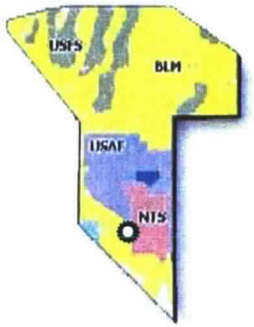
NYE COUNTY SCIENTIFIC PROGRAM

Presented to:

U.S. Nuclear Waste Technical Review Board

Longstreet Inn
Amargosa Valley, Nevada
31 JANUARY 2001



Early Warning Drilling Program

Phase I and II Recap
Phase III Plans

Nye County's Water Right Applications

Status and Significance

Five Year Grant Proposal

Preliminary Scope of Work

Presented By:

Nye County Nuclear Waste
Repository Office

Tom Buqo

Consulting Hydrogeologist
2280 E. Calvada #203
Pahrump, Nevada
89048

PHASE I AND II RECAP OF THE EARLY WARNING DRILLING PROGRAM

EWDP Phase 1 Summary

Six wells/six sites (alluvial, volcanic, & paleospring)
Six first water samples from six sites
Two rounds of water sampling & analyses
Three 48-hour pumping tests
Water level monitoring

Completed Wells and Piezometers

Completed

NC-EWDP-1D	2500' deep well in Tertiary sediments
NC-EWDP-1S	291' well in uppermost Tertiary volcanics
NC-EWDP-3D	2500' deep borehole into Tertiary volcanics and sediments
NC-EWDP-3S	296' deep well in Tertiary volcanics
NC-EWDP-5S	1167' deep borehole in alluvium
NC-EWDP-9S	361' well in paleospring deposits, alluvium, and Tertiary volcanics
NC-EWDP-Washburn	510' dual piezometer string in alluvium

EWDP Phase 2 Summary

Eleven wells (alluvial, volcanic, paleospring & carbonate)
Conductor casing at three more sites for deeper drilling
Six first water samples from four sites
Sampling underway now
One pump spinner test and one 48-hour pumping test
Alluvial Tracer Complex

Completed Wells and Piezometers

Completed

NC-EWDP-2DB	3075' well with open completion at Tertiary/Paleozoic contact
NC-EWDP-4PA,B	500' and 800' piezometers in alluvium and uppermost Tertiary(?)
NC-EWDP-5SB	500' piezometer in alluvium
NC-EWDP-7S, 7SC	53' piezometer in paleospring deposits, 460' well
NC-EWDP-12PA,B,C	390', 400', and 250' observation wells
NC-EWDP-19D, 19P	1438' ATC Test Well and 500' piezometer

In Progress

NC-EWDP-3DB	505' conductor casing
NC-EWDP-12D	68' conductor casing or test well
NC-EWDP-15D	607' conductor casing

