

# MODELING PERFORMANCE AND ECONOMICS OF POWER GENERATION BY ENERGY RECOVERED FROM COPRODUCED GEOTHERMAL FLUIDS

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**June 13, 2007**



# Agenda

Ø **Goals**

Ø **Key Variables -- “Dials”**

Ø **Model Organization**

Ø **Case Studies**

J **Temperature**

J **Flow**

J **Configuration**

Ø **Bases, Expansion**

Ø **Conclusions**





## Functions

- Ø Parametric
- Ø Performance
- Ø Economics
- Ø Configuration
- Ø COS

## Parameters

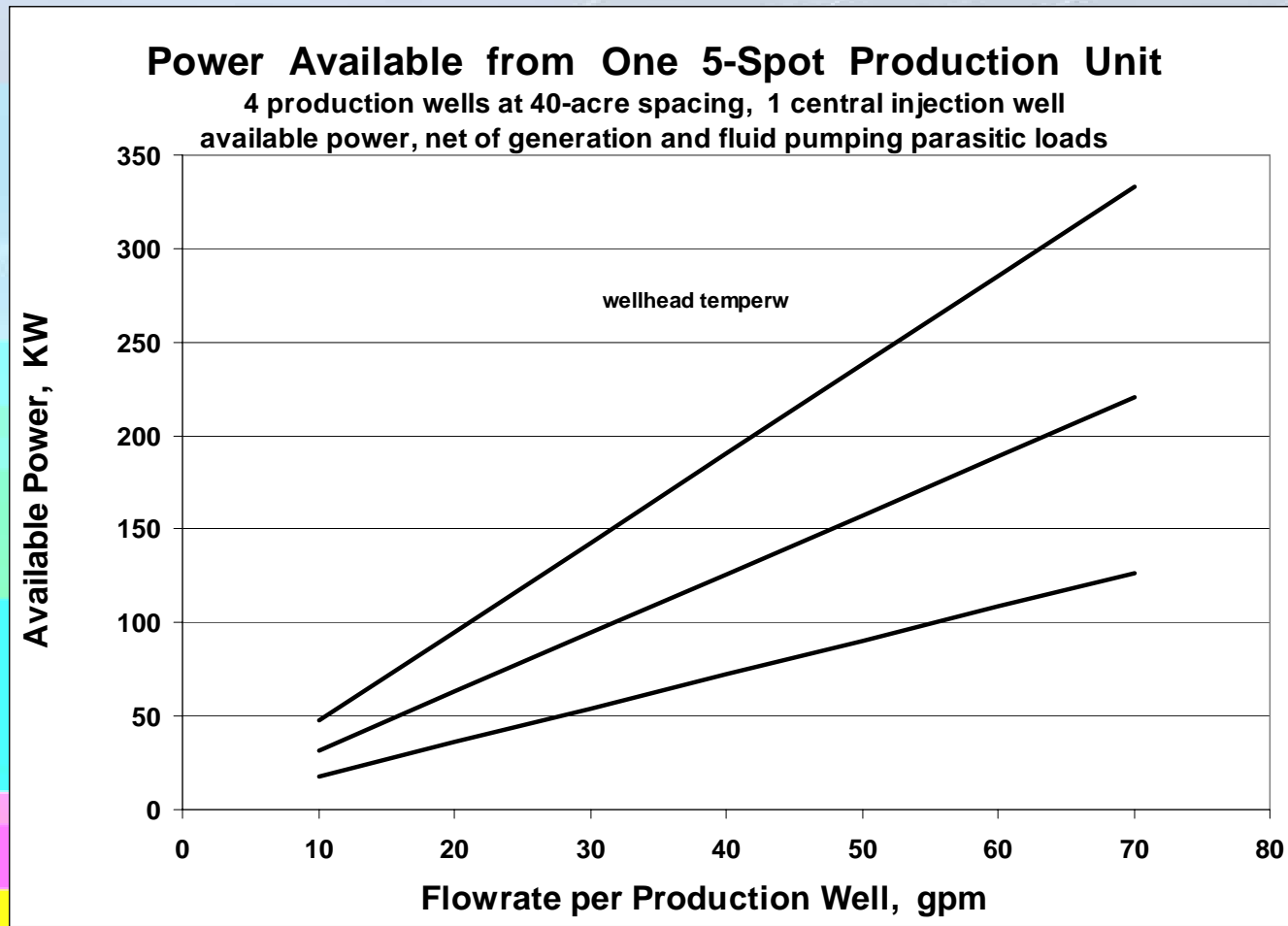
- Ø Temperature
- Ø Flowrates
- Ø System Capacities
- Ø Capital Costs
- Ø Financing Terms
  - J Tax Credits

