

# *Paralana Hot Rock Geothermal Project - Exploring for Radiogenic Heat*

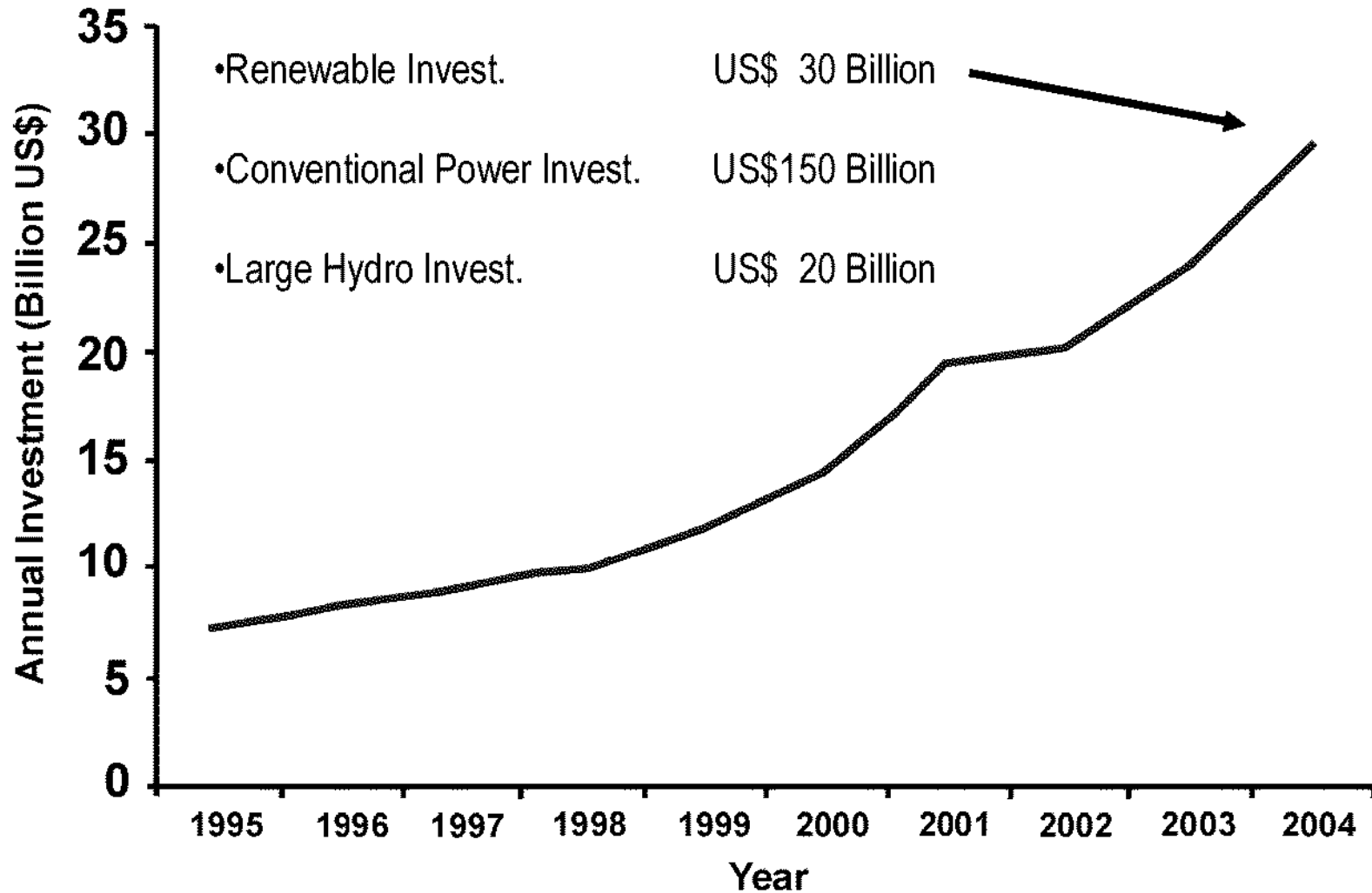


**petra**therm

*Exploring for Sustainable Energy*

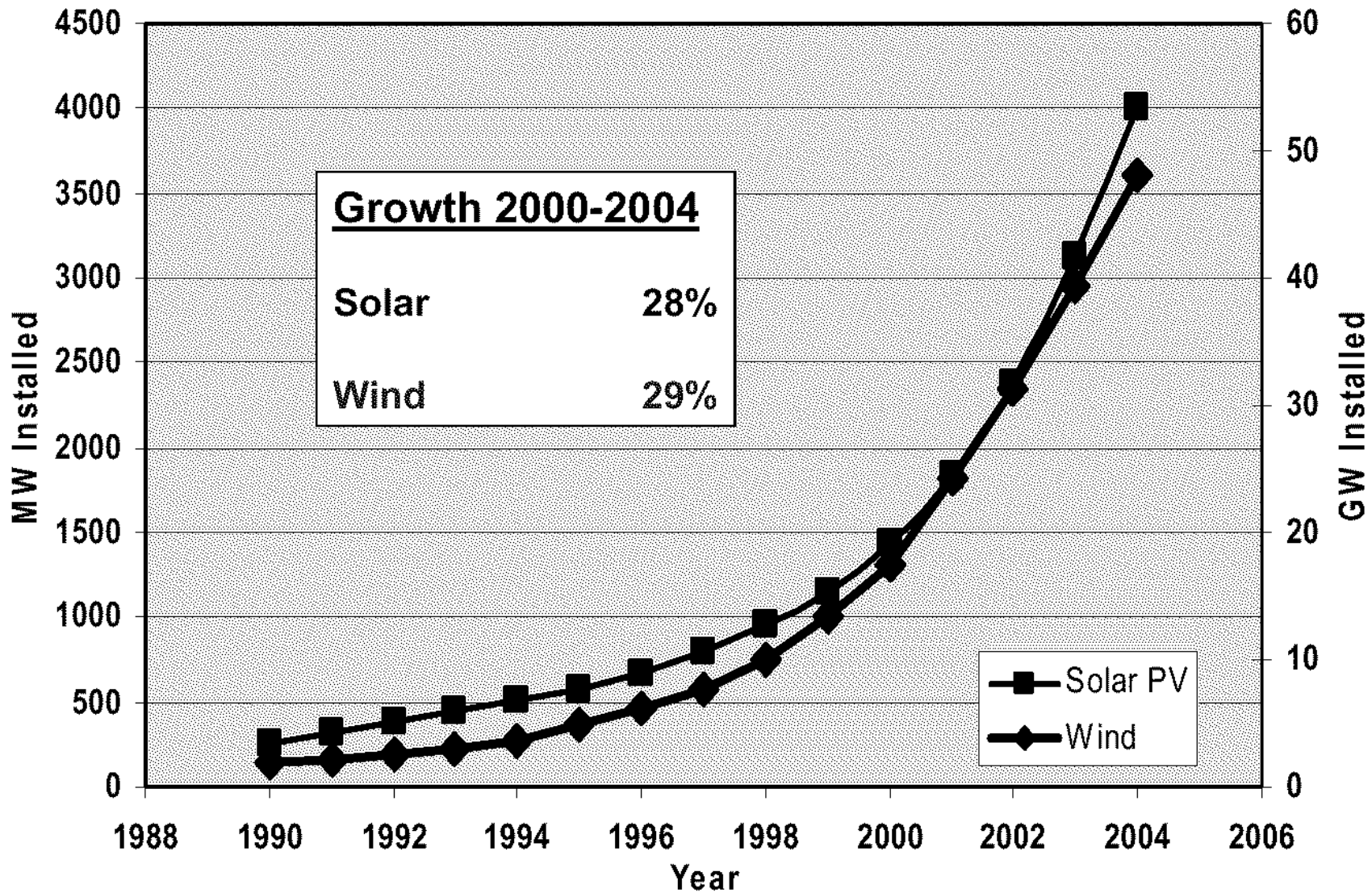


# ***Annual Investment in Renewable Energy***



***Now 4% of Global Power Capacity*** (excludes large hydro)

# Wind / Solar Growth



# ***Global Renewable Resource Base***

• **World Annual Electricity Consumption = 58 EJ**

(Fossil fuels 63%, Nuclear 17%, Large Hydro 16%, Renewables 4%)

• **Total Technical Potential of Renewables is 7500 EJ/year**

<b><i>Geothermal</i></b>	<b><i>5,000</i></b>