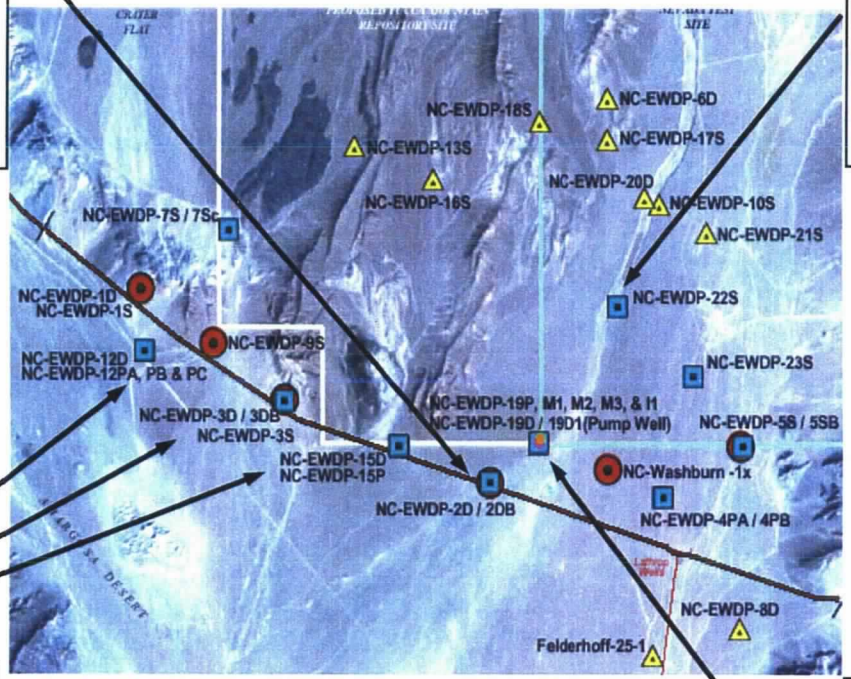
PHASE III PLANS

NC-EWDP-2DB

- Clean out to T.D. (3075')
- Geophysical logs
- 48-hour aquifer test
- Chemical samples
- Packer test carbonates
- Packer test LCZ

NC-EWDP-22S

- One PZ to 800'±
- One well to 2,000'±
- 48-hour aquifer test
- Chemical samples



Other Sites*

- 15D – 3,500' ±
- 12D – 1,500' ±
- 48-hour aquifer tests
- Chemical samples
- 3DB – 2,500'

* Budget/Schedule Dependent

ATC

- Two 1,500' wells
- Two 500' piezometers
- 48-hour aquifer test
- Chemical samples
- Continued tracer testing

Nye County Water Right Filings – Who? - When ? - What ? - Where ?

Who – Nye County Board of County Commissioners

When - February 16, 2000
State Engineer ruling could be three years away

What - Filed 10 Water Right Applications
Type of Use - Municipal

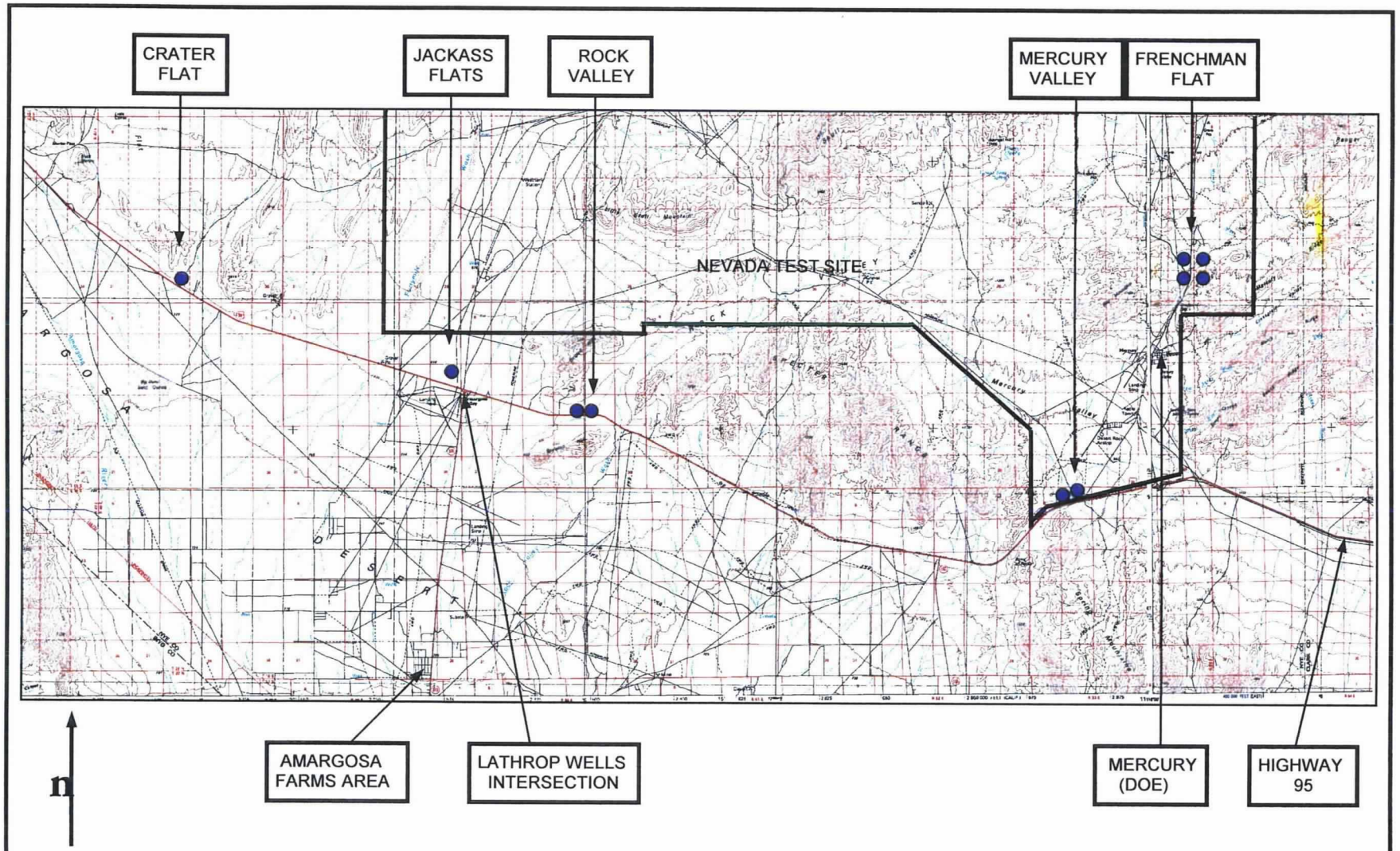
Where - From Points of diversion are in:

Crater Flat (1)
Jackass Flats (1)
Rock Valley (2)
Mercury Valley (2)
Frenchman Flat (4)

Two points of diversion are located on Early Warning Drilling Program well rights-of-way
Two points of diversion are located on BLM land
Six points of diversion are located on the Nevada Test Site - One is on top of Army Well 1

NO POINTS OF DIVERSION ARE LOCATED IN THE AMARGOSA DESERT HYDROGRAPHIC BASIN
BUT SEVERAL ARE WITHIN THE AREA INCLUDED IN THE ORDER OF DESIGNATION FOR THE BASIN

Where - To Place of use is Amargosa Desert Hydrographic Basin



LOCATION MAP SHOWING NYE COUNTY WATER RIGHT FILINGS
(BASE MAP REDUCED FROM USGS 30x60 MINUTE SERIES)

Nye County Water Right Filings – Why ?

1. Projected Population Growth in Southern Nye County

- Nye County population projected at 162,000 by 2050
- Most of this growth will be in Pahrump (150,000)
- Amargosa Valley is the "wildcard" (could be 5,000, could be 50,000)

2. Protection from Speculators

- Amargosa Resources Inc. tried but failed.....resulted in water right forfeitures
- Vidler Water, Inc. filings in Lincoln County basins, and Sandy Valley in Clark County
- Action lays claim to the last large block of unappropriated water in southern Nevada

3. Protection from Inter-County Transfers

- LVVWD did not consider areas around the Nevada Test Site the first time around
- Action could result in partnership with Clark County

4. Resolution of Federal Land Use and Land Management Policy Impacts on Water Resources

- Filings were protested by DOE/NTSO, DOE/YMP, NPS/DVNP, U.S. Fish and Wildlife Service
- State Engineer's ruling may lead to State and Federal Court challenges
- Action will bring the issue of federal land versus state water to a head
- More land withdrawals and restrictions are to be expected
- Has far-reaching consequences beyond Nye County and Nevada borders

Nye County Water Right Filings – Significance

Features, Events, and Processes in Saturated Zone Flow and Transport

YMP FEP 1.4.07.01.00 – Water Management Activities

TSPA Screening Decision:

Included (existing)
Excluded (changes)

Rationale: "Regulatory Guidance"

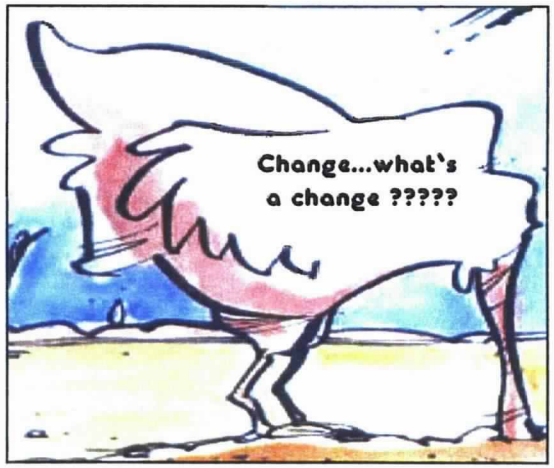
The TSPA methodology purports to follow the approach recommended by the National Academy of Sciences National Research Council, 1995 (Technical Bases for Yucca Mountain Standards). The TSPA analyses "follow" the recommended approach, using as defaults societal conditions as they existed; as such, the TSPA is based on the assumptions that populations would remain at their present locations and population densities would remain at their current levels.

