

**3-11-10  
Overview:  
Comprehensive  
Energy Plan for  
the Alaska  
Railbelt**

<target><bill></bill><subject>3-11-10 Overview Comprehensive  
Energy Plan for the Alaska  
Railbelt</subject><comm>HENE26</comm></target>

**Alaska Legislature  
House Special Committee on Energy**



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# AGENDA

Thursday, March 11, 2010

3:00 – 7:00 p.m.

House Finance Committee Room (#519)

Overviews  
on  
Comparative TELECONFERENCED  
Railbelt  
Energy

Project Analysis:

Railbelt Integrated Resource Plan, by

Alaska Energy Authority;

Susitna Hydro Project, by Alaska Energy  
Authority;

Mount Spurr Geothermal Project, by Ormat;

In-State Natural Gas Pipeline, by Bob

Swenson, In-State Natural Gas Pipeline

Coordinator, CIRI;

Chakachamna Hydro Project, by TDX Power;

Coal Gasification and Fire Island Wind

Farm Projects, by CIRI

Bills Previously Heard/Scheduled

+

###

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**Seven Questions for Proposed Railbelt Energy Projects**

**1) Project timeline –completion date and the date power will be turned on:**

**2) Total cost of project and funding request (state revenue):**

**3) Transmission needs to grid -who pays?:**

**4) Cost of power to consumer (KWH):**

**5) Amount of power supplied to railbelt:**

**6) Likelihood of completion:**

**7) Permitting roadblocks- Environmental challenges:**

Additional Notes:

# A Comprehensive Plan for the Alaska Railbelt

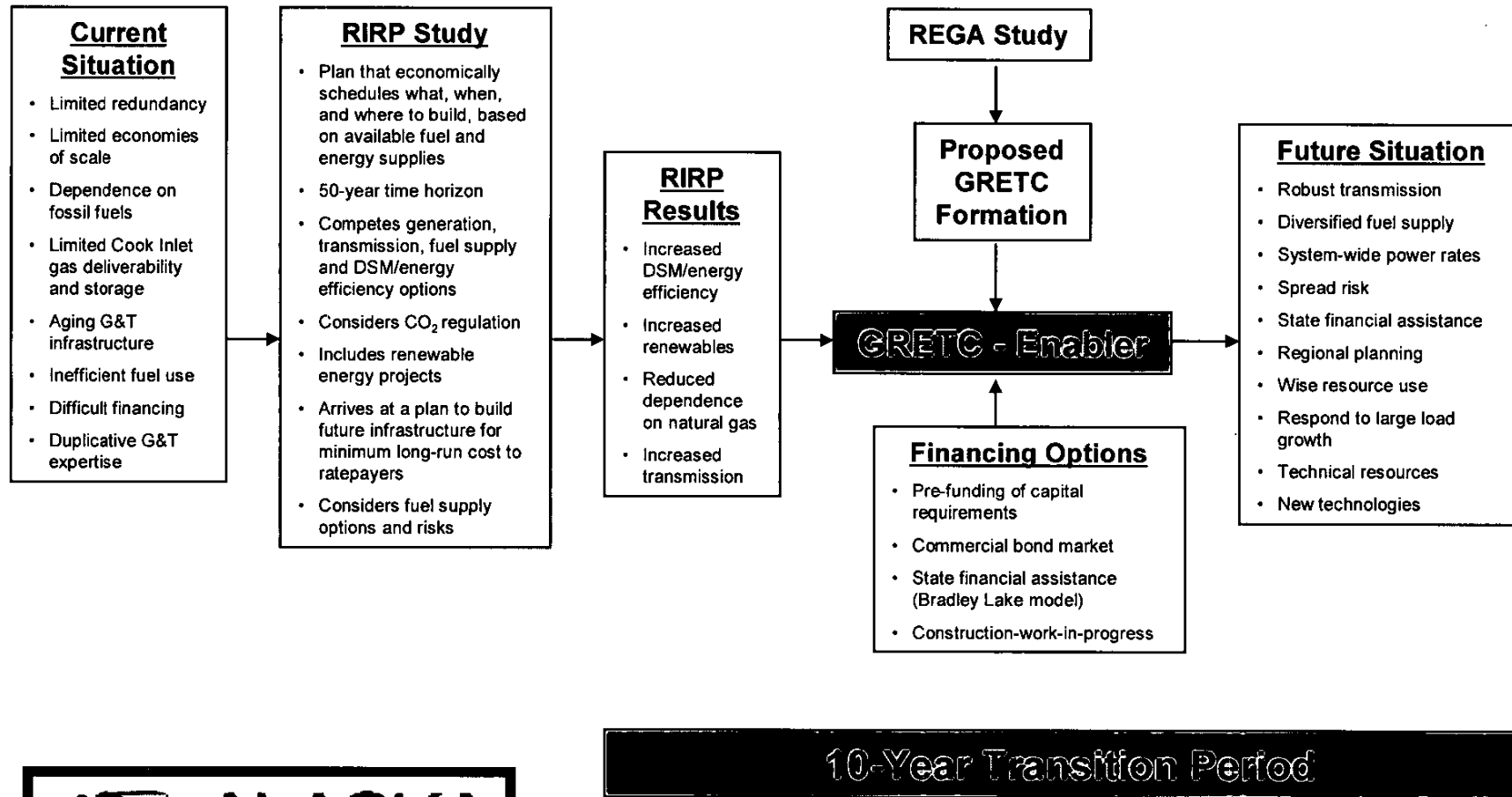
Results of the Railbelt IRP

House Energy Committee

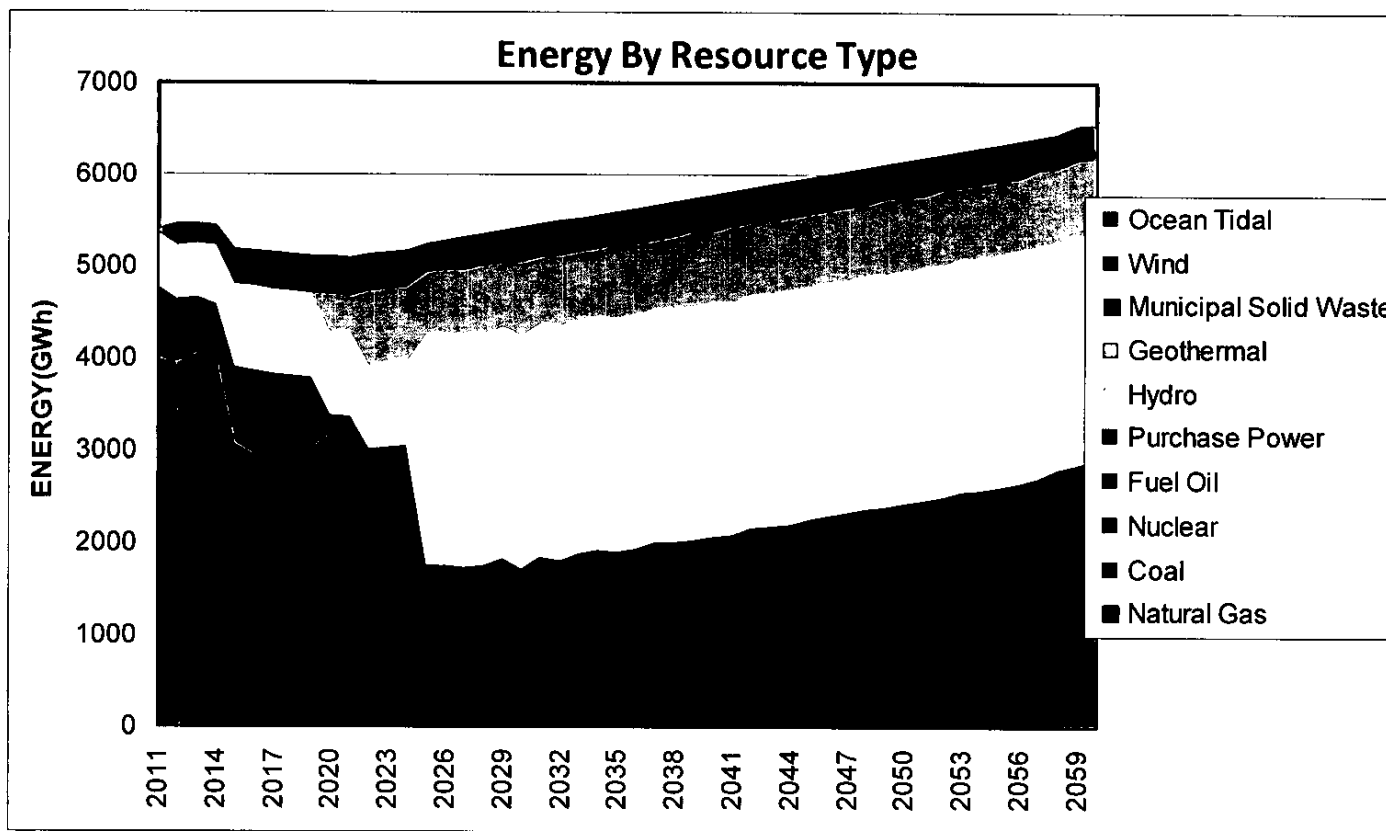
March 11, 2010



# A COMPREHENSIVE PLAN FOR THE RAILBELT



# A Comprehensive Plan for the Alaska Railbelt



Scenario 1A/1B



The Railbelt 50-year power portfolio, presented graphically

Source: B&V RIRP Final Report

## A Comprehensive Plan for the Alaska Railbelt

### **CONCLUSIONS - PREFERRED RESOURCE PLAN**

- ✘ DSM/EE Programs (2011)
- ✘ Nikiski Wind (2011)
- ✘ HCCP (2011)
- ✘ Fire Island Wind (2012)
- ✘ Southcentral Power Plant (2013)
- ✘ Glacier Fork Hydro (2014)
- ✘ Anchorage and GVEA MSW (2015/2017)
- ✘ GVEA North Pole Retrofit (2018)
- ✘ Mt. Spurr Geothermal (2020)
- ✘ Parallel pursuit of Chakachamna/Susitna/Glacier Fork
- ✘ Multiple transmission projects



# A Comprehensive Plan for the Alaska Railbelt

## CONCLUSIONS - PREFERRED RESOURCE PLAN

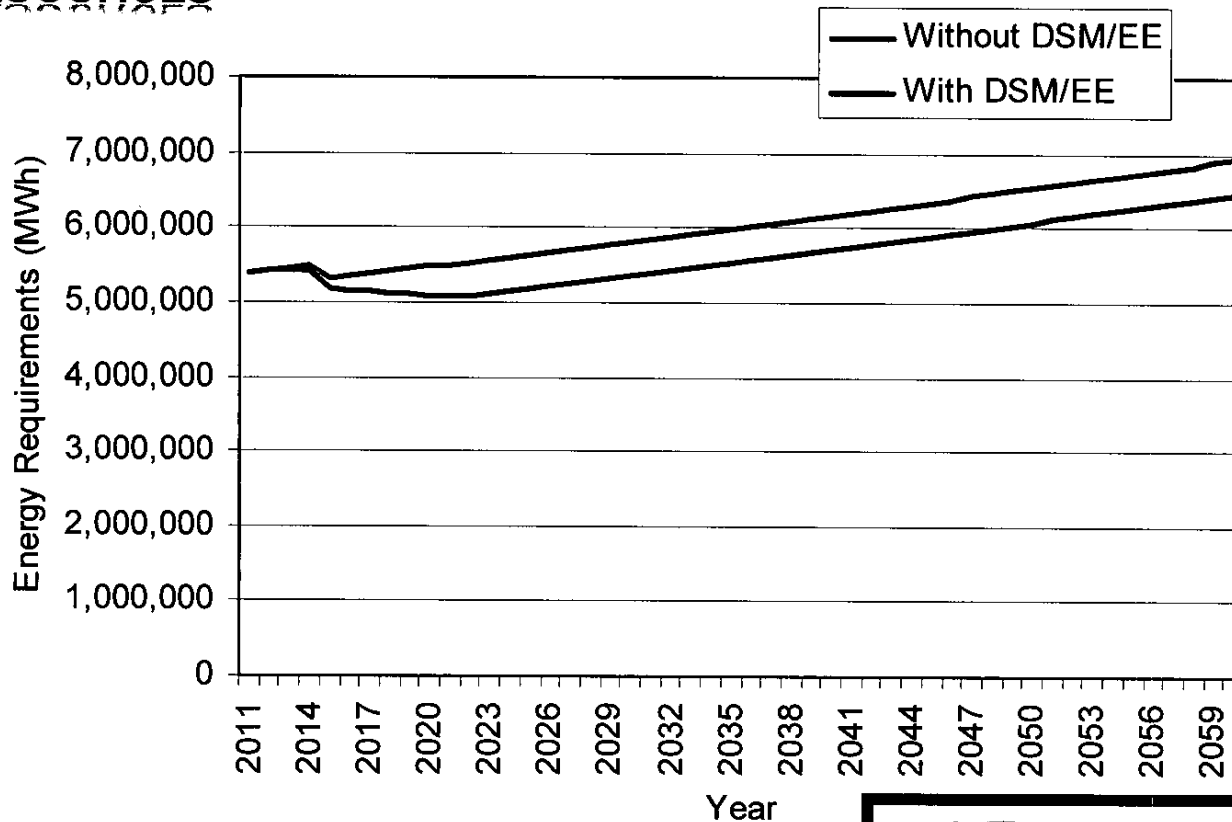
### ✘ Near-Term Transmission Projects

- + Soldotna-Quartz Creek transmission line (\$126MM)
- + Quartz Creek-University transmission line (\$165MM)
- + Douglas-Teeland transmission line (\$63MM)
- + Lake Lorraine-Douglas transmission line (\$80MM)
- + SVCs (\$25MM)
- + Southern Intertie study (\$1MM)
- + BESS - frequency regulation (\$50MM)