# Pro Organiz

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INPUT  
User enters data  
conditions, we

Informati  
.....  
Computat  
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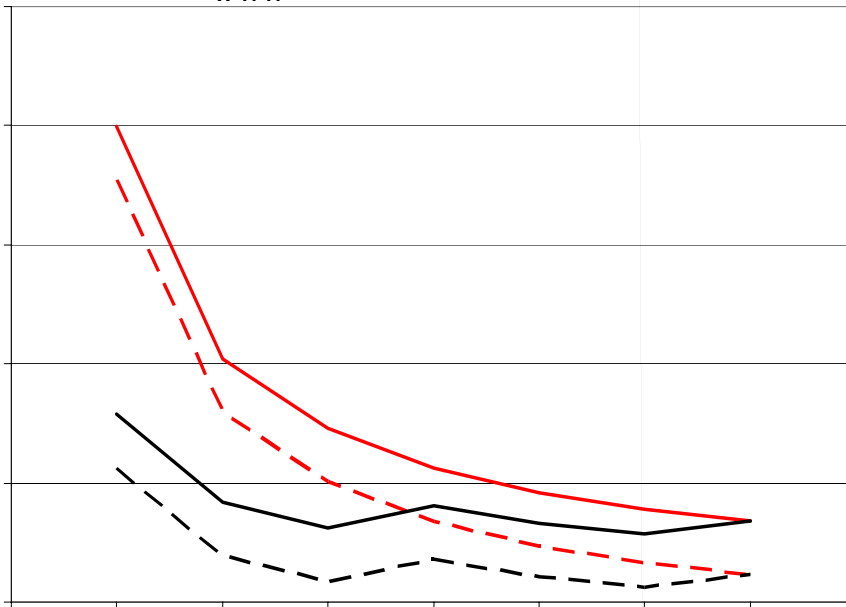
# Temperature Effects