<b><i>Solar</i></b>	<b><i>1,575</i></b>
<b><i>Wind</i></b>	<b><i>640</i></b>
<b><i>Biomass</i></b>	<b><i>276</i></b>
<b><i>Hydropower</i></b>	<b><i>50</i></b>
<b><i>Total</i></b>	<b><u><i>7541</i></u></b>

(Source: World Energy Assessment, UNDP, 2000)

# ***Global Renewable Energy Mix***

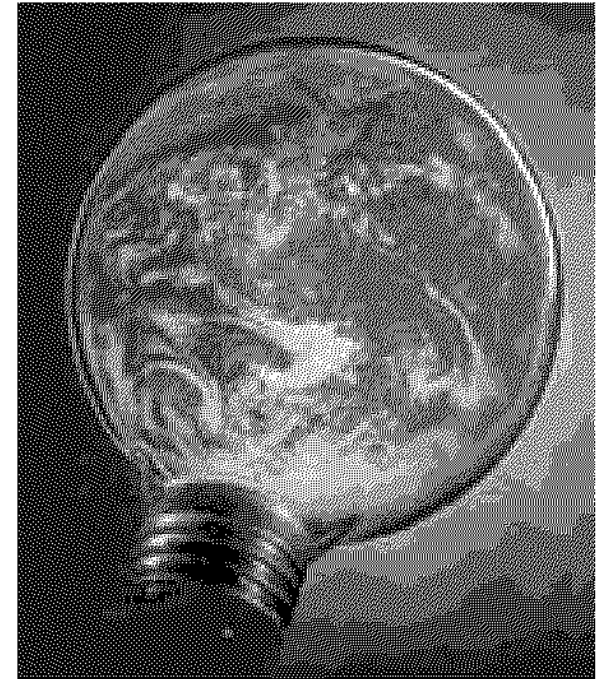
***(does not include hydro)***

<b>European Union</b>	<b>20% (25-30%? revised)</b>	<b>2020</b>
<b>China</b>	<b>10%</b>	<b>2020</b>
<b>India</b>	<b>10%</b>	<b>2010</b>
<b>California</b>	<b>20%</b>	<b>2017</b>
<b>Australia</b>	<b>1.3%</b>	<b>2010</b>