# A Comprehensive Plan for the Alaska Railbelt

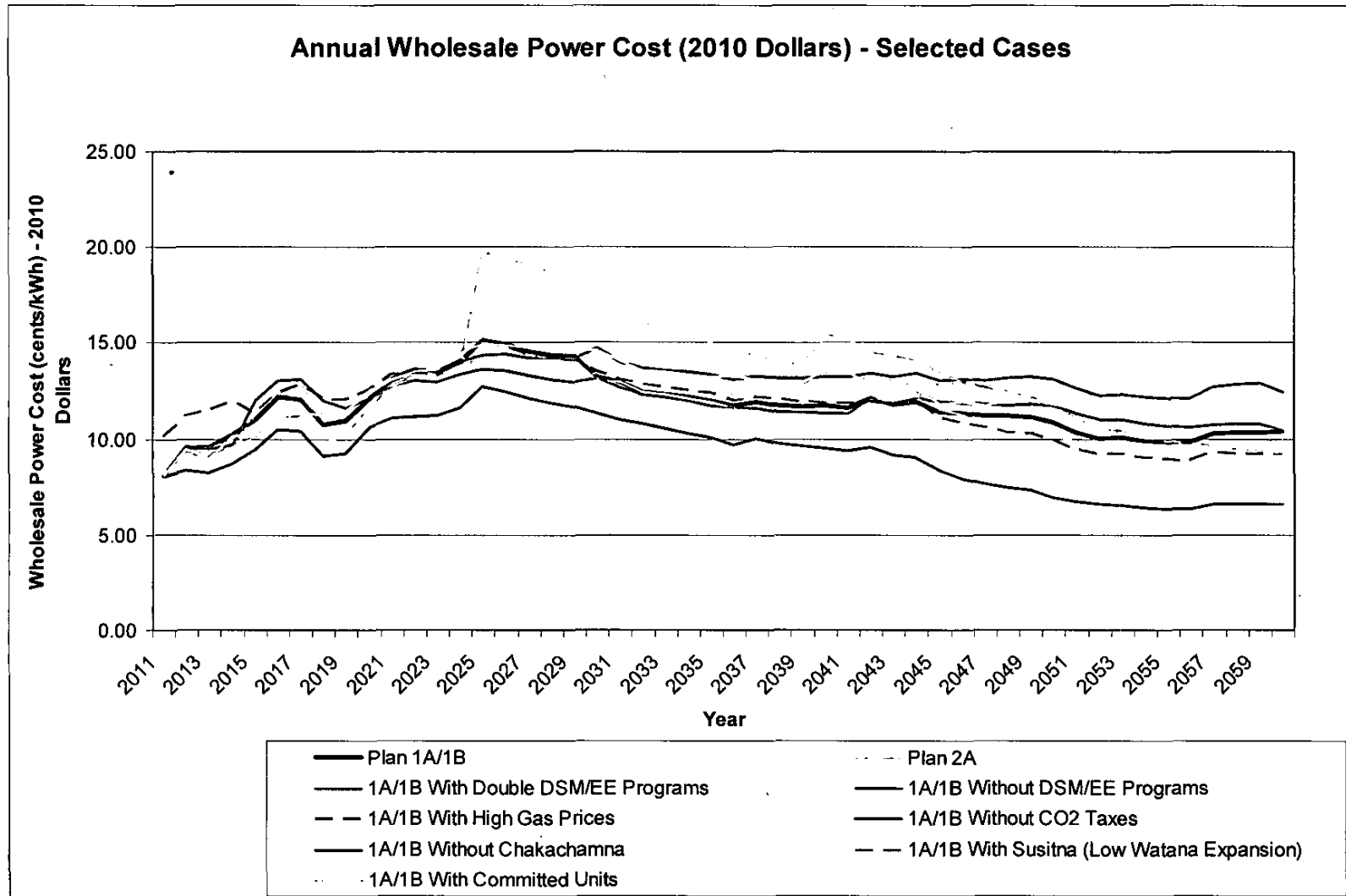
## RESULTS - DSM/EE Energy Requirements (MWh) RESOURCES



