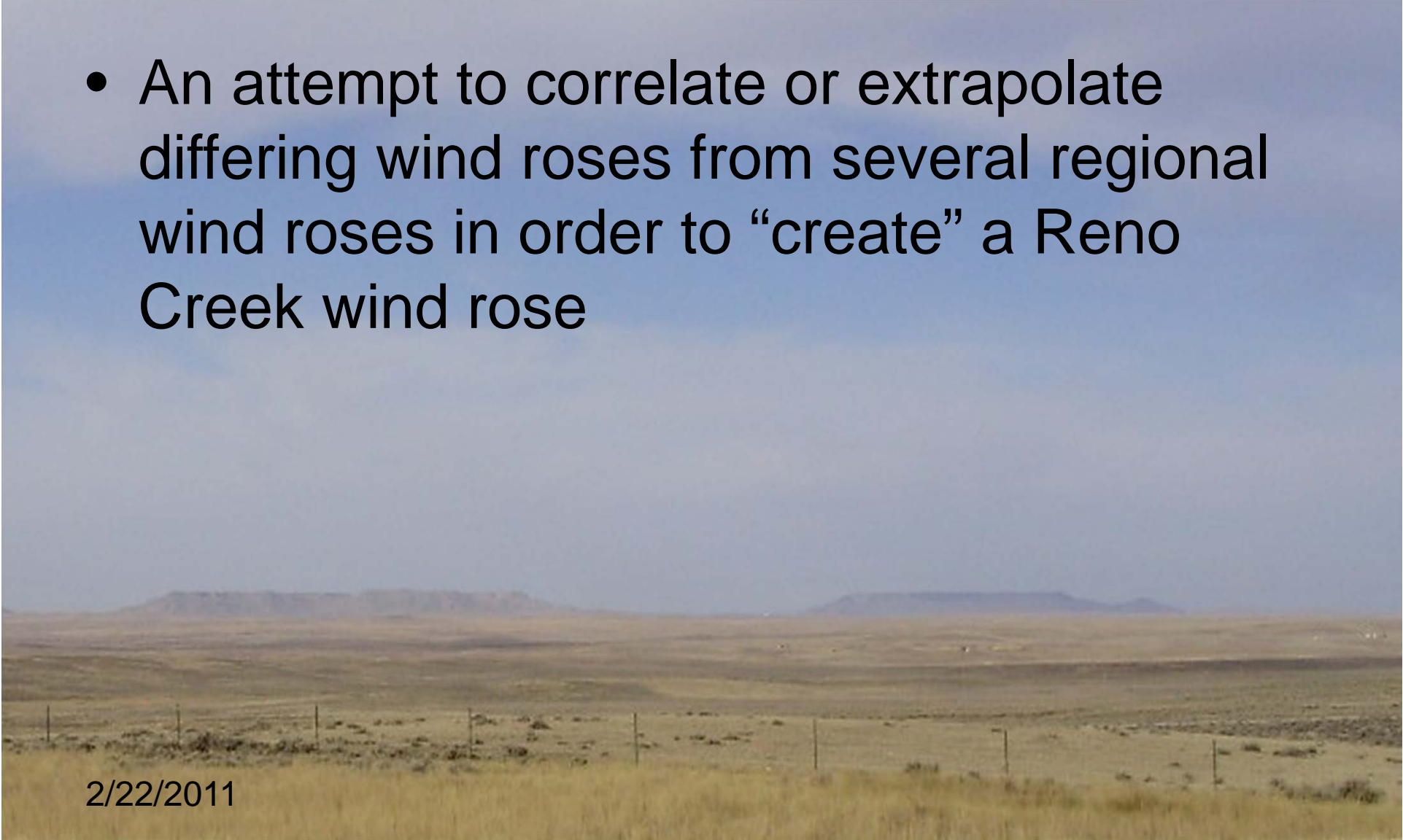
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What is NOT Proposed

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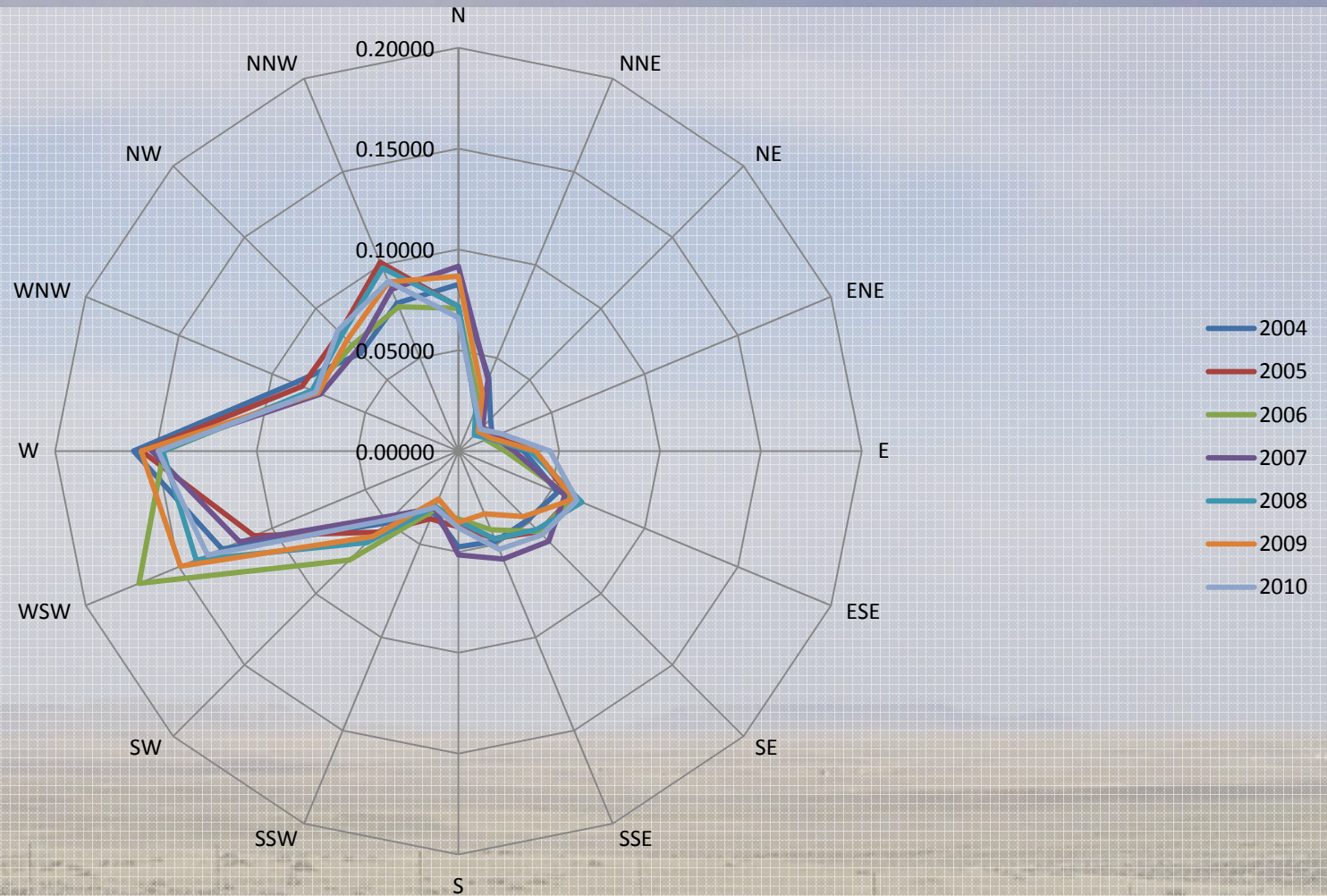
- An attempt to correlate or extrapolate differing wind roses from several regional wind roses in order to “create” a Reno Creek wind rose

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Windrose Stability Antelope 2004-2010

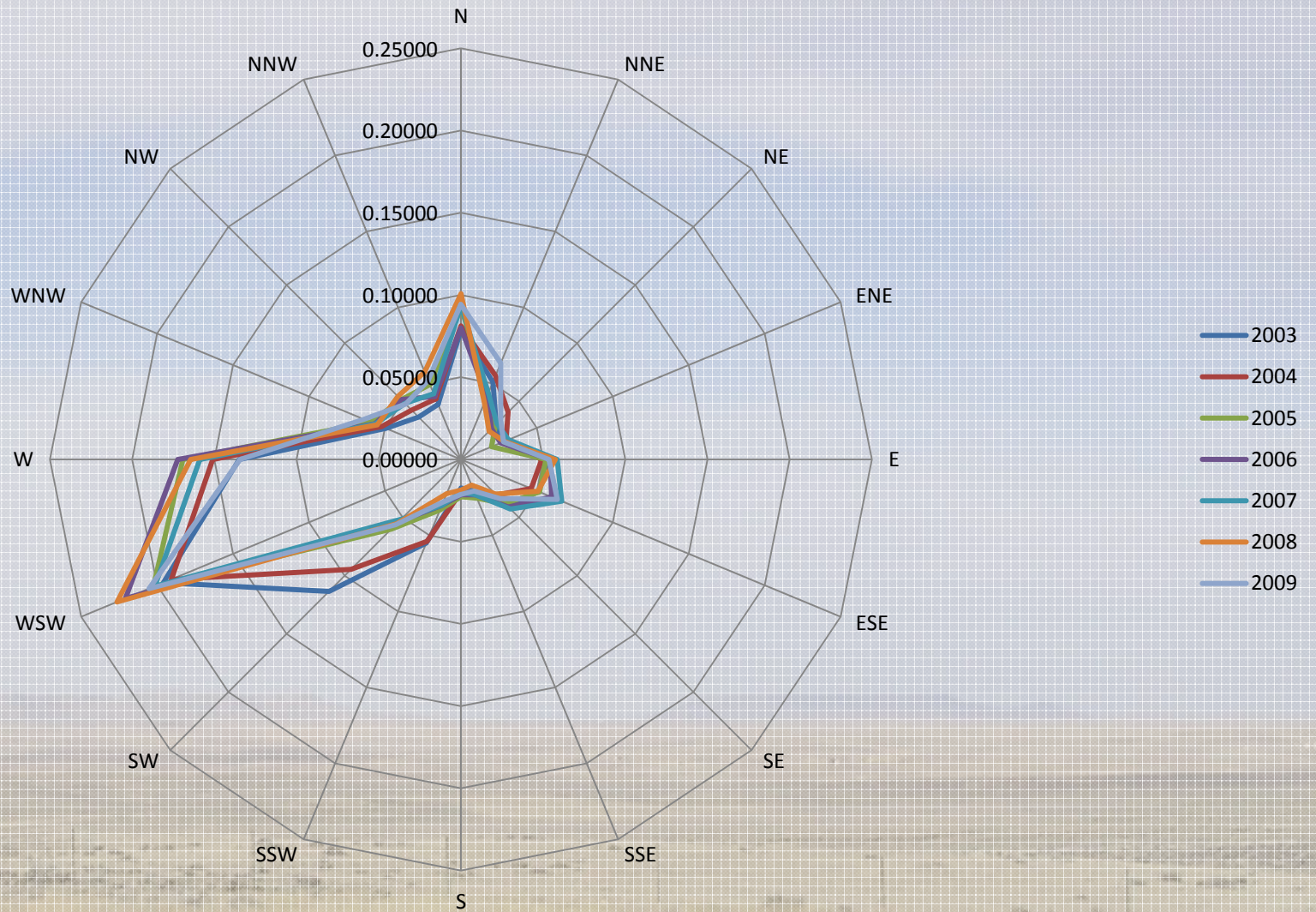
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Windrose Stability Glenrock 2003-2009

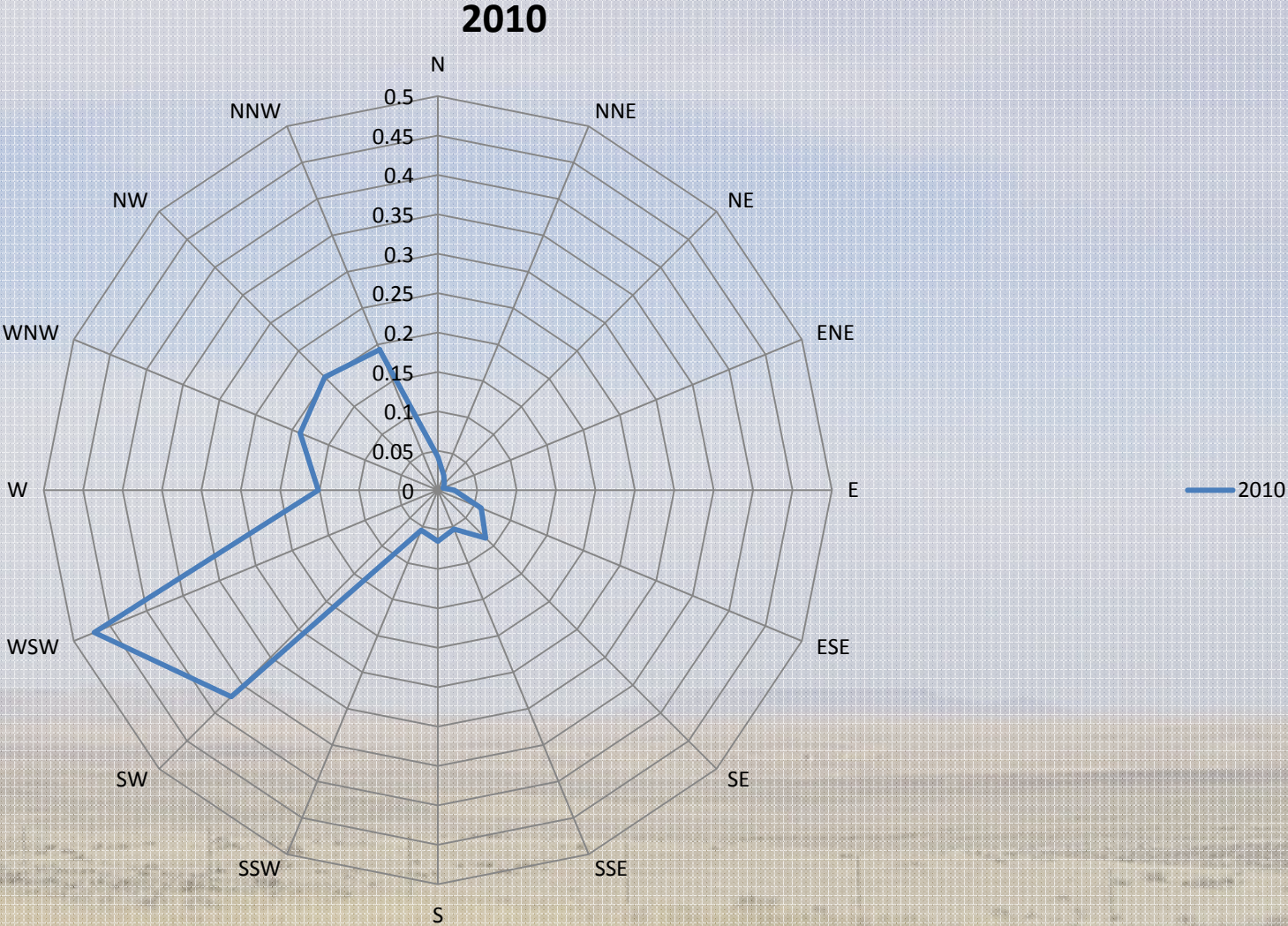
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Reno Creek Windrose Four Months

