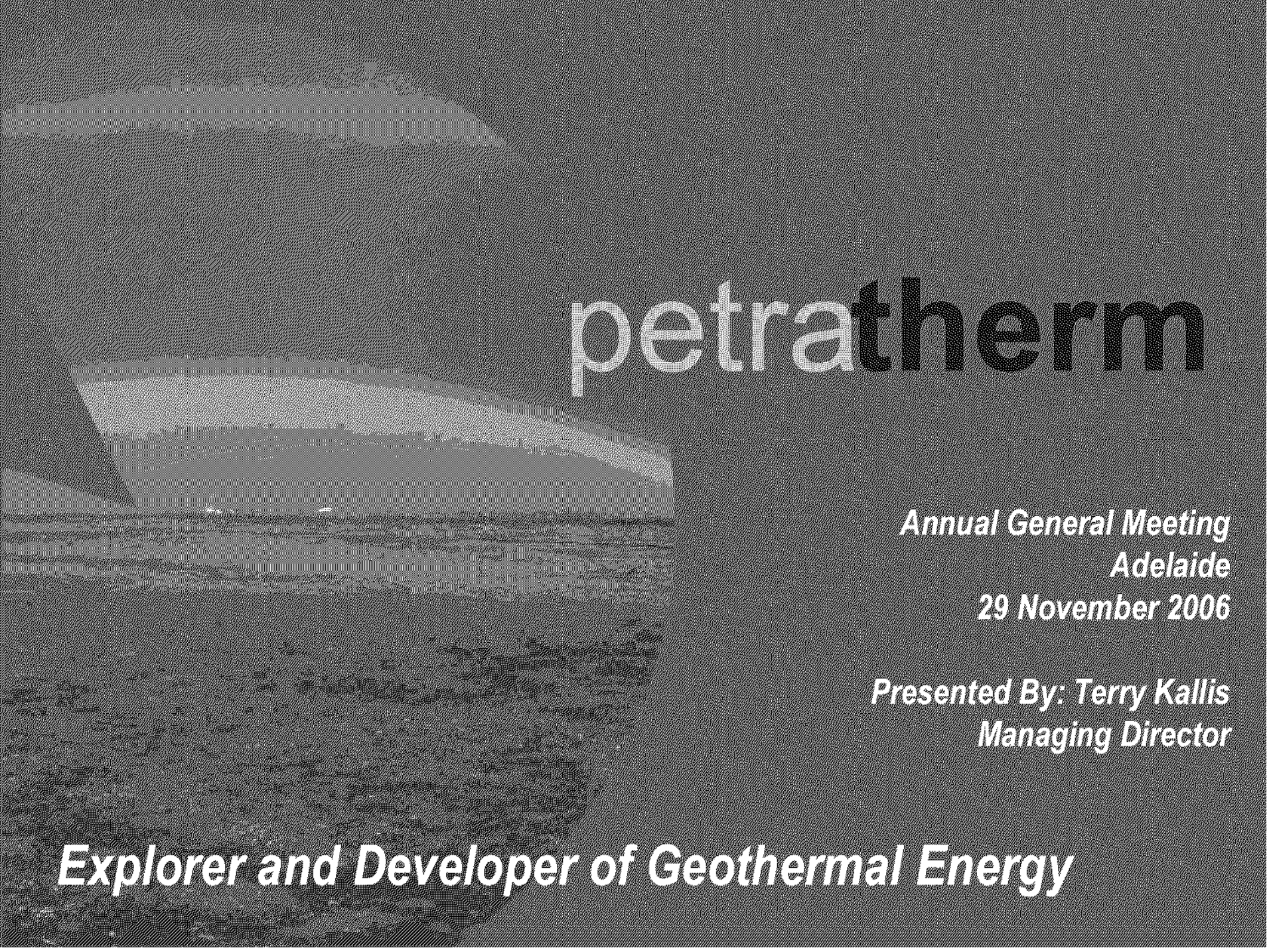




petratherm

*Annual General Meeting
Adelaide
29 November 2006*

*Presented By: Terry Kallis
Managing Director*

Explorer and Developer of Geothermal Energy

Presentation Outline

- Key Messages
- Corporate Overview
- Climate Change & Renewable Energy
- Geothermal Energy & Electricity Markets
- Market Differentiation
- Business Strategies
- Paralana Commercialisation Plans
- Operations Review (Peter Reid)
- Summary

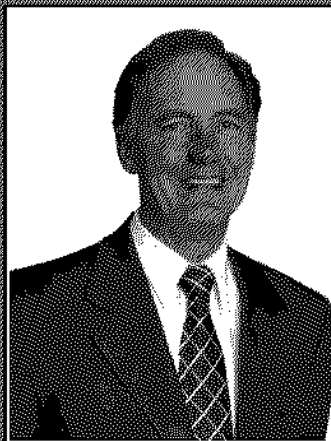
Key Messages

- Climate Change and the critical need for large scale, base load and low cost Renewable Energy.
- Petratherm is continually expanding its portfolio of projects in Australia and overseas.
- Paralana Project exhibits the key ingredients for success
 - Excellent thermal resource at shallow depths
 - Stable geological formation - expect good drilling conditions
 - Proximity to the “off-grid” Beverley Uranium Mine
 - A clear and realistic, long term commercialisation plan
- Petratherm’s “lower cost, lower risk approach”.

Corporate Overview

- Established in 2003 and listed on the ASX in July 2004
- Placement announced subject to allotment of 6,500,000 shares
- Major shareholder is Minotaur Exploration – 35%
- Shares on issue – 49,5000,000 & current price of 36 cents
- Market Capitalisation – approx. \$18 M
- Mission – “ ***to explore and develop, emission free, geothermal energy projects that are commercially sustainable***”
- Strategy – “ ***shallow hot rocks close to market*** ”

Board & Management



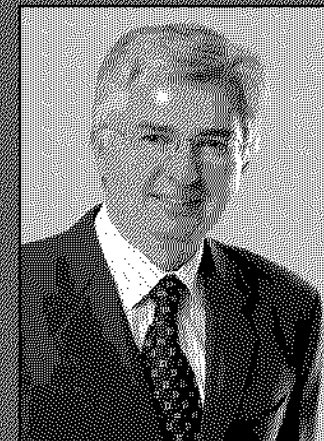
***Derek Carter
Chairman***



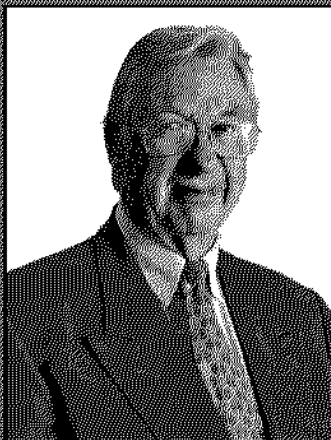
***Simon O'loughlin
Director***



***Prof. Richard Hillis
Director***



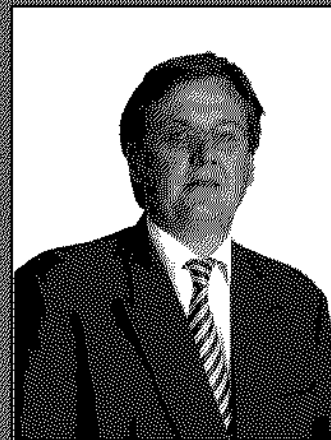
***Dr Lloyd Taylor
Director***



***Richard Bonython
Director***



***Terry Kallis
Managing Director***



***Donald Stephens
Company Secretary***



***Peter Reid
Operations Manager***

Climate Change and Renewable Energy

- Stern report – “Economics of Climate Change”
- Al Gore’s documentary - “An Inconvenient Truth”
- Renewed emphasis – Globally and Nationally
- Australia – Review of the energy white paper
- Among the top three political and media issues

PM sets the agenda on climate

Greg Egan and Mark Davis

Prime Minister John Howard has stepped up Australia's support for a new international carbon trading scheme and moved to draw China further into Australia's alternative greenhouse management push.

Regional leaders meeting in Vietnam have also given the green light to Australia's plan to make clean energy and energy security top priorities over the next year when Australia will chair the Asia-Pacific Economic Co-operation group.

Underlining the government's

KEYPOINTS

- APEC leaders agree clean energy and energy security are priorities.
- Australia and China will set up a working group on coal technology.
- IMF to press its member countries to tackle climate change.

this task group in Australia is to examine the structure and nature of what a global emissions trading system might take," he said.

He reiterated that while Australia would not ratify the Kyoto Protocol

and China have agreed to set up a working group on clean coal technology, which Mr Howard said would help China continue to use coal for its energy needs while also dealing with emissions issues.

Australia, as a big coal exporter, and China, as a leading coal consumer, have a common interest in maintaining the viability of the coal industry amid the growing pressure for action to rein in the greenhouse gas emissions from coal use.

Mr Howard told the business gathering that while he retained "some degree of scepticism" about some things said about climate

de Rato told the G20 summit on Saturday that the recent Stern report on global warming had shown that climate change was one of the main medium-term risks to the world economic outlook.

While the IMF did not have the expertise to design specific policies for reducing greenhouse gas emissions, it would ask its member countries to adopt a "risk management" approach and show they were considering the implications of climate change for their fiscal policies.

Mr de Rato said there was no longer room for debate over whether global warming was occurring.

MERON ENGLAND

SPACE would have million users by the

N Korea test condemned

The G20 meeting unanimously condemned the recent nuclear test by North Korea, but decided not to include their condemnation in the final communiqué. Treasurer Peter Costello said the meeting decided not to include condemnation of North Korea in the communiqué because it was a meeting of economic ministers and central bankers. "This does not mean the delegates took the matter lightly," he said.

Giant threat to stability

Treasurer Peter Costello warned of possible international friction and dislocation if giant emerging economies such as China and India could not be assured of secure access to energy and minerals supplies. In

s the news

Company tackling climate change

CHRISTOPHER RUSSELL

CLIMATE change was too serious an issue to ignore and it was up to private enterprise to act now, Rupert Murdoch said yesterday.

"I don't believe all the science about climate change is necessarily right," he said.

"But I've heard enough about it to think, 'well, maybe, there's a 10 or 20 per cent chance it's right and we owe it to the planet to take the insurance they may just be right. So we're getting on with that.'"

News Corp across the globe was determined to take a responsible position on reducing greenhouse gases.

"We think it's up to private industry to set an example and not to go running to the government for help," Mr Murdoch said.

"I think we (News Corp) can become carbon-neutral, probably within months. Carbon-zero may be a bit further away."

It was only right for News to act in this way.

"As a newspaper company, we're very good at taking stands on big public issues," he said. "Sometimes



FACING A GOOD YEAR: Rupert Murdoch answering journalists' questions after yesterday's shareholder briefing in Adelaide.

Picture: CAMERON BRIDGE

of this fiscal year we'll see was yet to be fully understood. By the year after, 300 Mr Murdoch stuck to the past 250 weeks. Once new price increases were rolled out, Fox would be

Keep pace on climate or suffer

MARK KENNY
POLITICAL EDITOR
CANBERRA

AUSTRALIA must be careful not to be left out of a global emissions trading scheme, Treasurer Peter Costello has warned, signalling a further shift in the Government's position on climate change.

Mr Costello said the results of the U.S. mid-term elections were further evidence the ground was shifting in the debate and it was important Australia kept pace with change.

Adelaide

HOW CARBON TRADING WORKS

NEWS.com.au/adelaidenew

appeared to signal a shift in the Government's position on climate change, following public concern over the drought and the warnings of economic catastrophe contained in the Britain's Stern Review.

The Federal Government has refused to sign the Kyoto Agreement on climate change, arguing it did

PM pushes global climate pact

Angus Glegg

Prime Minister John Howard has attempted to seize the initiative on climate change by setting up a working group on emissions trading last night, before lobbying United States President George Bush to support a new global agreement to reduce greenhouse gases.

The move comes as Business Council of Australia chairman Michael

Both politicians and business realise the climate debate is now moving faster than they are, and they risk losing control of the discussion if they don't join in.

—Laura Tingle, *Comment*, page 5

Chasey supported the development of a global carbon trading scheme, saying business was prepared to pay a "premium" to avert the consequences of global warming.

This is a significant change of

direction for the BCA, which rejected a carbon trading scheme three years ago, arguing it would drive industry and jobs offshore.

Mr Howard also expressed his strongest support yet for nuclear

power, saying it would become more economically competitive as clean-coal technologies would drive up the cost of electricity.

The Prime Minister's comments suggest his nuclear taskforce will next week support the establishment of a local uranium industry.

They also followed a report by a high-level government advisory group yesterday that called for the removal of impediments to the

expansion of Australia's uranium mining industry.

Mr Howard told the BCA's annual dinner in Sydney last night that he would establish a government/business taskforce to examine the implications of a global emissions trading scheme for Australia.