## 200 KW Generation Units -- Co-Production Cost of Power Versus Flowrates at Variable Wellhead Temperatures

5-Spot Layout, 40 Wells (total) at 40-Acre Production Well Spacing

W Ti Ti



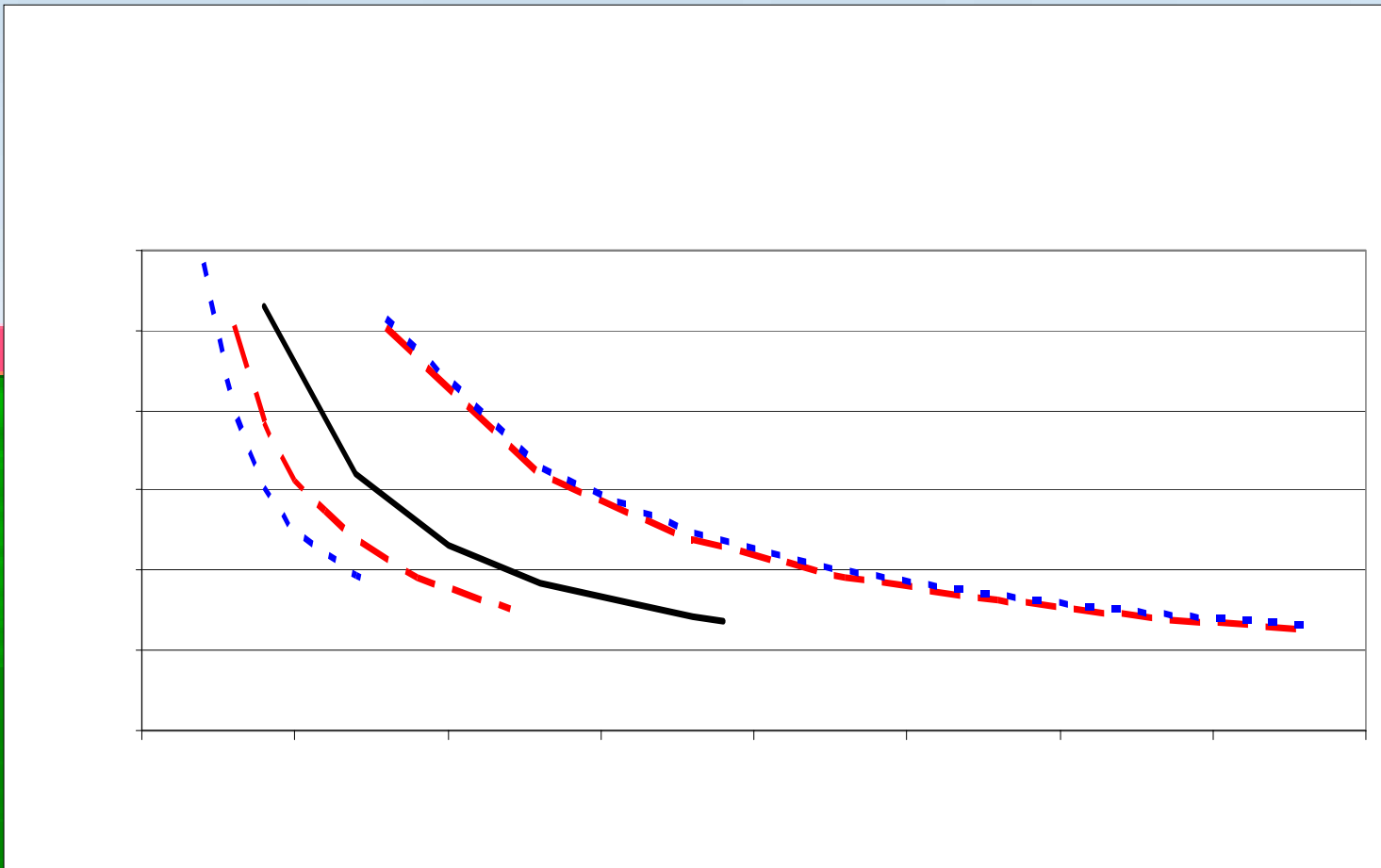


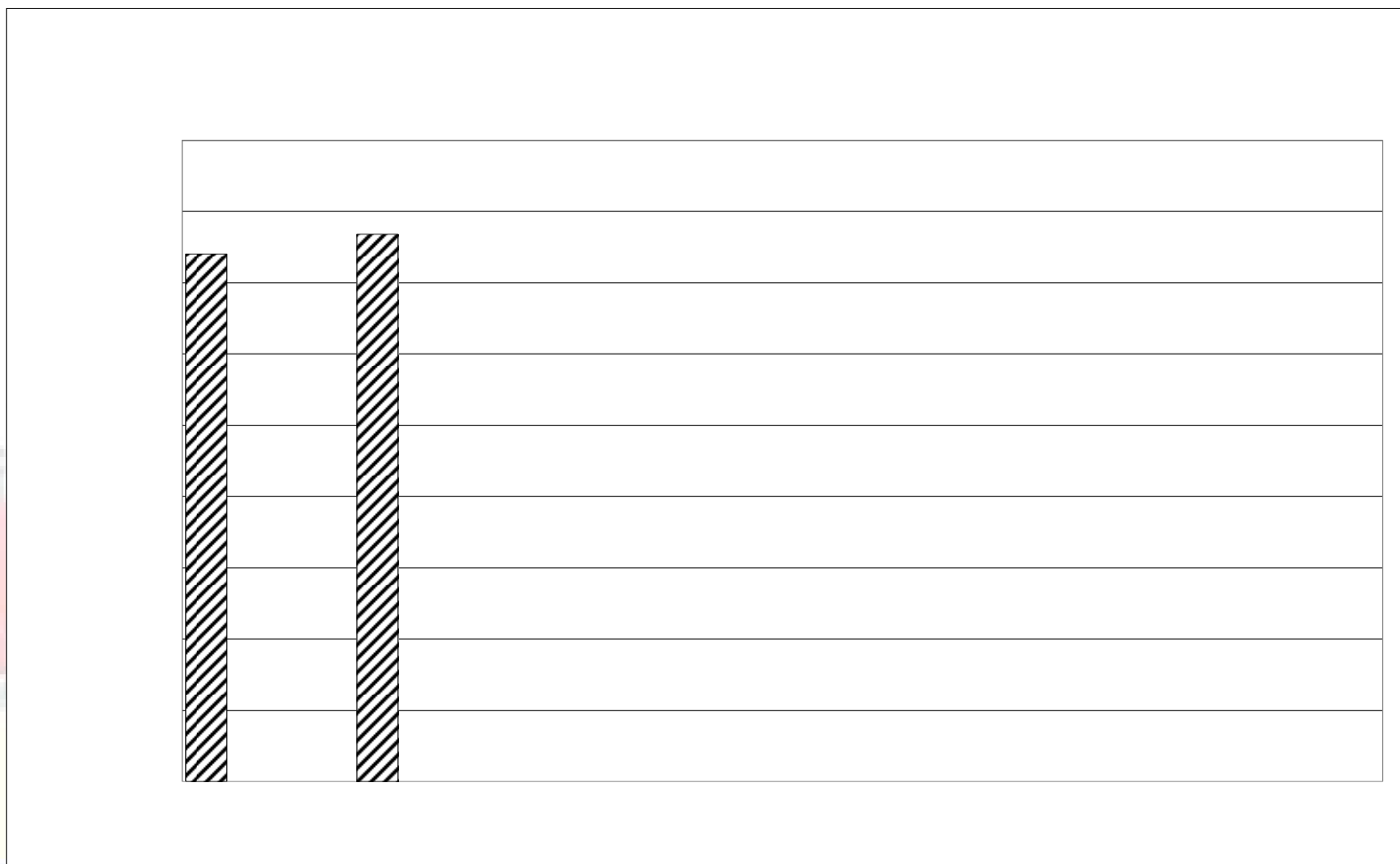