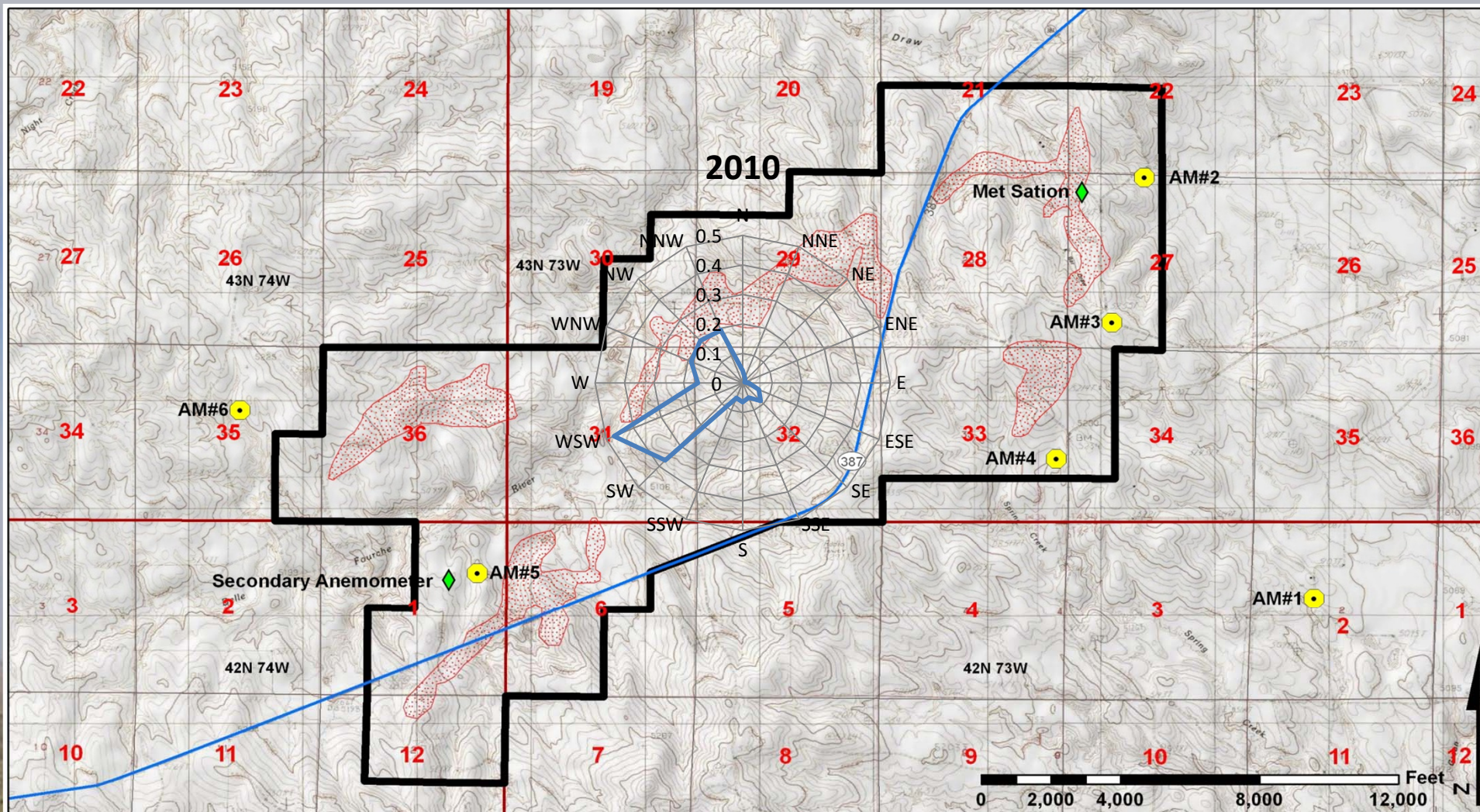
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Air Particulate, Radon, Environmental Radiation, and Meteorological Station Monitoring locations

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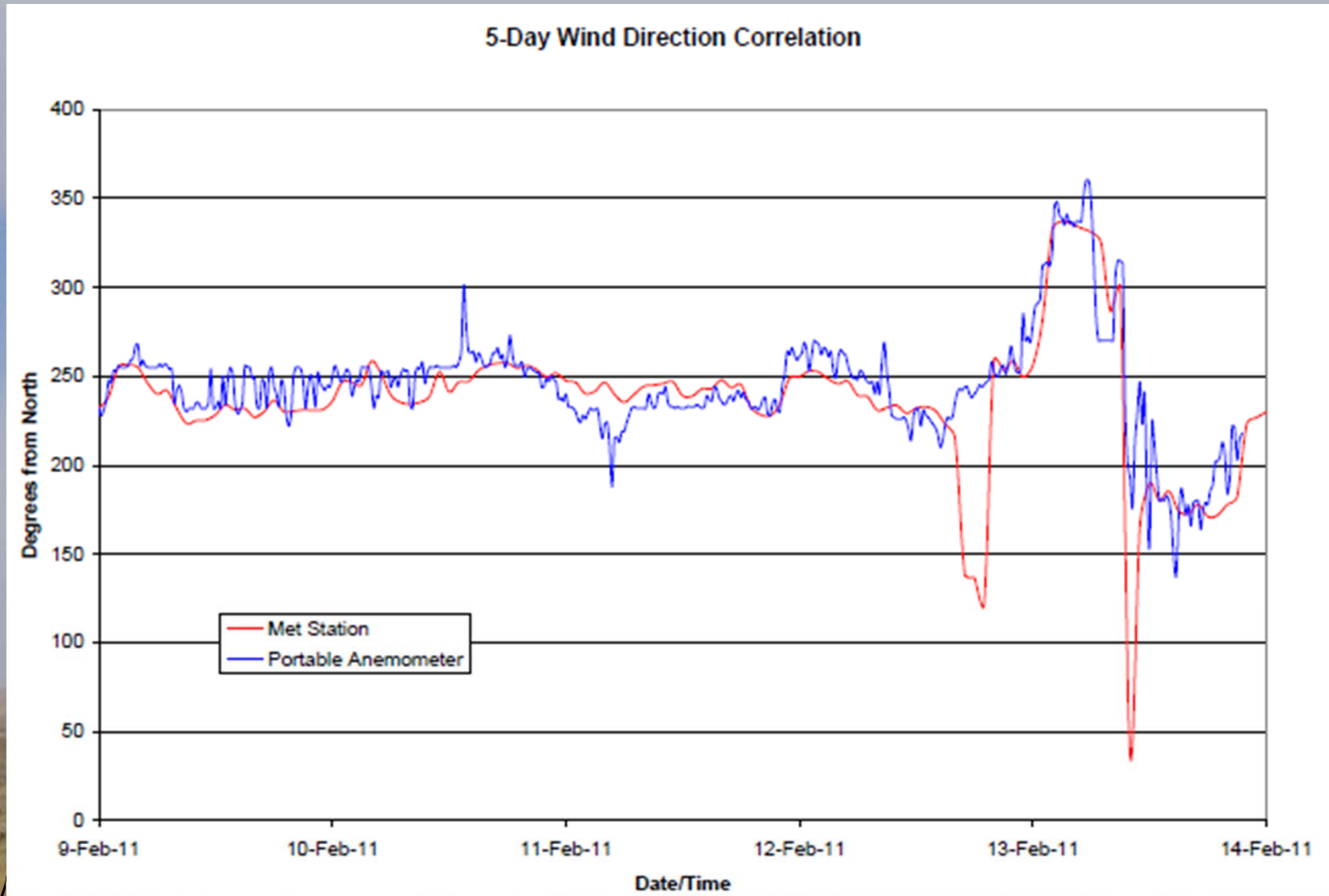


Legend

- Project Area
- AUC LLC Minerals
- Ore Bodies
- Air Monitor
- Met Station / Anemometer

Comparison Between Anemometer Locations At Reno Creek

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Historic, Archeological, and Cultural Resources

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- Background and Fieldwork
- Inventory Results
- Evaluation
- Recommendations

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Background and Cultural Fieldwork

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- **Prior to fieldwork, SHPO files were checked for information on previous surveys and recorded cultural resources. 2463 acres had been previously surveyed to present Class III standards.**
- **The remaining 3596 acres were intensively surveyed to Class III level between 8/15/10 and 12/11/10.**
- **The purpose of the inspection was to recognize and identify by surface observation all archeological or historic sites or isolates.**
- **Limited testing was done at two sites to evaluate the potential for buried prehistoric materials or deposits. No deposits were found.**
- **The area is all private surface, and no artifacts were collected.**

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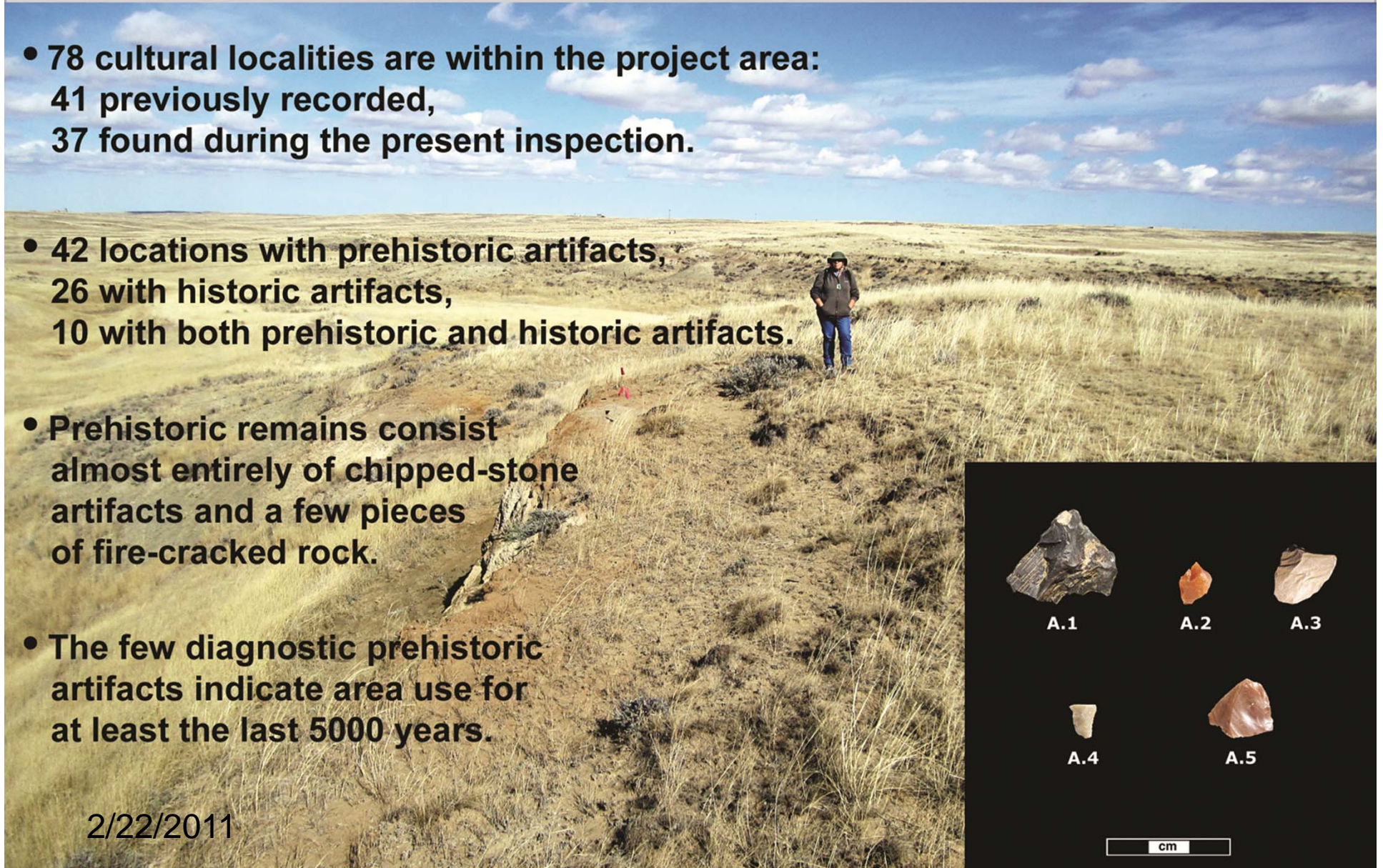
Cultural Inventory Results

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- 78 cultural localities are within the project area:
41 previously recorded,
37 found during the present inspection.
- 42 locations with prehistoric artifacts,
26 with historic artifacts,
10 with both prehistoric and historic artifacts.
- Prehistoric remains consist almost entirely of chipped-stone artifacts and a few pieces of fire-cracked rock.
- The few diagnostic prehistoric artifacts indicate area use for at least the last 5000 years.

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A.1



A.2



A.3



A.4



A.5

cm

Evaluation of Cultural Resources

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- All cultural resources within the project area are evaluated as not eligible for the National Register.

- Files indicate SHPO concurrence that all previously recorded sites are not eligible for the National Register of Historic Places.

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Recommendations for Cultural Resources

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- Although impact to cultural resources presently is not known, none of the 78 cultural localities is considered eligible for the National Register.

- Thus, no significant cultural resources will be affected, and no additional archaeological work is recommended.

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Geological Update

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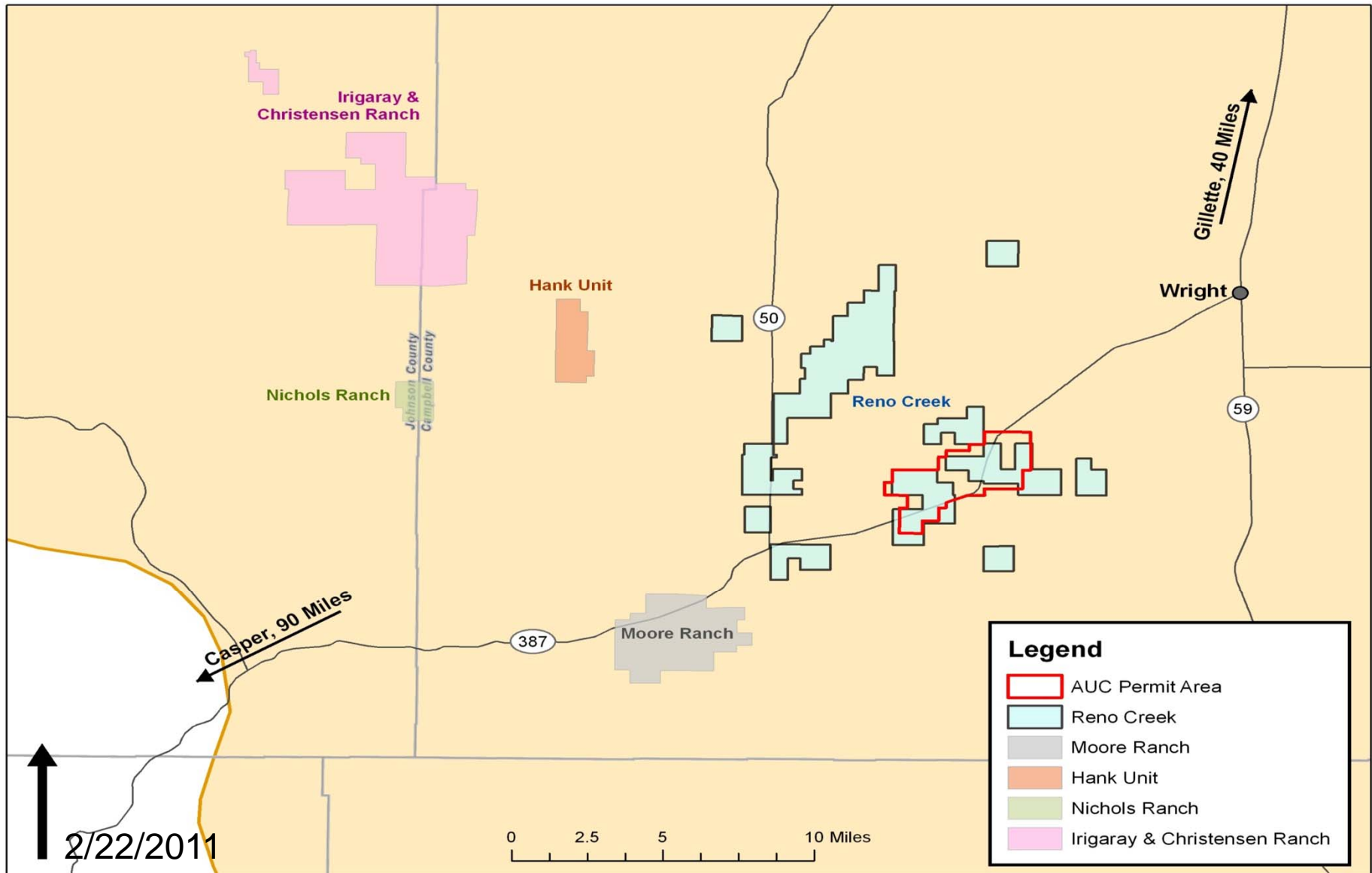
Reno Creek Geology

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Powder River Basin Nearby ISR Projects

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Geologic Overview

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Geologic Strategy:

- Use historical data to develop an understanding of the Reno Creek Uranium Deposit
- Acquire additional data
 - CBM logs
 - Oil and gas logs
 - Historical log collections
- Construct a Geologic Model through mapping of litho-stratigraphic units in relation to deposit
- Identify data gaps to be addressed in further investigations

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Current & Proposed Drilling Regional Hydrologic Evaluation

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- Procedures to fill data gaps:
 - Four of seven planned well clusters are now complete
 - Deep strat holes are being drilled in each cluster to evaluate underlying geology and hydrology
 - Core will be collected to assess aquitard integrity and characteristics
 - Approximately 350 test holes are planned for 2011
 - Coring and wells construction will be conducted as needed
 - Efforts will be concentrated in the western portion of the project where data is needed most

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Key Geological Characteristics