# ***Petratherm's Commercial Strategy***

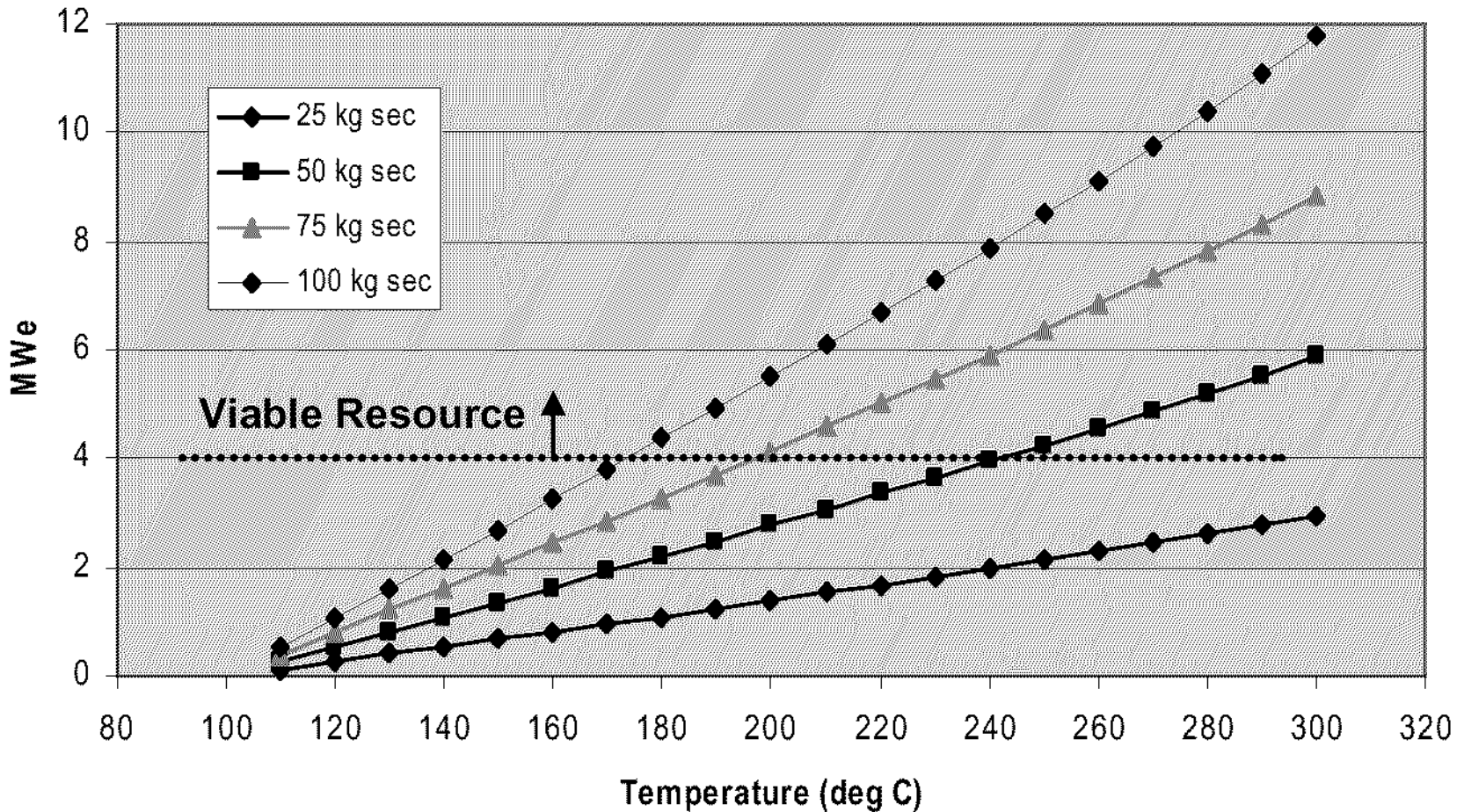
## ***The 5 Hot Rock Cost Pillars***

- **Temperature**
- **Flow Rate**
- **Depth (Drill Cost)**
- **Location**
- **Plant**



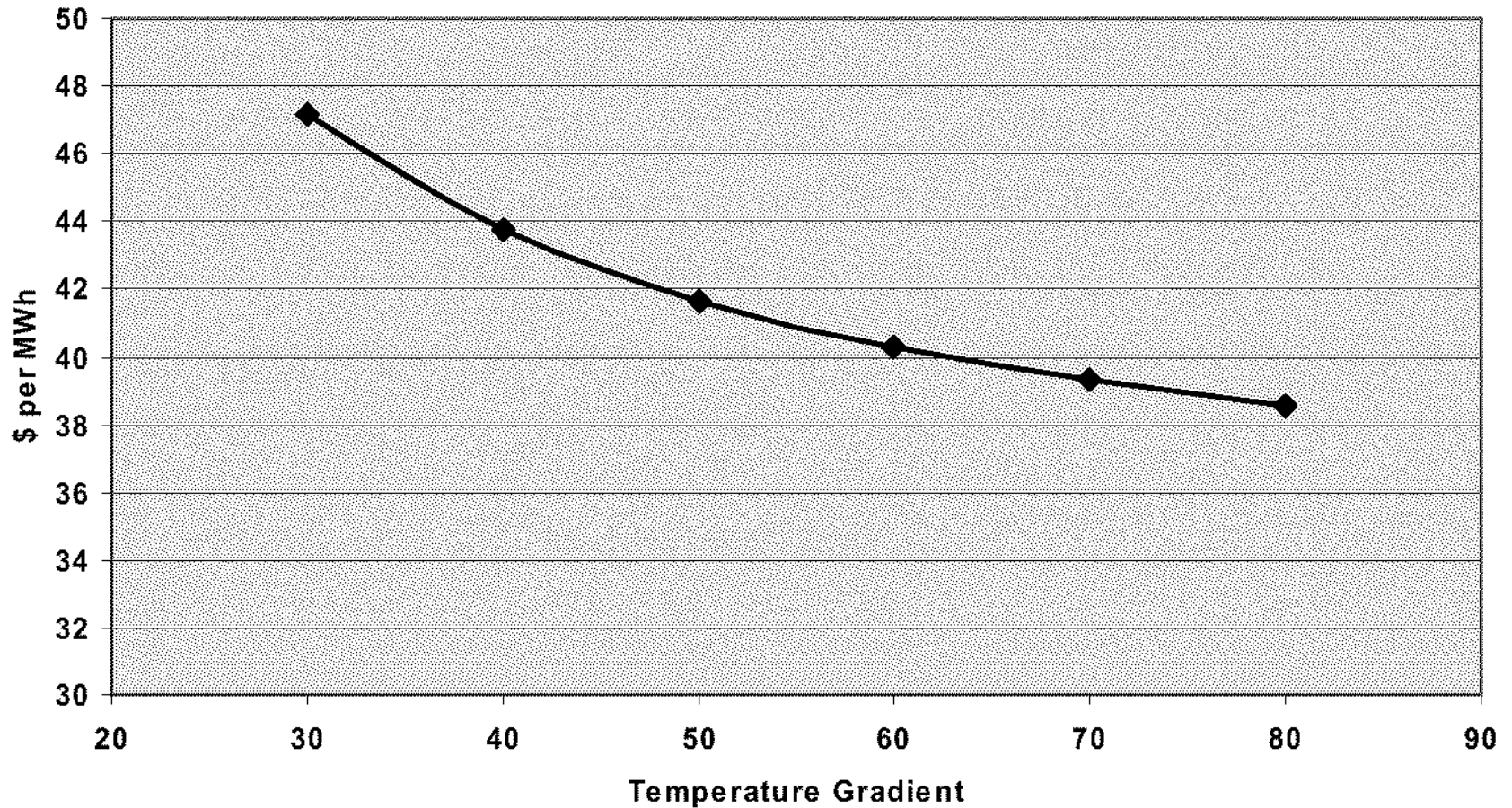
***Shallow Hot Rocks Close to Market!***

# Temperature - Flow vs Net Power Output



(viable resource assumptions : \$1.4M per MWe plant, \$3.5M per well, triplet configuration, 13% plant efficiency)