The taskforce would look at the

Continued page 6

Uranium expansion urged, page 6

MARK KERRY
POLITICAL EDITOR
HANOI, VIETNAM

LOOKING across Iraq and North Korea and "other hotspots" over climate change have dominated today's meeting between Prime Minister John Howard and President George W. Bush.

Mr Howard and Foreign Affairs Minister Alexander Downer will meet President Bush and Secretary of State Condoleezza Rice for talks to take the lead of the total



John W. Bush with a global outburst at the Asian Civilisation Museum in Singapore yesterday. In the picture, Howard is seen at the top right, and Bush is at the bottom left. A lot of APEC members are not too climate change as a top priority.

Dealing with climate change in the post-Kyoto world

Treasurer Peter Costello, on the ABC's *Insiders*, on why we'll have to sign up to a global carbon trading scheme

IN Australia, we've got to keep a careful eye on climate change. I think the ground is changing. I think it is important that we bring new countries into this discussion. And I think from Australia's point of view, if the world starts moving towards a carbon trading system, we can't be left out of that. That Australia has a role.

Question: You think the world is moving towards that system?

CUT & PASTE

will have to come in, and Australia will have to come in with wide-ranging technical expertise to shape the way in which this system emerges. Peter Costello, *Insiders*, Monday 20 November 2006

follow, but it seems that isn't the way it's so far played out over the climate change issue.

The Australian Conservation Foundation's campaign director is Denise Boyd, and she says Rupert Murdoch's very public change of heart hasn't been universally taken up by the various arms of his media empire.

Boyd: Well that's right. There has been a change in some, but not uniformly. Perhaps that's a good thing, perhaps there is more editorial independence in the Australian press than we think there is. There's obviously an editorial call that's been made there, however, it is disappointing that the only daily national

just another gabfest. The global response to climate change is also daunting. APEC countries but the Downer said there was a continuing divide between developed and

less developed nations. Mr Downer was scheduled to host a dinner of foreign ministers last night aimed at getting a greater foreign policy focus on the global warming question. He said

A lot of APEC members are not too climate change as a top priority. The APEC leaders' meeting starts tomorrow. Adelaide now: APEC only explained

OPINION 63

Energy stability needs a long-term view

G20: Energy and climate change

Transparency, sensible investment and a united approach to climate change are the keys to stable energy markets, writes Rodrigo de Rato.

Over the past few years, the world has lived with high oil prices without serious macro-economic repercussions. In part, this is because the current price, stable in the 1970s, was insulated by demand pressures against the background of strong global growth. The world also has lower

oil and gas production by over 10 percent by 2011.

We have also seen some responses to high prices which are more questionable. Some oil-producing countries have reacted to higher prices by allowing large increases in their own oil fiscal deficits, measures which are unlikely to be sustainable in the long term.

An increased focus on energy security has also led some countries to be suspicious of investment by foreign companies. But changing the rules of the game too often can have long-term costs. These countries and producers-country governments which have sought to make short-term gains by taking a larger share of oil and gas revenues should bear this in mind. There are trade-offs between immediate revenue gains and maintaining a business environment that encourages competition and investment; governments should

there is a adequate supply response. This would help to meet demand pressure that is likely to be felt over the next few years. Second, reducing transparency in oil markets would help to reduce price volatility. The creation of the Joint Oil Data Initiative is a particularly important step. The International Monetary Fund strongly supports the G20 initiative to ensure transparency in oil markets. To ensure that revenues are used well, the argument for transparency is compelling.

Many countries still maintain subsidies on energy. They are an expensive way of protecting the poor from rising energy prices. Much of the benefit goes to the better off. Subsidies can lead to severe misallocation of resources. They are blunt instruments to conserve energy and hinder the efficient investment in clean, reducing energy subsidies not only for the fiscal

human capital. Others can repay debt or accumulate financial assets to give themselves more room for manoeuvre.

The link between greenhouse gas emissions and changes in global temperature is now well established. The consequences of global warming are less certain, but they are expected to be serious. The recently published Stern report, commissioned by the UK government, suggests that gross domestic product losses from dangerous climate change could range from 5 to 20 percent of GDP in many countries.

If these numbers are borne out by further analysis, they are alarming. Indeed, in some of the effect on

"Subsidies are an expensive way of protecting the poor from rising energy prices."

short term and mitigating the economic costs of serious reductions.

But, in convincing new investment is not likely to be sufficient. The international community has to come together to find ways to limit emissions of greenhouse gases that are both fair and economically efficient. I believe that a successful Kyoto agreement, including use of either an emissions trading scheme or a tax scheme for greenhouse gases, will be necessary.

What is important is that we have an energy market and energy production that is not based on fossil fuels, and perhaps in some cases capture carbon produced from existing energy sources. Ultimately

Carbon price is best way forward

A property right over carbon must be at the core of a multi-layered response to climate change, writes Warwick McKibbin.

The release of the Stern Review of the Economics of Climate Change has had a dramatic impact on the climate change debate in Australia. The key lesson from the review is that there is enormous uncertainty about the future. There might be some very extreme scenarios that are worrying enough that clearly some action is needed to encourage low-cost responses to reducing emissions, perhaps substantially.

There are some flaws in the report, but many of its key messages are valid. We need the major emitting countries to put in place incentives to reduce greenhouse gas emissions both through behavioural changes in the way all citizens use energy and in investments in carbon-reducing technologies.

The debate in Australia is rife with misadventure. The usual polling question (Should Australia ratify the Kyoto Protocol?) should be preceded by another question: Understand the K. Those who say "yes" used the rationale of those who said "no" in the Kyoto in the end make it to the

The Howard government's correct not to ratify the Kyoto Protocol. It is in the immediate relative to expect support for Kyoto conventional way is misplaced. The



Putting a price on carbon will encourage everyone to change the way they emit carbon.

which are moving in the right direction, but more needs to be done. The Asia Pacific Partnership for Clean Development is a

through providing a supply of short-term permits (in addition to the long-term permits already distributed) sufficient to cap the short-term price

reducing uncertainty and increasing the ability for companies to manage their own risk and protect their large capital investments can be more.

THE AUSTRALIAN WEDNESDAY NOVEMBER 15 2006

28 HIGHER EDUCATION

The climate's right for science to go to war

The race is on to make radical, widespread changes to the way we work and live before it is too late

CLIMATE change may come more rapidly and with far greater effect than expected. The warning comes from Australian atmospheric scientist Bernie Brierley. He argues there are firm scientific grounds for supposing the pace of climate change may be faster and its manifestations more extreme than presently thought.

the US and Soviet Union — that the nuclear winter unleashed by atomic war would have no respite. Thus, one of the first uses of climate modelling was to save humanity.

Brierley lists the following reasons for believing the consensus on climate change may underestimate the effect:

- Global dimming, which acts as a brake on global warming, has



The Atlantic meridional overturning circulation, one of the Earth's



this view applies rationally, then climate change is a political science and politicians who ignore it waste whatever time exists before the pole. Studies across to promote solar, nuclear and any fuels suggest the federal Government's policies are telling it something similar.

So much for the three main climate change model scenarios and other estate crash as their unavailability to the new Australian climate change? Will our demand for light colour garments and not accelerate the destruction of inland river system? Will agricultural offices with unacceptably windows need fundamental redesign? Can our infrastructure withstand fiercer cycles, bigger storm surges, heavier monsoons and

PM creates task force to look at carbon trading

VINCENT MORELLO SYDNEY

PRIME Minister John Howard has softened his opposition to a carbon trading scheme as a response to the effects of greenhouse gas emissions.

Speaking at the Business Council of Australia's annual dinner in Sydney last night, Mr Howard said he would commission a government-business group to develop a carbon trading scheme for Australia.

Howard said. "And unless we lay the foundation over the years immediately ahead of us to deal with the problem, future generations will face significant penalties and will have cause to criticise our failure to do something substantial in response."

Mr Howard has repeatedly said carbon trading is no "silver bullet" solution to reducing greenhouse gas emissions.

But he has said the Government has long acknowledged Australia's world-leading position

meet with resource sector business leaders later this week to discuss setting up the task force.

"The Government will establish a joint government-business task group to examine in some detail the form that an emissions trading system here in Australia and globally might take in the years ahead," he said.

The Prime Minister repeated that Australia would not ratify the Kyoto Protocol and urged countries to focus on all energy

G20 to parley on global energy agreement

Florence Chong Energy

AUSTRALIA plans to initiate a global energy agreement to ensure price and supply stability when it hosts "the world's most important financial meeting" in Melbourne this weekend.

Treasurer Peter Costello, chair of what is known as the Group of 20 (G20) meeting of finance ministers

"adequate supply, adequate security, and proper international pricing" over the next couple of decades.

He believed that if it could be achieved, it would prevent "jostling and instability over resources" in future years.

He said: "We know oil prices have gone up. We know commodity prices have gone up. We know there is incredible demand for energy."

He believed that the two-day G20 forum, which begins on Saturday, was the best group to begin discussions on such an agreement.

This was because it consisted of the world's largest developed economies, including the US, and developing economies such as India and China and oil producers Saudi Arabia and Russia.

"We've got to keep a careful eye on this (climate change). The ground is changing."

He said the next chapter was to bring in the key consumers China and India, and to look at the shape of a global carbon trading system.

Australia would not be able to stay out when the rest of the world moved

CLIMATE CHANGE 2050

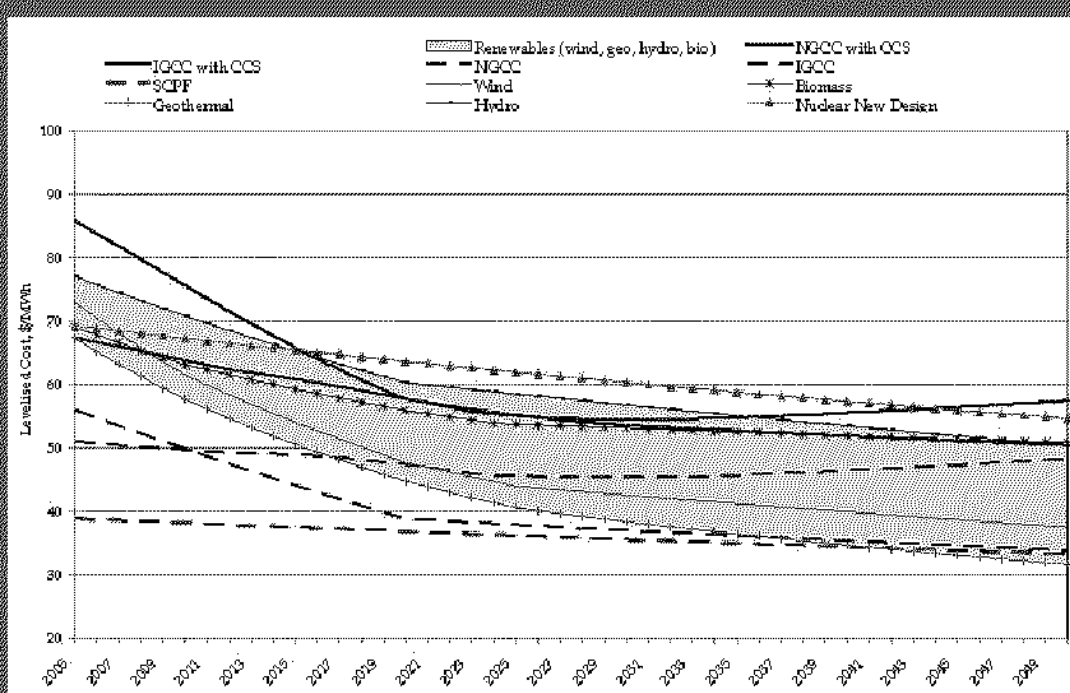
SIR,
THE BOARD
THINKS THE LACK
OF HUMANITY
WILL SERIOUSLY
AFFECT
PROFITS!