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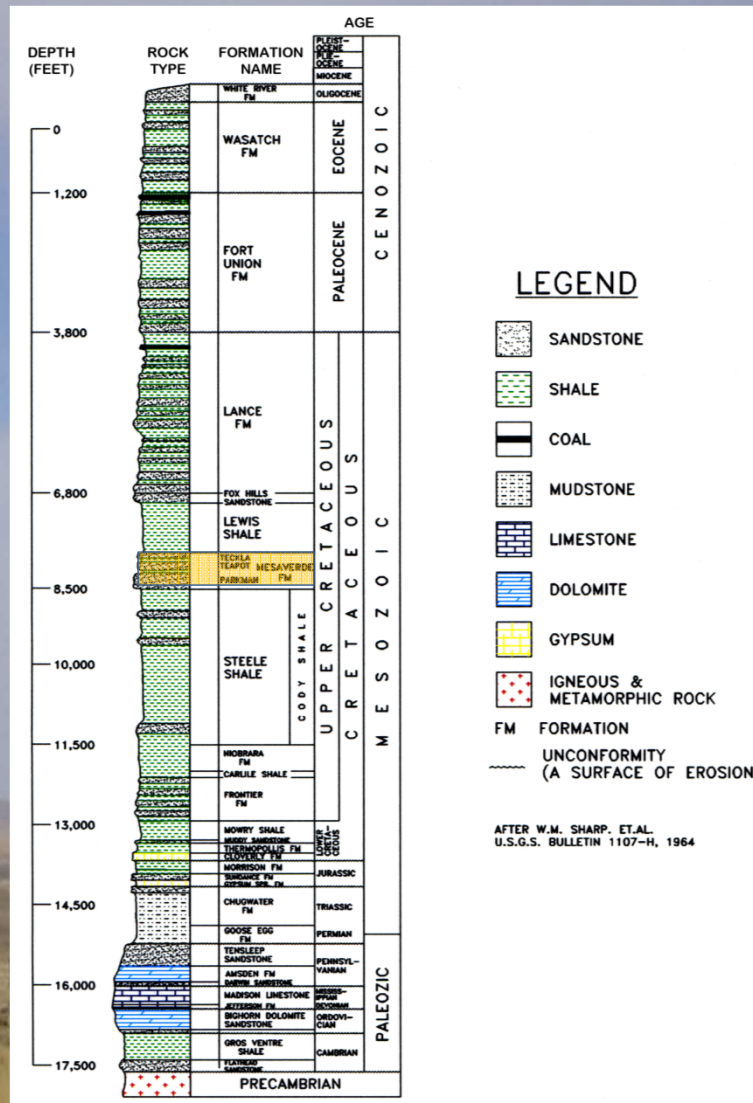
Geologic Findings:

- Overlying and Underlying Aquitards are continuous over entire project area.
- The Production Zone Aquifer is discrete & continuous over the entire project area
- Overlying and Underlying Aquifers are variable and discontinuous
- No evidence of faulting has been observed

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Powder River Basin Stratigraphic Section

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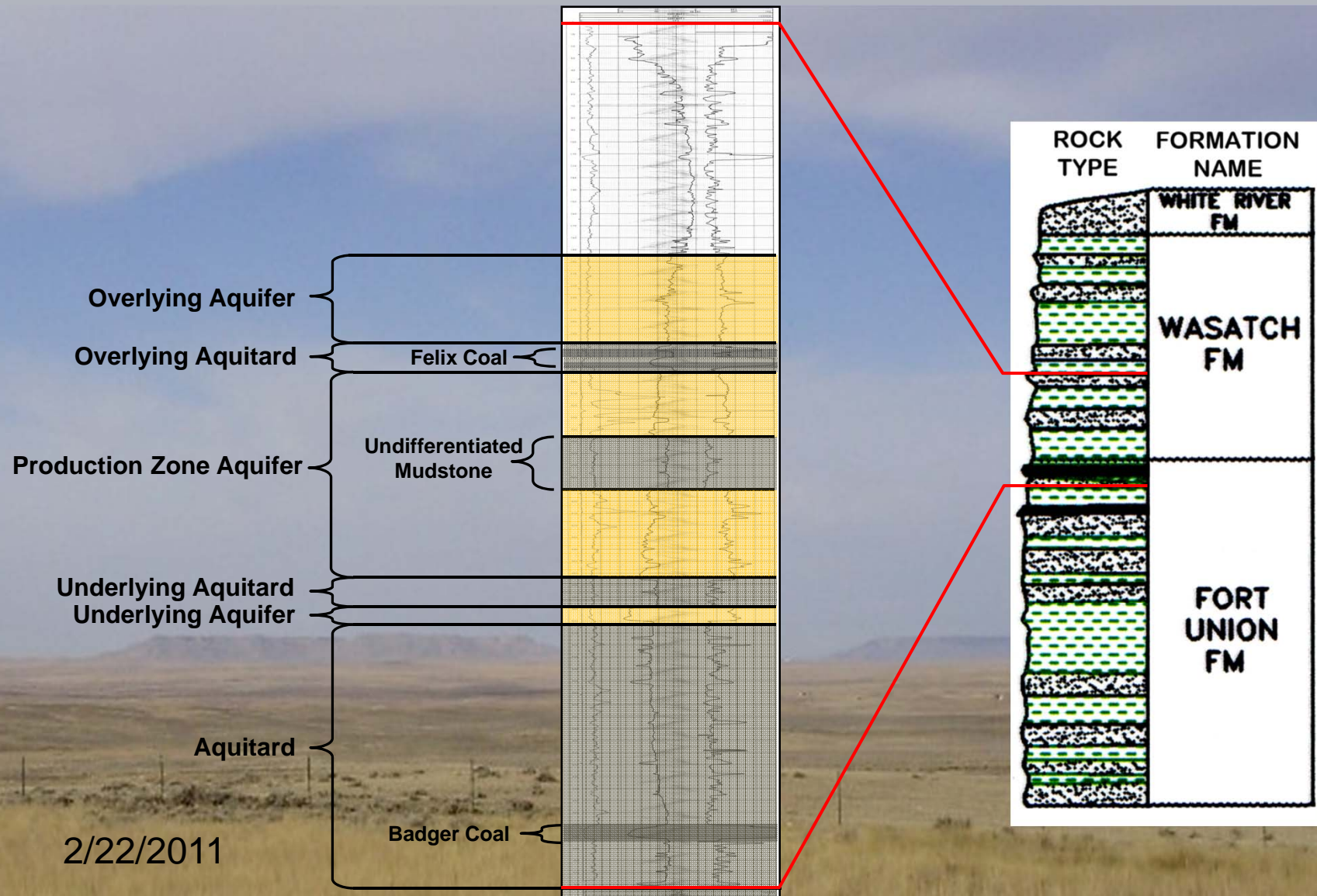


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Project Type Log

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RN3937



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Hydrogeological Update

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Reno Creek Hydrogeology



Historical Hydrogeological Characterization

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- Hydrogeologic characterization primarily focused on the Production Zone Sand, Overlying Aquitard and Overlying Aquifer;
- Majority of historical hydraulic testing consisted of small scale multi-well and single-well tests;
- Production Zone Aquifer (PZA) is geologically confined; however, groundwater occurs under fully saturated and partially saturated aquifer conditions; and
- Integrity testing identified no communication between the PZA and the Overlying Aquifer.



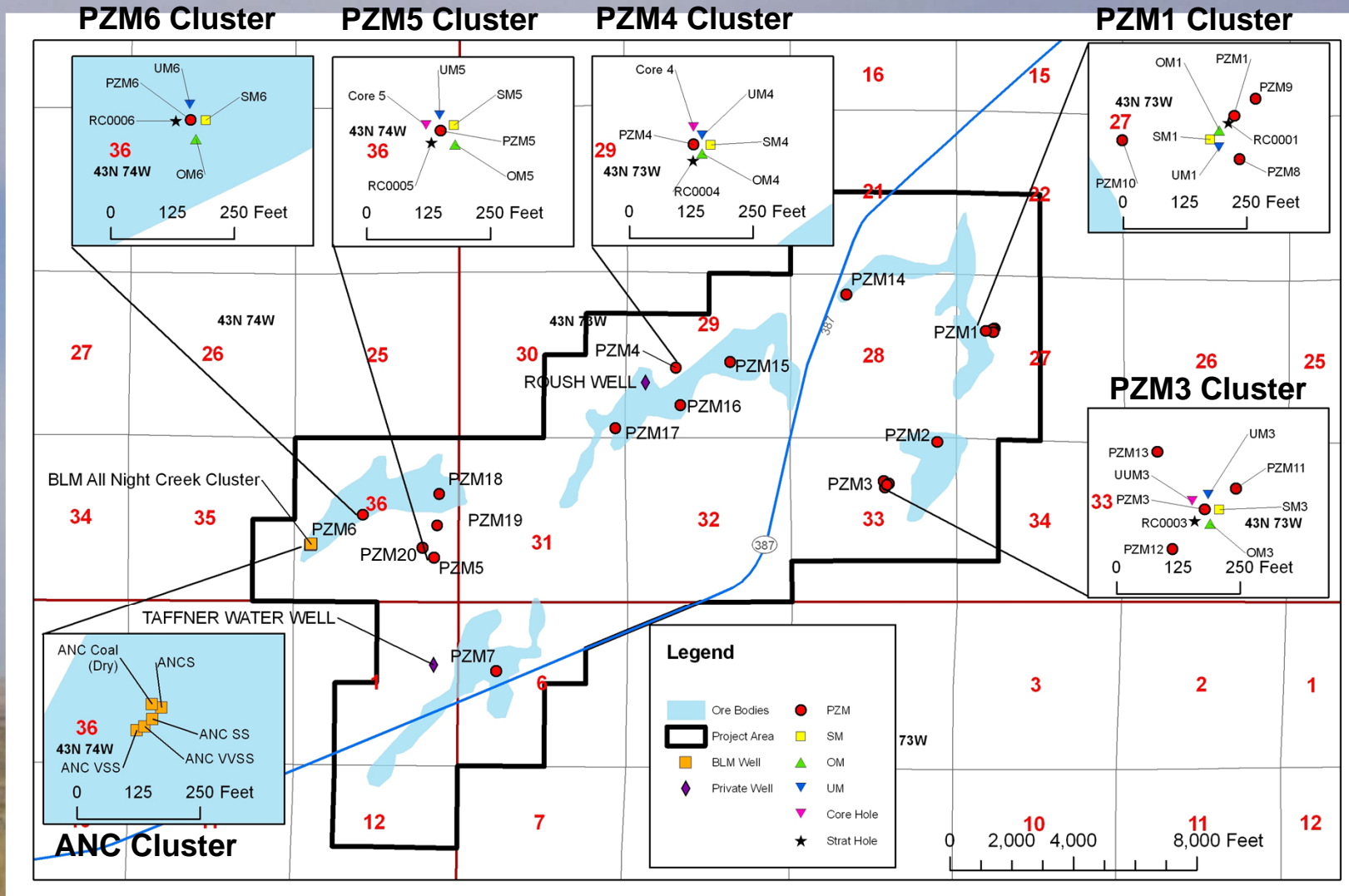
Summary of Historical Pump Tests Results

- Results are similar to aquifer properties where ISR has been successfully performed:

Year	Test	Range of Values	Representative Value
1979 - 1980	RME Single and Multi Well Tests - PZA		
	Transmissivity (T; ft ² /d)	72 to 867	200
	Hydraulic Conductivity (k; ft/day)	0.6 to 5.3	2.0
1982	Hydrogeologic Integrity Evaluation - PZA		
	Transmissivity (T; ft ² /d)	149 to 555	272
	Hydraulic Conductivity (k; ft/day)	0.9 to 4.1	2.3
1993	Hydro/EFNI Single-well Tests - PZA		
	Transmissivity (T; ft ² /d)	85 to 639	200
	Hydraulic Conductivity (k; ft/day)		2.0
1993	Hydro/EFNI Single-well Tests - Overlying Aquifer		
	Transmissivity (T; ft ² /d)	0.24 to 164	uncertain
	Hydraulic Conductivity (k; ft/day)		
1994	EFNI Mine Unit I Test - PZA		
	Transmissivity (T; ft ² /d)	47.4 to 52.5	50.7
	Hydraulic Conductivity (k; ft/day)	0.46 to 0.51	0.5
	Storativity (S)	6.9E-05 to 1.4E-04	1.40E-04

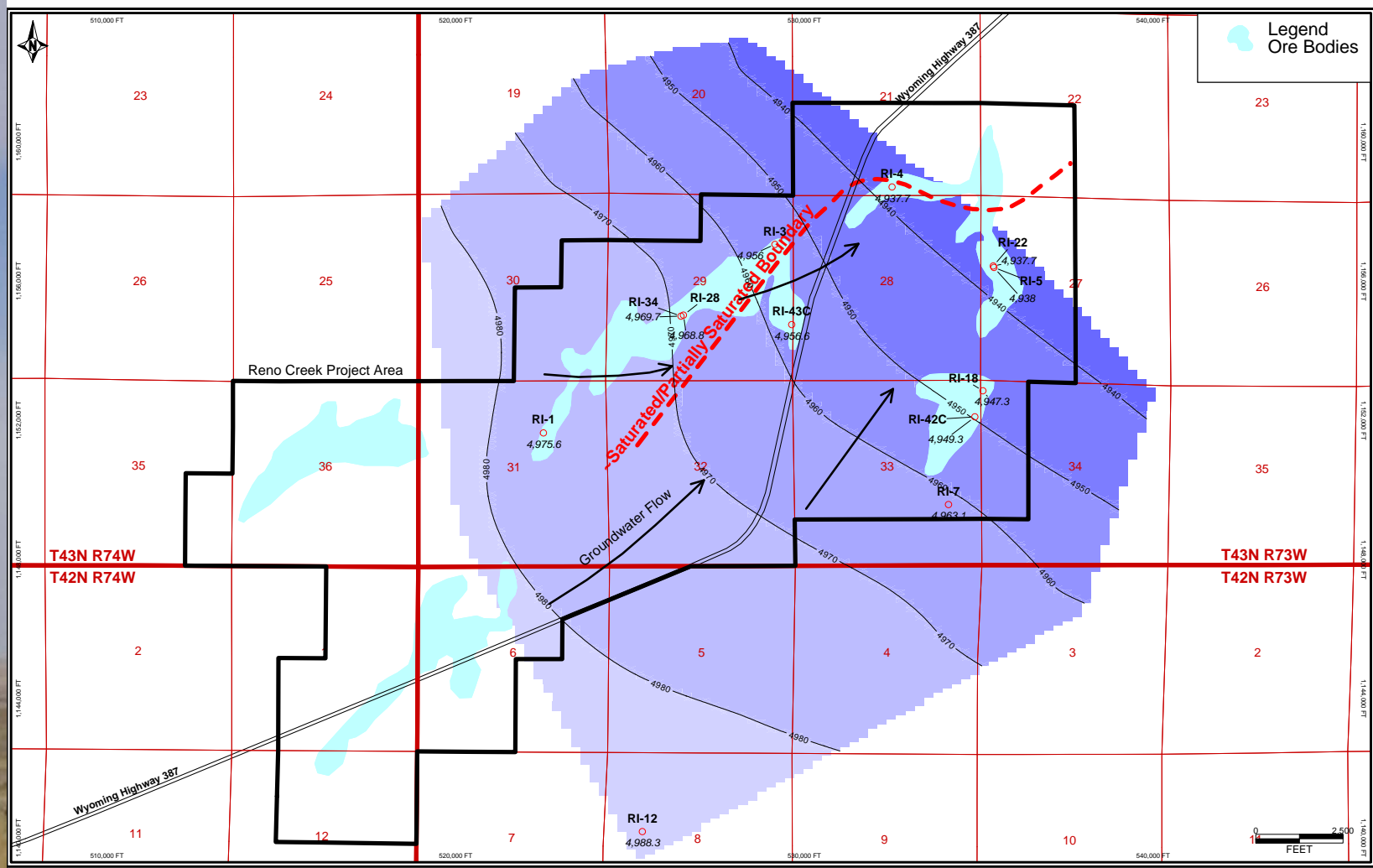
Reno Creek Pump Test Locations

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Historical Potentiometric Surface (1993) and Approximate Location of Saturated/Partially Saturated Boundary

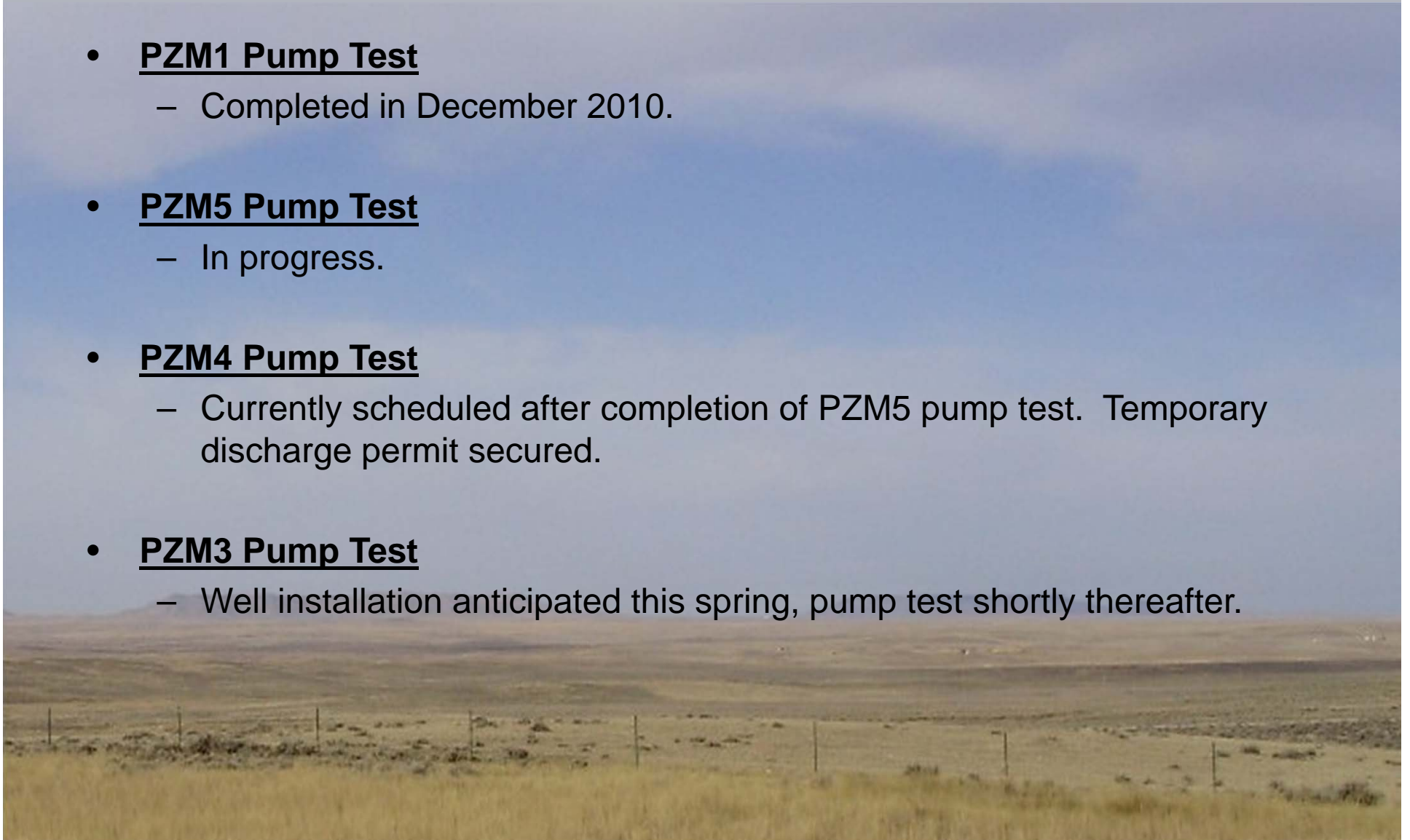
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Status on Reno Creek Pump Tests