# Temperature Gradient (Drill Cost) vs. Cost of Power

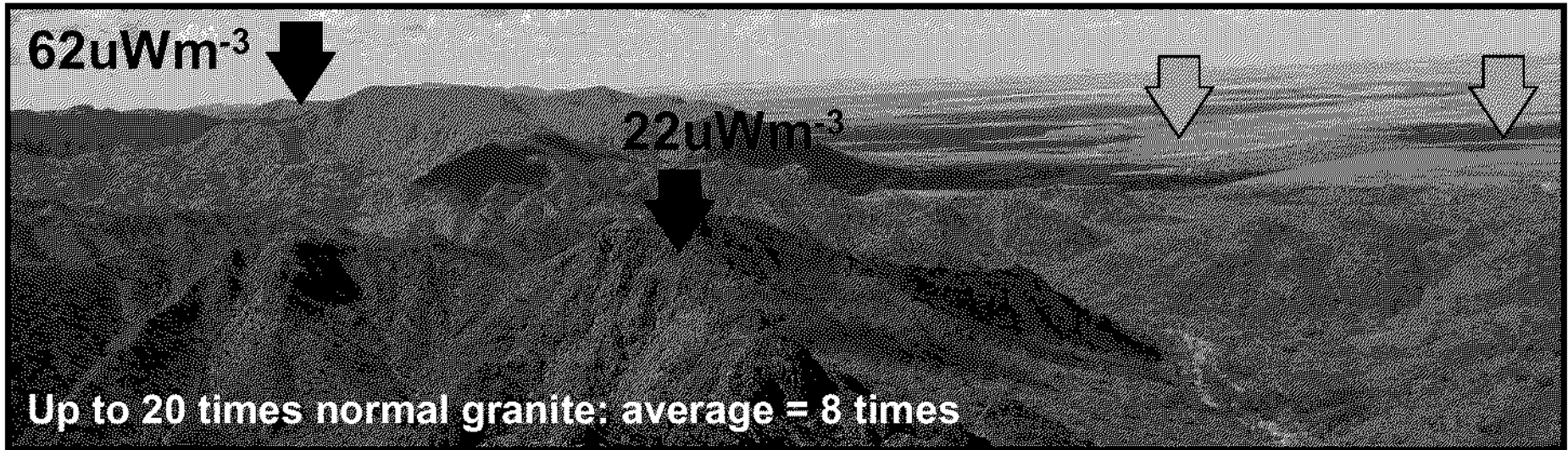


(model assumptions : 5 MWe output per well, temp = 250 deg, \$1.4M per MWe plant,O/M = \$19MWh, 25yr operating life)



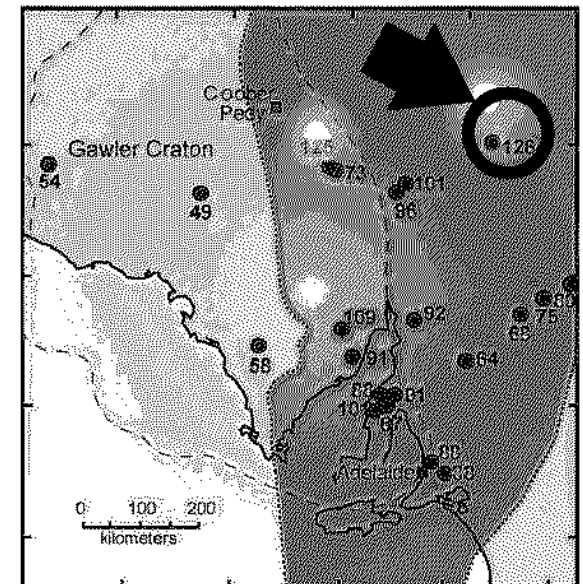
# Mt Painter Projects –

## Thermally Anomalous Granite Model

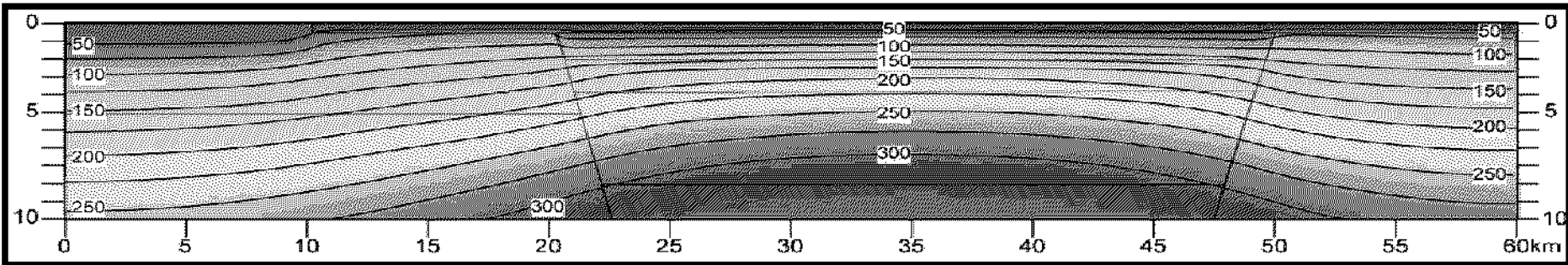
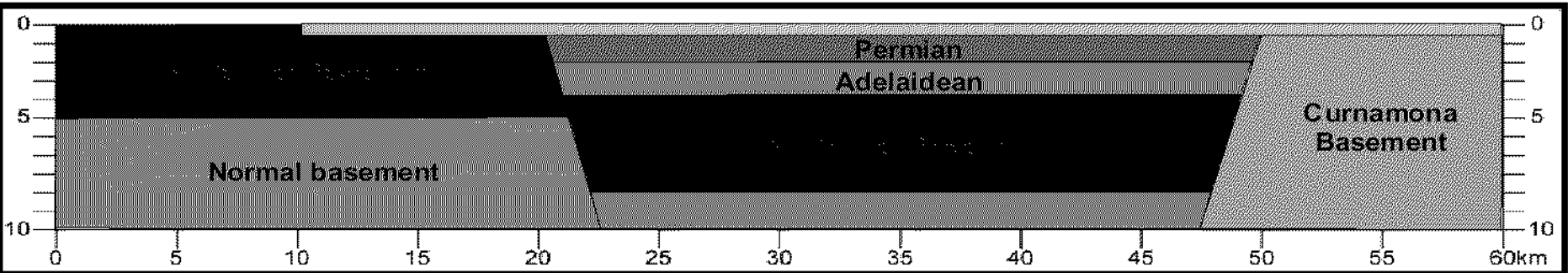