Source: B&V RIRP report

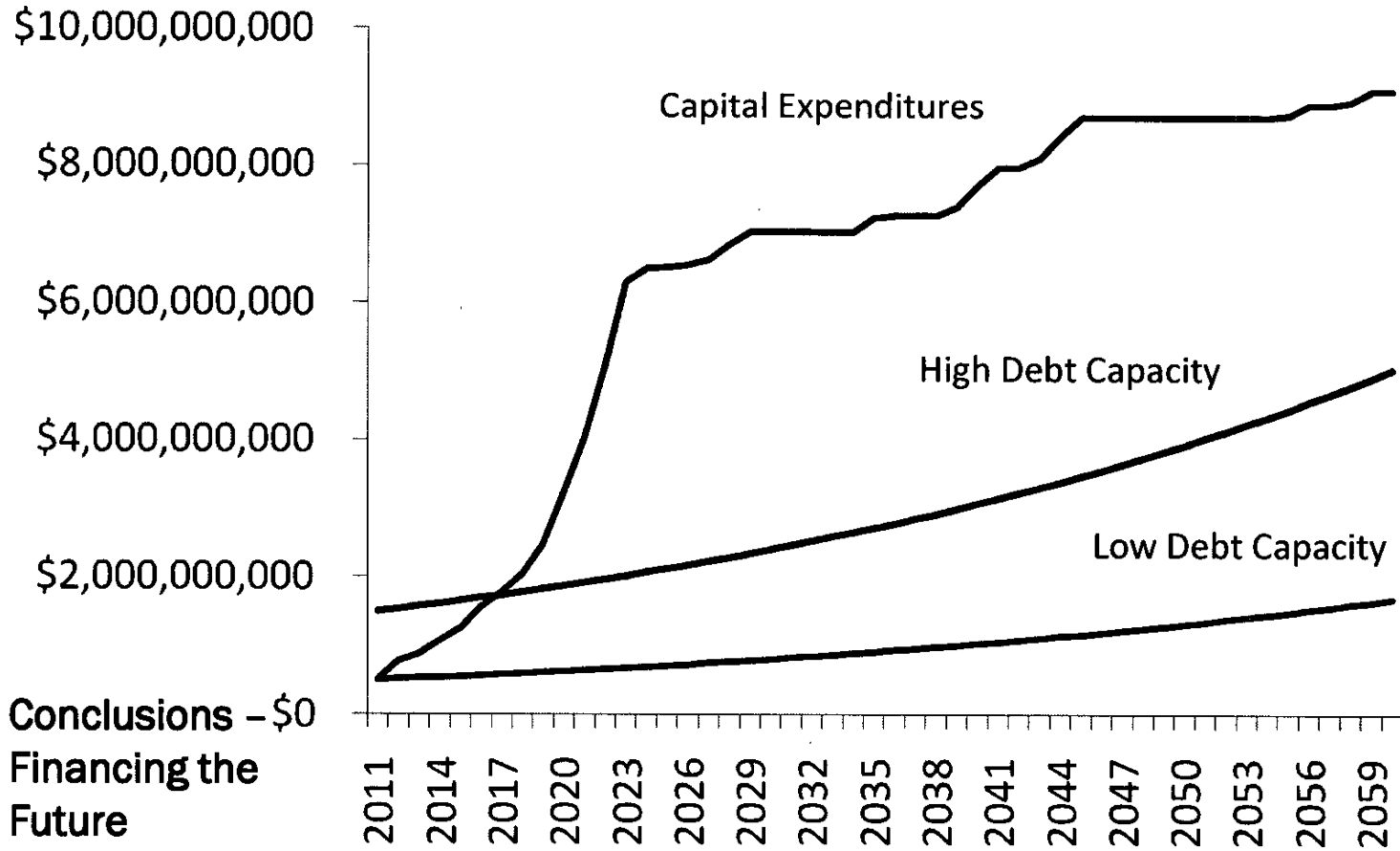


## A Comprehensive Plan for the Alaska Railbelt



### A Comprehensive Plan for the Alaska Railbelt

#### RIRP Plan 1A Capital Expenditures and Debt Capacity of the Railbelt Utilities



Conclusions – \$0  
Financing the  
Future

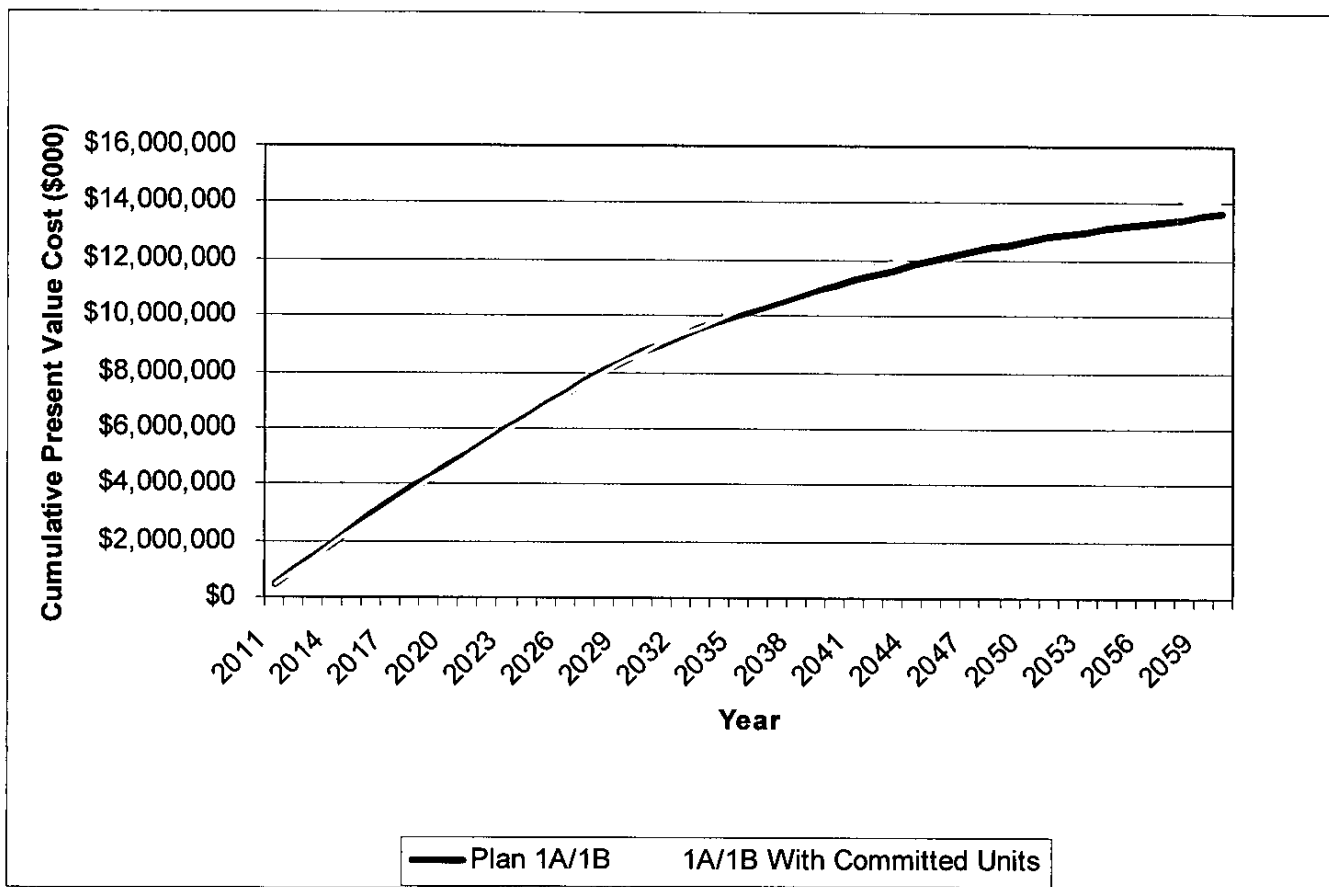


Source: B&V RIRP report, Seattle Northwest Securities

# A Comprehensive Plan for the Alaska Railbelt



## CONCLUSIONS - REGIONAL OR INDIVIDUAL UTILITY FUTURE



Source: B&V RIRP report

## A Comprehensive Plan for the Alaska Railbelt

### CONCLUSIONS – PREFERRED RESOURCE PLAN

#### Results of Financial Analysis

##### Techniques Considered

- ✘ Ratepayer benefit surcharge
- ✘ “Pay-go” financing
- ✘ CWIP
- ✘ State financial assistance
  - + 2.4 billion zero-interest loan
  - + Bradley Lake model

	Maximum Rate	Average Rate
Base Case	\$0.13/kWh	\$0.07/kWh
Alternative Case	\$0.08/kWh	\$0.06/kWh

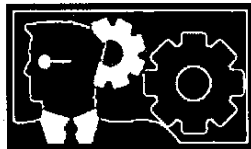


# SUSITNA HYDROELECTRIC PROJECT

## PROJECT SUMMARY

# House Energy Committee

March 11, 2010



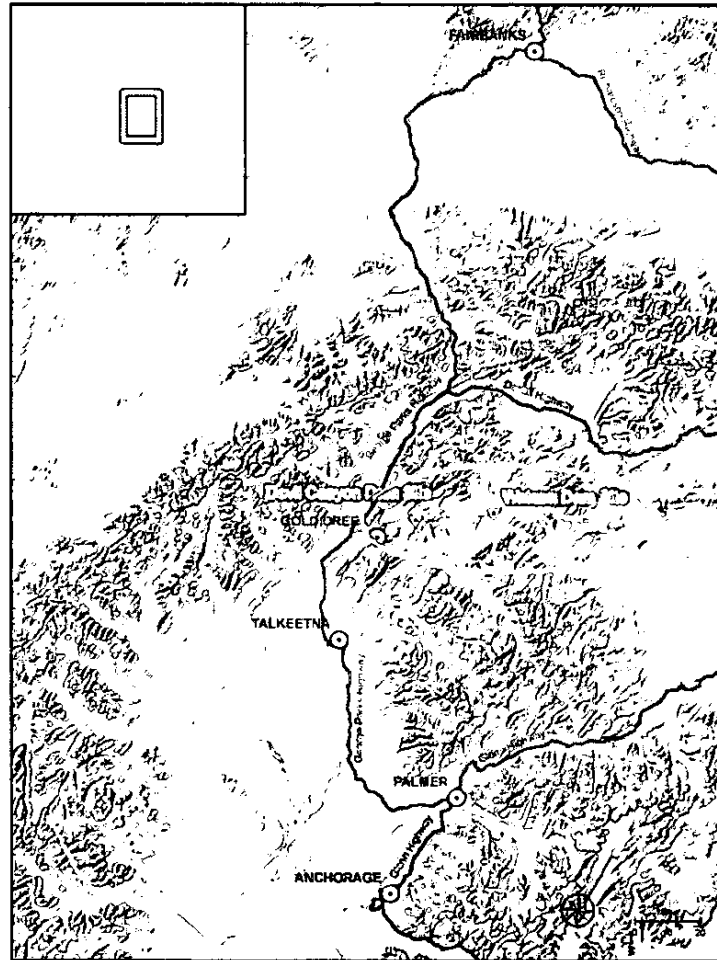
## **MAJOR POWER GENERATION PROJECTS RECOMMENDED BY THE RAILBELT INTEGRATED RESOURCE PLAN (RIRP)**

---

- ⊗ **DSM/EE Programs (2011)**
- ⊗ **Nikiski Wind (2011)**
- ⊗ **HCCP (2011)**
- ⊗ **Fire Island Wind (2012)**
- ⊗ **Southcentral Power Plant (2013)**
- ⊗ **Glacier Fork Hydro (2014)**
- ⊗ **Anchorage and GVEA MSW (2015/2017)**
- ⊗ **GVEA North Pole GT Addition(2018)**
- ⊗ **Mt. Spurr Geothermal (2020)**
- ⊗ **Parallel pursuit of Chakachamna/Susitna/Glacier Fork**
- ⊗ **Multiple transmission projects**