# Wellfield Configuration




# Wellfield Configuration





**Figure 9**  
**Comparison of Configuration and Generation Capacity Effects**





# Input Variables

Flow



# Bases

## Ø Engineering

£ Perry

£ McCabe and Smith

£ Smith and VanNess

## Ø Costs

£ Means

£ Contact

## Ø “Open Architecture”

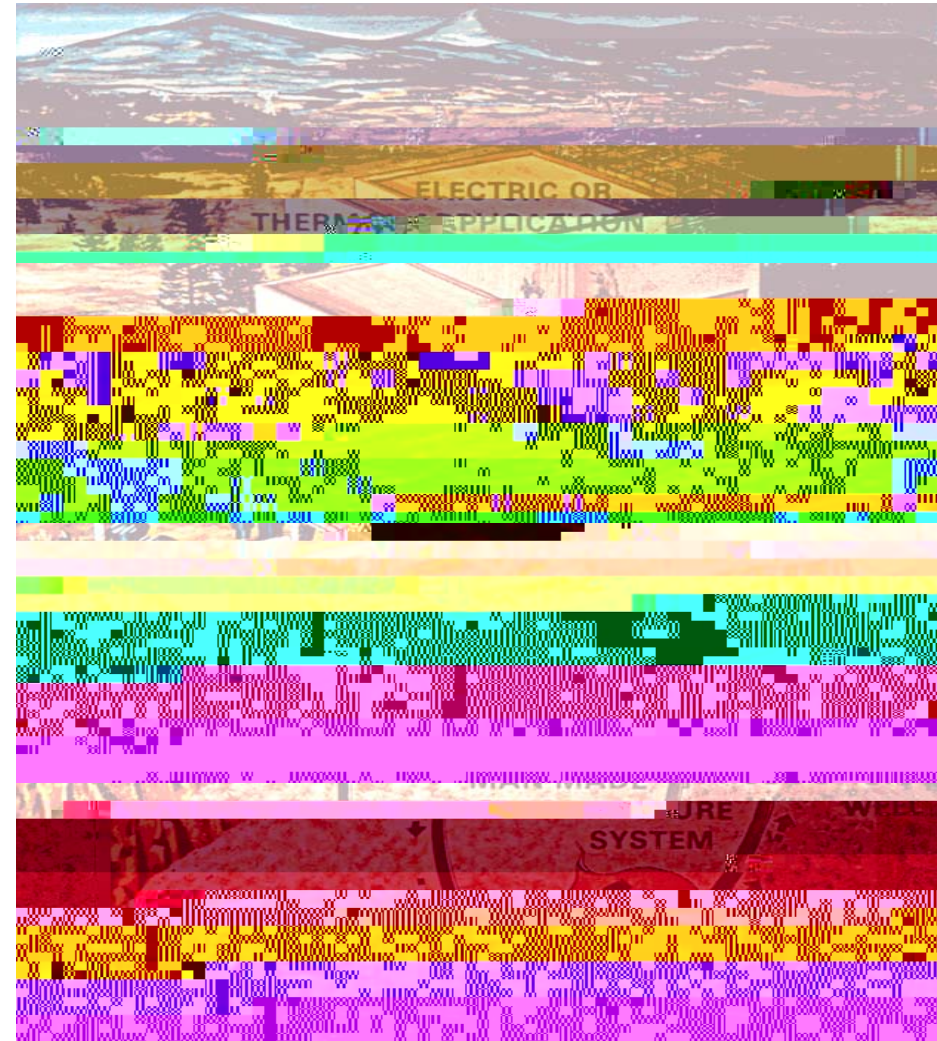
£ parametric “spread”