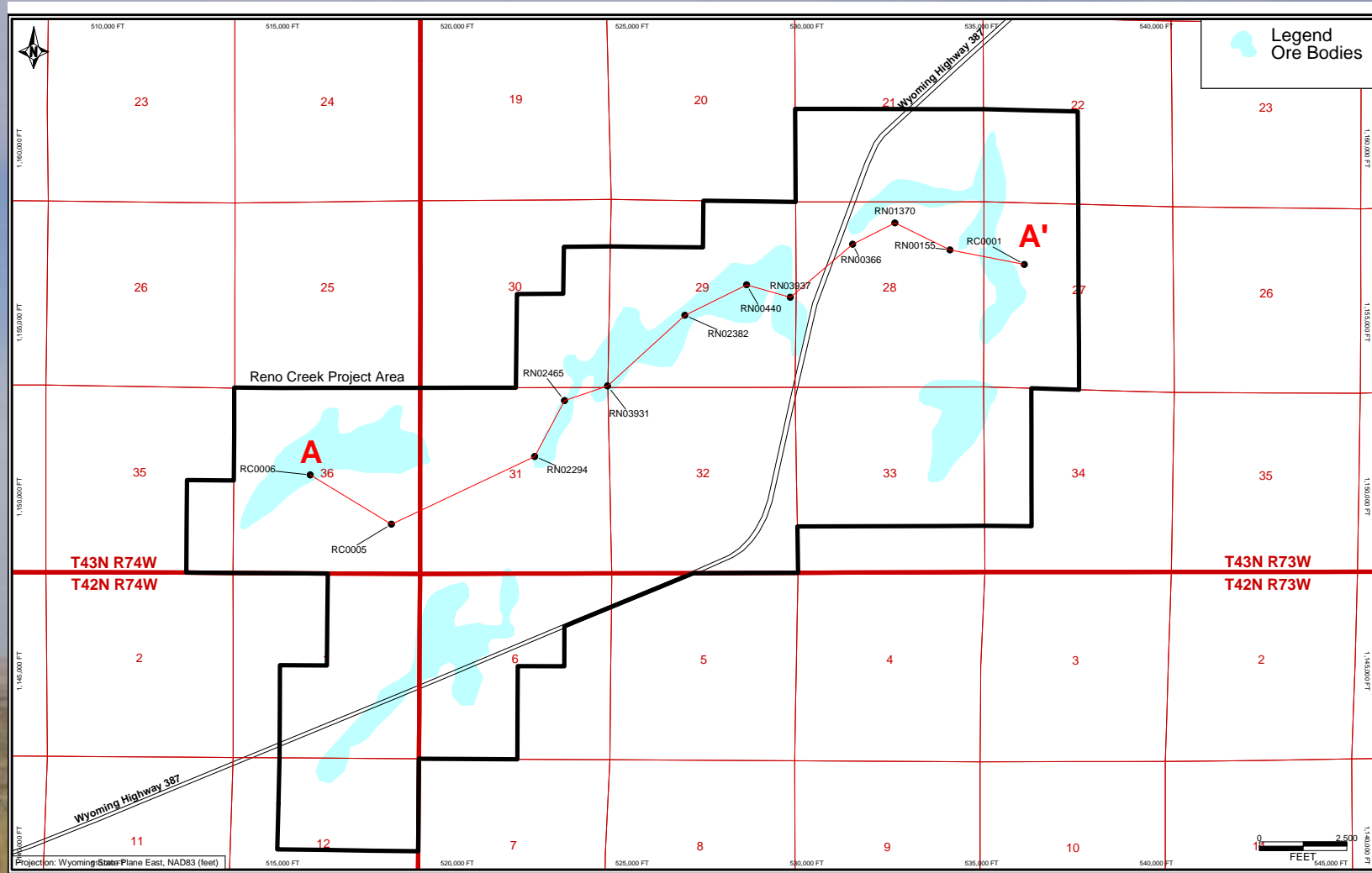
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- **PZM1 Pump Test**
 - Completed in December 2010.
- **PZM5 Pump Test**
 - In progress.
- **PZM4 Pump Test**
 - Currently scheduled after completion of PZM5 pump test. Temporary discharge permit secured.
- **PZM3 Pump Test**
 - Well installation anticipated this spring, pump test shortly thereafter.



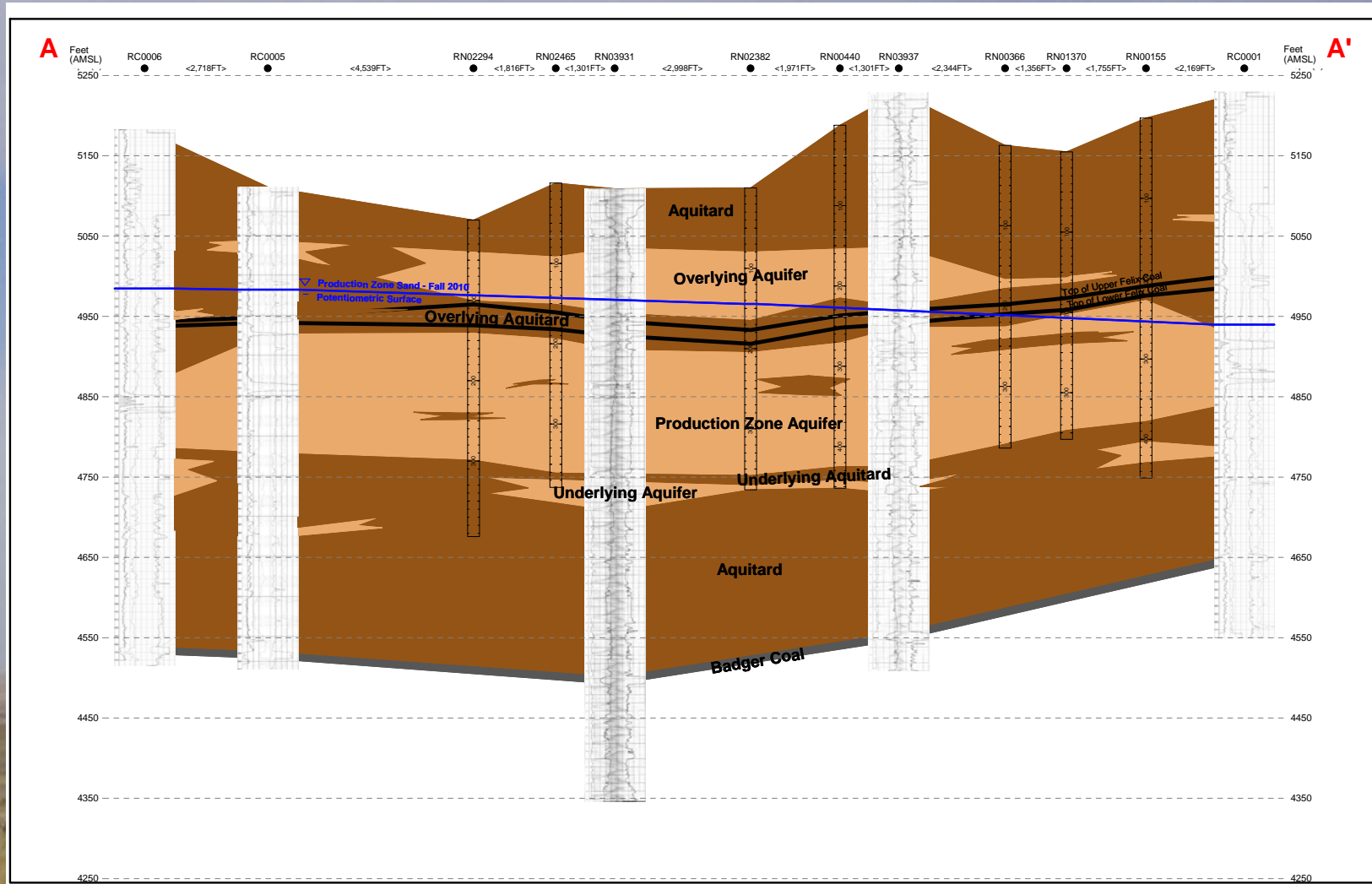
Regional Hydrostratigraphic Cross Section A-A' Location Map

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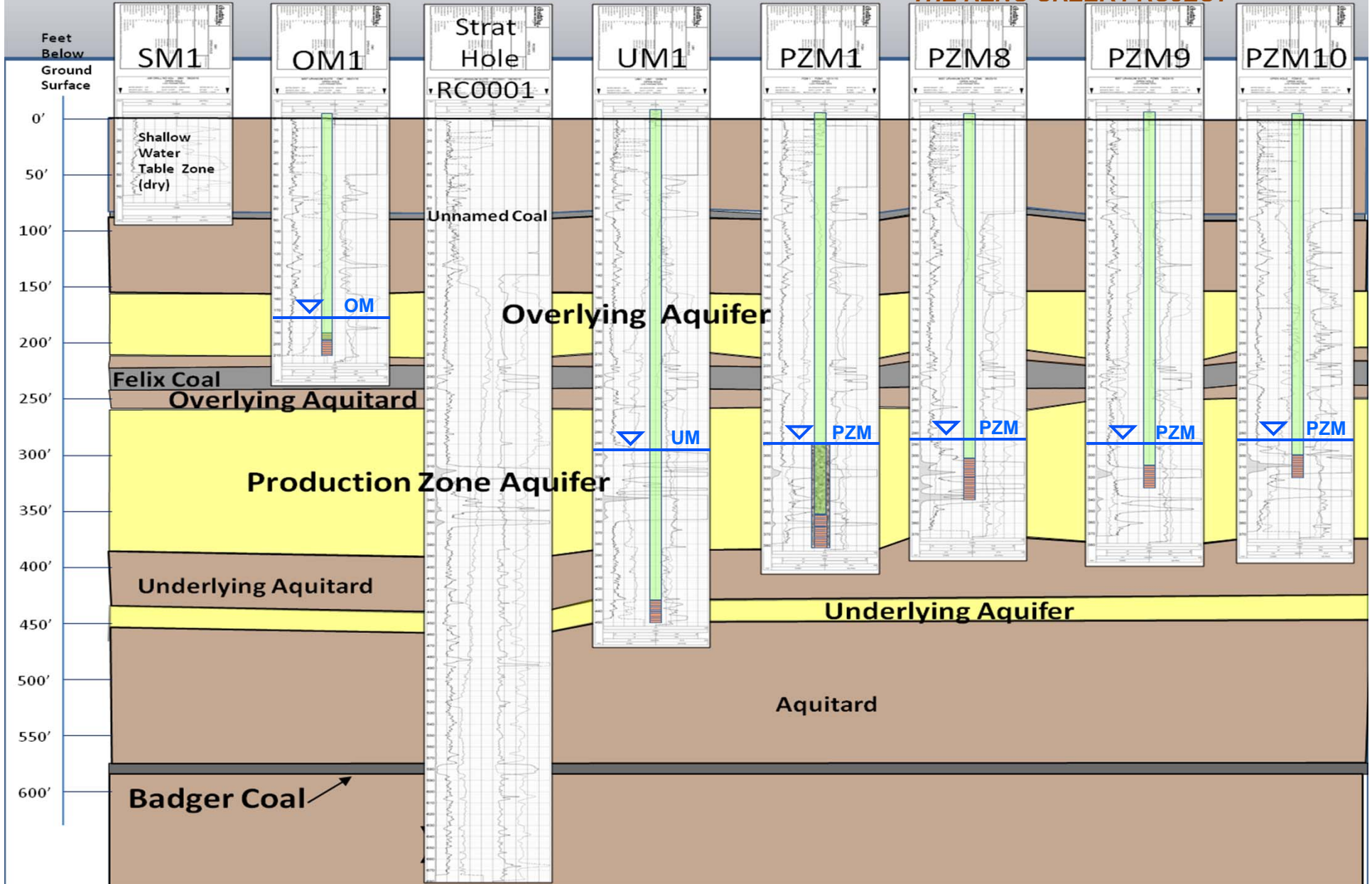
Regional Hydrostratigraphic Cross Section A-A'

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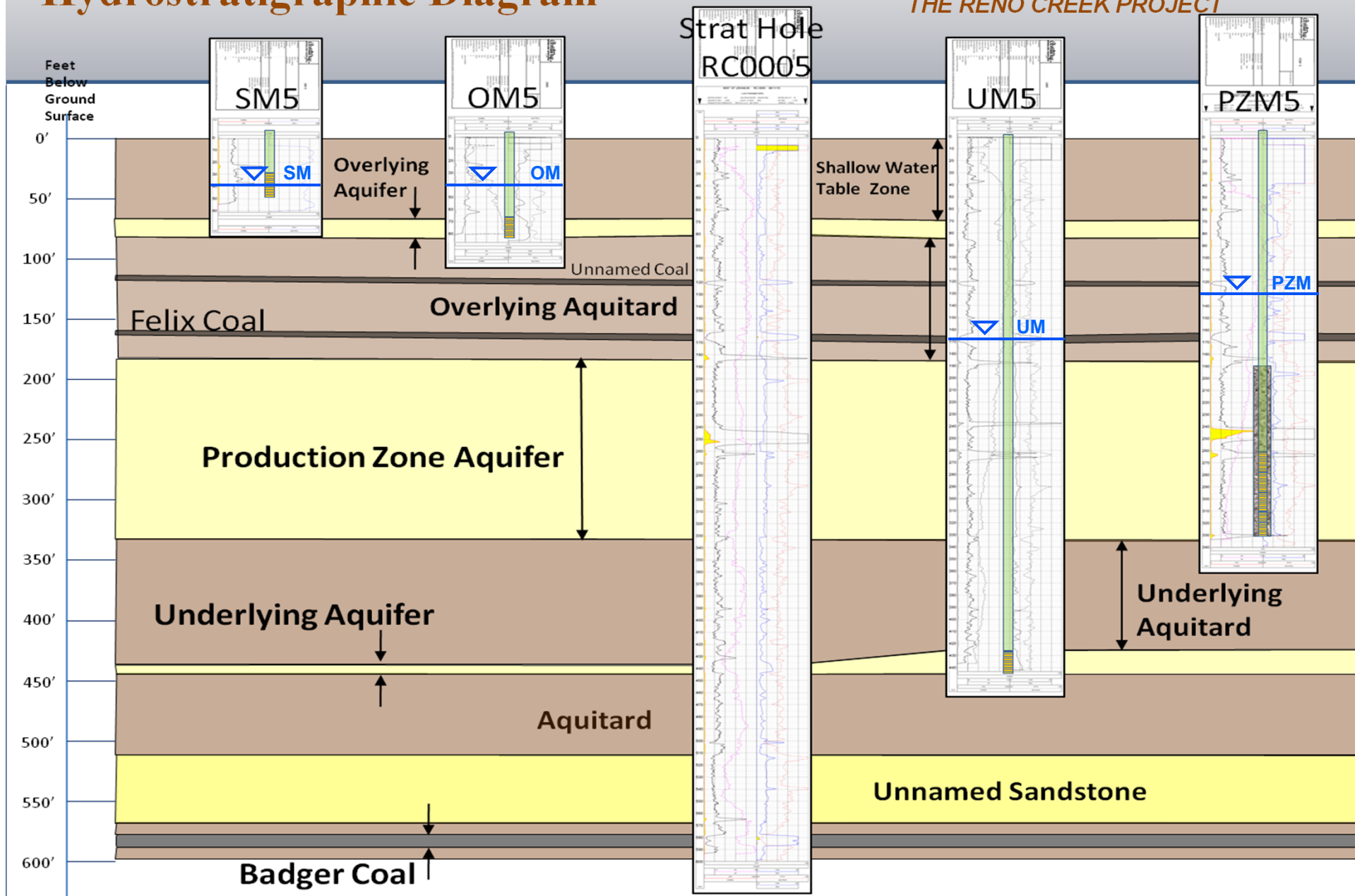
PZM1 Hydrostratigraphic Diagram