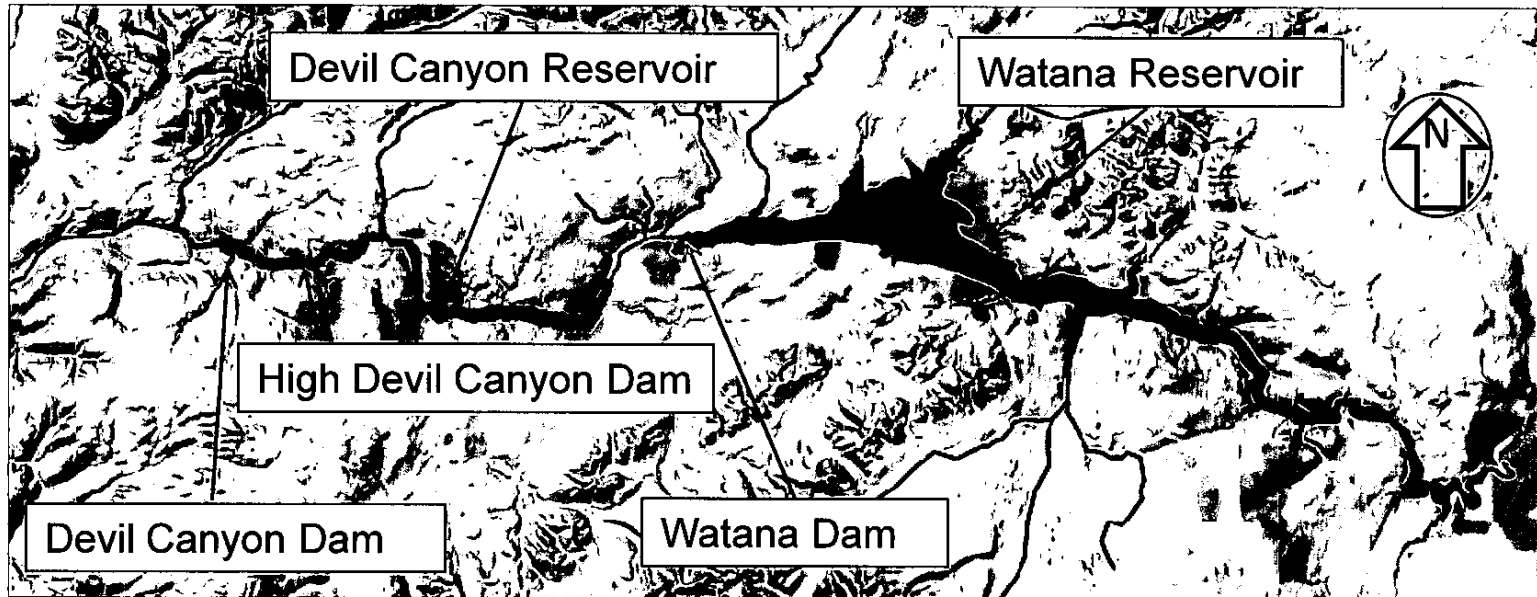


# SUSITNA PROJECT LOCATION



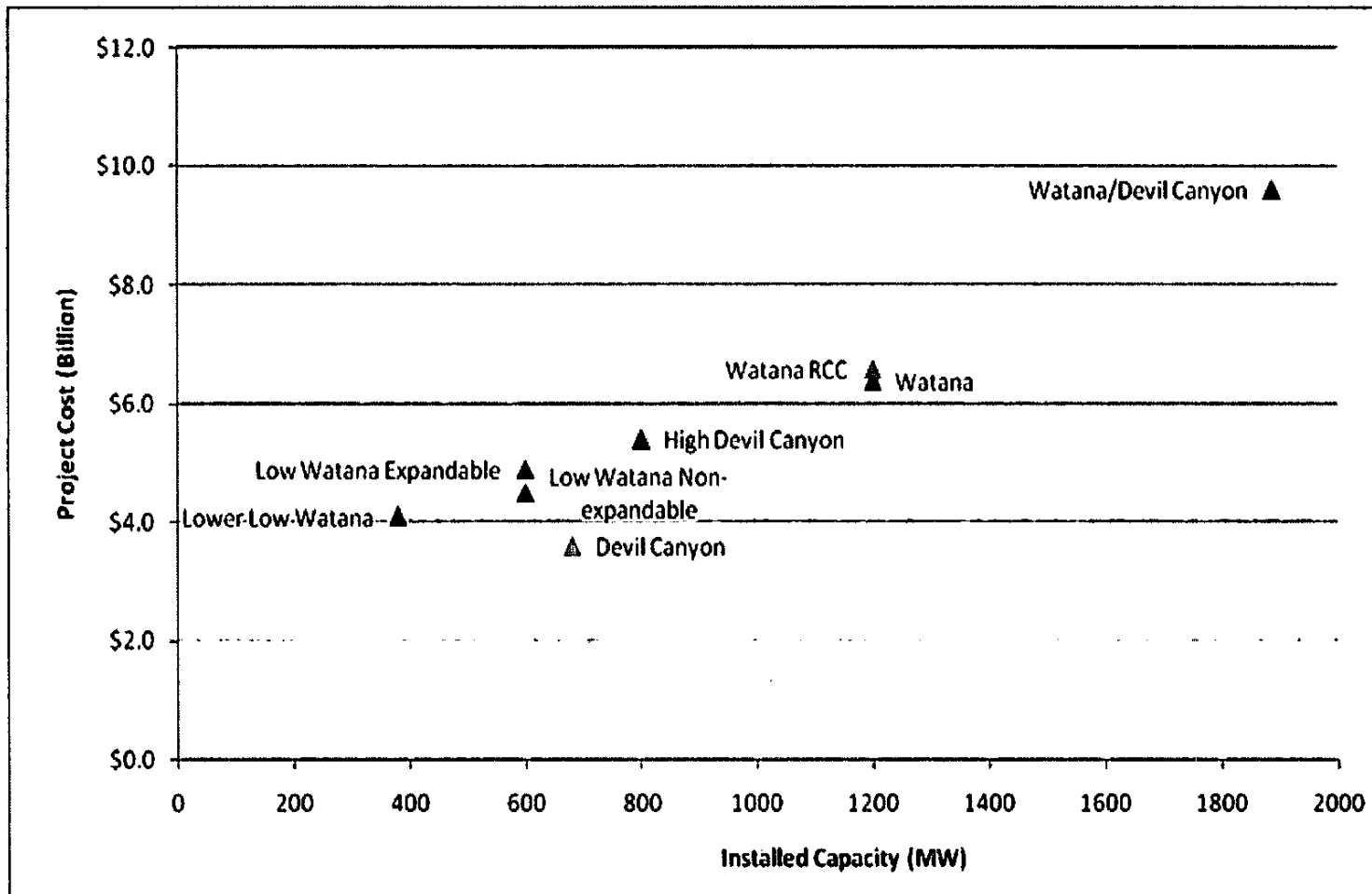
Susitna Hydro project area

# Potential Project Sites



## RIRP Project Susitna Evaluation

- Identify a range of single dam alternatives
  - Estimate energy & cost

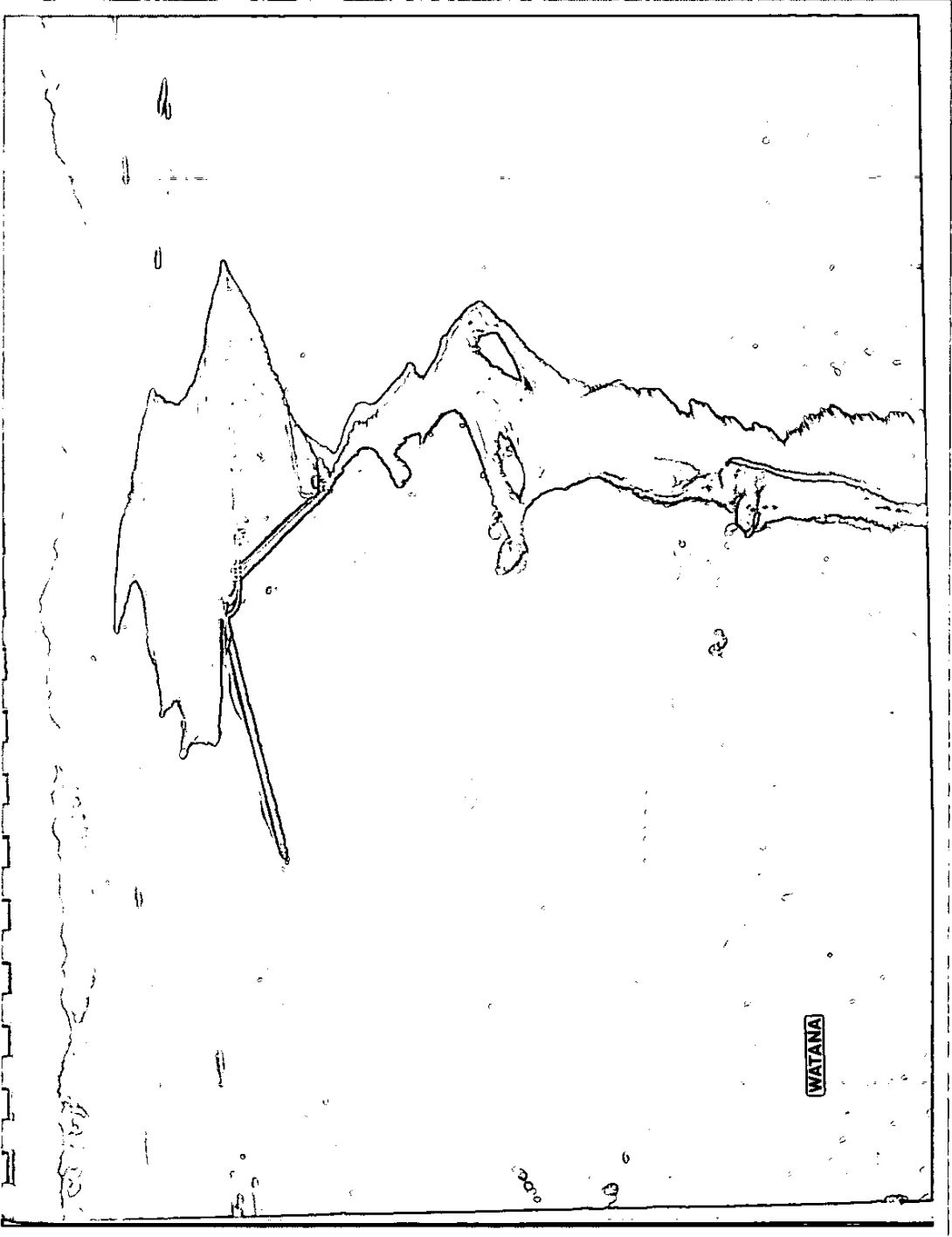


## Study Results

Alternative	Dam Type	Ultimate Capacity (MW)	Construction Cost (\$ Billion)	Energy GWh/yr)	Schedule (years from start of Licensing)
Lower Low Watana	Rockfill	380	\$4.1	2,100	13-14
Low Watana Non-expandable	Rockfill	600	\$4.5	2,600	14-15
<b>Low Watana Expandable</b>	<b>Rockfill</b>	<b>600</b>	<b>\$4.9</b>	<b>2,600</b>	<b>14-15</b>
Watana	Rockfill	1,200	\$6.4	3,600	15-16
Watana RCC	RCC	1,200	\$6.6	3,600	14-15
Devil Canyon	Concrete Arch	680	\$3.6	2,700	14-15
High Devil Canyon	RCC	800	\$5.4	3,900	13-14
Watana/Devil Canyon	Rockfill/Concrete Arch	1,880	\$9.6	7,200	15 - 20
Staged Watana/Devil Canyon	Rockfill/Concrete Arch	1,880	\$10.0	7,200	15 - 24

Option selected by RIRP model

# ROCK-FILLED EMBANKMENT DAMS



# FOCUSED QUESTIONS

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- ❖ **Project Timeline – 15 years from start of licensing**
- ❖ **Total Cost of Project – \$4.9 B**
- ❖ **Project Cost includes Transmission to Grid**
- ❖ **Cost of Power to Consumers**
  - ❖ **Levelized cost of power for 100 years (2010 dollars) - \$0.15/kwh**
- ❖ **Amount of Power Supplied to Railbelt - 2600 Gwh/year**
- ❖ **Likelihood of Completion – High, majority of technical and environmental issues resolved in 1980's**
- ❖ **Licensing Roadblocks – Next step for project is to engage stakeholders to explore project issues and concerns.**

# CONCLUSIONS

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- Of the renewable resources in the railbelt region, the Susitna project is the most studied and best understood.
- Project is considered to be technically feasible.
- Project has potential to expand to meet future loads.
- Large hydro provides dispatchable energy and stabilizes the grid.
- Environmental and seismic risk is considered manageable.
- Long term stable cost of power.

# Chakachamna Status Report.

TDX Power  
Nicholas Goodman  
Eric Yould

House Special Committee on Energy  
March 11, 2010

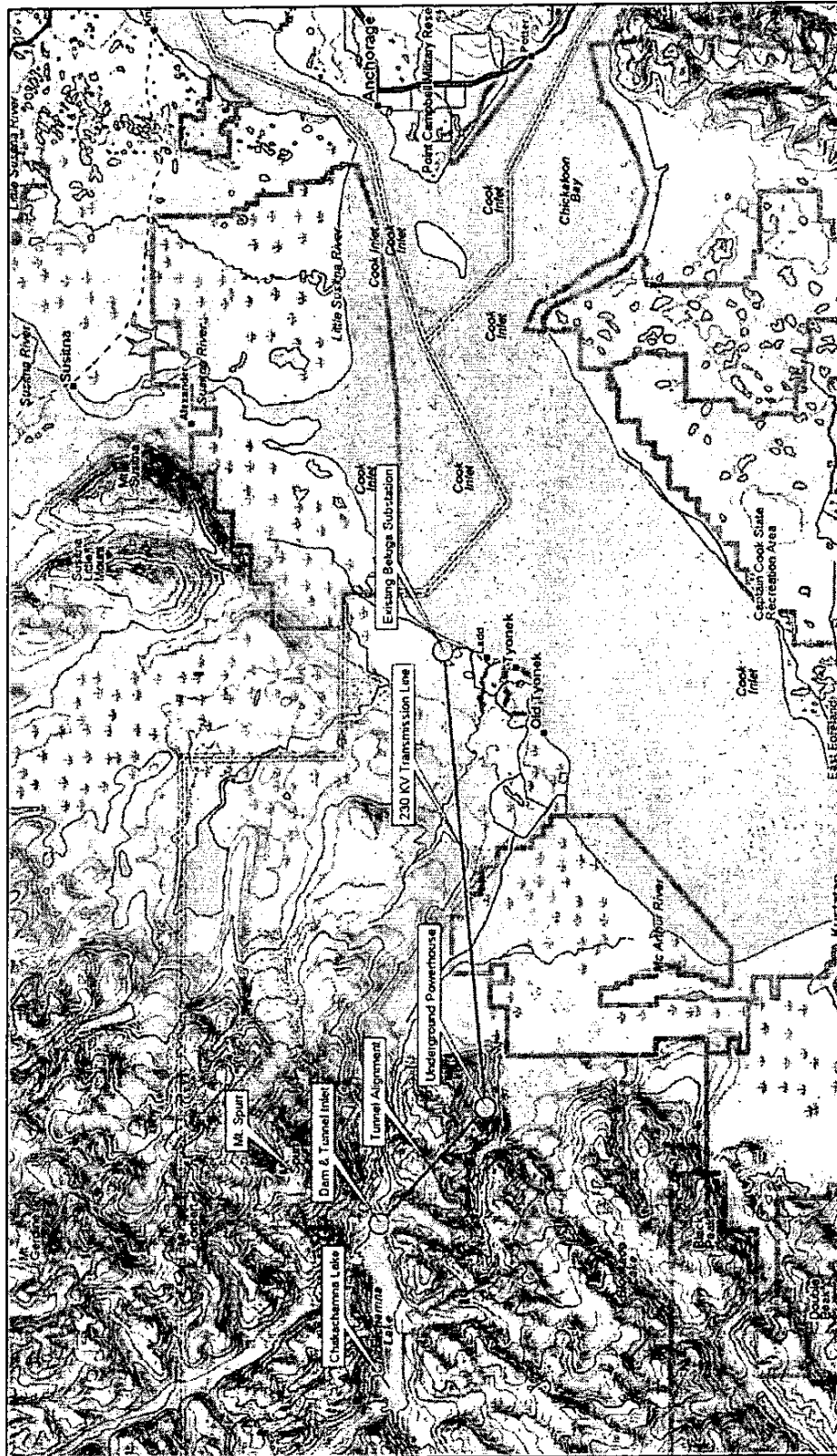
# Chakachamna Hydropower Investigations

- |                                |             |                 |
|--------------------------------|-------------|-----------------|
| ▪ Department of Interior       | Late 1940s  | Reconnaissance  |
| ▪ U.S. Army Corps of Engineers | 1970s       | Reconnaissance  |
| ▪ Alaska Power Authority       | Early 1980s | Pre-feasibility |
| ▪ TDX Power                    | 2006        | FERC permit     |

# Chakachamna Hydro Power

- High head lake tap – 12 mile power tunnel
- No dam
- 330 MW creating 1.6 billion KWH annually
- Total cost of project in 2008 dollars = \$1.7 billion
- Project is 40 miles from Chugach T-line at Beluga