❖ Heat Source(s) in the upper crust

❖ Thermally insulating rock sequences

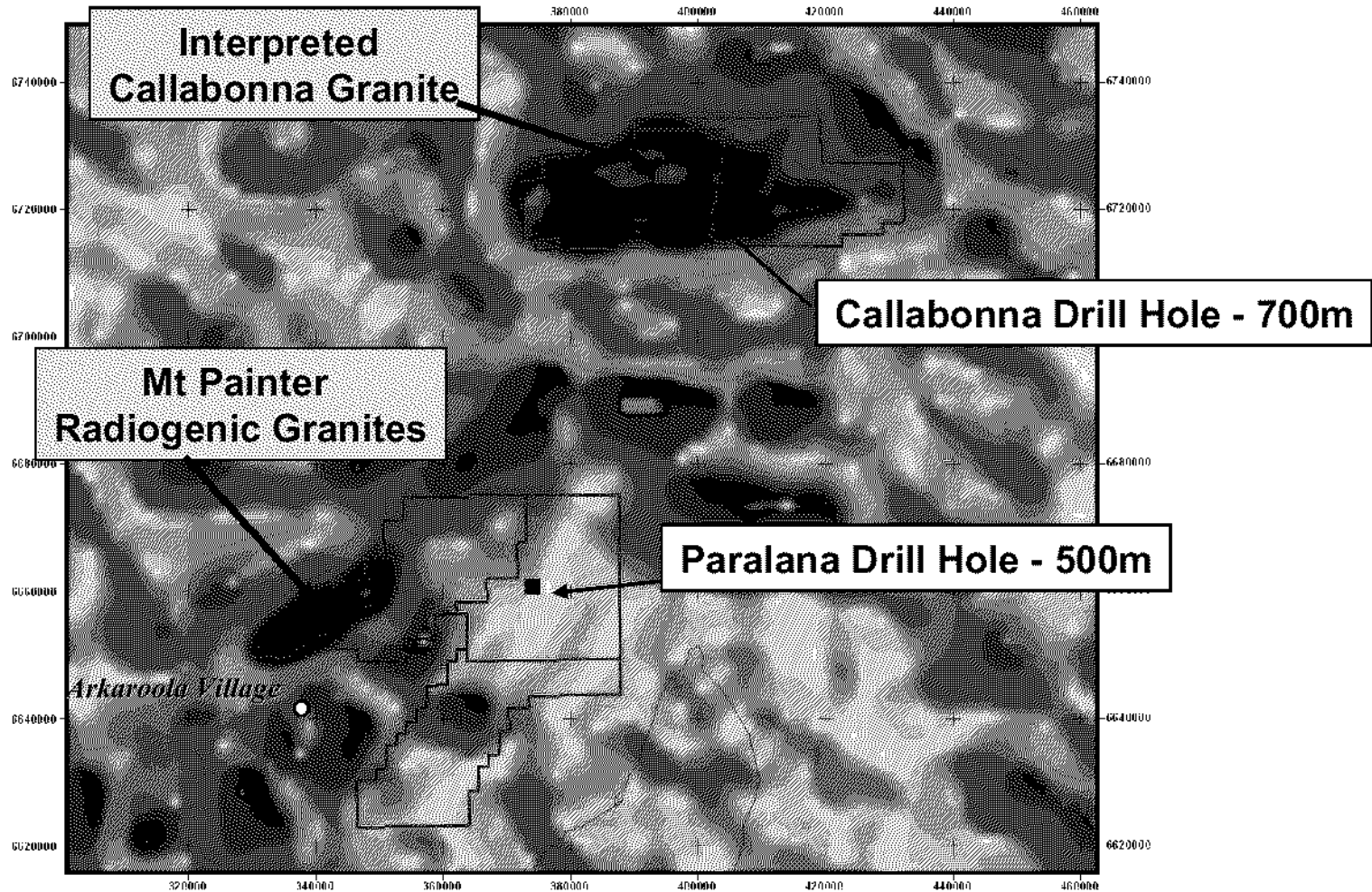


# How Hot Might Paralana Be?



**Potential temperature from the modelling above = 225°C at 3.5km**

# Geothermal Evaluation Drilling

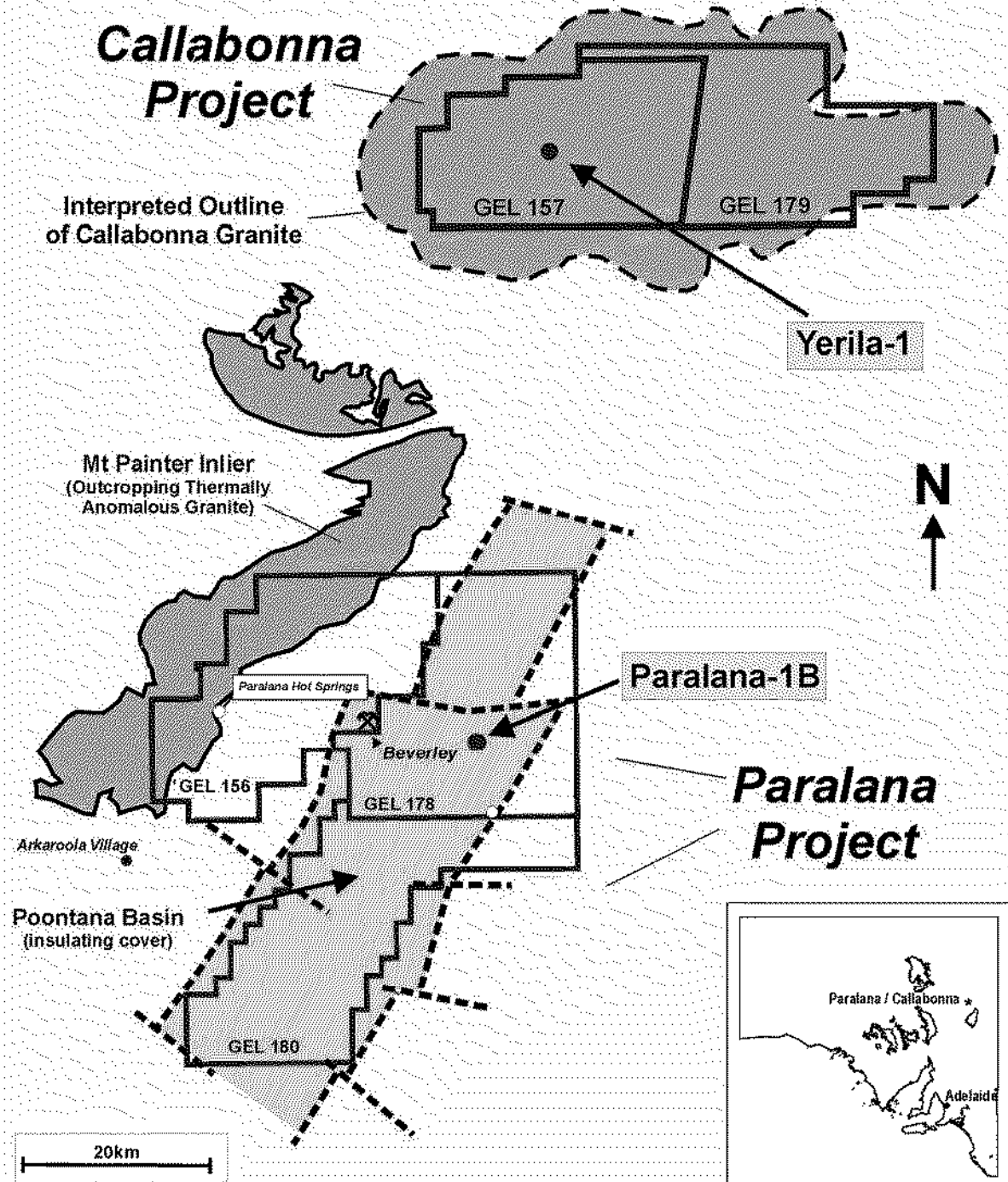