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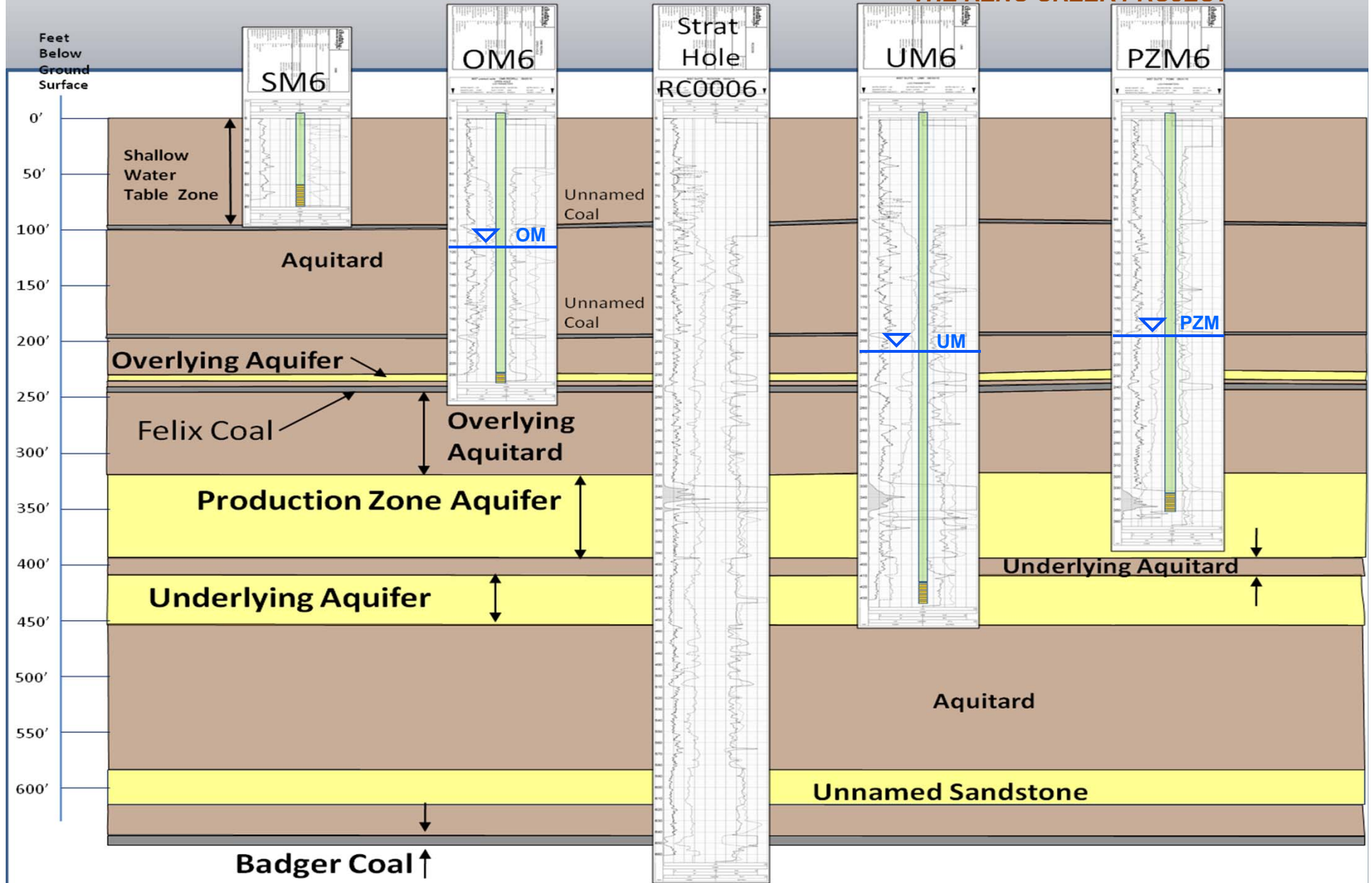
PZM5 Hydrostratigraphic Diagram

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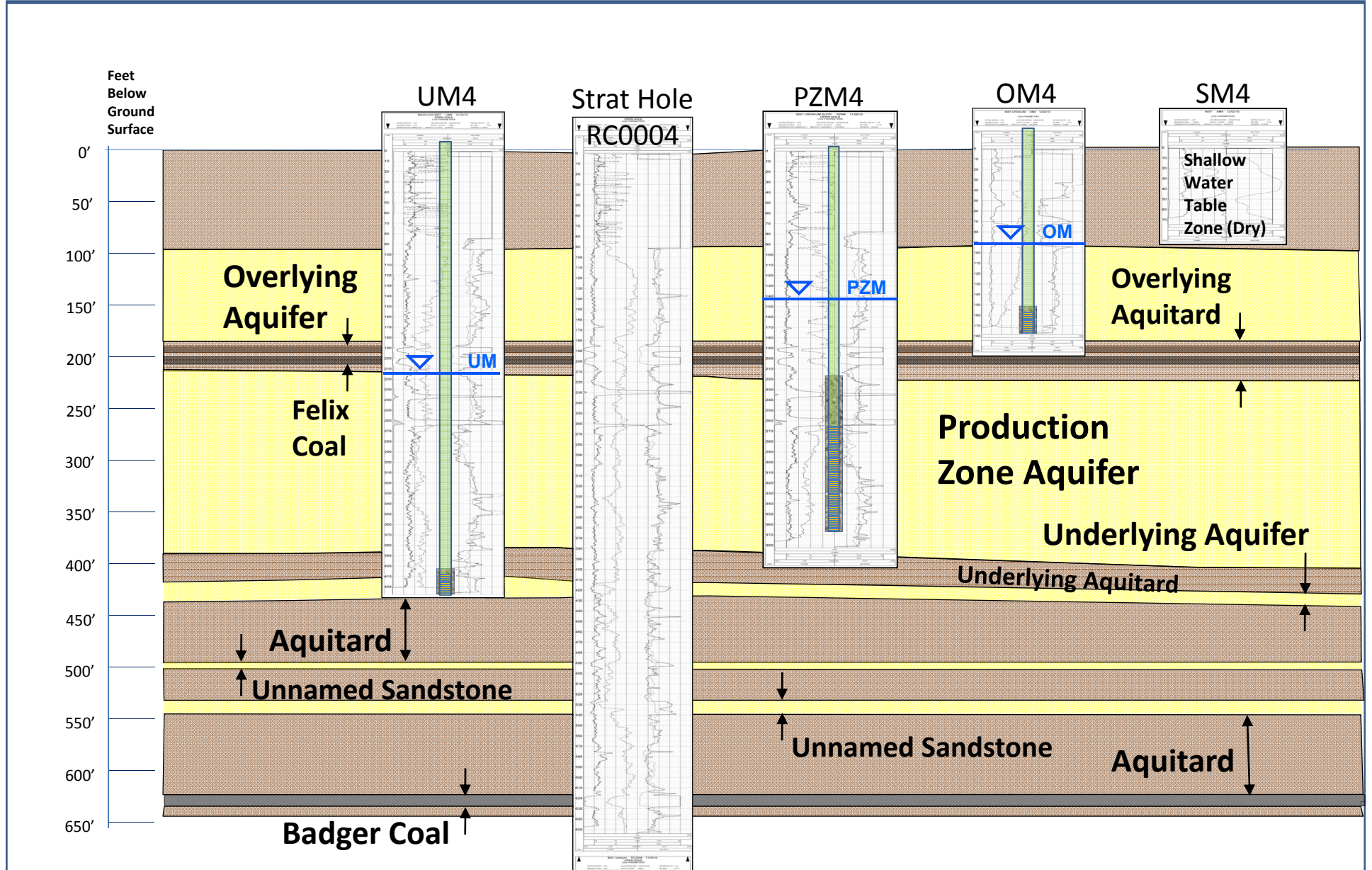
PZM6 Hydrostratigraphic Diagram

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PZM4 Hydrostratigraphic Diagram

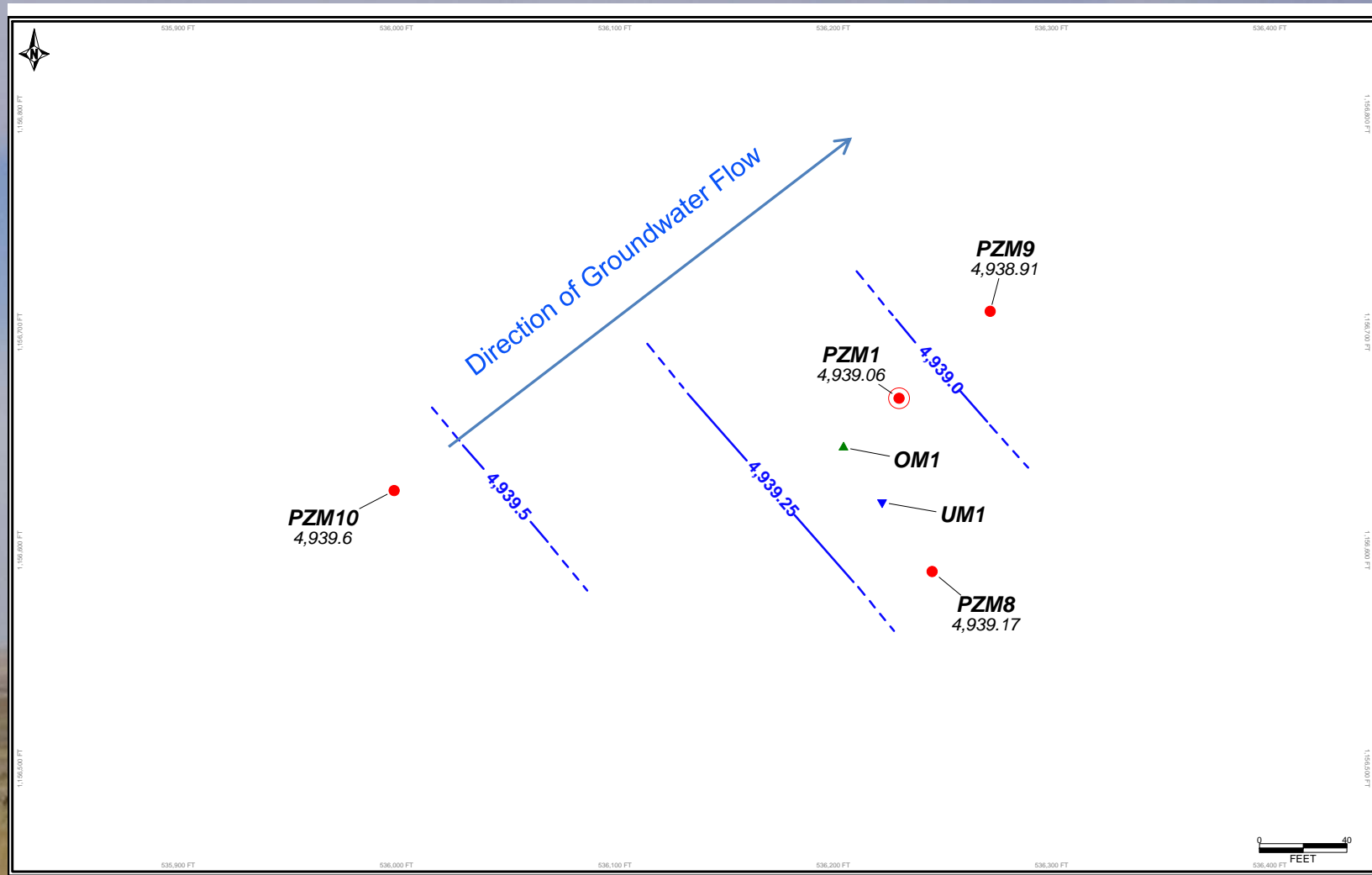
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PZM1 Pump Test Production Zone Aquifer Potentiometric Surface 11/30/10

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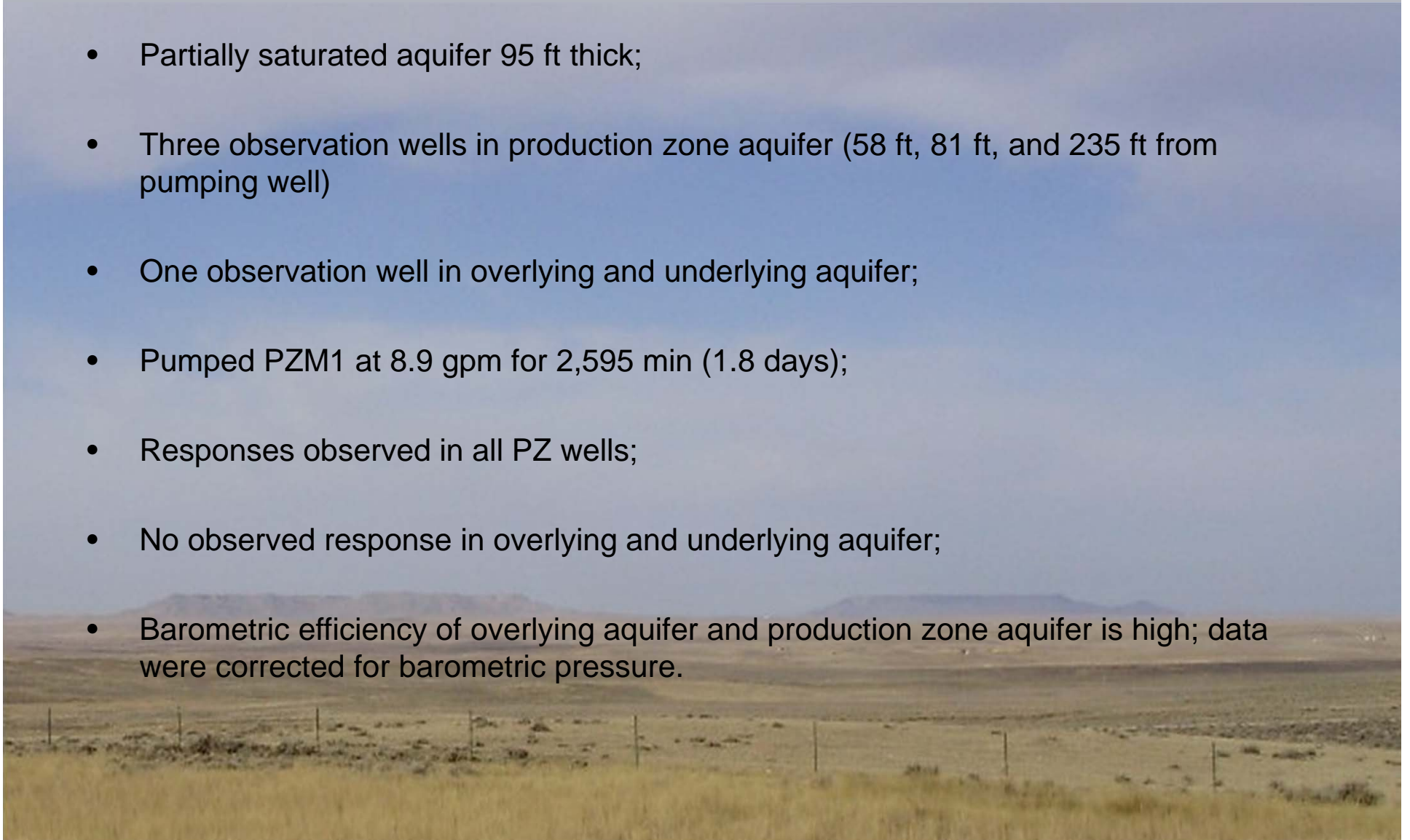
- Current and historical potentiometric surfaces of Production Zone Aquifer are consistent.