# Chakachamna Project Location



# Chakachamna Aerial View



# Chakachamna Lake



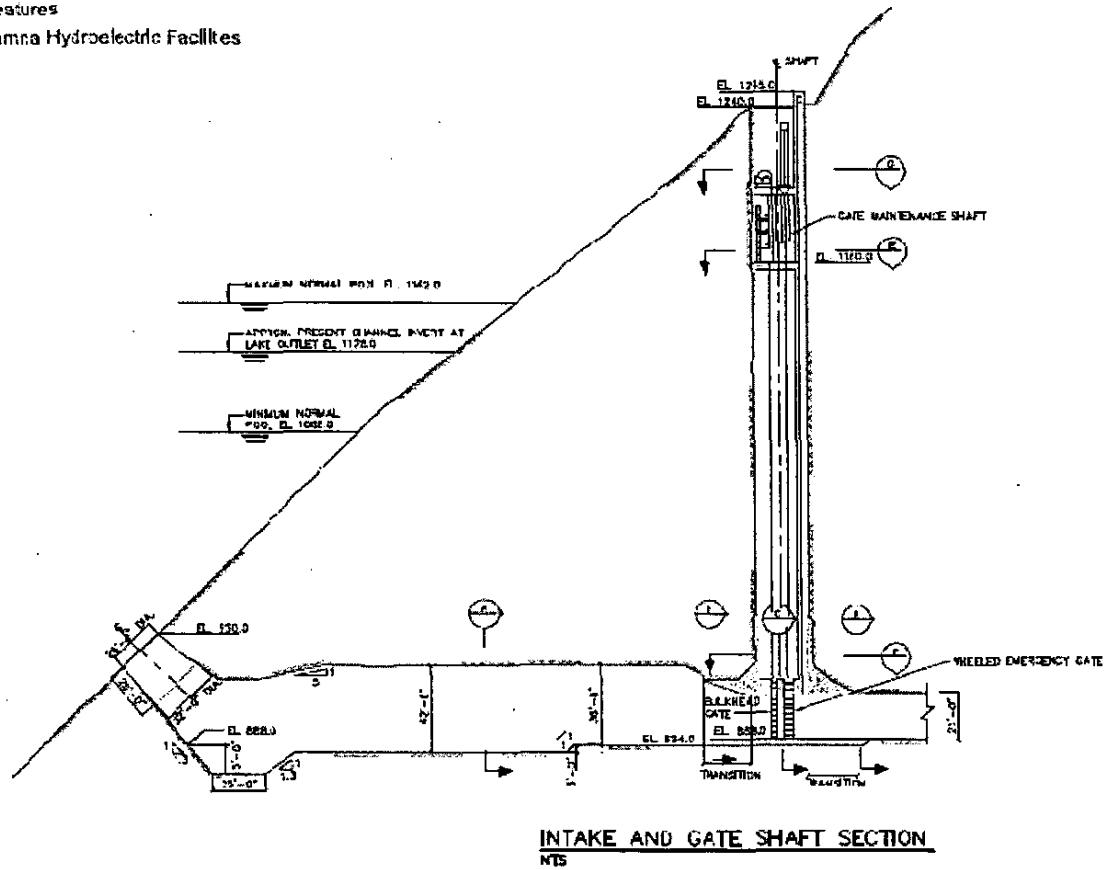
# McArthur River Valley Power Plant Site





Project Features  
Chakachamna Hydroelectric Facilities

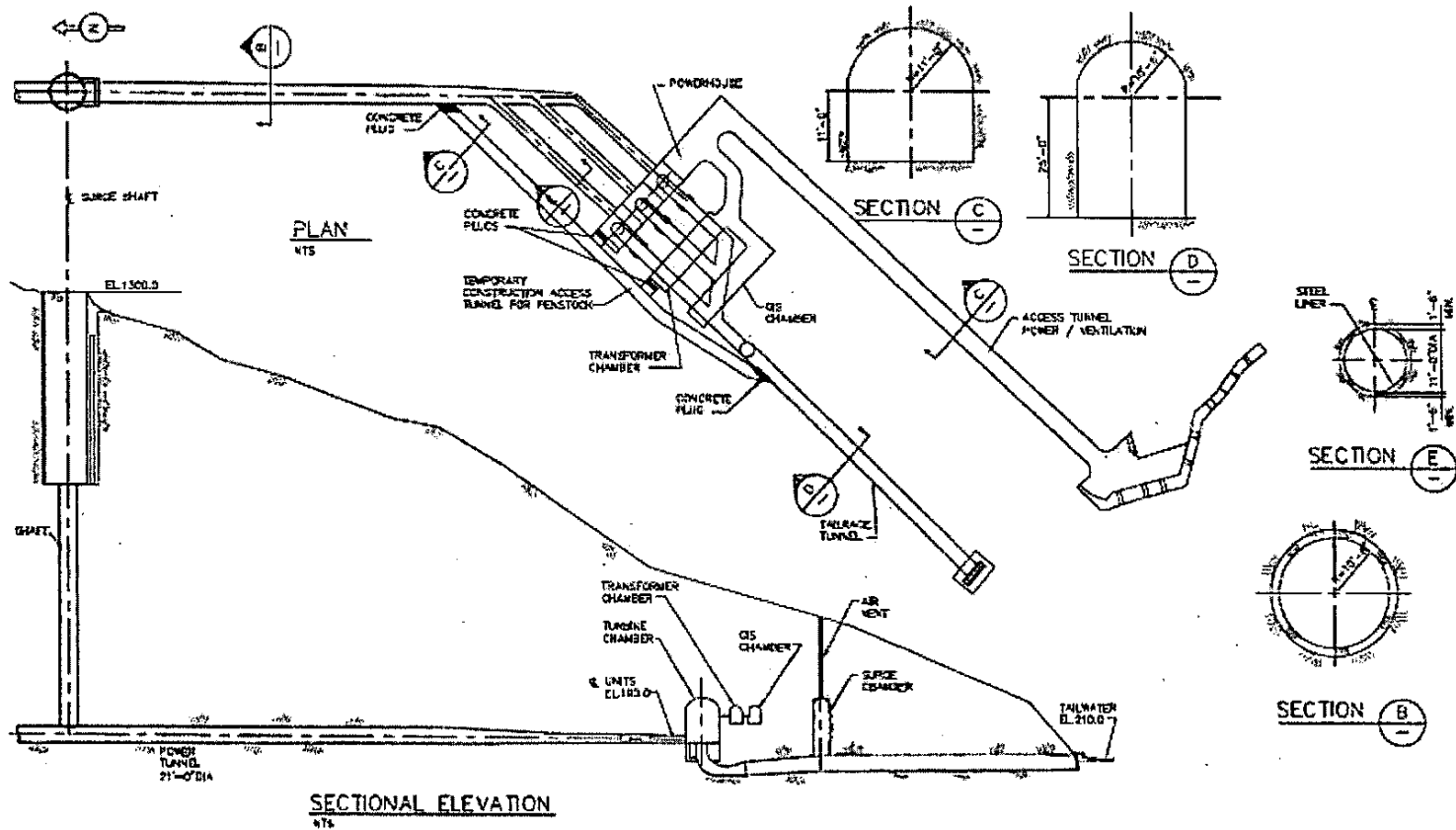
Figure 3.3-2  
Intake and Gate Shaft Section





Project Features  
Chakachamna Hydroelectric Facilities

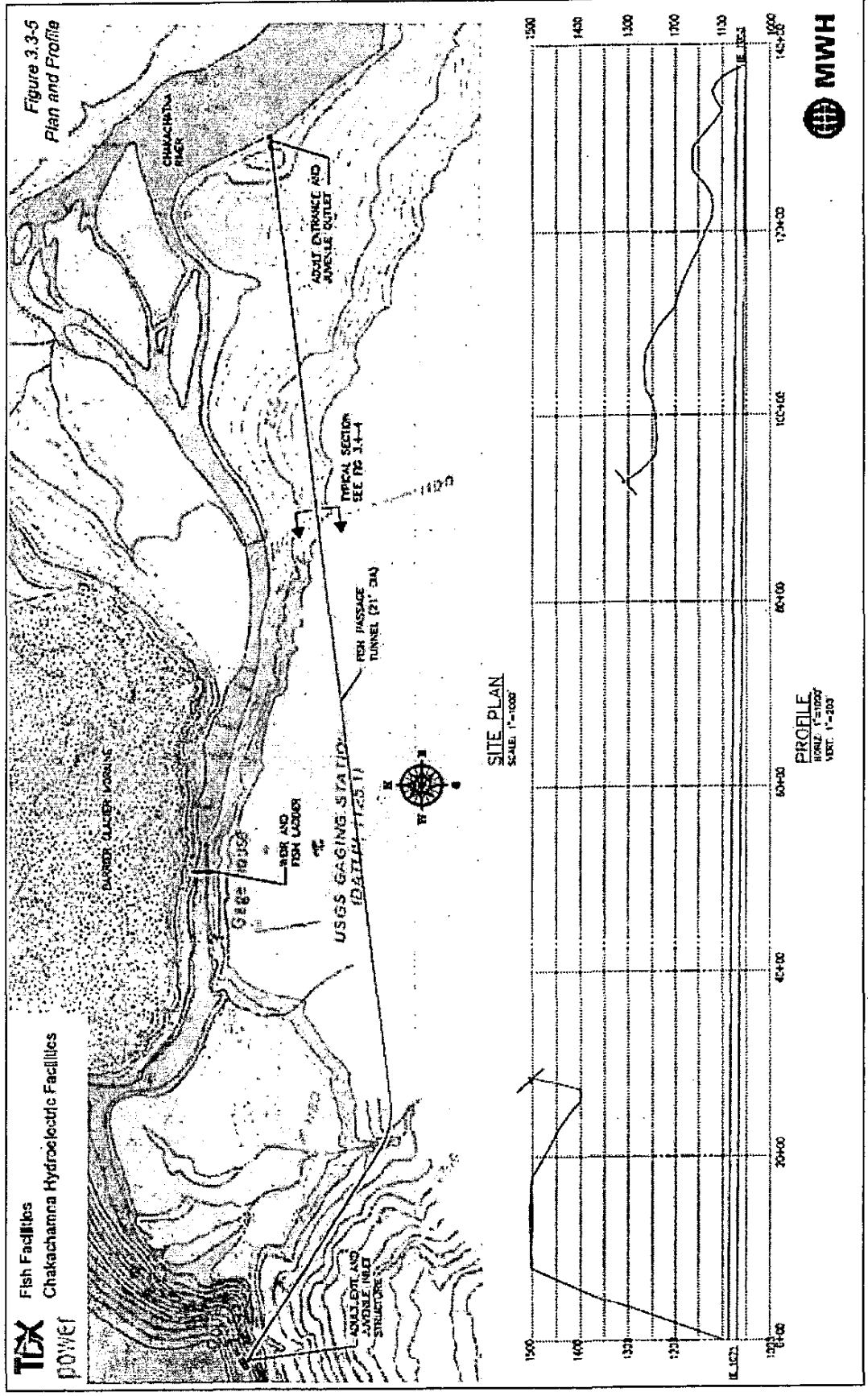
Figure 3.3-4  
Powerhouse Plan and Sections





Fish Facilities  
Chakachama Hydroelectric Facilities

Figure 3.3-5  
Plan and Profile



# Project Area Landownership



# CHAKACHAMNA FISHERIES

- 5 species of salmon use the basin
- Sockeye the main salmon species
- Dolly Varden ubiquitous in the streams
- Lake trout observed in lake
- Not a large anadromous fishery but worthy of protecting
- Fish passage at lake outlet required
- Possible temperature enhancement to river

# Cook Inlet Sockeye 2007 Fish Runs

<u>System</u>	<u>Run</u>	
Crescent River	109,000	
Fish Creek	37,000	
Kasilof River	1,247,000	
Kenai River	2,411,000	
Susitna River	487,000	
Minor Systems	644,000	
*Chakachamna (1982)	78,000	

# CHAKACHAMNA WILDLIFE

- 56 species of birds
- 16 species of mammals
- Moose, wolves, lynx, bear, wolverine, other fur bearers
- None on the endangered species list
- Less impact than other hydro projects of similar size

# Geotechnical Considerations

- Seismic – Castle Mountain Fault
- Volcanic – Mount Spurr (1992 & 1953 eruptions)
- Glacial – Barrier, Blockade, McArthur, Shamrock

# CHAKACHAMNA LAKE OUTLET



# MCARTHUR RIVER POWERHOUSE SITE



# Development Costs

- 2010 Field Season -- \$5 million
- 5 year permitting -- \$30 million
- Construction (2008\$) -- \$1.7 Billion

# Cost of Power

- TDX Power financial model = 9 cents/kwh

(assumes 100% debt at 5% interest rate, \$10 million annual O&M, insurance, debt coverage etc.)

- AEA model for large hydro = 6-8 cents/kwh

(some differences from TDX Power model include lower O&M, lower debt coverage, no inflation etc.)