 **LIBBECKE**

Climate Change & Renewable Energy Technologies

- Advantages of Geothermal Energy include:
 - Large scale base load
 - Large resources and reserves
 - Expected to be lowest cost renewable energy source



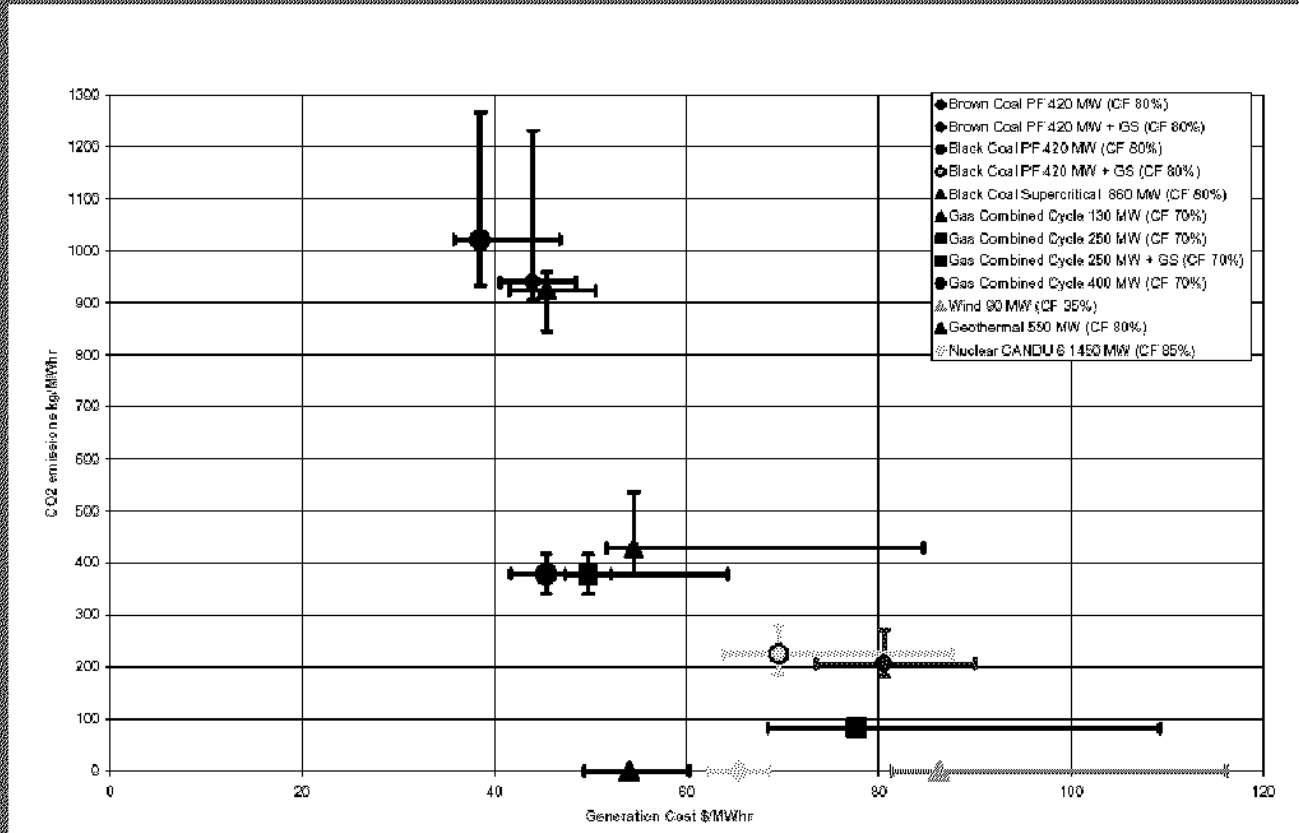
Extract from McLennan Magasanik Associates independent report "Renewable Energy – A Contribution to Australia's Environmental and Economic Sustainability".

Total renewable cost envelope v's coal, gas and nuclear cost.



Climate Change & Renewable Energy Technologies

The SA Electricity Supply Industry Planning Council (ESIPC) Annual Planning Report assesses geothermal energy as the current lowest cost renewable energy source of electricity production.



New Entrant Generation and Clean Coal Technologies v's Emissions.

Geothermal Energy and Electricity Markets

International

- The global renewable energy market (all forms) represents only 4% of electricity production but is growing at 25% per annum.
- Geothermal energy has largest technical potential of all renewable **SOURCES** (source: World Energy Assessment UNPD 2000).
- Renewable energy policies with favourable targets and “in-feed tariffs” over \$100 per MWh
 - European Union target of 20% by 2020
 - China target of 10% by 2020
 - India target of 10% by 2020
 - California target of 20% by 2017

Geothermal Energy and Electricity Markets

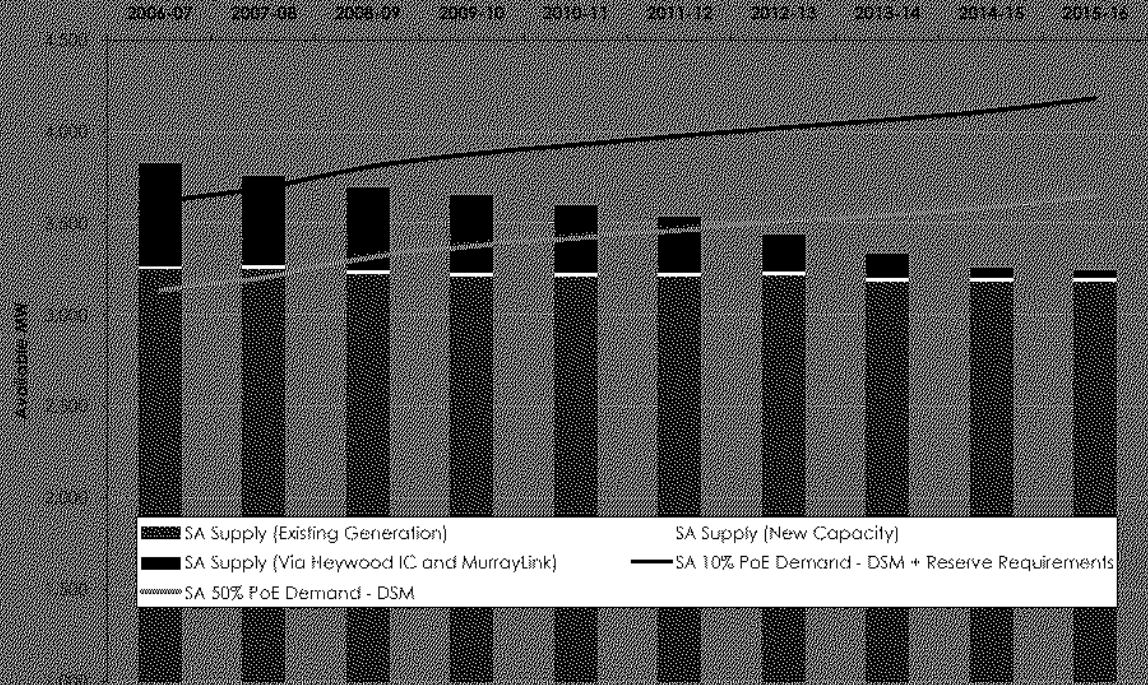
Australia

- Review of the Energy White Paper and current policy on renewable and low emission energy technologies.
- Strong support for geothermal energy due to competitive, large scale, base load potential.
- The Ministerial Council on Energy considering the Energy Reform Implementation Group review of the National Electricity Market (NEM).
- The interconnected NEM in Australia is projected to require 5,000MW of new capacity over the next 10 years (source: NEMMCO Statement of Opportunities).

SA Electricity Market & Geothermal Power

- SA NEM region electricity demand to require at least 600MW of new capacity
- Does not include the potential increase of 420MW from Olympic Dam.
- Nor the effect of depleting Leigh Creek coal.
- Demand requirements will be between 600 – 1,500MW.

Forecast Supply
Demand Balance for
South Australia (source
SA ESIPC APR 2006)



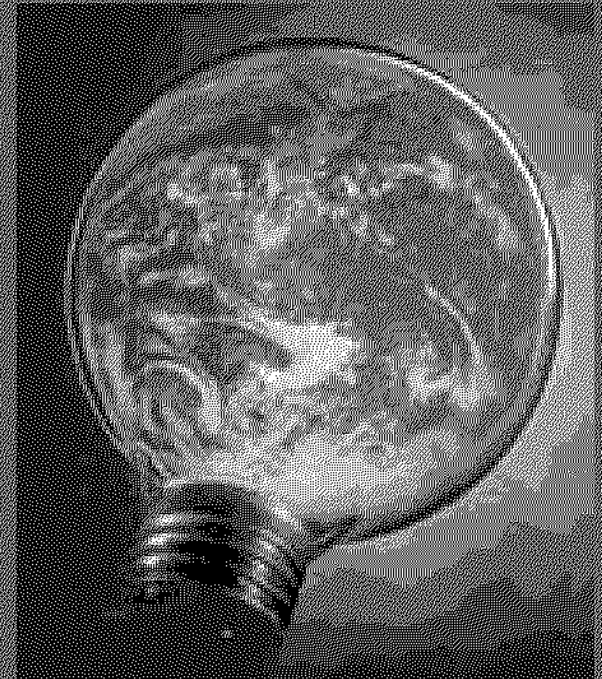
Market Differentiation

Petratherm's Exploration Model

"Shallow Hot Rocks close to Market"

Prime Cost Drivers

- **Temperature Differential**
- **Drilling Depth**
- **Flow Rate**
- **Network Connection**
- **Generation Plant**

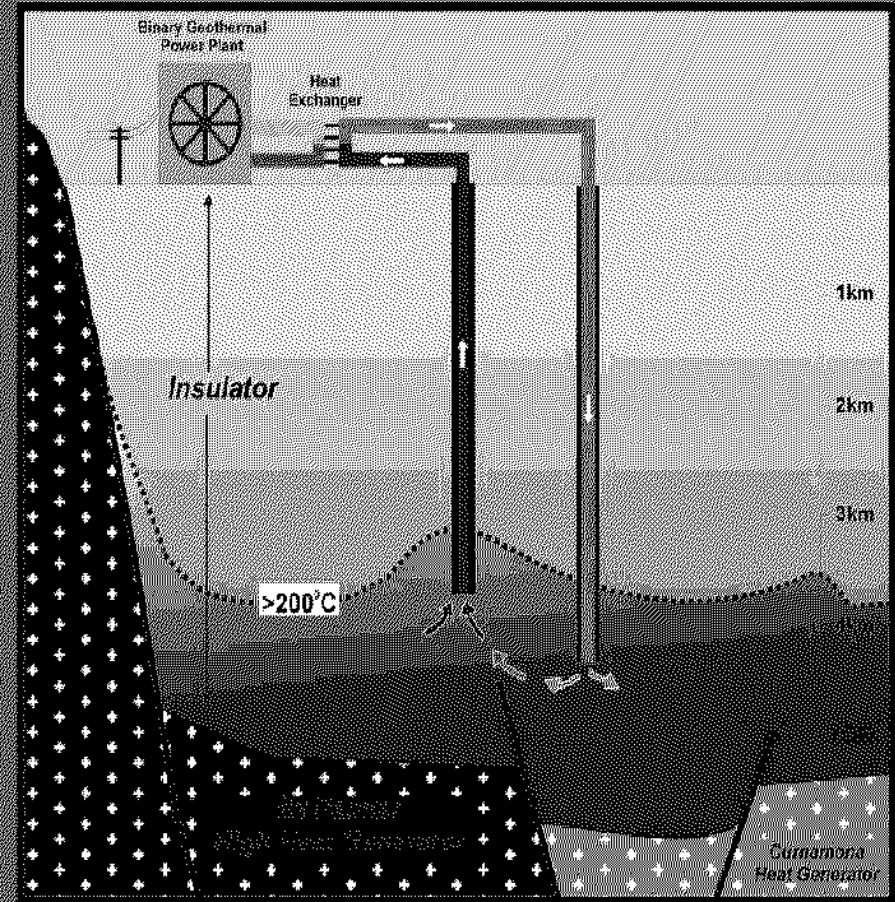


Petratherm is seeking to optimize the key drivers to achieve the lowest long run average cost electricity delivered while minimizing project risks.

Market Differentiation

Heat Exchanger Within Insulator (HEWI) Model

- Higher Permeability
 - Chemically Stable
 - No Potential Radon build up
 - Lower Risk
- = Cheaper Power!



Key Points of Differentiation

- Heat exploration strategy grounded in strong and unique geological research, measurement and exploratory techniques.
- Heat exploration strategy that can be readily applied in other Australian states and Internationally – “repeatable” application.
- HEWI model is lower cost/lower risk approach to optimising temperature differential, drilling depth & cost and circulation
- A portfolio of high quality projects that is being expanded to create value and diversify risk.
- Focus on the lowest LRAC electricity delivered to the NEM.
- Adopted proven technology and standard unit design and sizes wherever possible (i.e. organic-rankine cycle plant).

Business Strategies

- ✓ Completed Phase 2 drilling program at Paralana – confirmed temperature
- ✓ Completed business model and pre-feasibility study for Paralana – recently completed with UST, GHD & ElectraNet
- ✓ Updated and enhanced Strategic Business Plan and conducted detailed Competitor Analysis of Projects/Tenements in SA and other States
- ✓ Secured MOU with Heathgate Resources for electricity supply to Beverley
- ✓ Obtained AP6 Project endorsement and support to explore Geothermal prospects in China – Universities & Provincial Power Utilities.