1VD Gravity Image

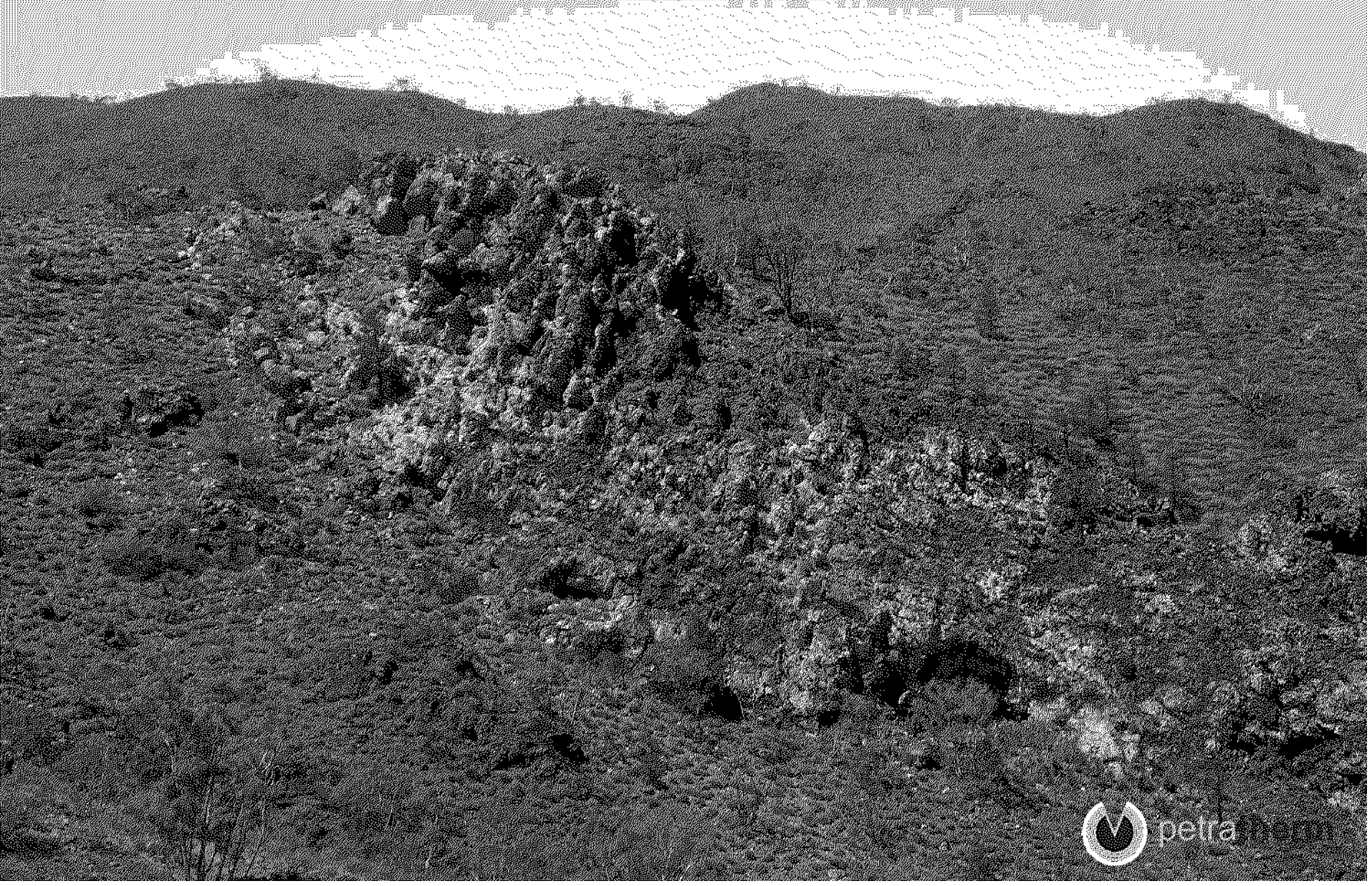
# Mt Painter Project Areas

## Evidence for Thermal Anomalism

- Hot Springs
- Fossil Hydrothermal Breccias
- Elevated groundwater temperatures
- High Heat flow recorded