# Schedule

- Preliminary permit investigations 36 months
- FERC licensing 18-36 months
- Project construction 54 months
- Power on line 2019

# 2010 Field Season

- Sockeye spawning in drawdown zone
- Adult salmon access to Chakachamna Lake
- Timing of juvenile salmon outmigration
- Maintenance of downstream groundwater dependent habitats
- Flow maintenance in tributaries south of Noaukta
- Maintenance of vegetation and wildlife habitats
- Geotechnical investigations
- Project optimization & cost estimate

# The Mount Spurr Geothermal Project

House Special Committee on Energy Hearing

March 11, 2010

Juneau, Alaska

Paul Thomsen  
Director of Policy & Business  
Development  
Ormat Technologies, Inc.  
[www.ormat.com](http://www.ormat.com)



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# Disclaimer

Statements in this presentation as well as oral statements made by the officers or directors of Ormat Technologies, Inc., its advisors, affiliates or subsidiaries often will contain "forward-looking statements." Whenever you read or hear a statement that is not simply a statement of historical fact (such as when we describe what we "believe", "expect" or "anticipate" will occur, and other similar statements), you must remember that our expectations may not be correct, even though we believe they are reasonable. You should read and listen to these statements completely and with the understanding that actual future results may be materially different from what we expect, as a result of certain risks and uncertainties. For a complete discussion of the risks and uncertainties relating to the forward-looking statements in this presentation, please see "Risk Factors" as described in the Annual Report on Form 10-K report filed with the Securities and Exchange Commission on March 2, 2009.

We will not update these forward-looking statements, even though our situation will change in the future.



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# Outline

0. Introduction to Ormat; Geothermal Power; Mt. Spurr project
1. Project timeline
2. Total cost of project
3. Transmission needs
4. Cost of power to consumer
5. Amount of power supplied to railbelt
6. Likelihood of completion
7. Permitting roadblocks; environmental challenges
- +. Community Support



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# Introduction to Ormat

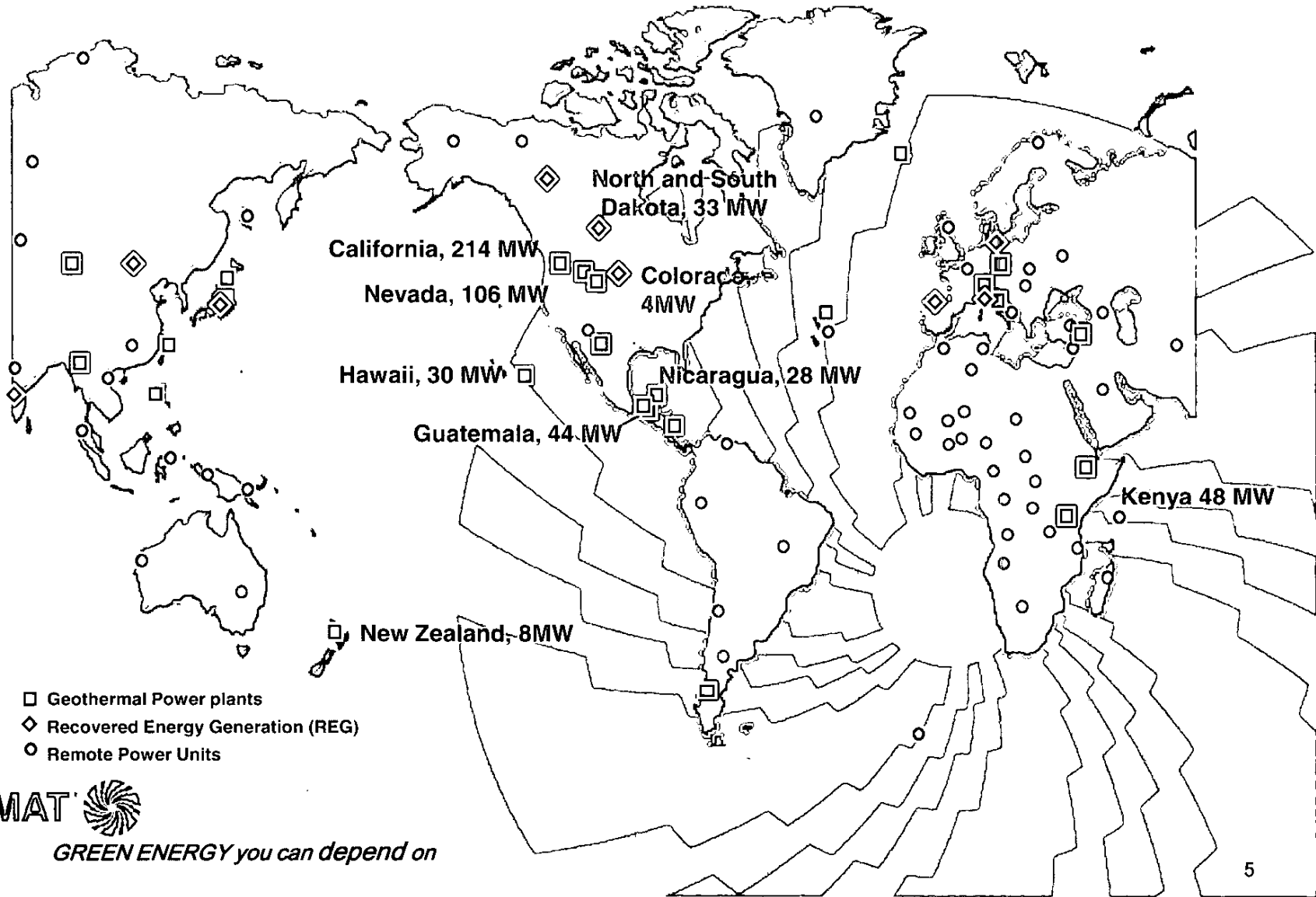
- A leader in geothermal power
- Owns and operates 520 MW worldwide
- Supplied approximately 1,300 MW to 24 countries
- Vertically integrated:
  - Explores, develops, engineers, manufactures, constructs, operates
- Currently exploring and developing projects in >6 states
- Employs >1,000 people worldwide; 450 in the U.S.

**NYSE: "ORA"**

**Market Cap. : \$1.54B\***

**LTM Revenues: \$415 M**

# Global Presence; 71 Countries



- Geothermal Power plants
- ◇ Recovered Energy Generation (REG)
- Remote Power Units




# The Power of Experience

1300 MW of field proven power plants, including in:  
remote locations; volcanic areas;  
arctic environment; un-manned facilities



# Nearly 40 Years of Ormat in Alaska

- >100 Remote Power Units
  - Serving remote gate valves
  - TransAlaska Pipeline
  - Since 1975
  
- First geothermal unit
  - Tested in 1979
  - University of Alaska Fairbanks
  - At Manley hot springs

**ORMAT** 

35 Years of Ormat in Alaska

ORMAT Energy Converters (OEC) powering 62 Remote Gate Valve stations along the TransAlaska Pipeline, since 1975

OEC Prototype for TAP6 Tested at UAF, 1970

4 kW Geothermal OEC at UAF, 1979

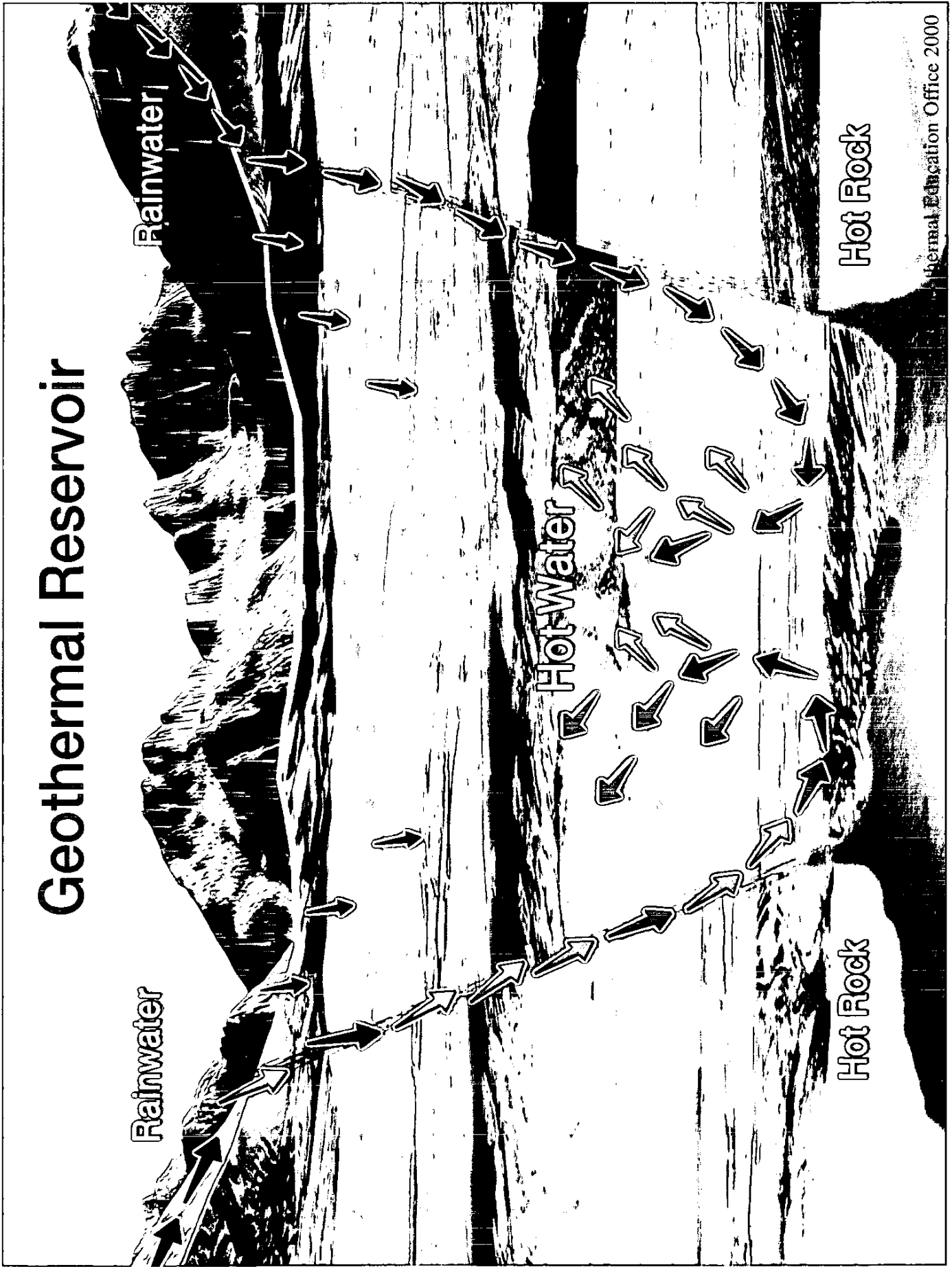
**Time,  
the Only True Test of  
Reliability**

[www.ormat.com](http://www.ormat.com) [ormat@ormat.com](mailto:ormat@ormat.com)