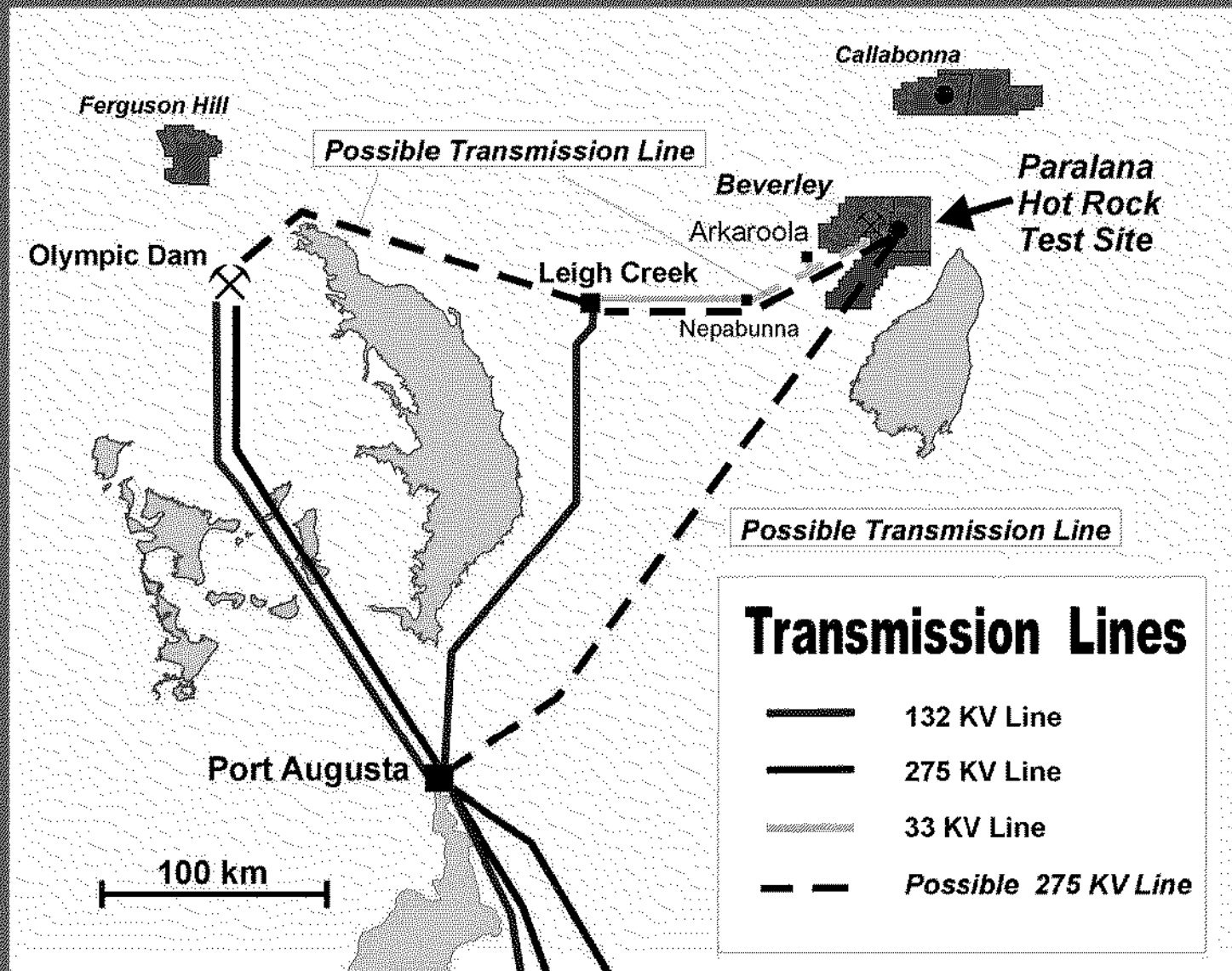
Business Strategies

- Secure additional high prospect tenements in SA
- Assess prospects in other States – Vic., Qld, NT and other States
- Secure high prospect tenements in China over the next 9 months and explore other international opportunities
- Establish Joint Venture arrangements with target partner(s) – tailored to project needs.

Paralana Commercialisation Plans

- Staged development of 7.5 MW small-scale commercial plant
 - Drilling to first deep well to 3.5 - 4.0 kms in 2007
 - Create and test underground heat exchanger in 2008 & 2009
 - Develop and commission 7.5 MW geothermal (organic-rankine cycle) plant in 2009 & 2010
 - Develop transmission line (11 kms) to supply Beverley Uranium Mine in 2009 & 2010
- Staged local expansion from 7.5 MW to 30 MW.
- Continue to refine large-scale Generation development options – current long term plan is for 520 MW (2 x 260 MW) power plant using standard sized plant increments and connecting to the SA power system at Port Augusta and Olympic Dam, via a “meshed” 275 kV transmission network.

Paralana Commercialisation Plan



Operations Review

***By Peter Reid
Operations Manager***

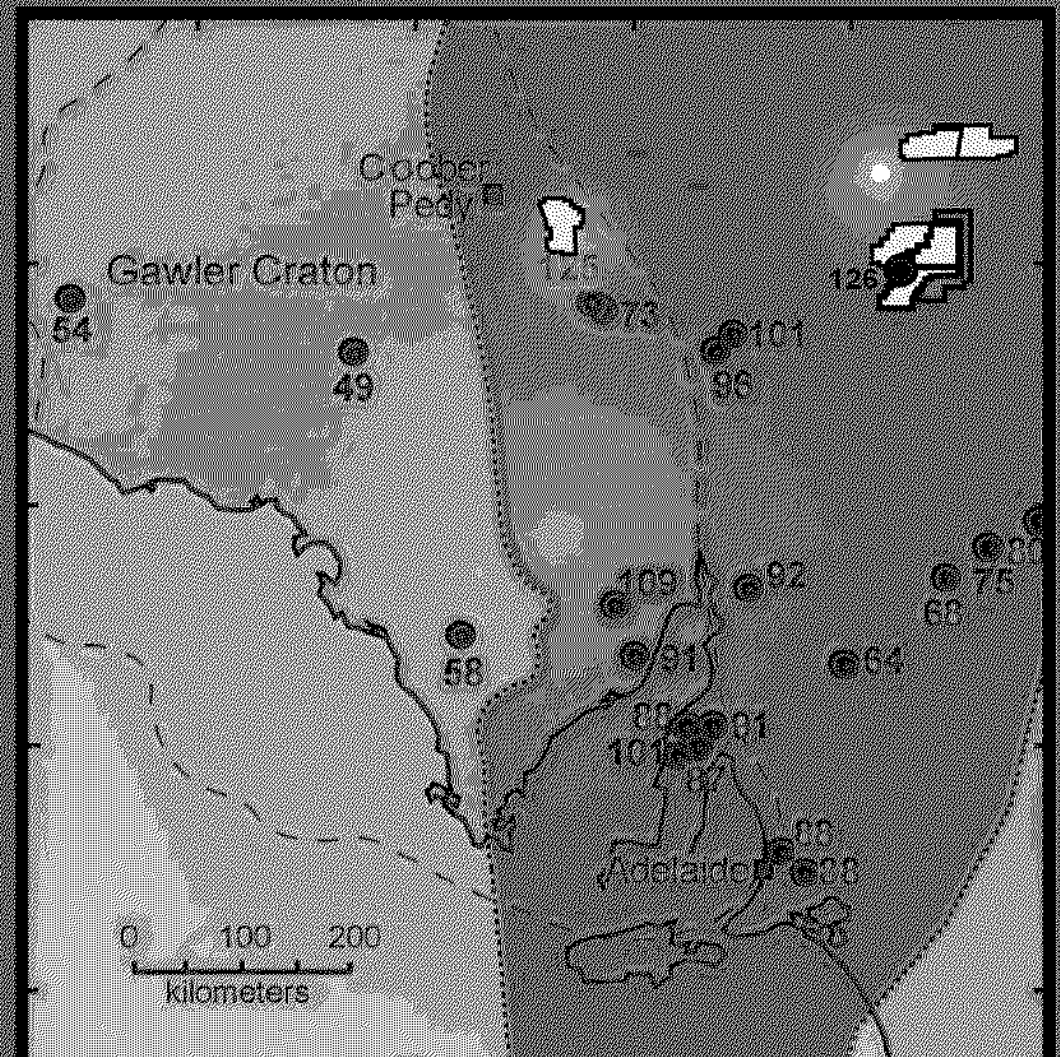
South Australian Heat Flow Anomaly

Exceptional target for Geothermal Energy

80% higher heat flow than typical Proterozoic crust

Heat due to :

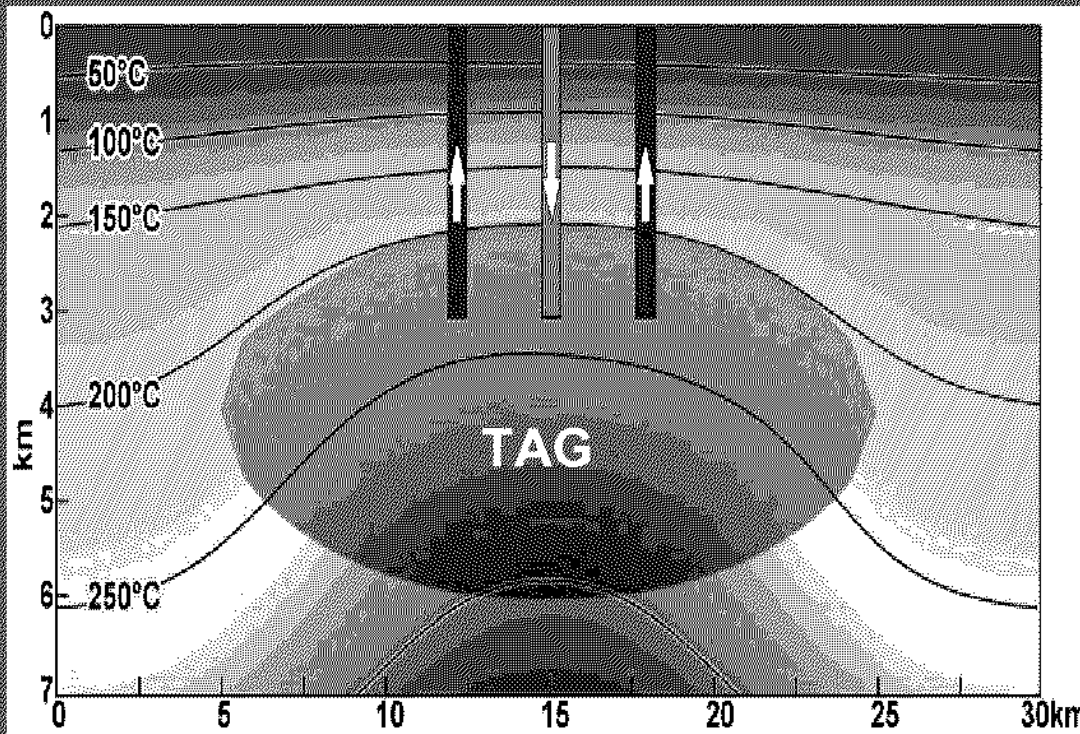
- Thermally Anomalous Granite (TAG)
- Radiogenic Iron Oxide (RIO)



Finding Hot Rocks

In Australia only 7% of the continent has sufficient well hole data

Forward modelling of **Geothermal Resource** potential based on constrained geological models