# ***Fossil Hydrothermal Systems***



# *Regionally Elevated Aquifer Temperature*

## Gradient

- 12-22 deg/km
- 22-32 deg/km
- 32-49 deg/km
- 49-62 deg/km
- 62-82 deg/km



therm

# *Paralana Hot Springs – 62°C*



# *Drilling - Callabonna*



# *Petratherms's Drilling Success*

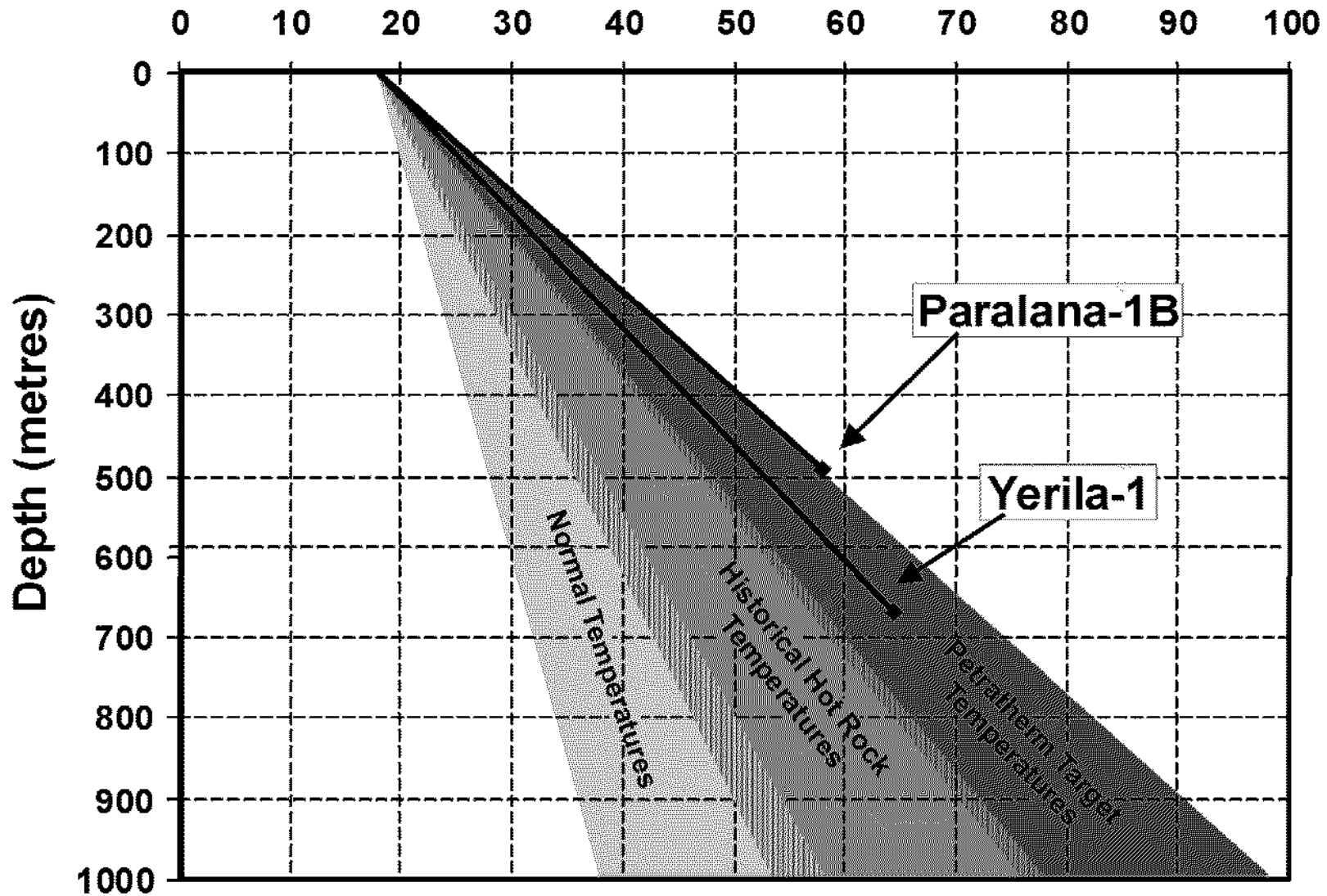
## Temperature Gradient

Callabonna      64°C at 675m      = 68°C/km

Paralana      58°C at 485m      = 81.5°C/Km

# Thermal Resource Potential

Temperature (°C)