PZM1 Pump Test Preliminary Results

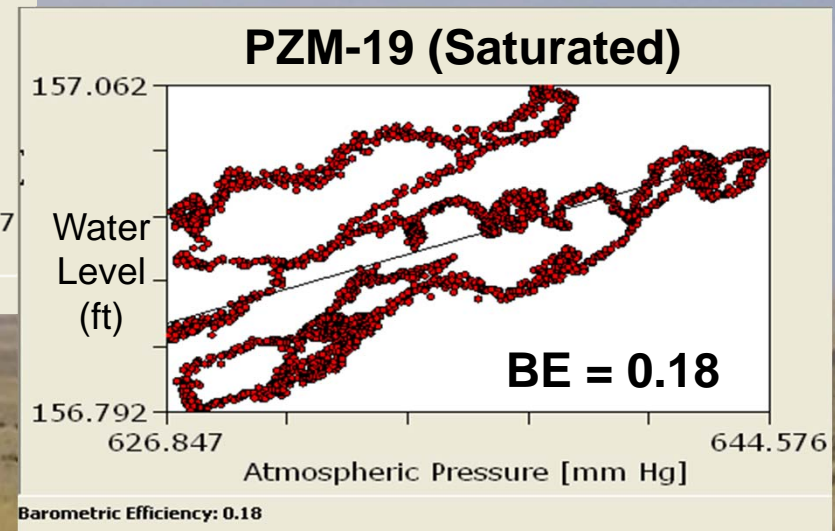
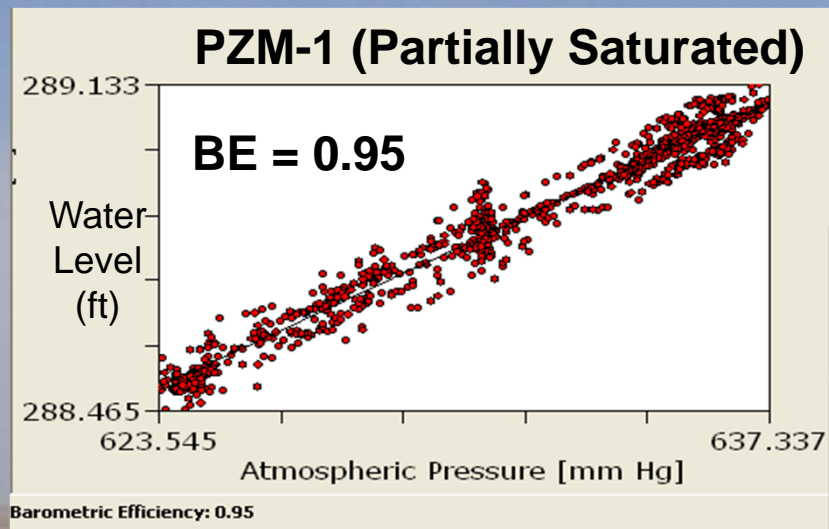
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- Partially saturated aquifer 95 ft thick;
- Three observation wells in production zone aquifer (58 ft, 81 ft, and 235 ft from pumping well)
- One observation well in overlying and underlying aquifer;
- Pumped PZM1 at 8.9 gpm for 2,595 min (1.8 days);
- Responses observed in all PZ wells;
- No observed response in overlying and underlying aquifer;
- Barometric efficiency of overlying aquifer and production zone aquifer is high; data were corrected for barometric pressure.



Barometric Efficiency

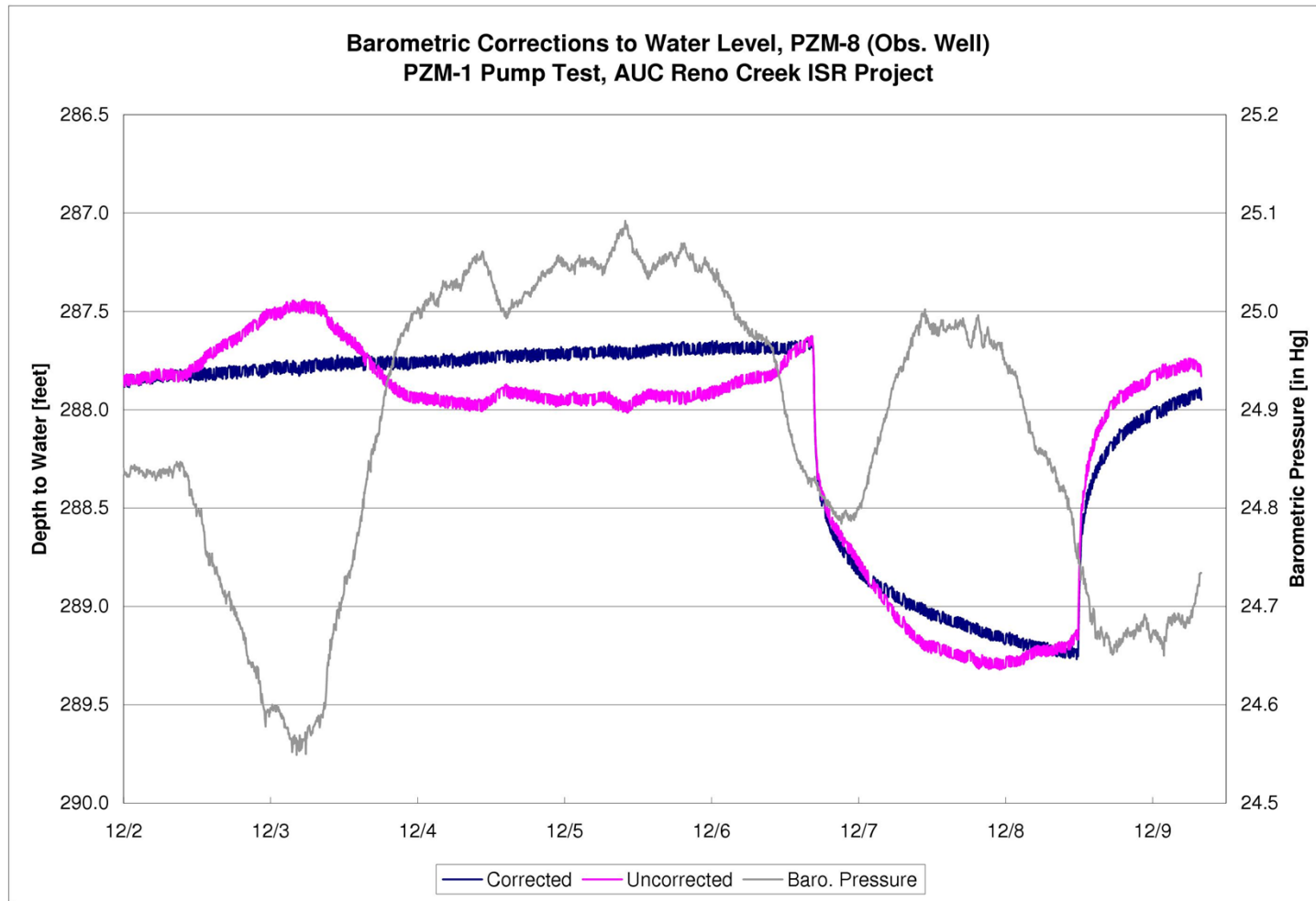
- Evaluate water level versus atmospheric pressure on baseline water levels prior to testing;
- Typical confined efficiency ranges from $\sim 0.20 - 0.75$;
- Partially saturated efficiency ranges from $\sim 0.80 - 1$



PZM8

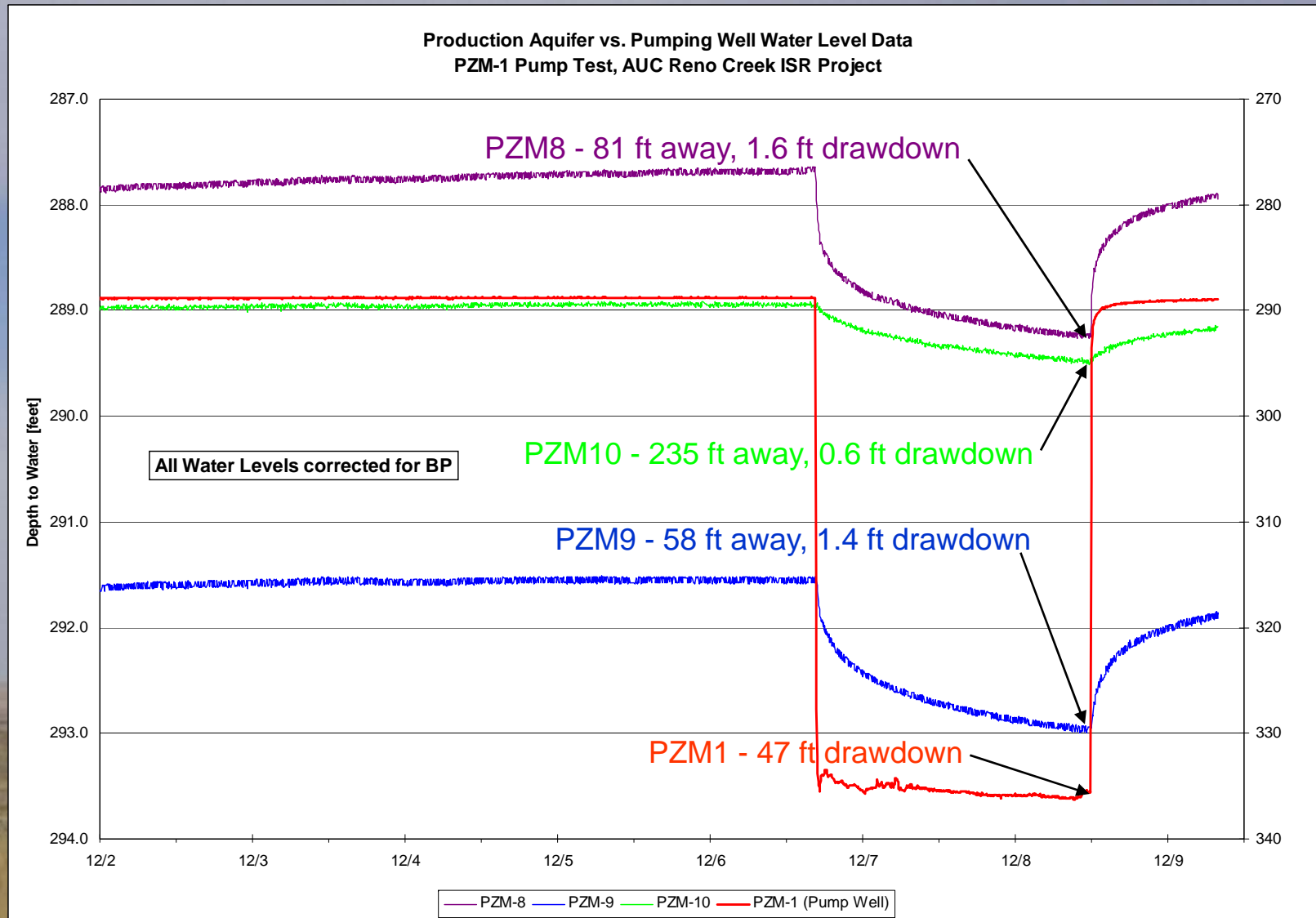
Barometric Corrections

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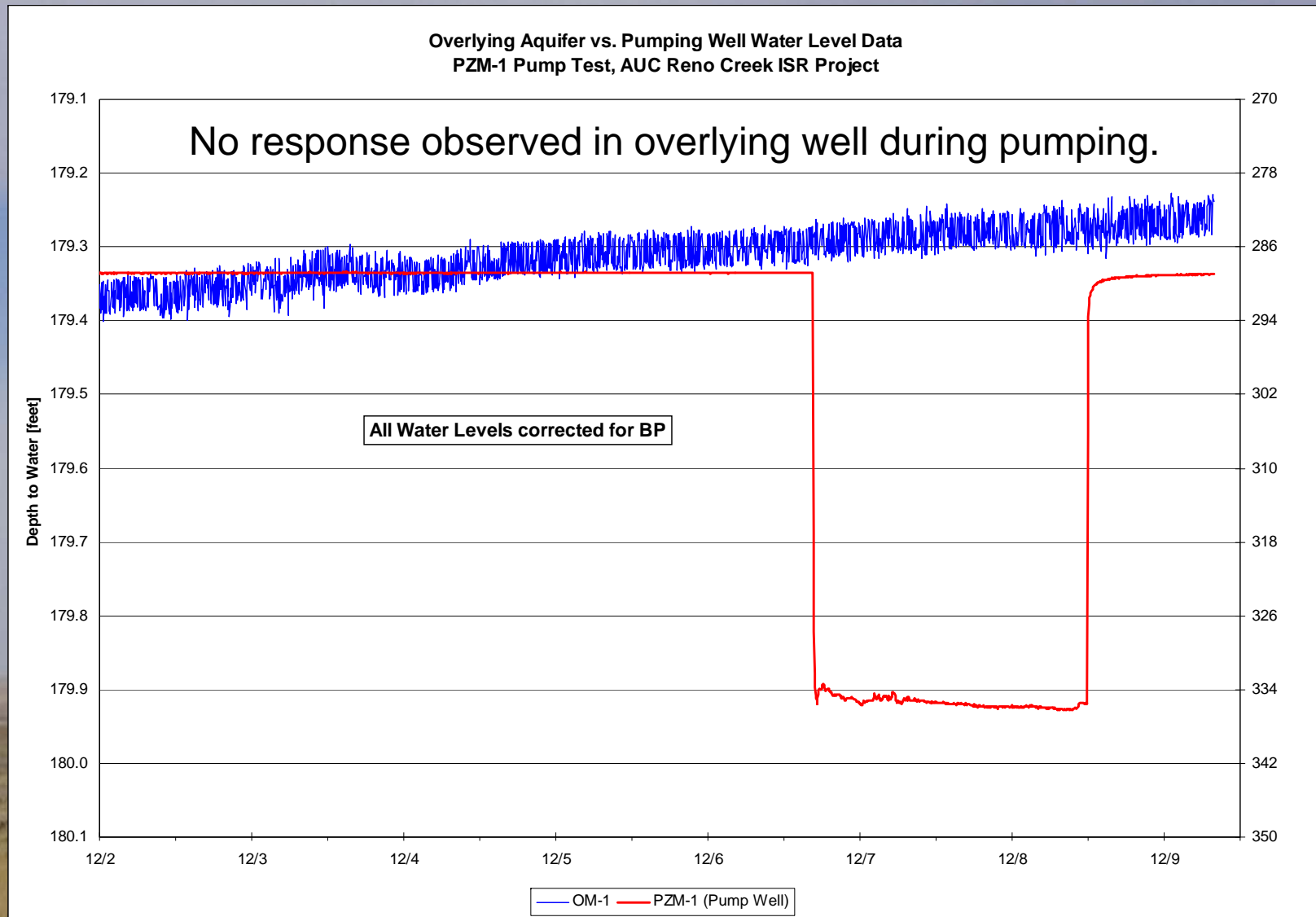
PZM1 Pump Test Drawdown Observed in Production Zone Aquifer

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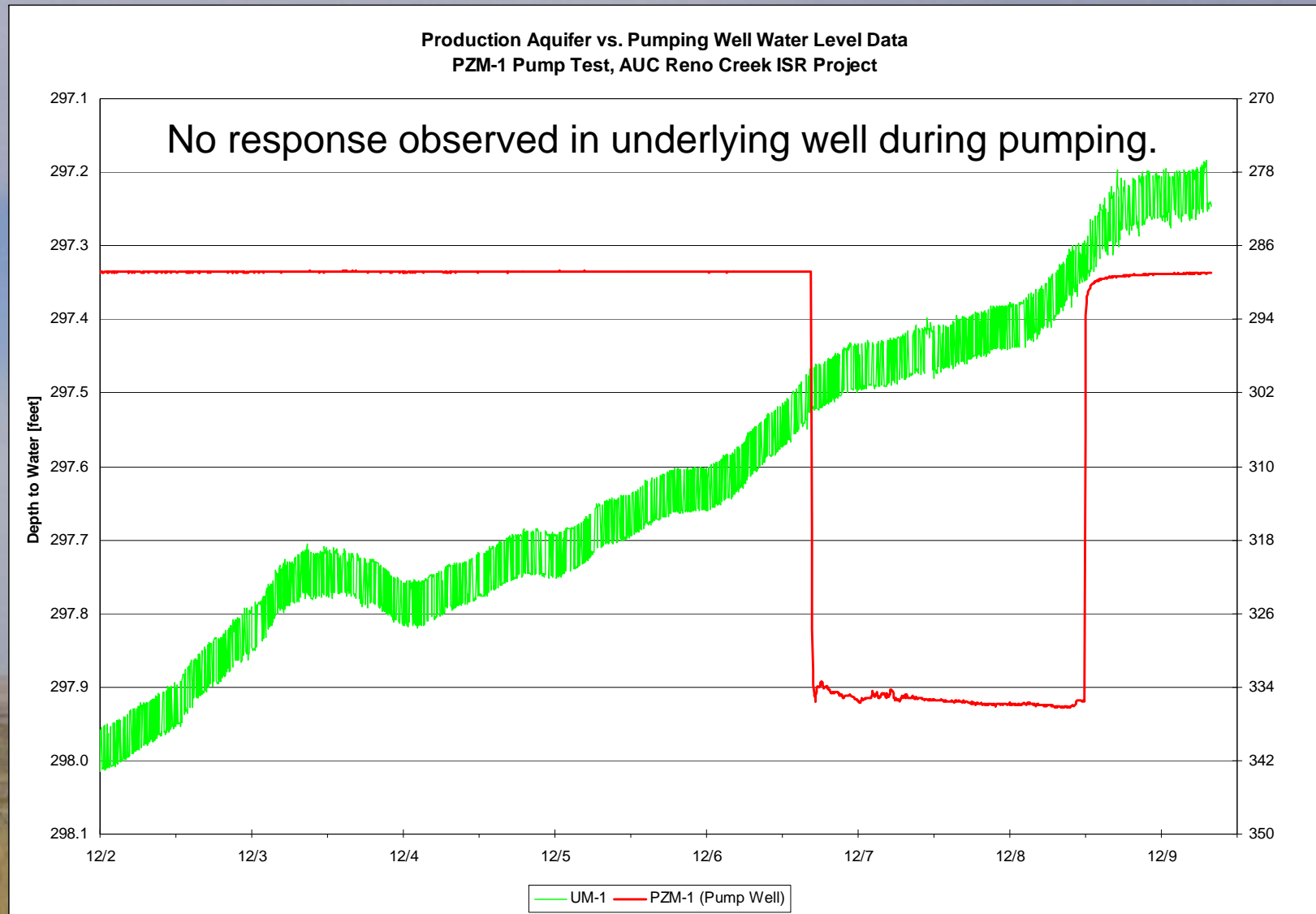
PZM1 Pump Test Water Levels Observed in Overlying Aquifer