£ cut ‘n paste new features

š well losses

š conversion system

š user-defined configurations

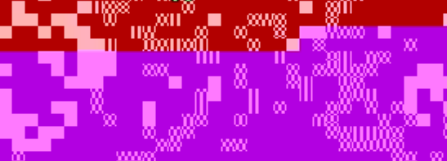
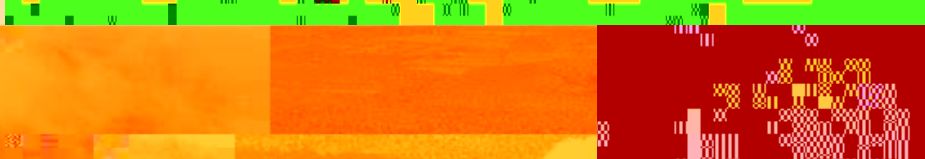
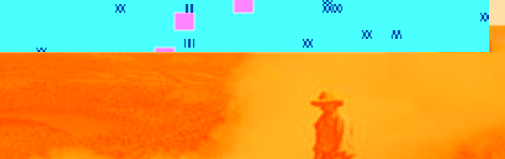
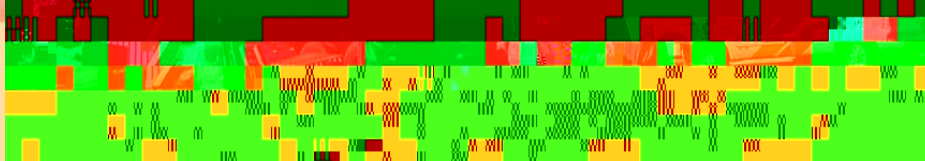
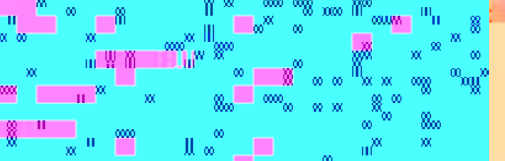
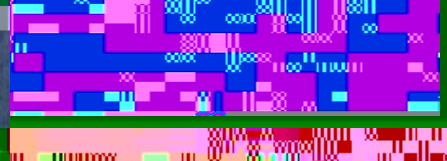
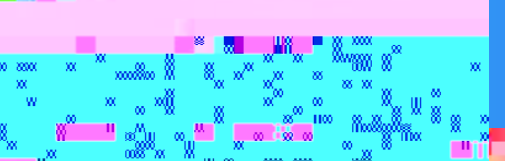
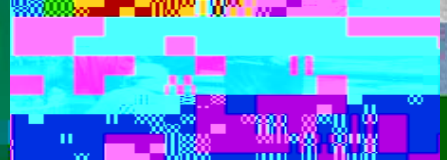
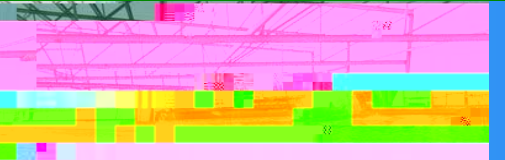
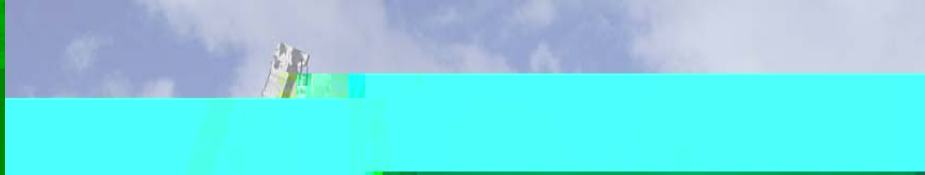
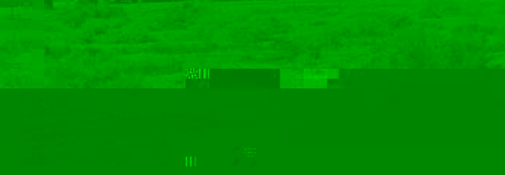