# Paralana Work Program

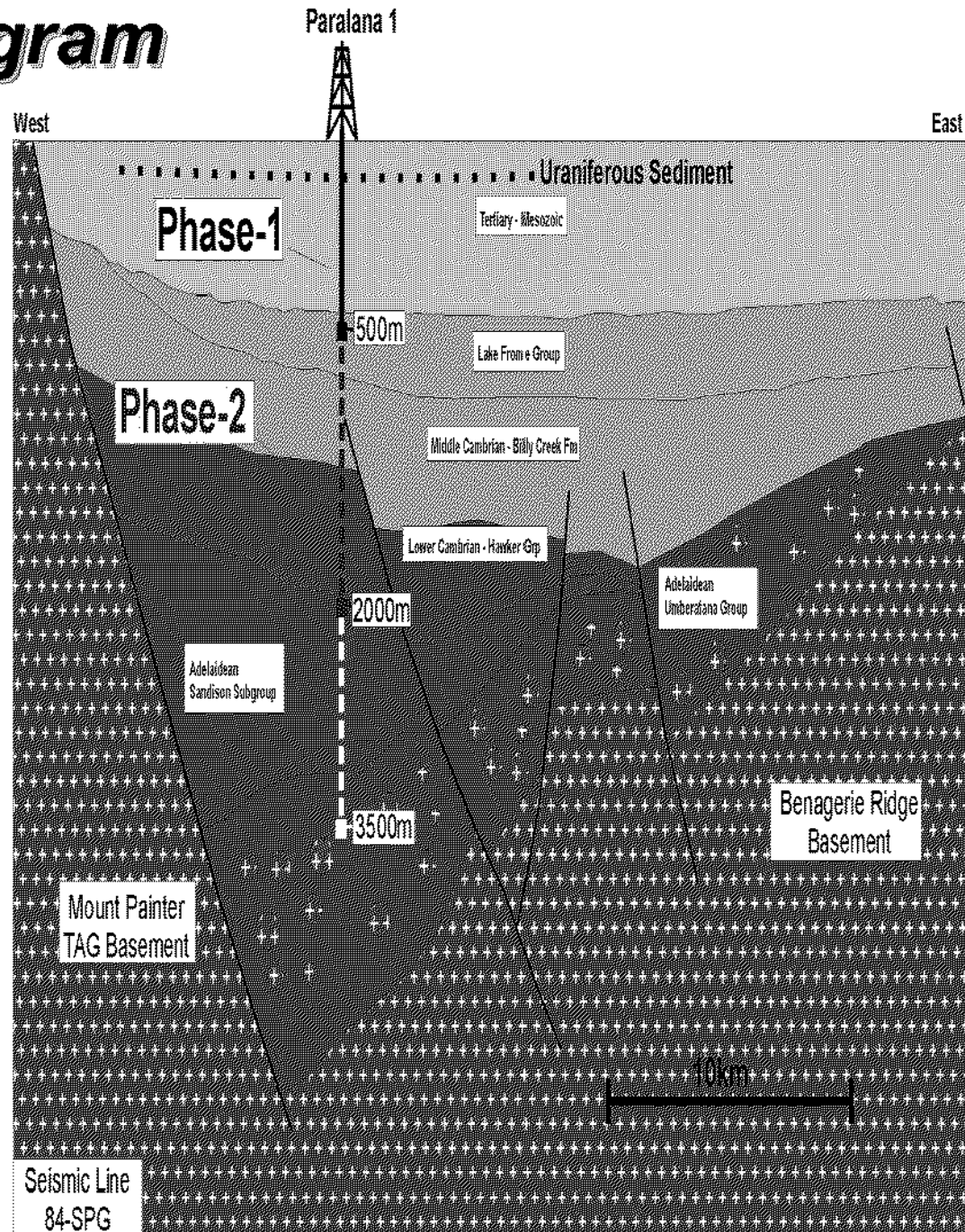
## Phase-1 - 500m Rotary Mud Well

- Gradient 81°C/km
- Compressive Stress Regime

## Phase-2 – 1500m Diamond Tail

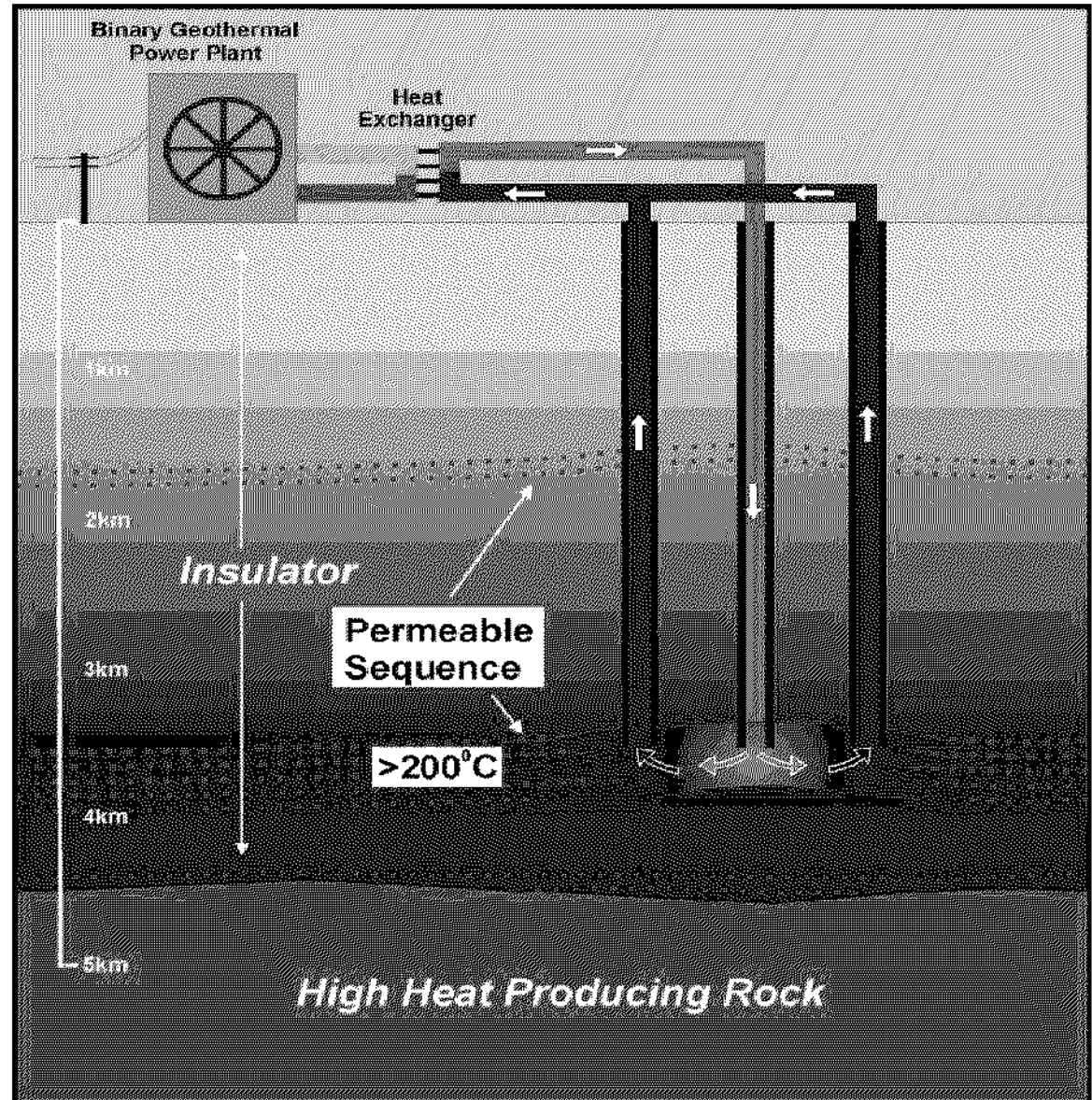
- Begins March 2006

**ENTS – MT Survey April 2006**

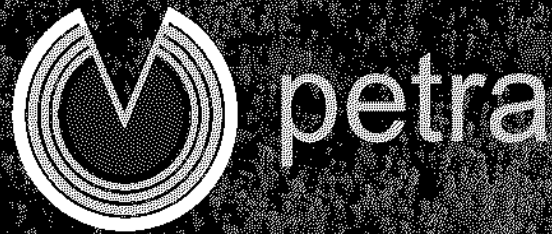


# Heat Exchanger Within Insulator (HEWI) Model

- *Higher Permeability*
- *Chemically Stable*
- *No Potential Radon build up*
- *Low Risk*
- *Cheaper Power*



# ***Callabonna Plains After Rain***



*innovative exploration, risk mitigation, commercial optimisation*