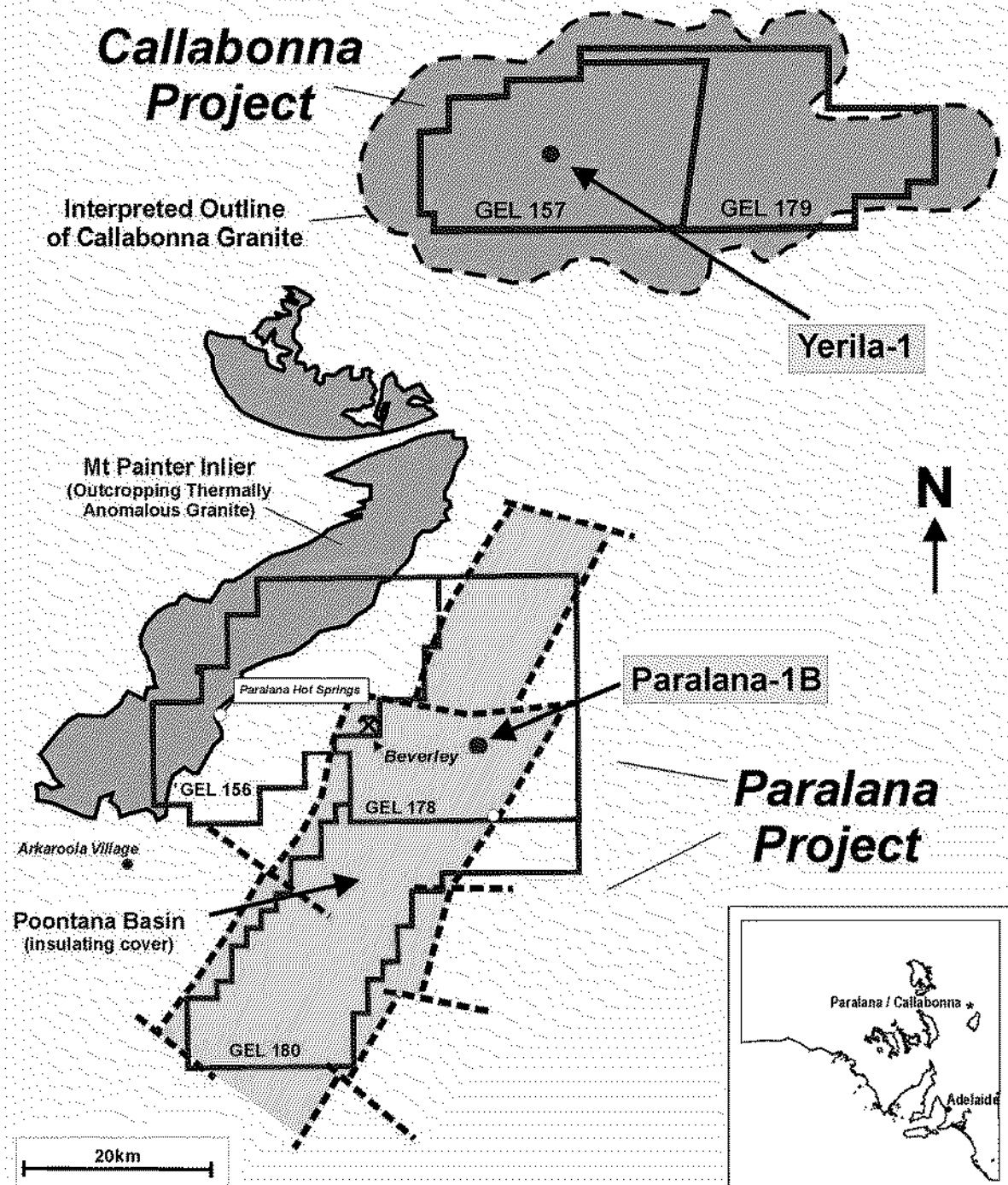


- ☐ Prediction of geothermal gradients
- ☐ Target depths
- ☐ Heat outputs

Mt Painter Project Areas

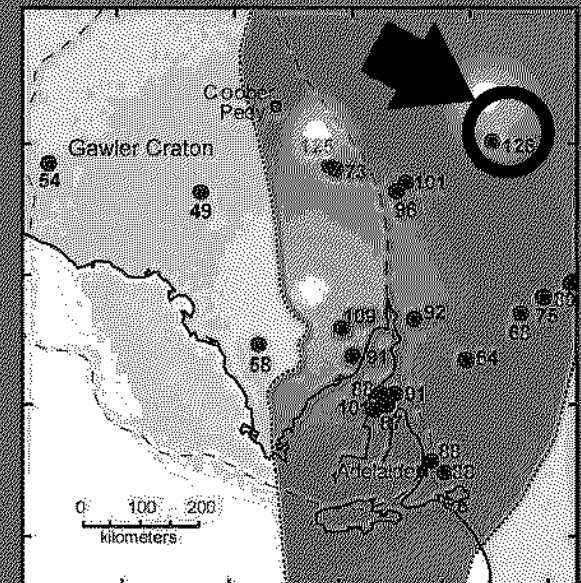
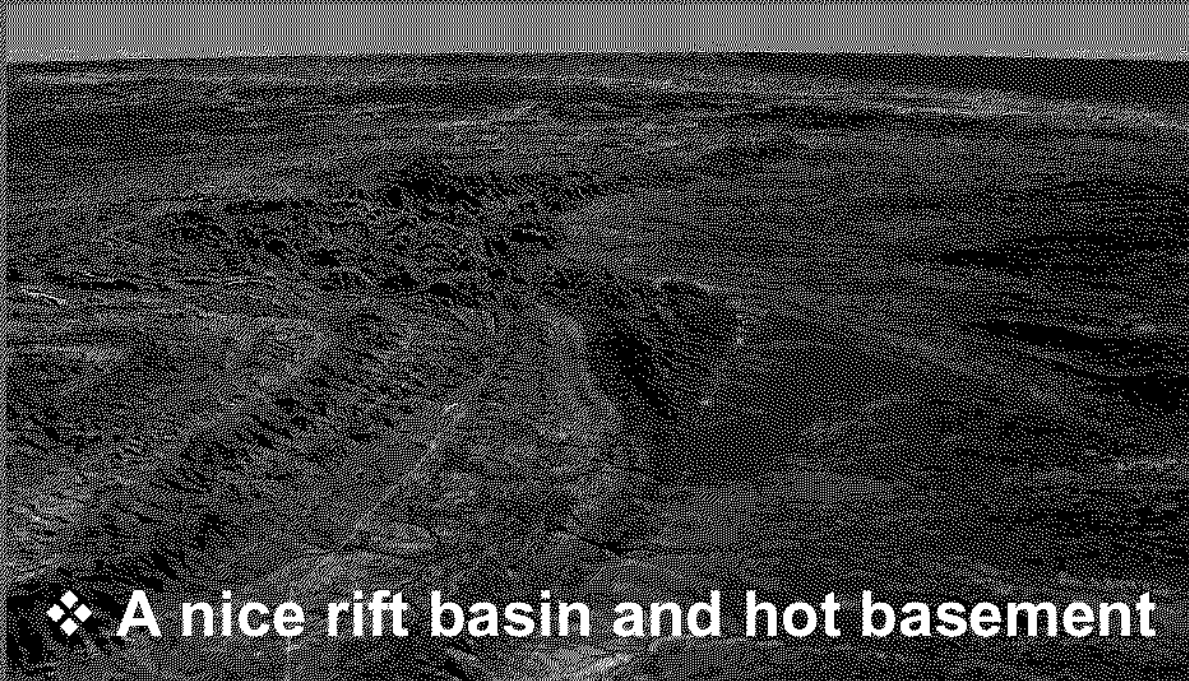
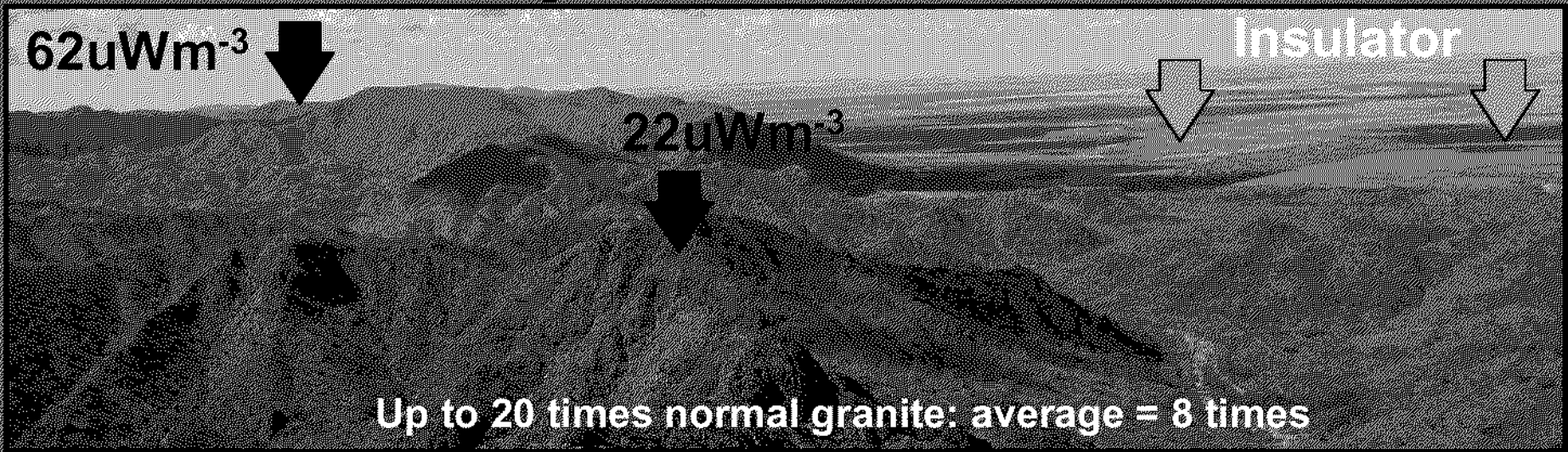
Evidence for Thermal Anomalism

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

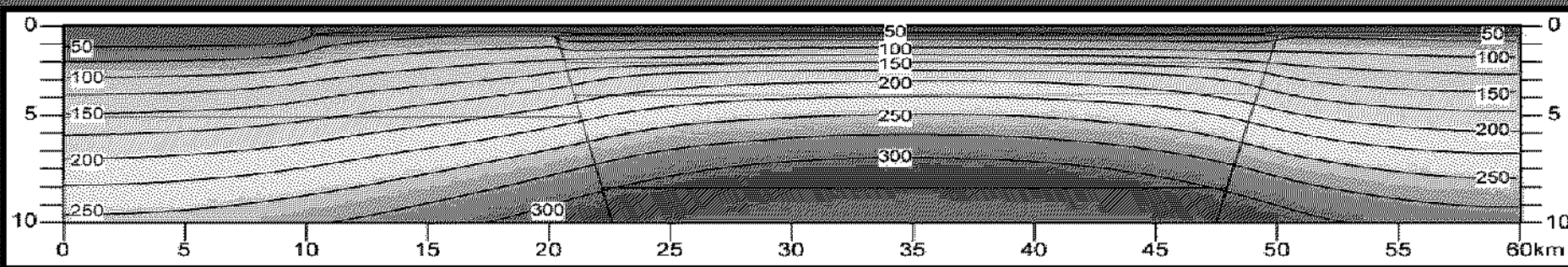
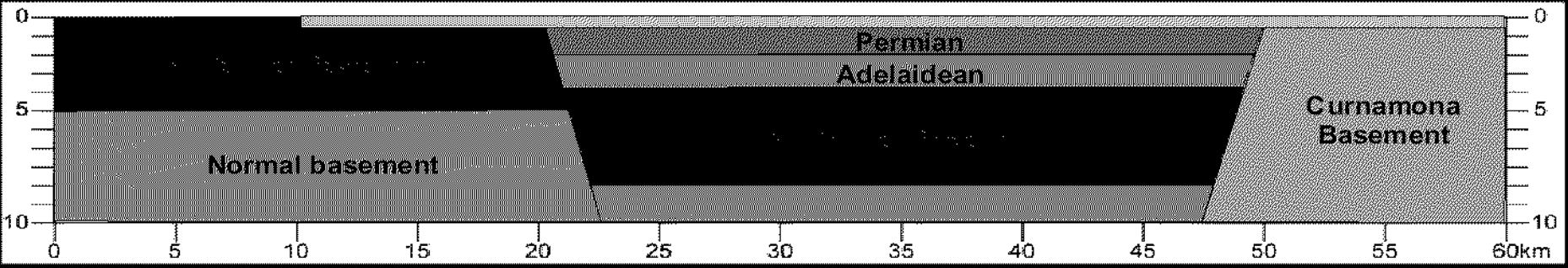