The reference to NAS (1995) is taken out of context; the discussion for which it is germane is the consideration of a population-risk standard, not TSPA. The TSPA uses the NAS discussion as a rationale for ignoring the present (2000) population of Amargosa Valley, short-term (50 year) future growth in the area, and water resource management strategies which are very predictable.

Excluded Water Management Activities

- Increased water use in Amargosa Desert by the residents of Amargosa Valley
- Nye County's water right filings
- Las Vegas Valley Water District's water right filings east of the Nevada Test Site
- Increased water use on the NTS for mission related and private actions

These actions are not speculative, they are real.



Nye County's Five Year Grant Proposal

NINE DRAFT WORK ELEMENTS WILL PROBABLY BE PROPOSED

Element 1 - Data Collection at ONC#1

Element 2 - NC-EWDP-19D Alluvial Testing Complex

Element 3 - Archive Water Samples

Element 4 - Annual Water Chemistry Monitoring

Element 5 - Water Level Monitoring

Element 6 - Additional Early Warning Drilling Program Wells

Element 7 - Lithologic Sample Analysis

Element 8 - Surface Geophysical Surveying

Element 9 - Regional Groundwater Studies

EARLY WARNING DRILLING PROGRAM AND SURFACE GEOPHYSICAL SURVEYS

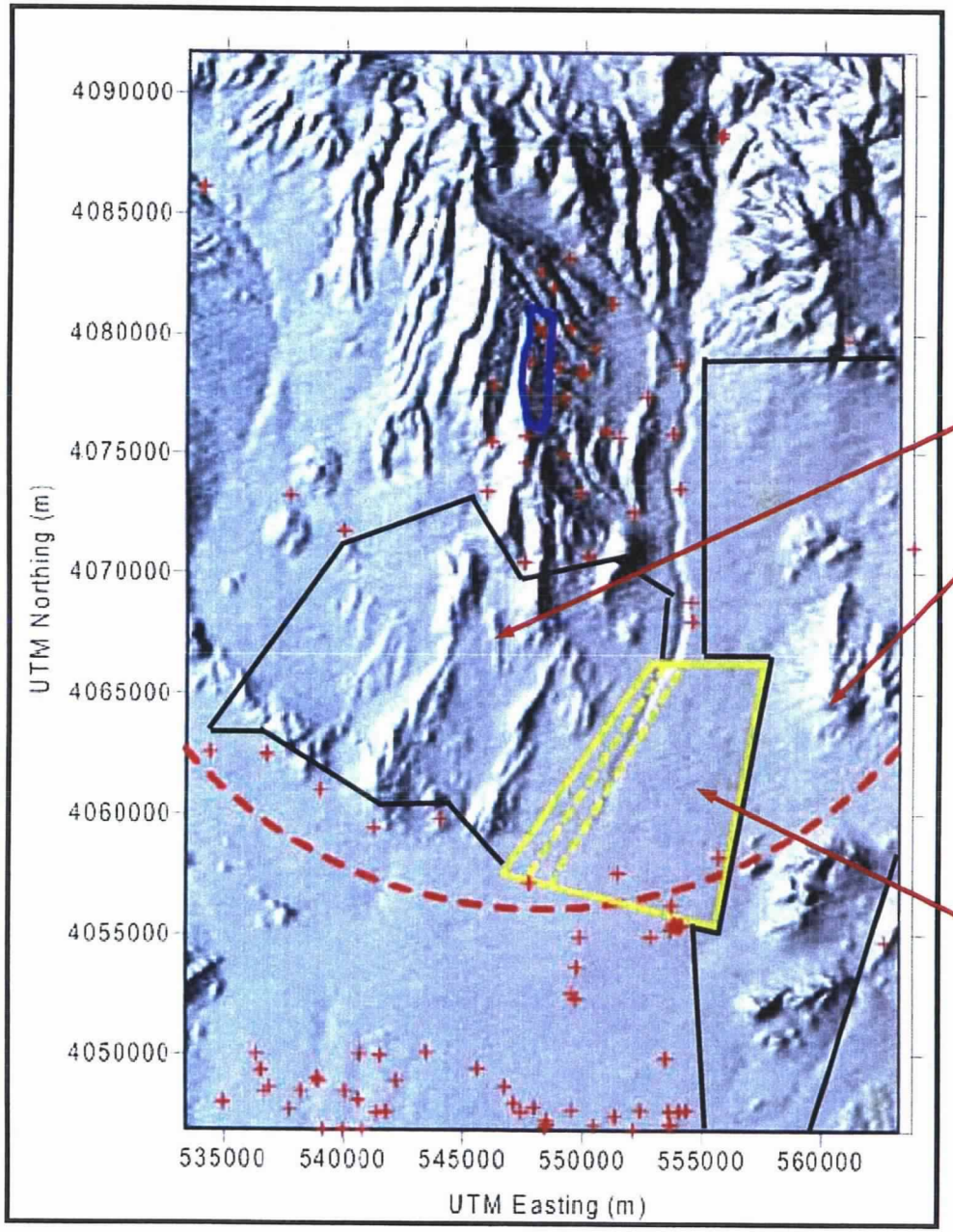
If Money Were Not a Concern What Would You Do...Where....and Why ?