# Conclusions

- ∅ **Model covers a profile of project variables:**
  - ┆ **physical (process engineering),**
  - ┆ **configurational,**
  - ┆ **E&C,**

who makes it happen?

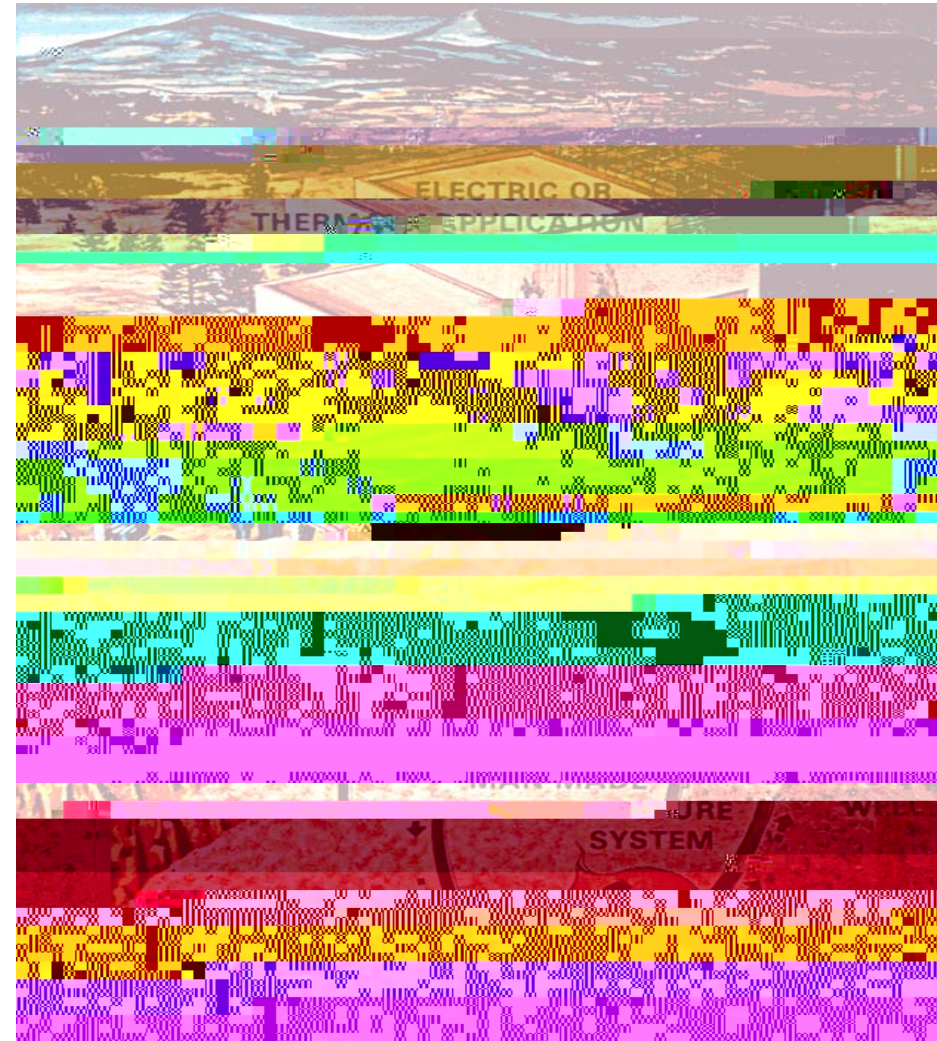




# BACKUPS

Ø ALTERNATE AMBIENT TEMPERATURE

Ø POWER VERSUS RESOURCE TEMPERATURE



# Temperature Effects