Mt Painter Projects –

Thermally Anomalous Granite Model

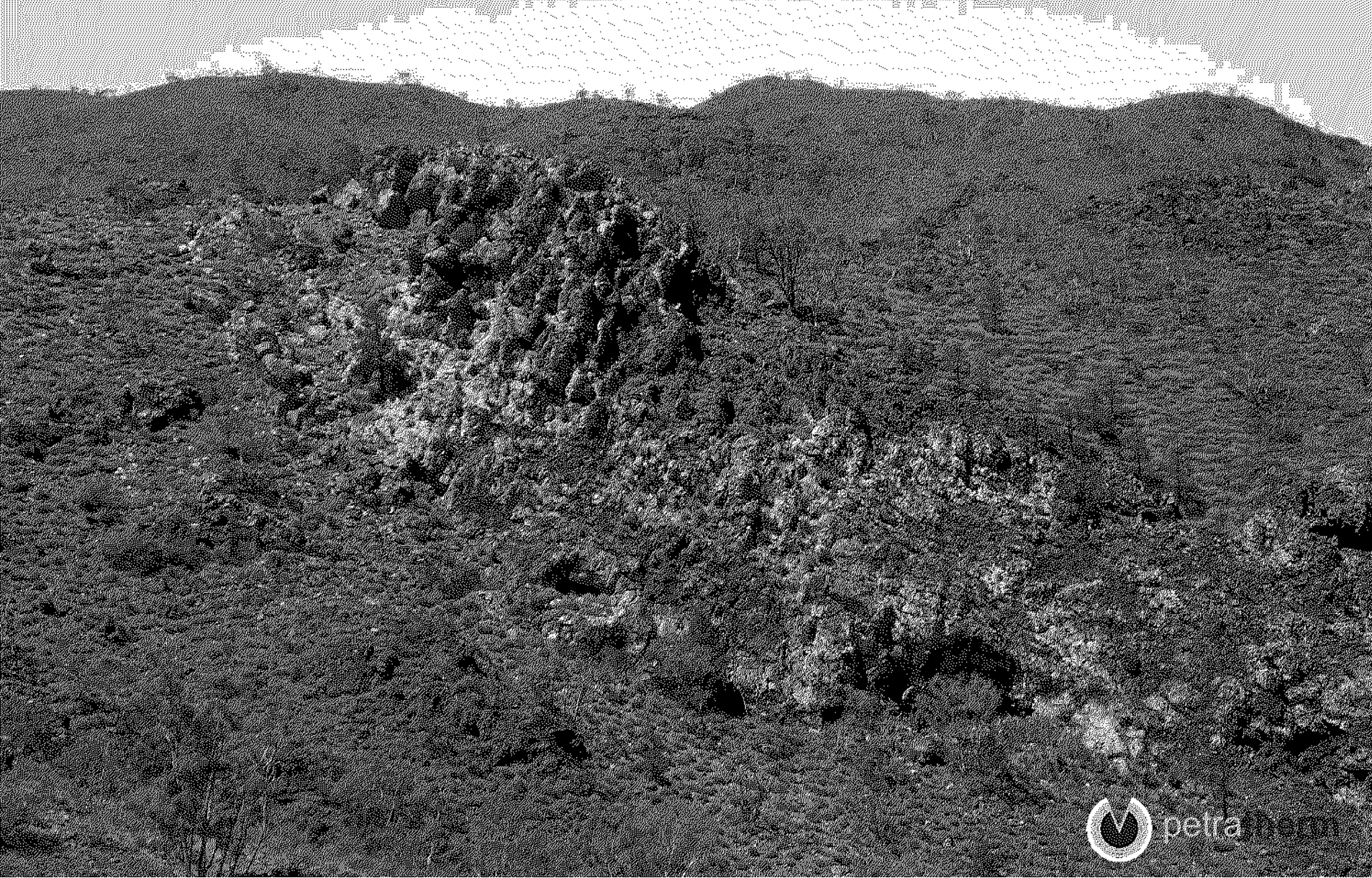


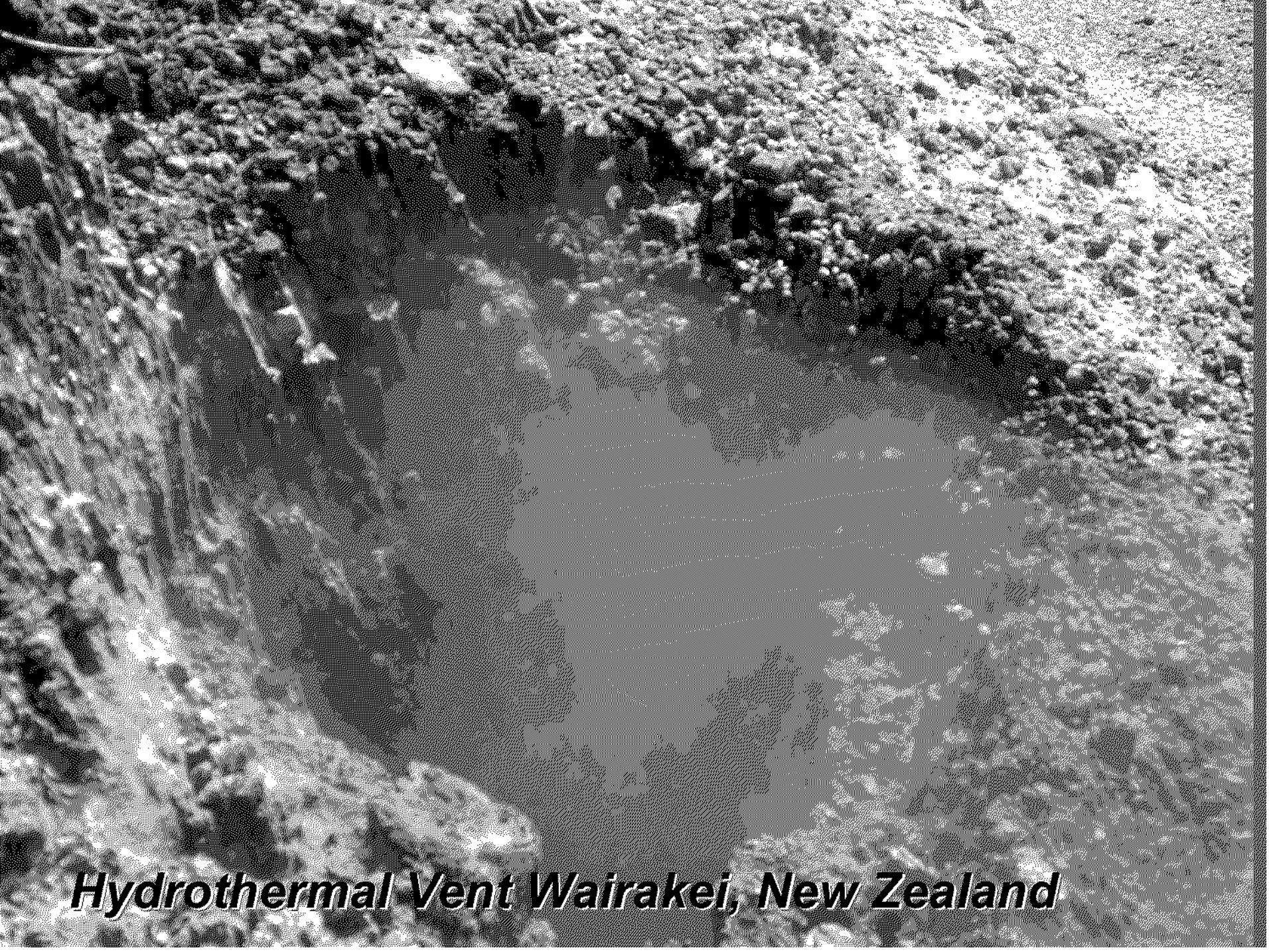
How Hot Might Paralana Be?