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PZM1 Pump Test Water Levels Observed in Underlying Aquifer

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Preliminary Aquifer Properties

PZM1 Pump Test

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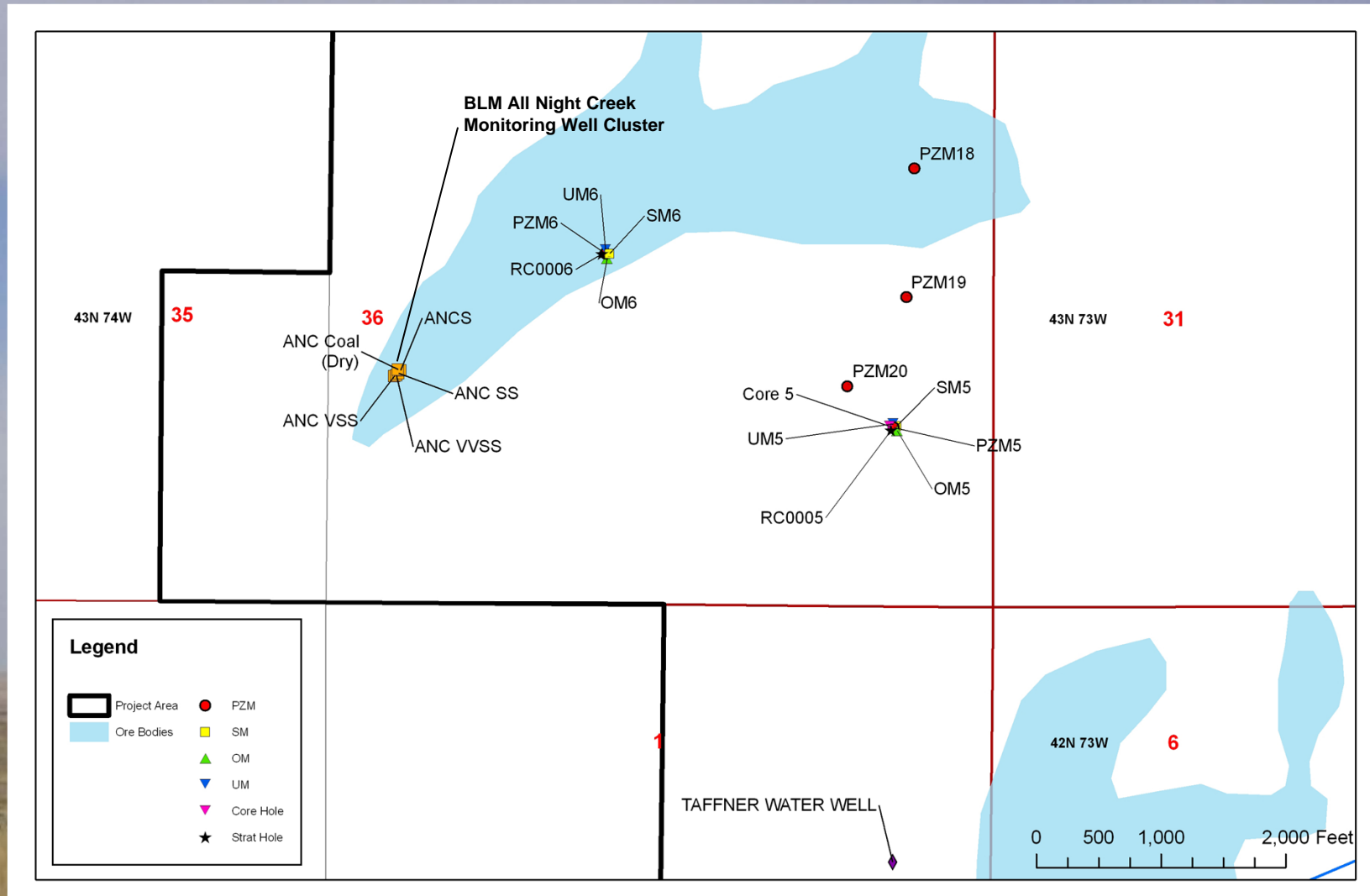
Well Name	Well Type	Distance from PW (feet)	Theis Drawdown, Jacob Corrected			Theis Recovery	
			T (ft ² /d)	K (ft/d)	S	T (ft ² /d)	K (ft/d)
PZM1	Pump	0	--	--	--	384	4.0
PZM9	Obs.	58	460	4.8	4.5E-03	456	4.8
PZM8	Obs.	81	537	5.7	7.5E-04	604	6.4
PZM10	Obs.	235	798	8.4	2.7E-03	895	9.4
		Averages:	598	6.3	2.7E-03	652	6.9

- Results are similar to historical testing conducted ~1,000 feet southwest of PZM1;
- Results indicate that aquitards above and below the production zone aquifer are adequate; and
- Permeability results calculated from pump test fall within the ideal range for successful ISR mining and restoration operations.



PZM5 Pump Test In Progress

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PZM5 Pump Test Status

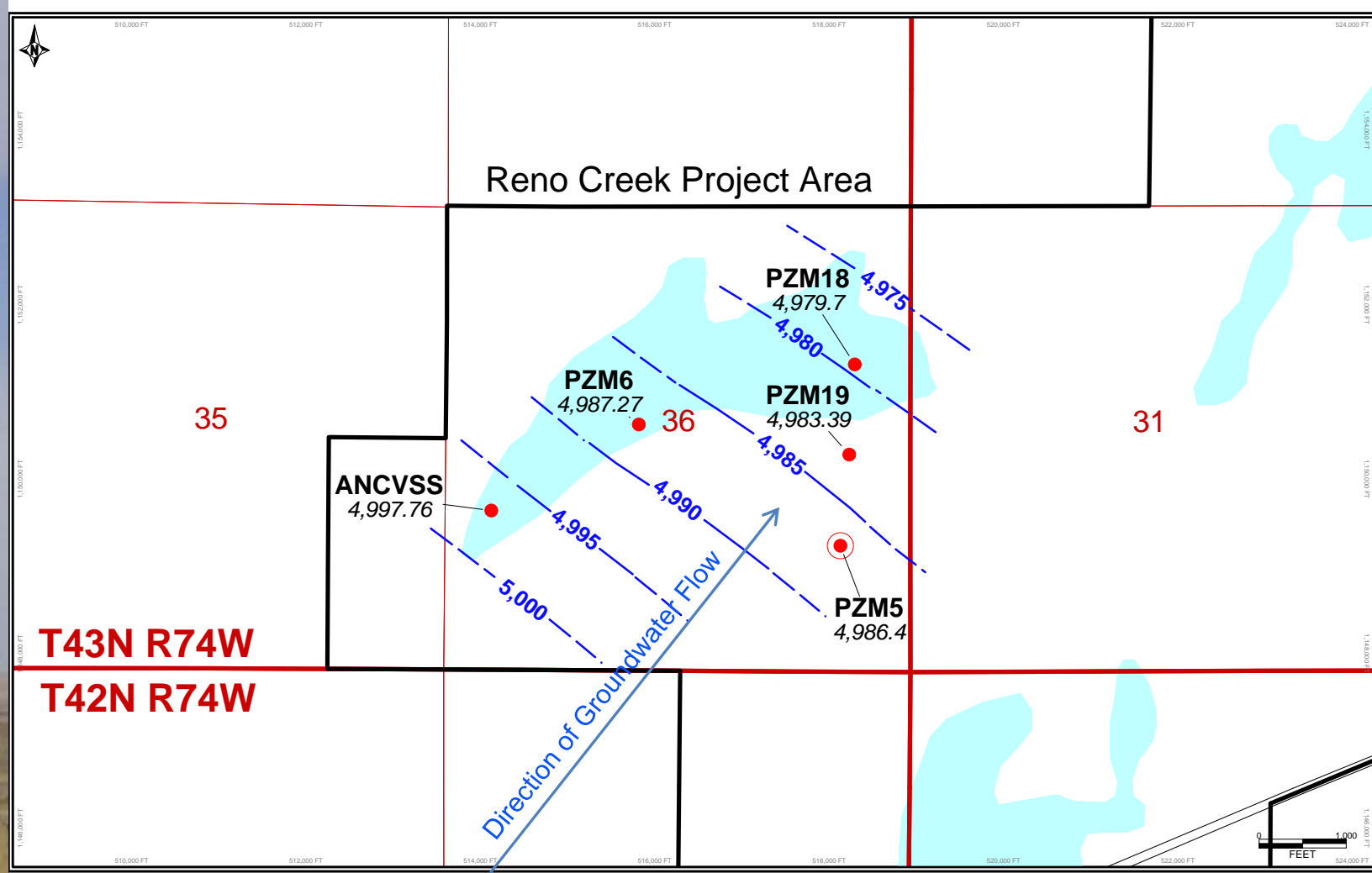
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- Initiated test on 02/07/11 at 16:00.
- Test prematurely ended on 02/09/11 at 09:45 due to generator failure associated with sub-zero temperatures.
- Drawdown observed in production zone aquifer (PZM19) at 1,000 feet from pumping well.
- Test will resume after adequate recovery is achieved.



PZM5 Pump Test Production Zone Aquifer Potentiometric Surface 02/07/11

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Additional Coal Bed Natural Gas Groundwater Monitoring

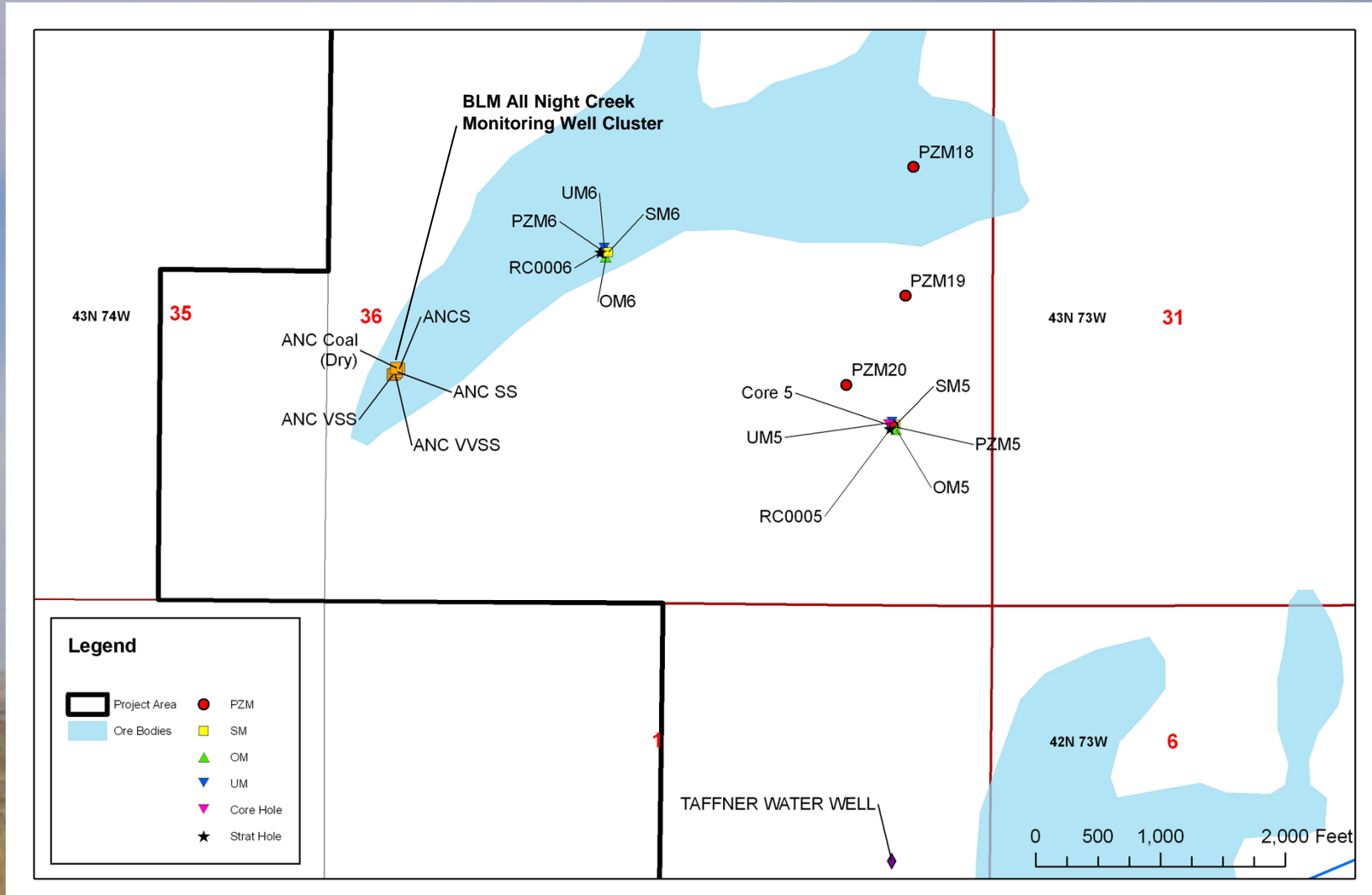
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- Regional groundwater monitoring conducted by BLM to assess four aquifers overlying the Fort Union, Big George Coal.
- Monitoring is conducted at the All Night Creek monitor well cluster located in Section 36 of T43N R74W of the Reno Creek Project Area.
- 1993 – 2006 Coalbed Natural Gas (CBNG) Regional Groundwater Monitoring Report: Powder River Basin, Wyoming, Keith E. Clarey, P.G., July 2009.
- This report represents one of the most complete groundwater studies performed in the Powder River Basin.
- Over nine years of water level data collected at the All Night Creek monitor well cluster indicate that four overlying Wasatch aquifers, including the overlying and production zone aquifer, are unaffected by CBNG production within the Big George at Reno Creek.



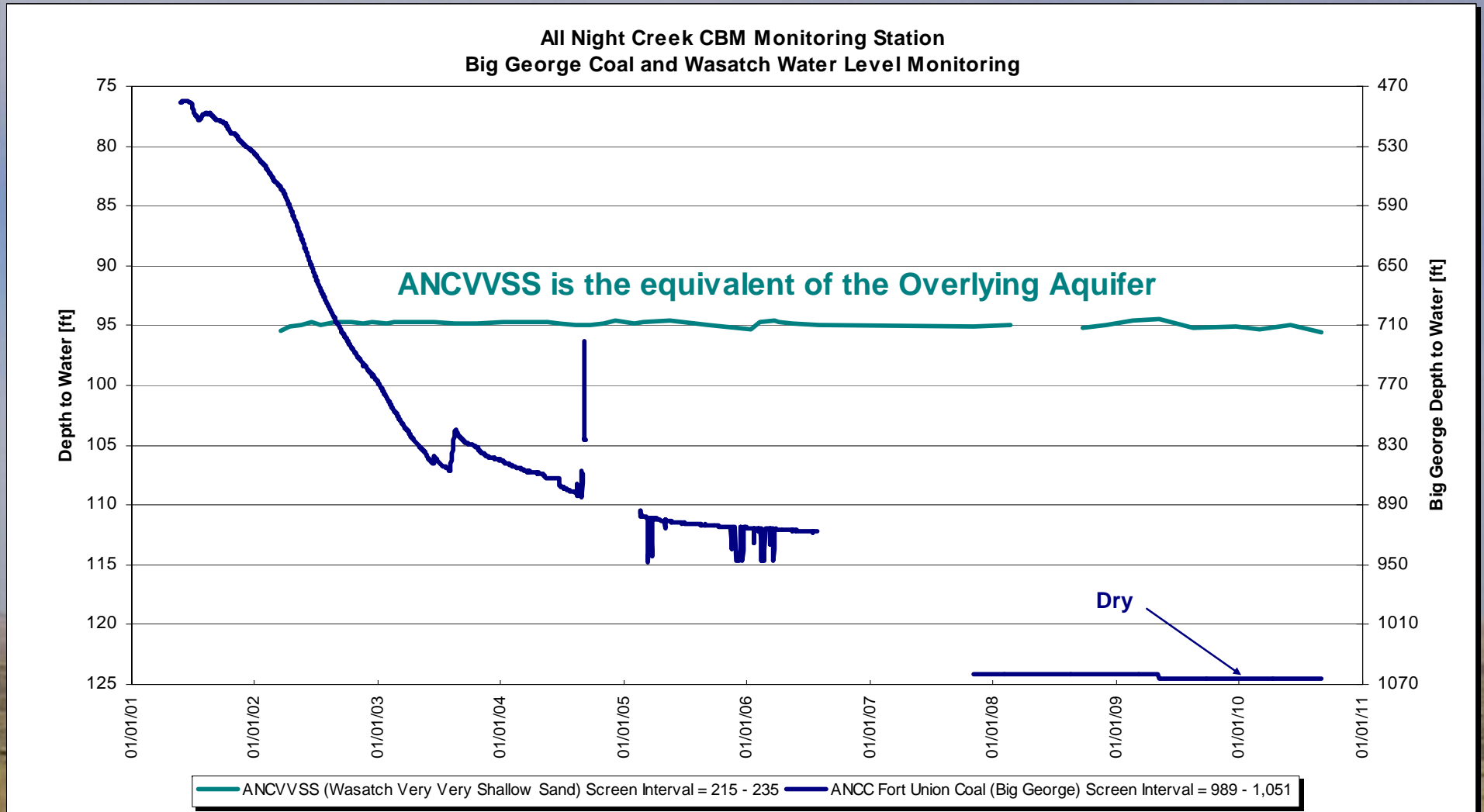
Location of BLM All Night Creek Monitoring Well Cluster