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# Geothermal Reservoir

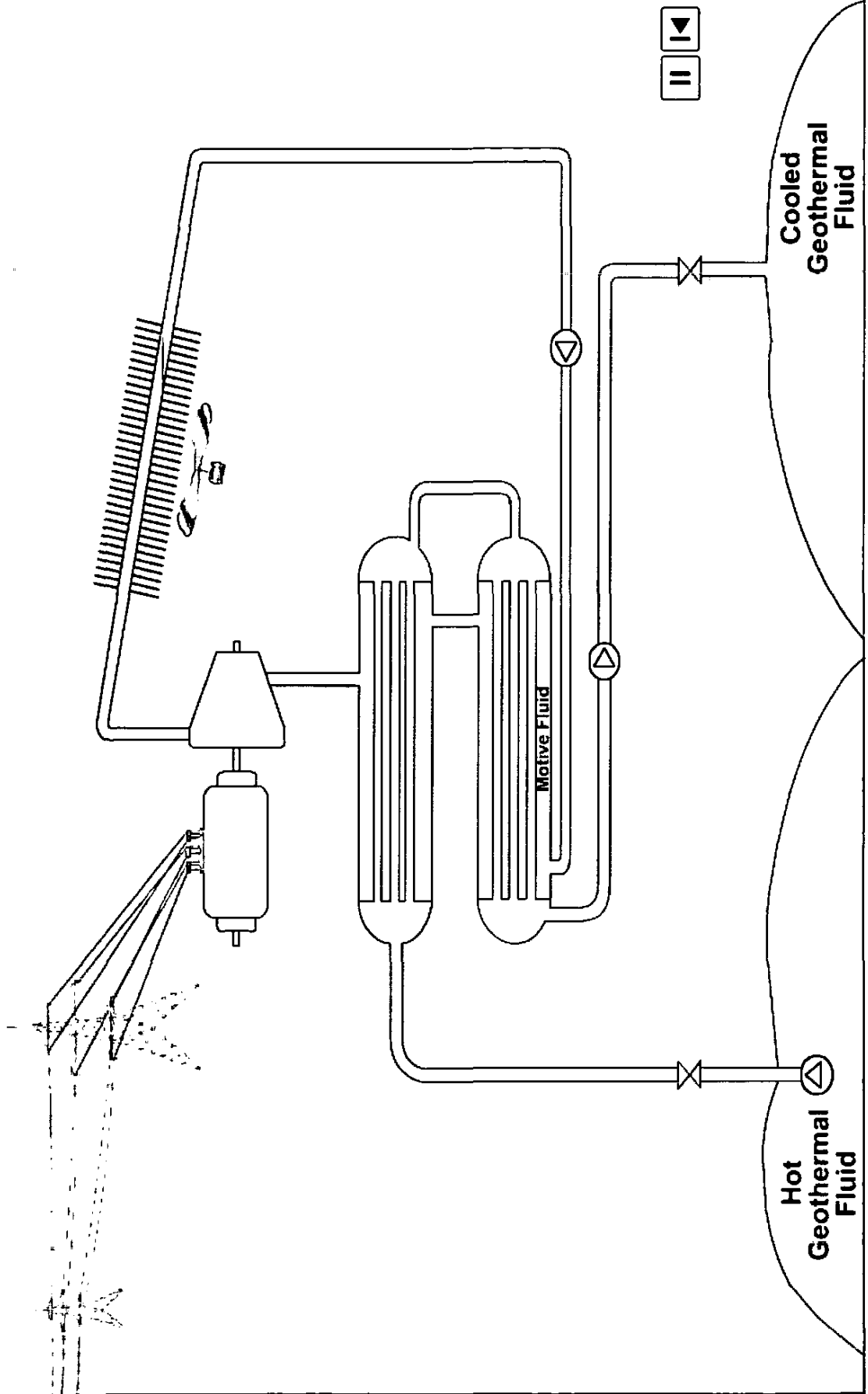


Thermal Education Office 2000

# Air-Cooled Binary Geothermal Power Plant



© NREL



# Geothermal – Key Attributes

- Utilities' renewable energy of choice:
  - Base-load generation
  - Cost-competitive
  - Highly reliable; >95% availability
  - Proven technology: ~10,000 MW deployed worldwide
- No fuel cost risk; Fixed long-term pricing
- Sustainable & environmentally friendly
  - Closed loop system with near zero emissions
  - No water consumption [Mt. Spurr plant will be air-cooled]
  - Minimal surface and visual impact
- Creates long-term, high-quality jobs



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# Mt. Spurr Geothermal Project



Mt. Spurr Summit - 6 Aug 2009



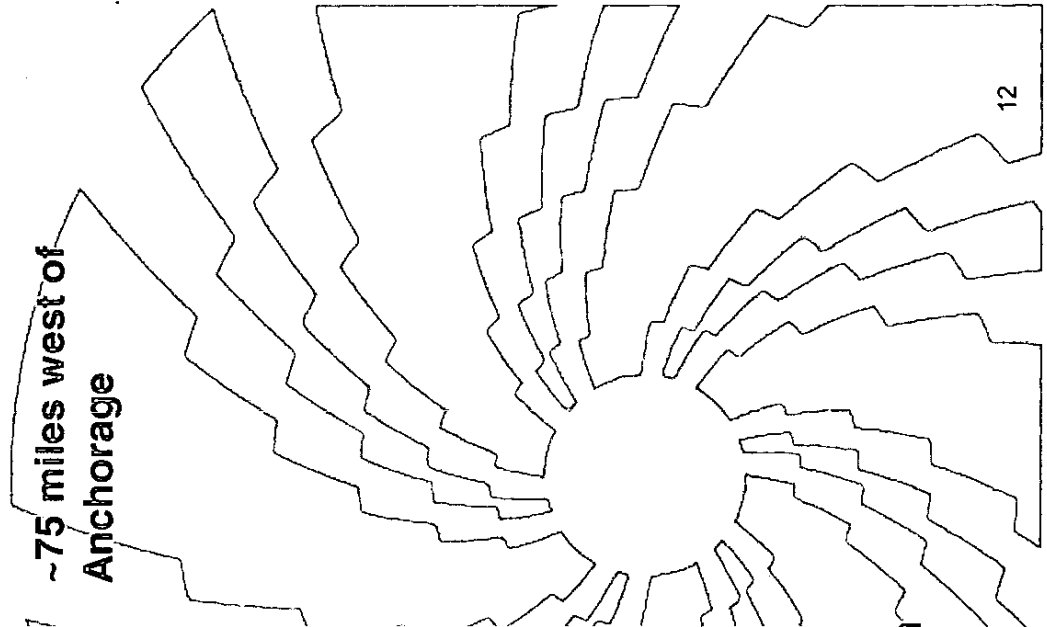
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# Location

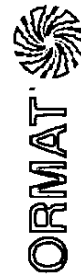


West Cook Inlet

~75 miles west of Anchorage

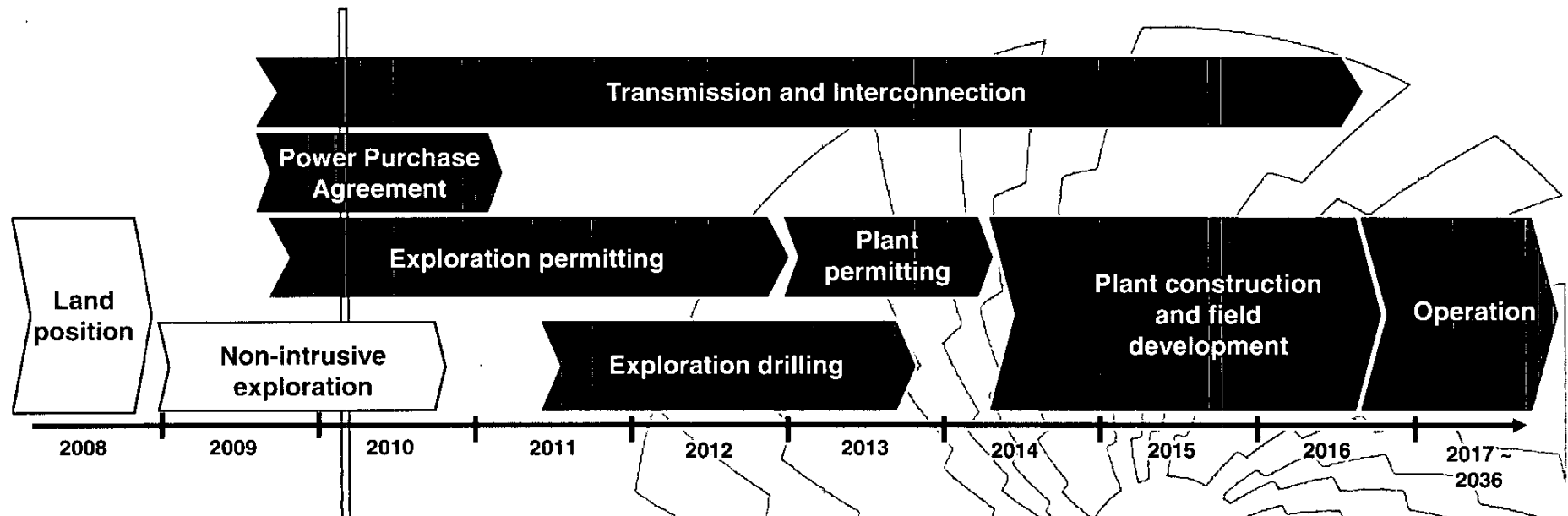


Source: GoogleEarth



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# 1. Mt. Spurr – Estimated Timeline



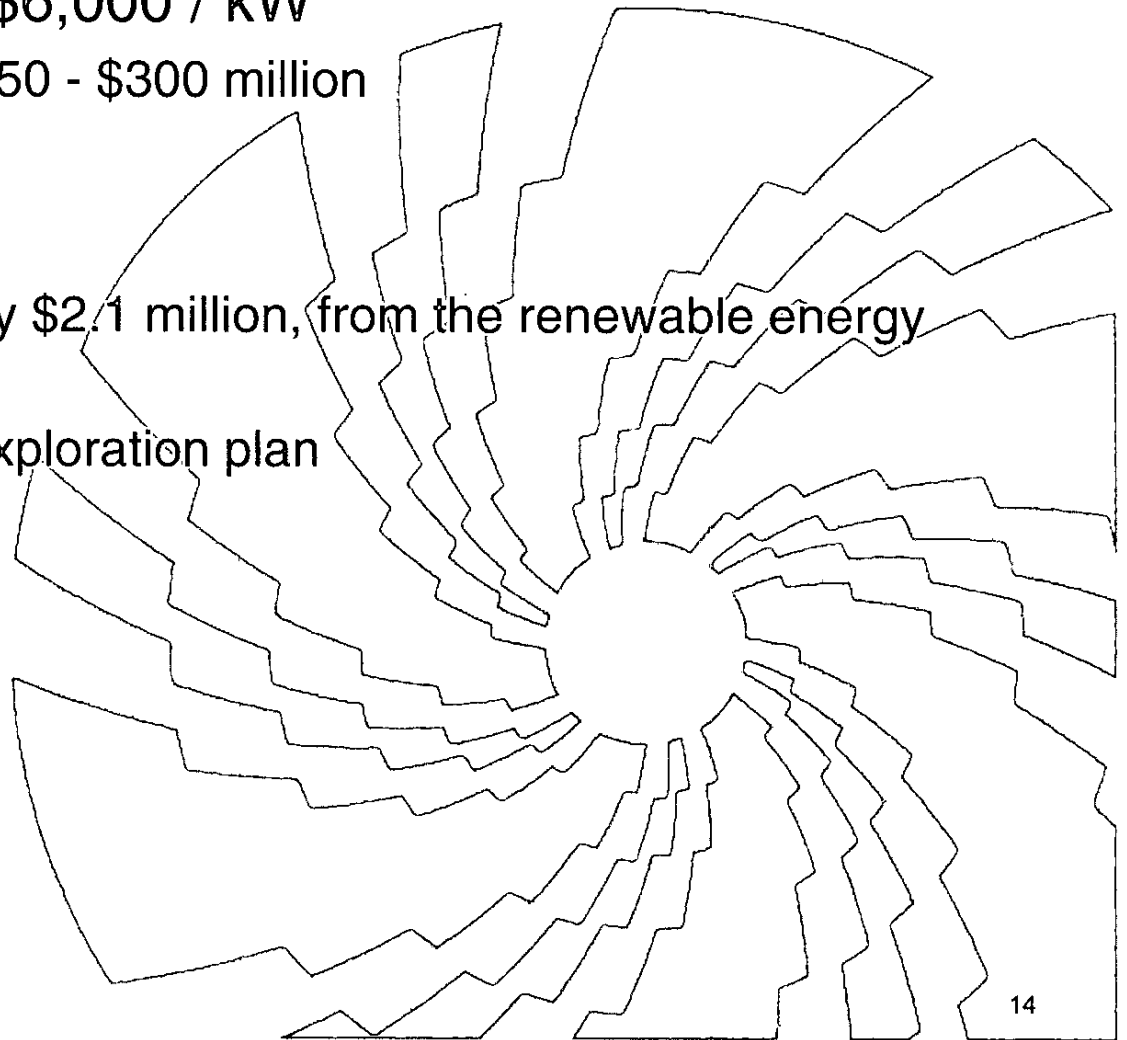
- 36,000 acres of state lands leased in October, 2008
- Geophysical exploration began in summer of 2009
- Plan of exploration for 2010-2011 approved by DNR on January 2010