Above modelling and recent temperature measurement suggest
200°C at 3.6km

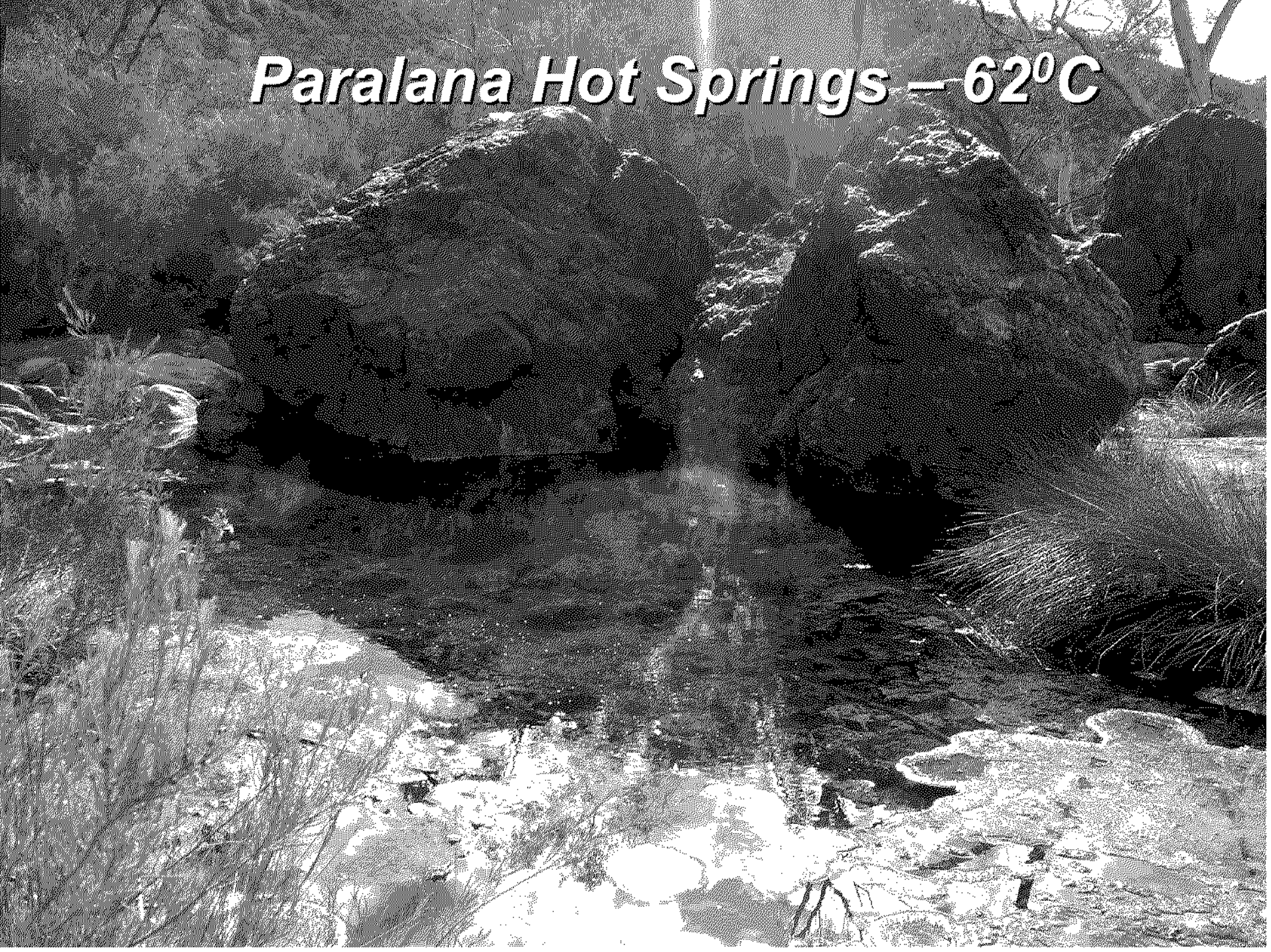
Fossil Hydrothermal Systems





Hydrothermal Vent Wairakei, New Zealand

Paralana Hot Springs – 62°C

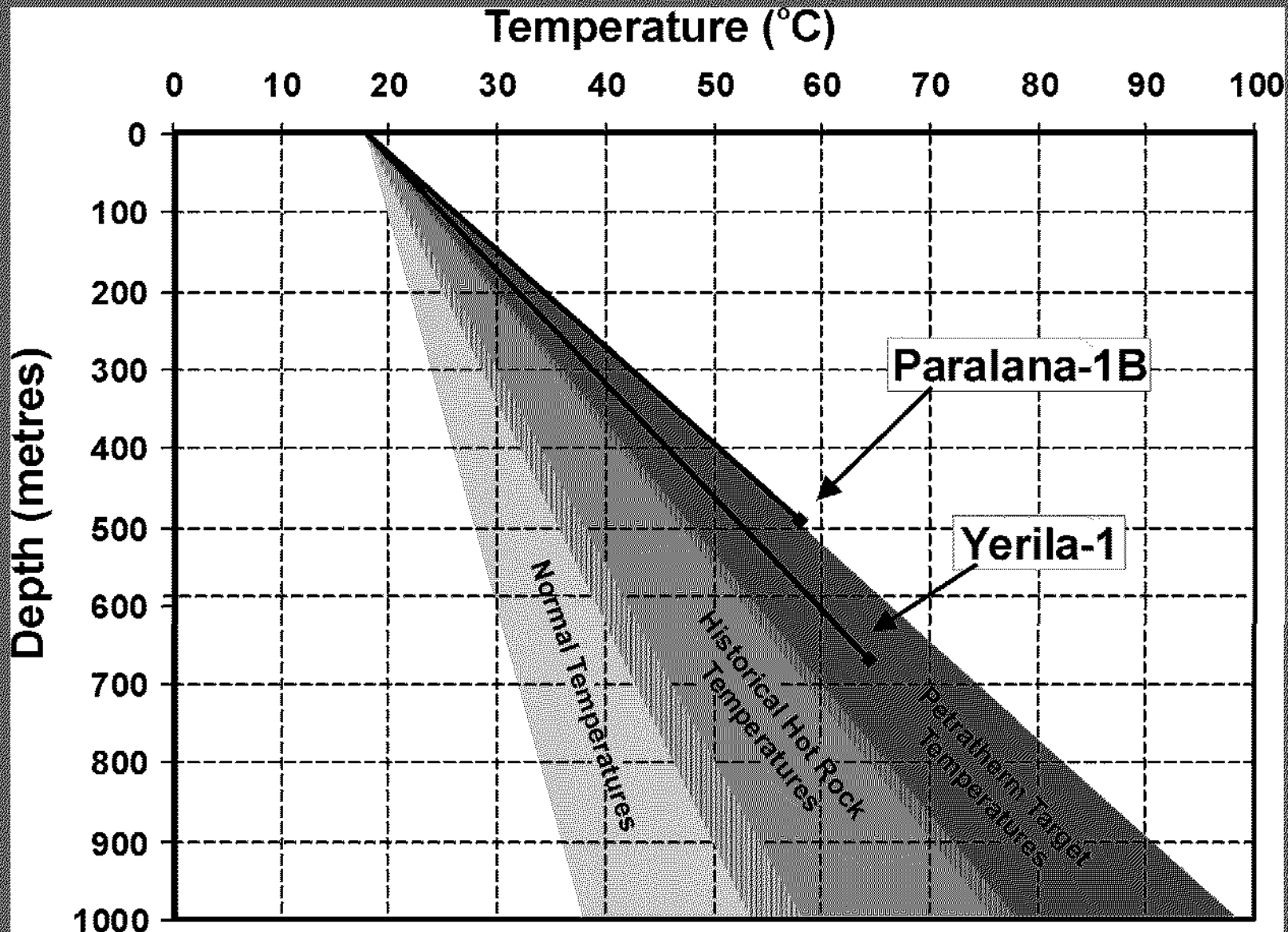


Drilling Campaigns

- ***September 2005***
- ***June 2006***

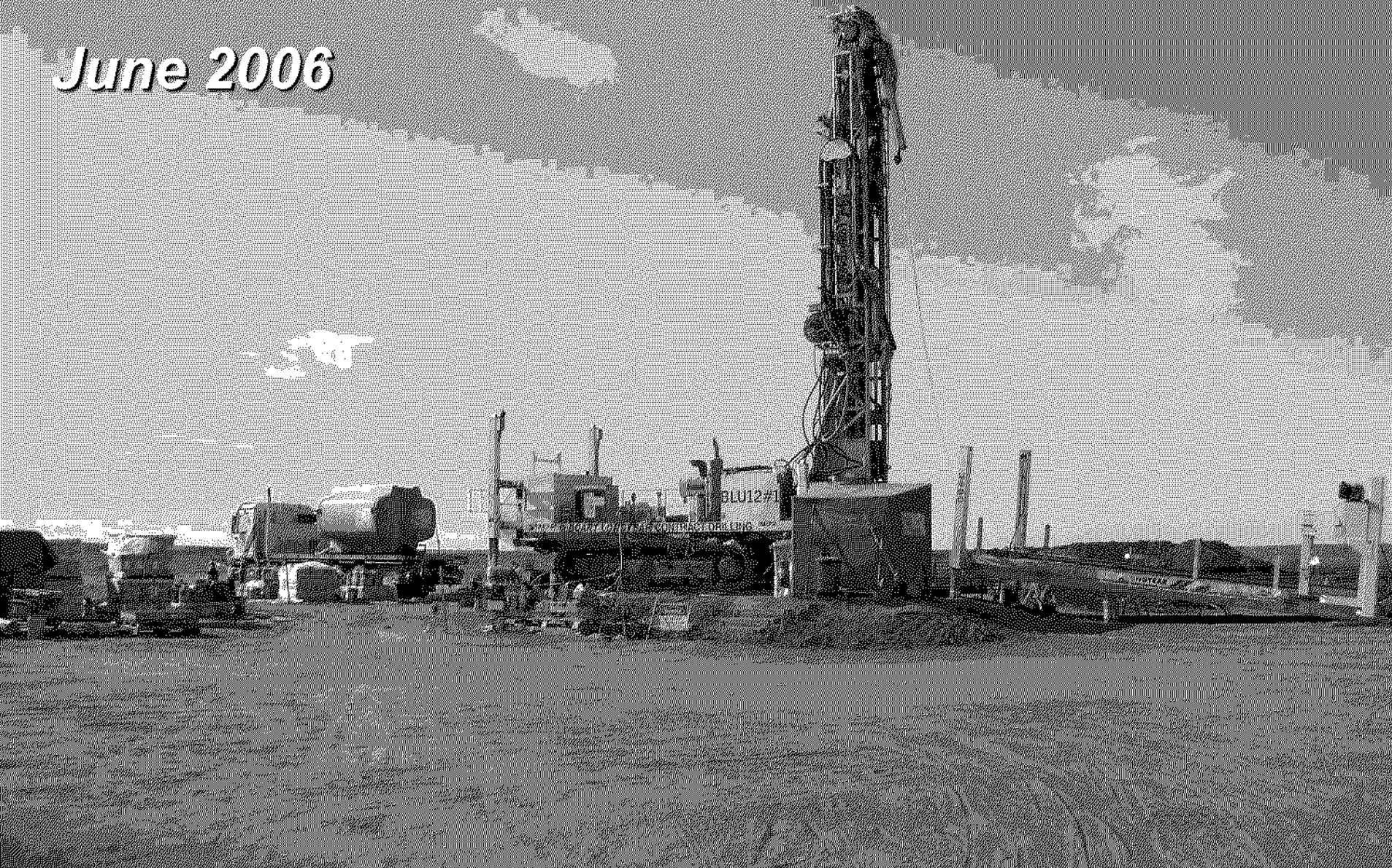


Outstanding Thermal Resource



Paralana - Phase 2 Drilling

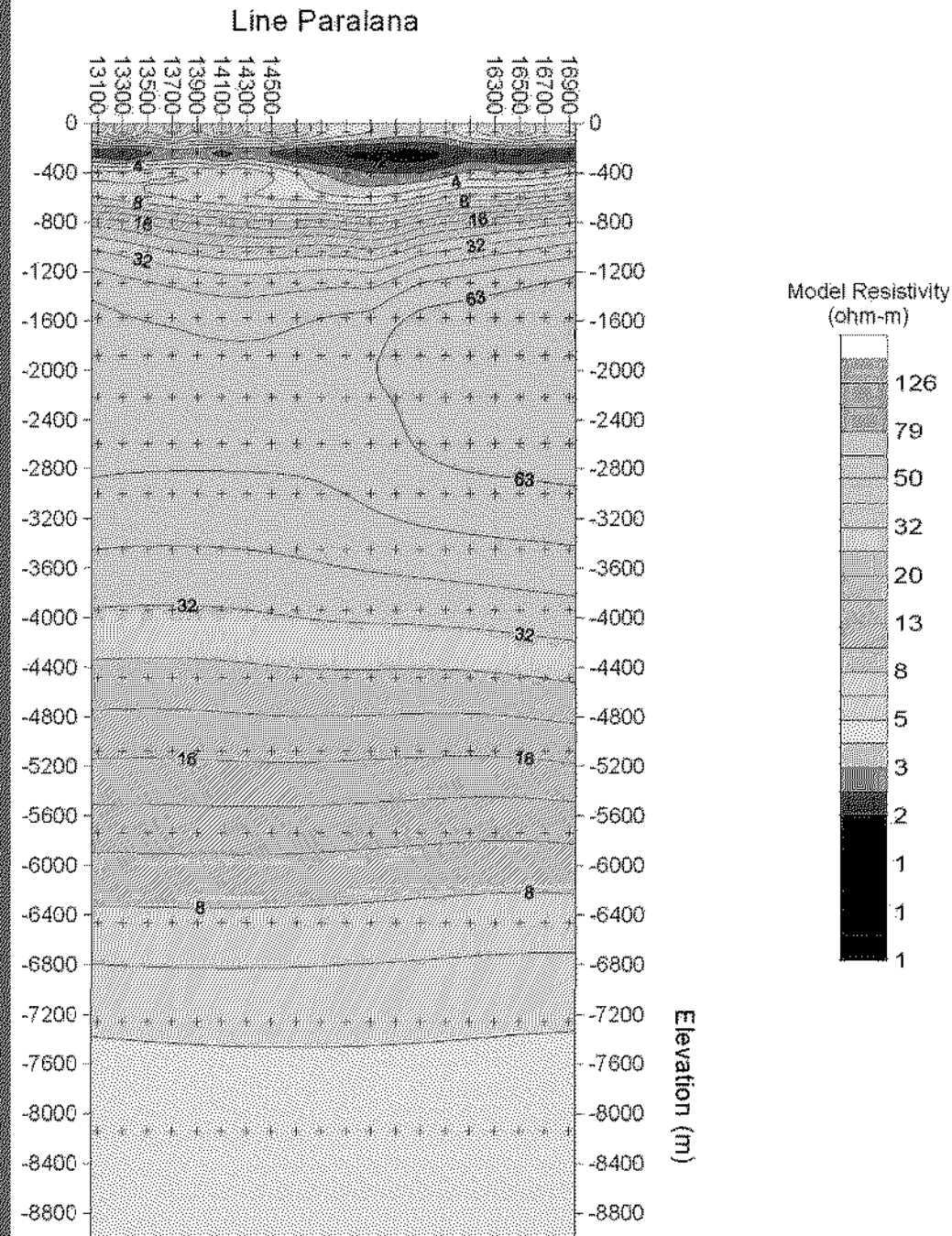
June 2006





Paralana – MT

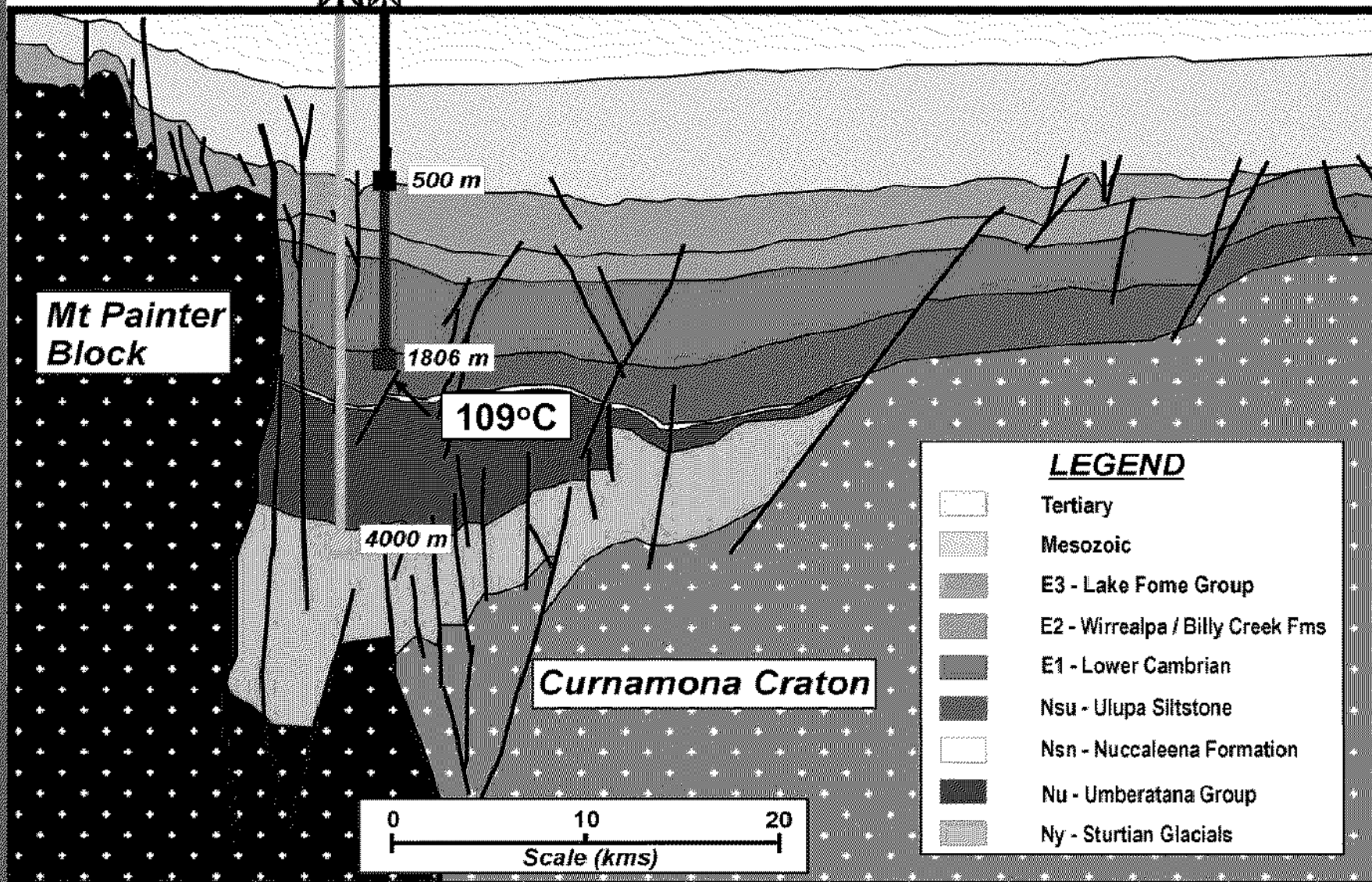
2D Smooth-model Inversion



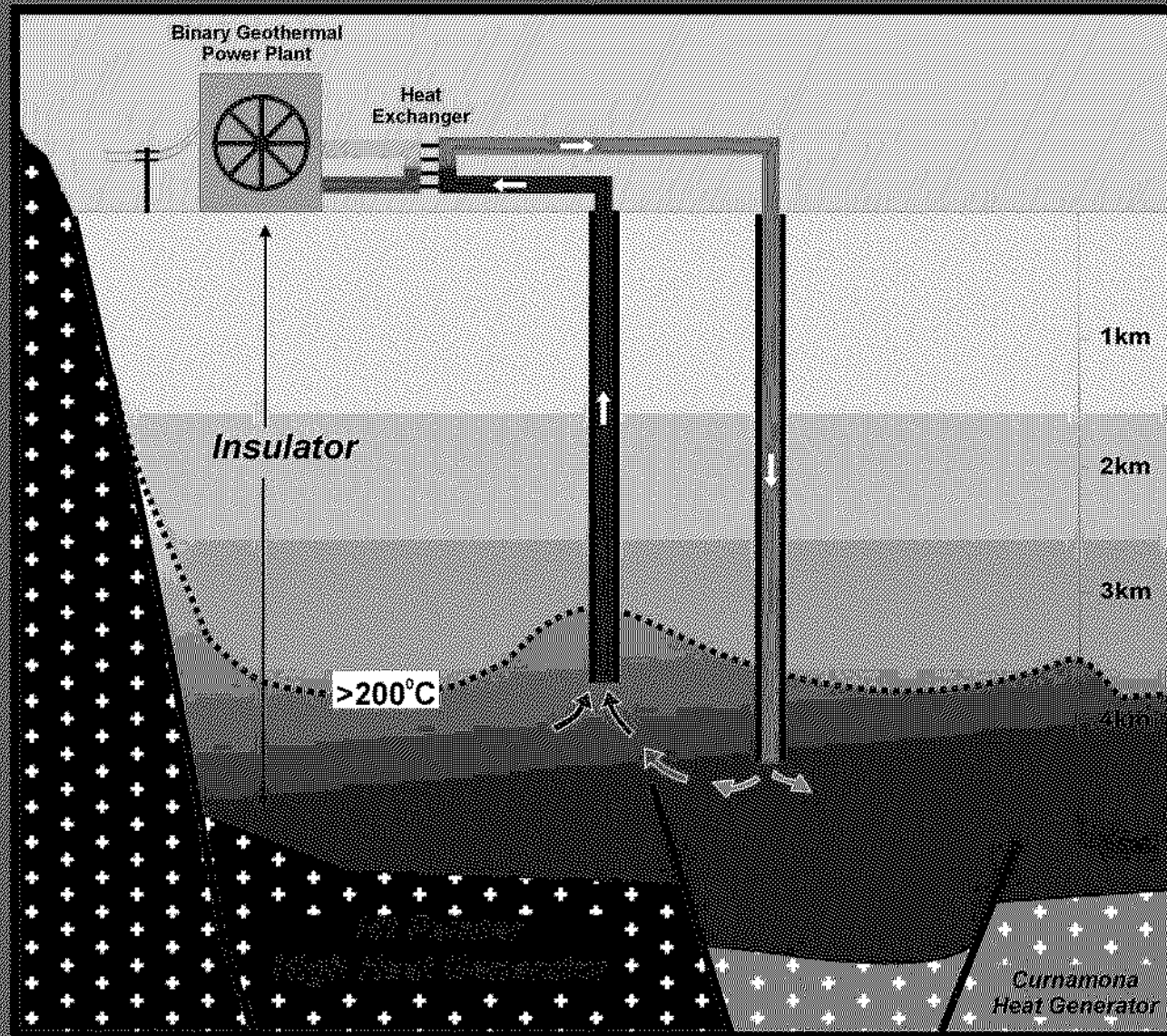
Paralana 2
Phase 3 drilling

Paralana 1

Paralana Work Program

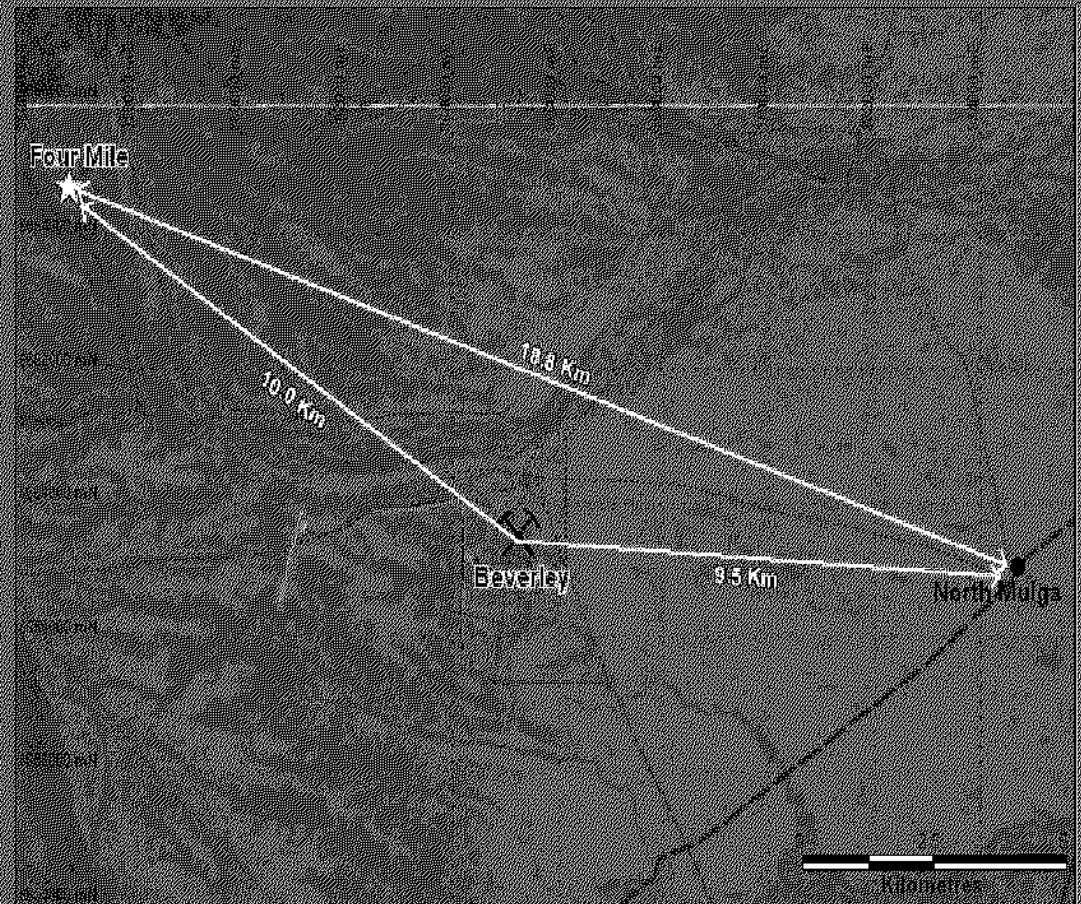


Heat Exchanger Within Insulator (HEWI) Model



Paralana 2 – Well Plan

- **Well Prognosis**
- **Well Location Optimisation Study**
 - Transmission
 - Field Logistics
 - Fracture Monitoring
 - Aboriginal Heritage
 - Environment
- **Reservoir Development Plan**