What

ADDITIONAL EWDP WELLS	SURFACE GEOPHYSICAL SURVEYS
Twenty-five shallow (<800') wells and piezometers	Seismic Reflection – 50 miles
Fifteen intermediate (1,000' – 2,000') wells	Square-Array Direct Current Resistivity – 25 miles
Five deep (2,000' - 5,000') wells	Ground Magnetometer Surveys – 50 miles

Where

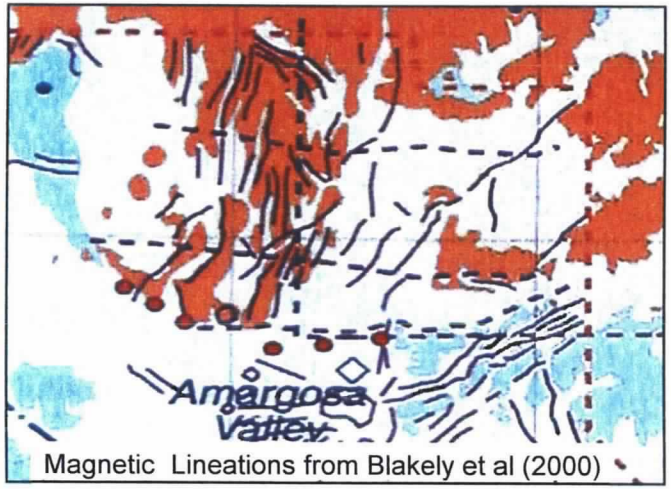
Zone of alluvial uncertainty	Zone of alluvial uncertainty
Site scale numerical model boundaries	Site-scale numerical model boundaries
Based on results of first three EWDP Phases and the geophysical surveying	Across inferred compartment boundaries
Final sites selected in consultation with others (YMP, NRC, NWTRB, ACNW, UNLV, USGS, Nevada)	Volcanic rock-sediment transition zone
(Road building not a binding constraint)	Across Highway 95 and Bare Mountain faults
	Tie lines between EWDP deep boreholes and wells