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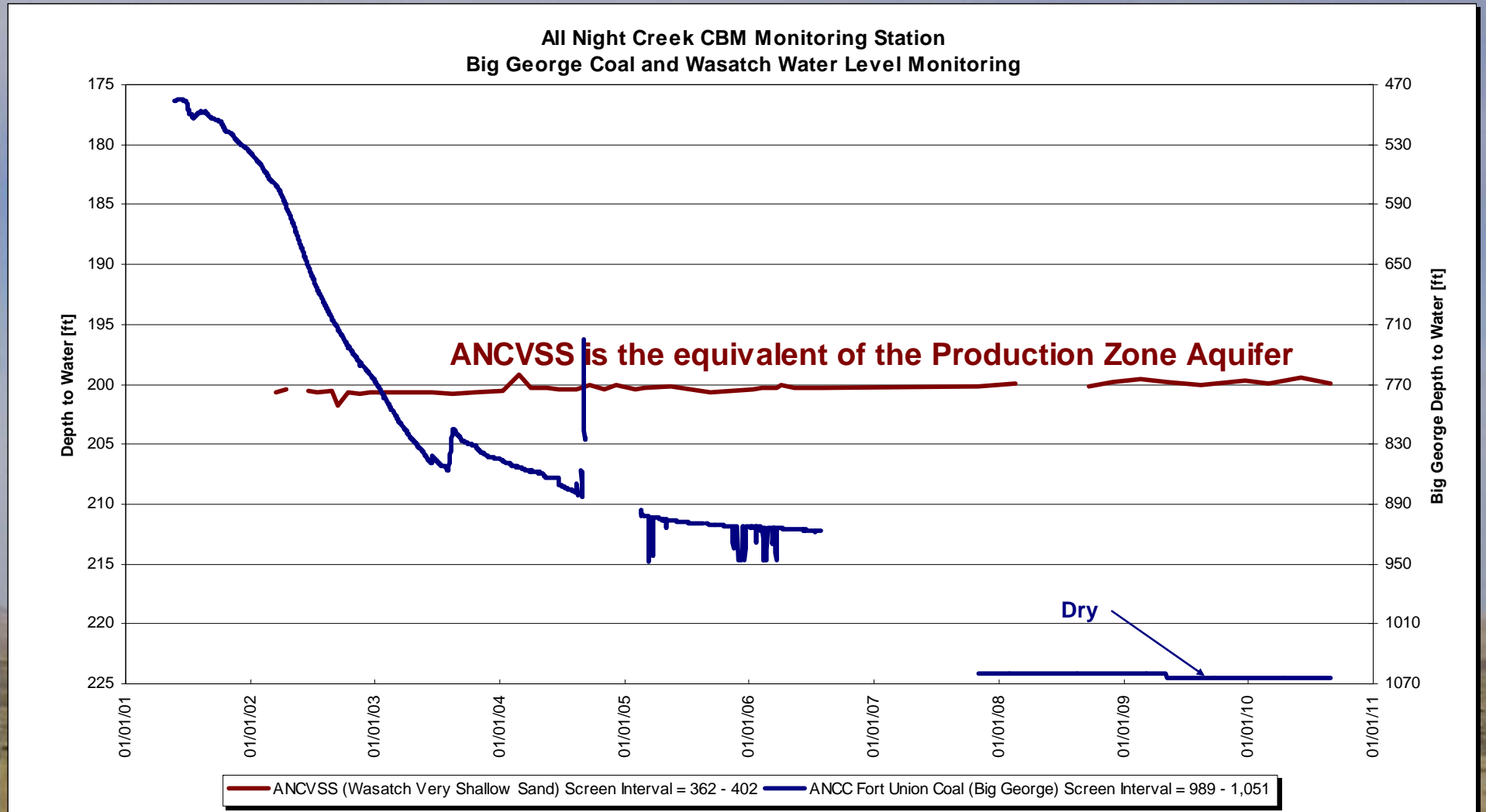
ANCVVSS (Wasatch Very Very Shallow Sand)
Screen Interval = 215 – 235 ft bgs
Reno Creek Overlying Aquifer

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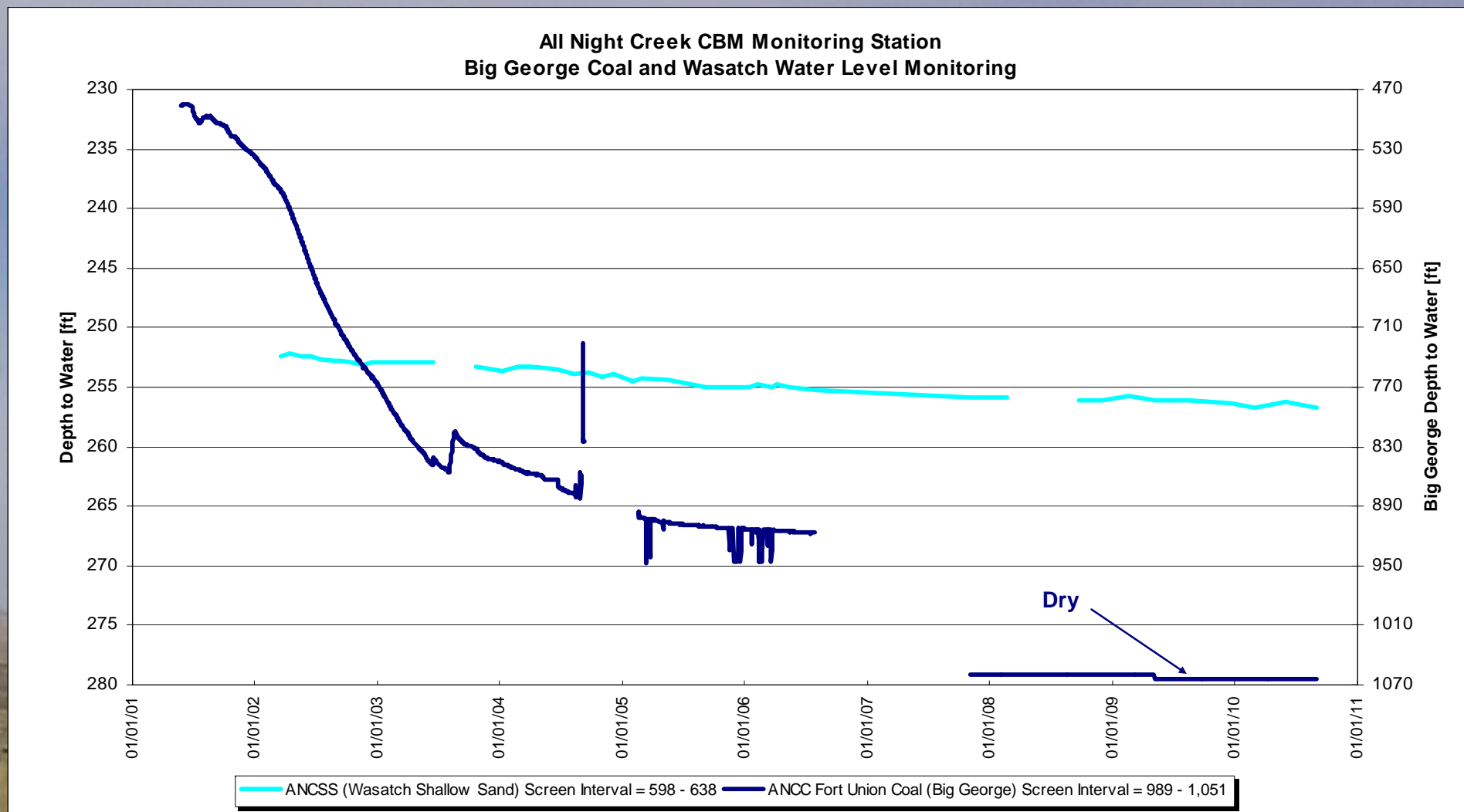
ANCVSS (Wasatch Very Shallow Sand) Screen Interval = 362 – 462 ft bgs Reno Creek Production Zone Aquifer

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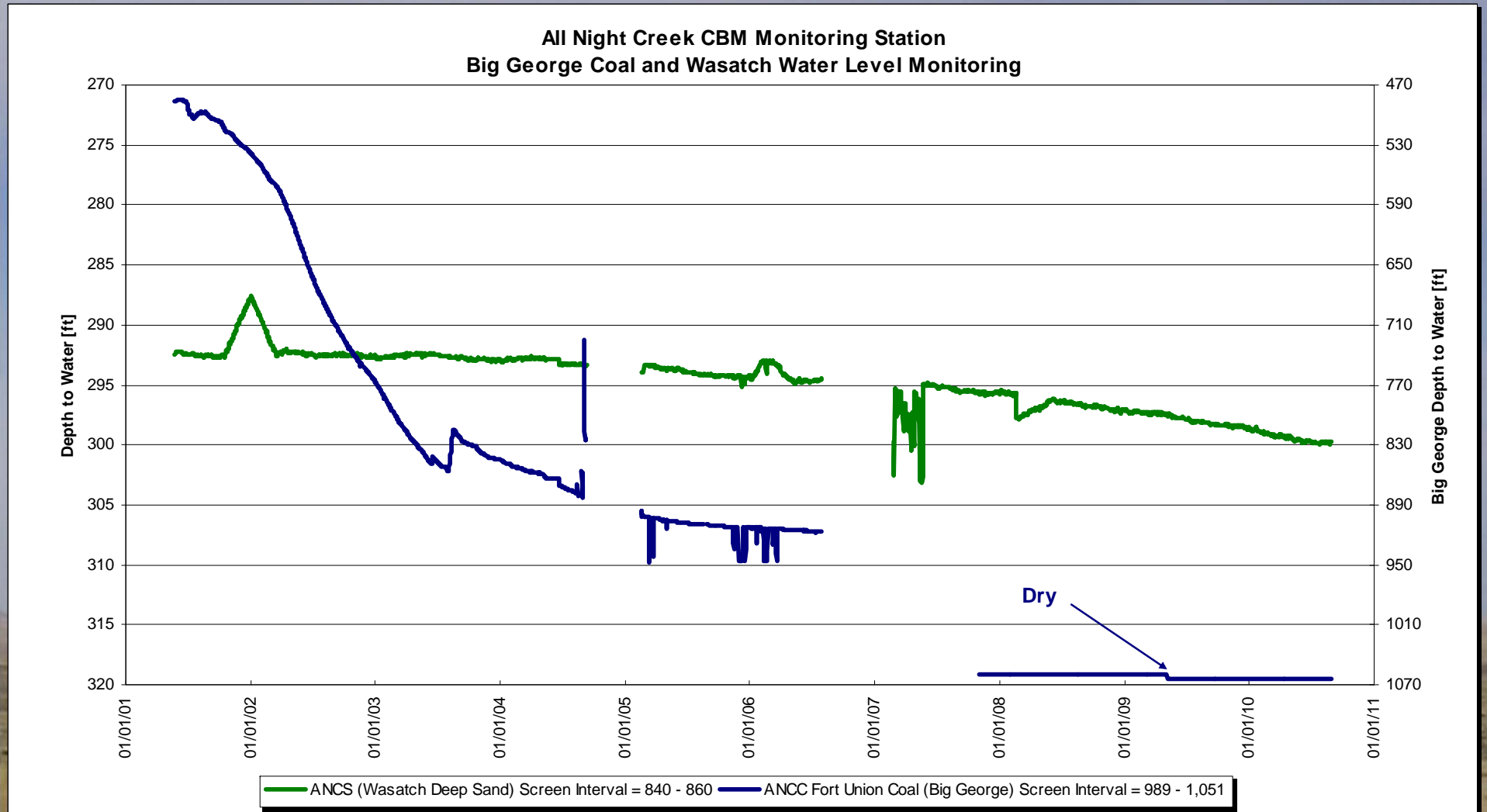
ANCSS (Wasatch Shallow Sand) Screen Interval = 598 – 638 ft bgs

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ANCS (Wasatch Deep Sand) Screen Interval = 840 – 860 ft bgs

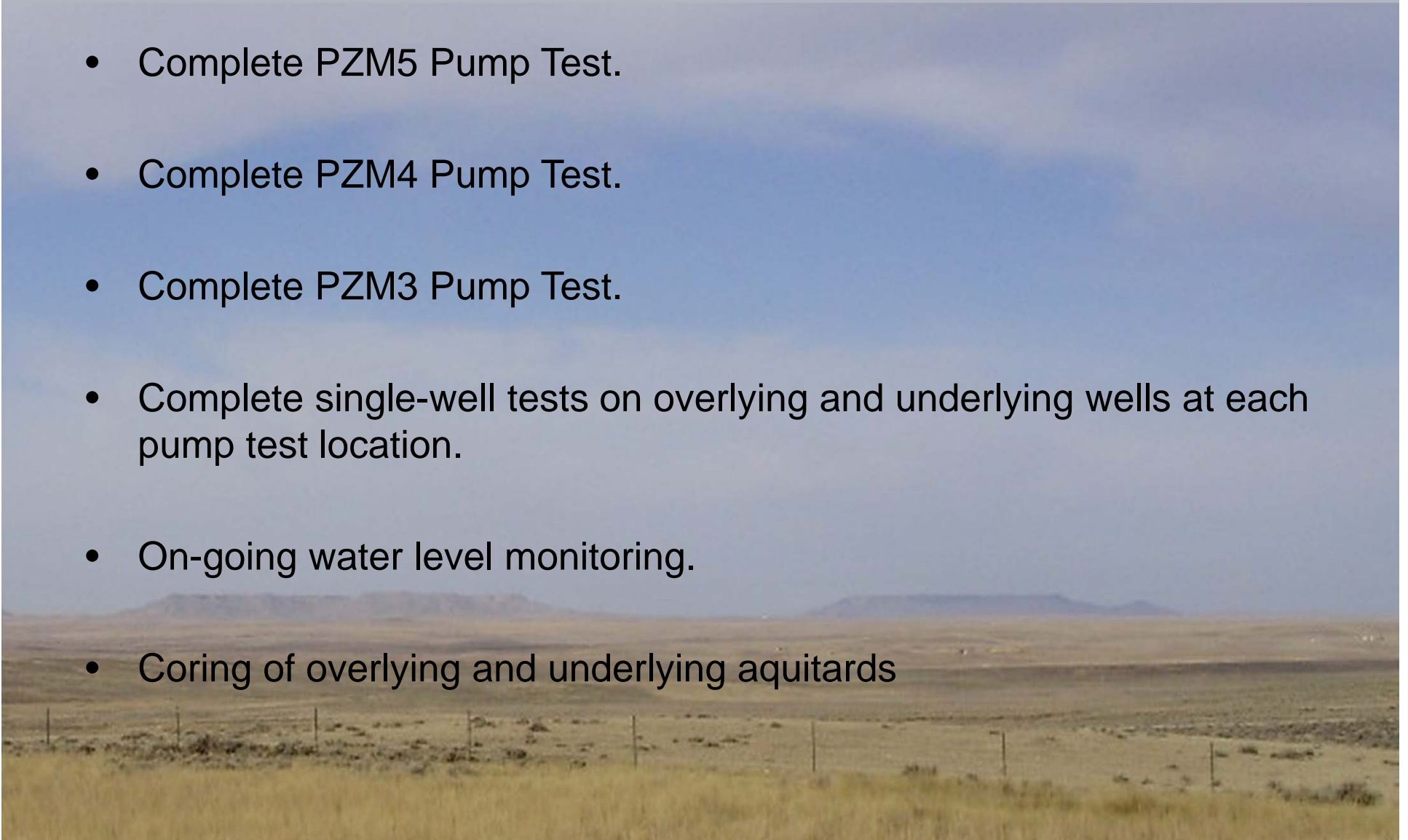
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Remaining Hydrogeological Characterization Tasks

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- Complete PZM5 Pump Test.
- Complete PZM4 Pump Test.
- Complete PZM3 Pump Test.
- Complete single-well tests on overlying and underlying wells at each pump test location.
- On-going water level monitoring.
- Coring of overlying and underlying aquitards



Groundwater Modeling

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The Pump Test results will be used to construct a groundwater model for both the fully saturated and partially saturated portions of the Production Zone Aquifer. It is expected that the model will address the following issues:

- Monitor well ring spacing (adequacy for excursion detection);
- Excursion control/recovery;
- Drawdown impacts to all potentially affected hydrologic units in response to production and restoration activities;
- Hydraulic control;
- Water balance during:
 - Production
 - Concurrent production and restoration
 - Restoration
- Drawdown life of mine.

Groundwater Modeling Continued

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- Optimize monitor well placement;
- Optimize sweep efficiency;
- Optimize excursion control; and
- Optimize restoration activities



Questions for NRC

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- Inclusion of historical data in format compatible with pdf specifications.
 - Some historical documents are only available in electronic form that are not compatible—
 - 300 dpi
 - Embedded fonts

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