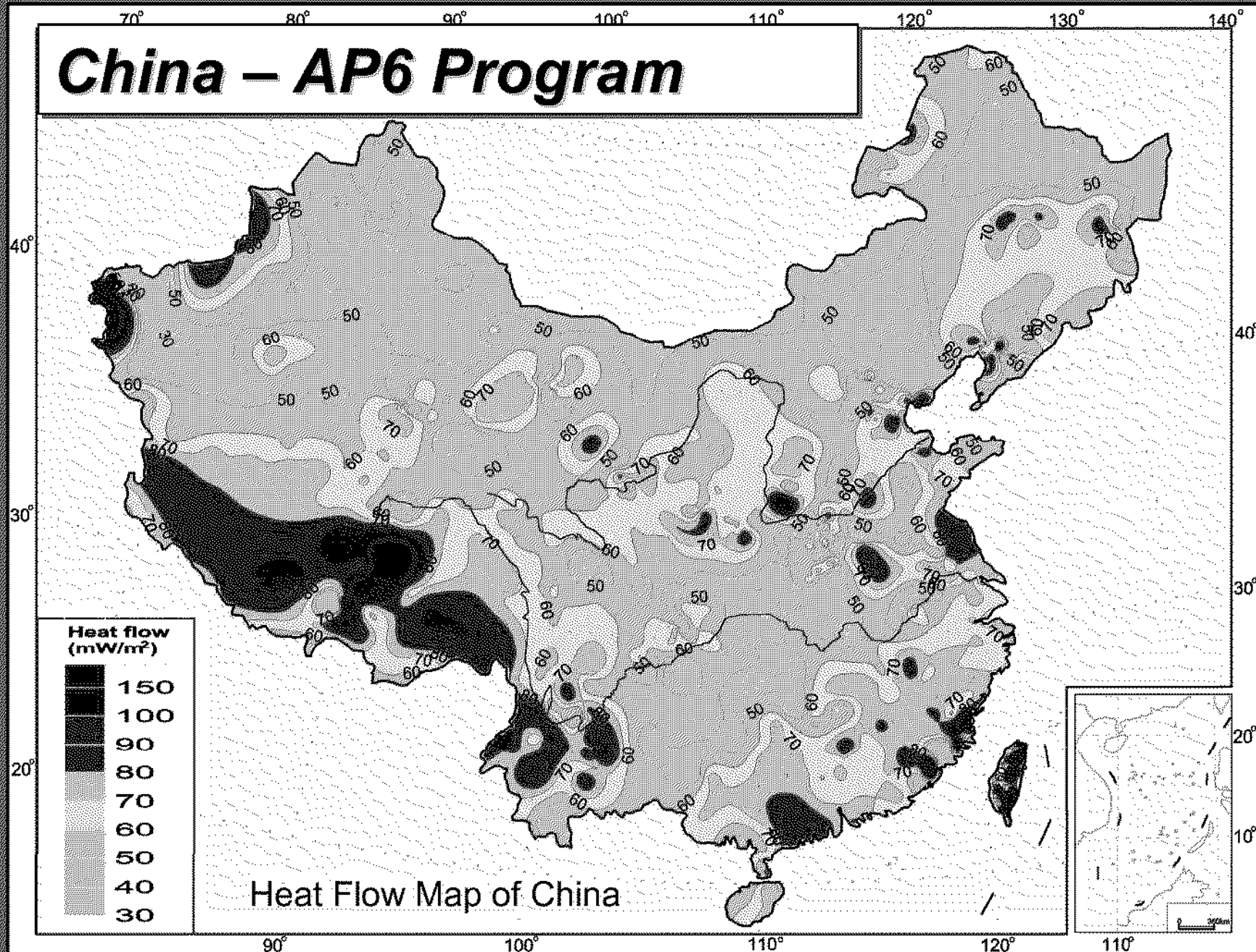


China – AP6 Program

- Over 240 recorded geothermal sites
- Conventional Geothermal Potential ~1400 MWe
- Untested EGS (Hot Dry Rock) Potential

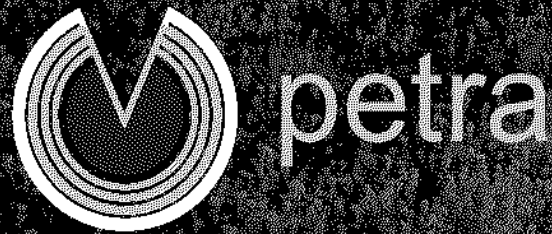
Ningzhong - Tibet

China – AP6 Program



Source: Hu Shengbiao, He Lijuan and Wang Jiyang. 2000.

Callabonna Plains After Rain



Summary

- Climate Change and the critical need for large scale, base load and low cost Renewable Energy
- Petratherm is continually expanding its portfolio of projects in Australia and overseas.
- Paralana Project exhibits the key ingredients for success
 - Excellent thermal resource at shallow depths
 - Stable geological formation - expect good drilling conditions
 - Proximity to the “off-grid” Beverley Uranium Mine
 - A clear and realistic, long term commercialisation plan
- Petratherm’s “lower cost, lower risk approach”.

Thank you



ASX Code: PTR

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