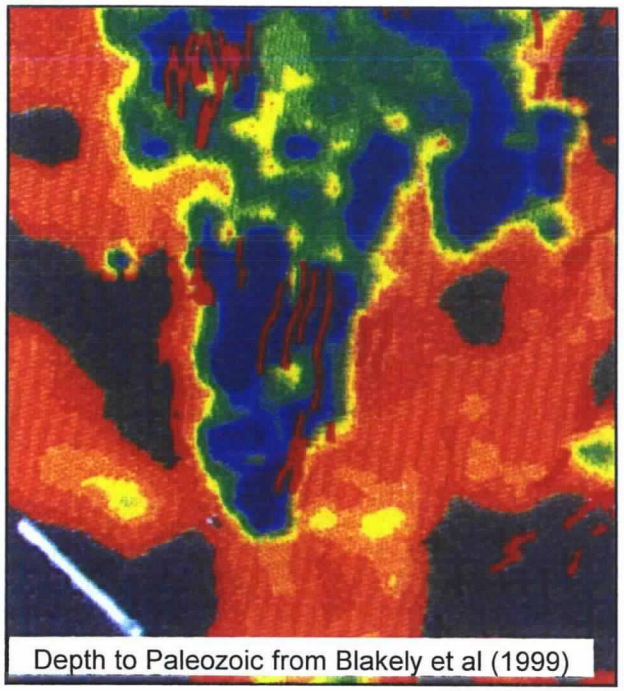
Other Zones of Uncertainty
(both alluvium and consolidated rock)

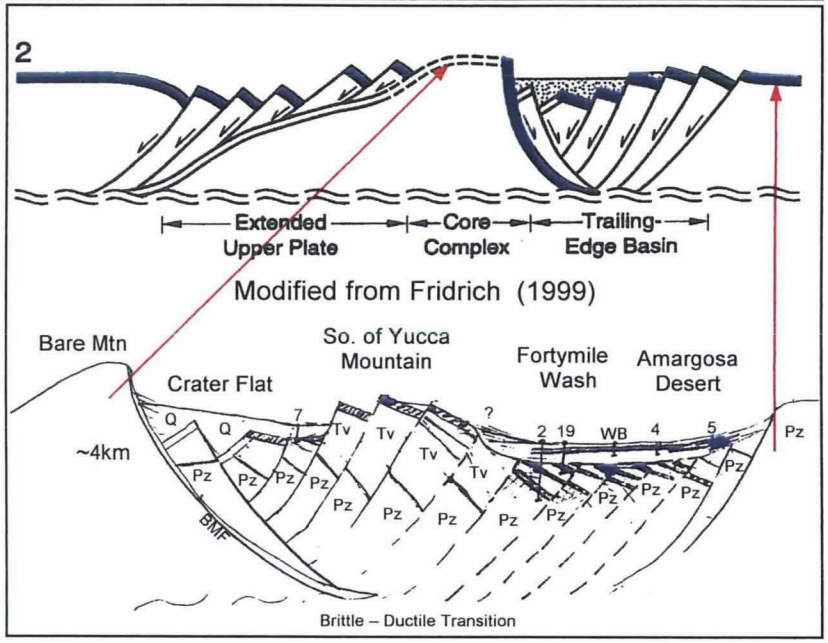
Area of Alluvial Uncertainty
from
Saturated Zone Flow and Transport PMR

Why ?



Magnetic Lineations from Blakely et al (2000)


Depth to Paleozoic from Blakely et al (1999)



Flow path definition requires an understanding of:

- Style of deposition (flow, fall, volcaniclastic, lacustrine, alluvial, etc.)
- Depositional environment (deltaic, fluvial, colluvial, etc.)
- Post -depositional deformation (faulting, folding, fracturing)
- Aquifer properties (permeability, transmissivity, storativity)
- Hydraulic gradients (horizontal and vertical, and thermal)

Groundwater Flux Comparisons Between the Regional and Site-Scale Models

Boundary Zone	Regional Flux (kg/s)	Site-Scale Flux (kg/s)	Calibration Target
N1	-101.24	-60.009275	Yes
N2	-16.48	-33.442643	Yes
N3	-53.05282	-30.557419	Yes
N4	-18.41	-44.807523	Yes
W1	3.45	4.1663	No
W2	-71	-0.0071871	No
W3	-6.9	-0.0000078	No
W4	2.73	-0.0000223	No
W5	-46.99	-6.8542863	No
E1	-555.45	-553.85002	Yes
E2	-5.46	3.5334027	Yes
E3	2.65	16.4956192	Yes
E4	-3.07	16.8224586	Yes
S	918	724	No

Source: Saturated Zone Flow and Transport Process Model Report

Note: Negative values indicate flow into the site-scale model, positive values are flow out of the site-scale model.
Red highlighting indicates boundary zones with opposite flow directions in the two models.
Yellow highlighting indicates boundary zones with appreciably different fluxes in the two models.