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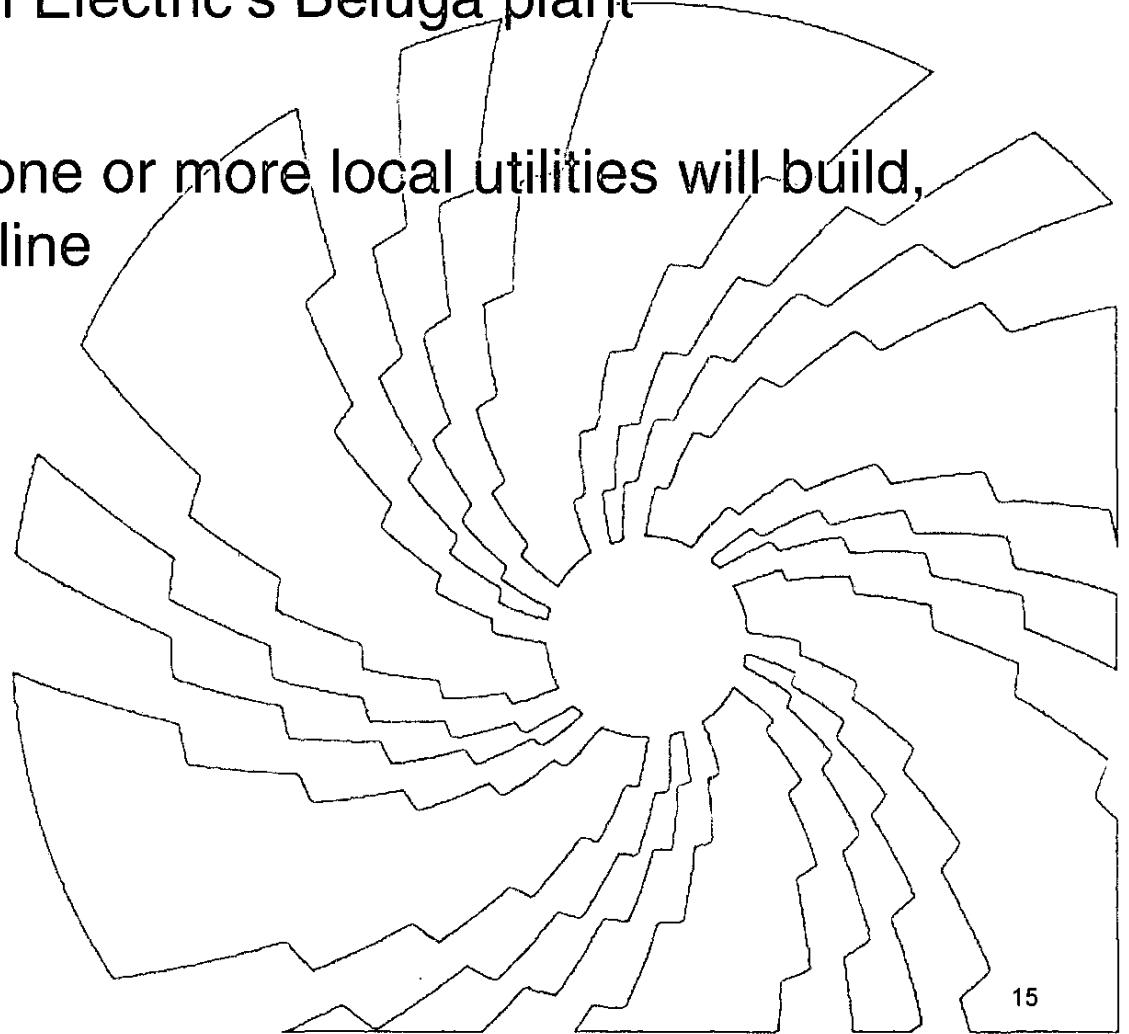
## 2. Total Cost of Project

- Estimated at \$5,000-\$6,000 / kW
  - Assuming 50 MW: \$250 - \$300 million
  
- Requested funding:
  - \$2 million, matched by \$2.1 million, from the renewable energy grant program
  - Support 2010-2011 exploration plan



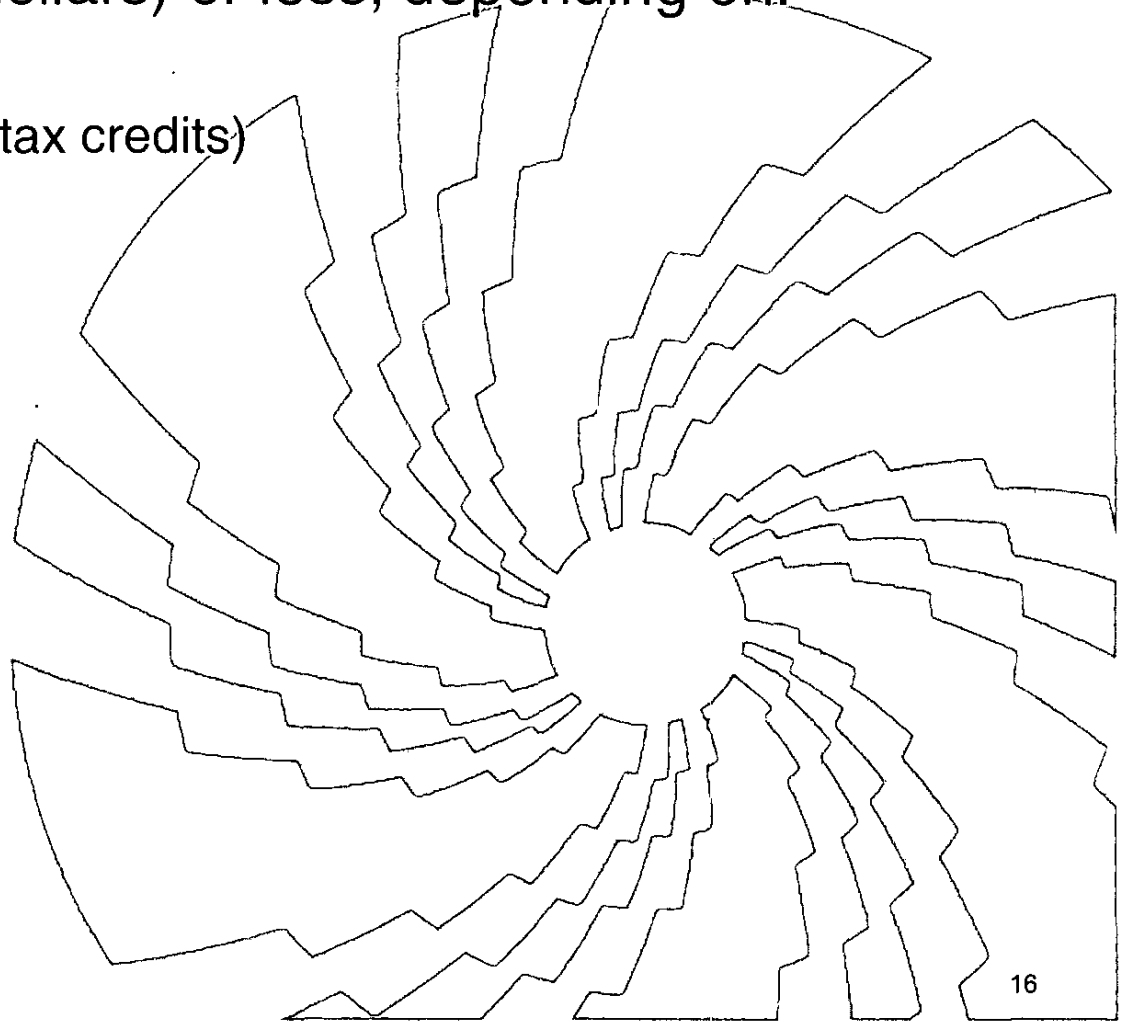
### 3. Transmission Needs

- ~40 miles to Chugach Electric's Beluga plant
- Assume the state or one or more local utilities will build, own and operate the line



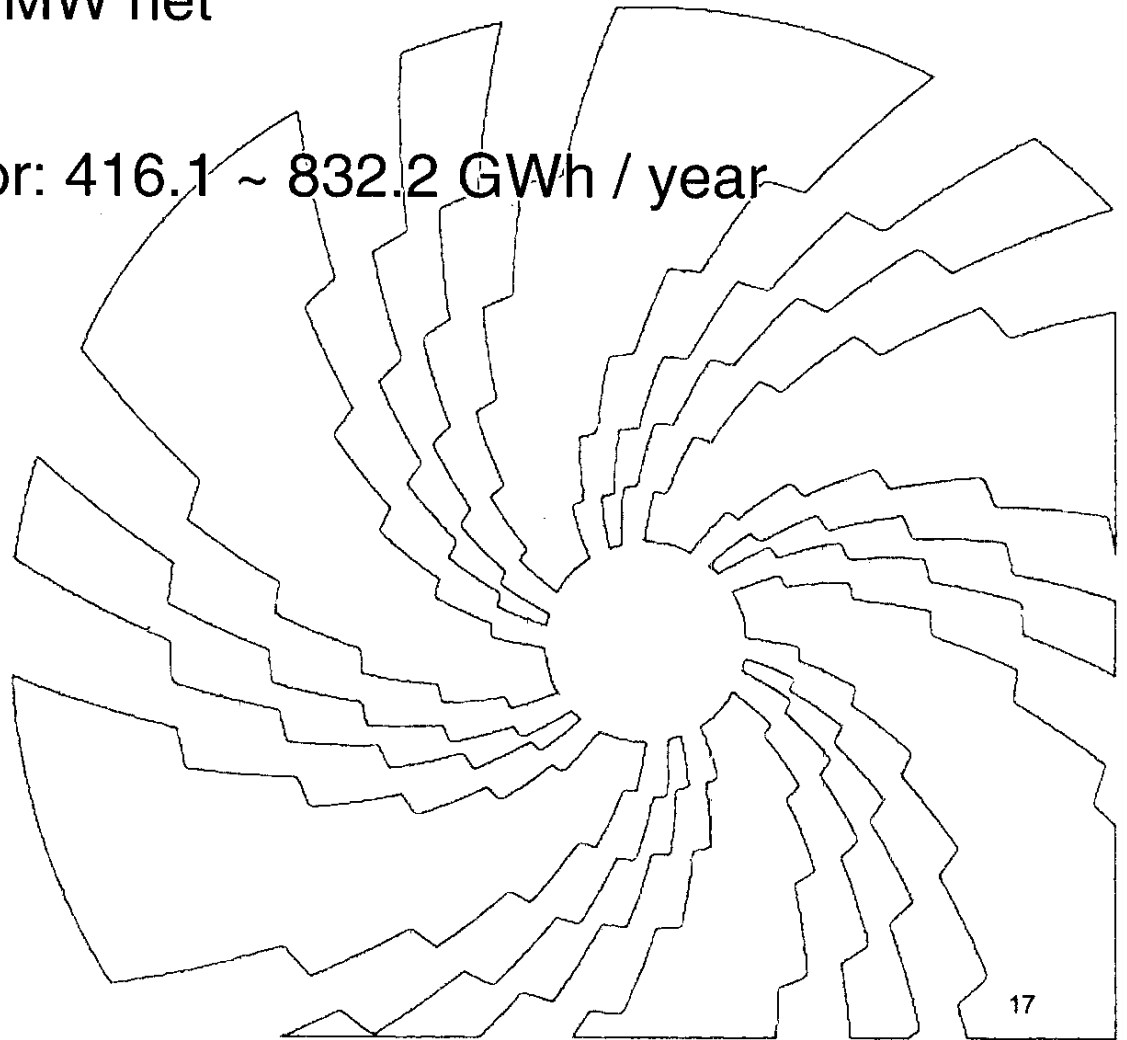
## 4. Cost of Power to Utility

- 11~14 c/kWh (2009 dollars) or less, depending on:
  - Royalty rate
  - State incentives (e.g. tax credits)



## 5. Amount of Power to Railbelt

- Estimated at 50~100 MW net
- At 95% capacity factor: 416.1 ~ 832.2 GWh / year



## 6. Likelihood to Completion

- **Technology-wise: Very likely**
  - Practically no technology risk
  - Ormat has built dozens of plants worldwide, ~1300 MW
  
- **Business-wise: Depends on utilities and state**
  - Chugach and other utilities highly interested in off-taking power
  - Need to incentivize development in order to meet the utilities' price expectations
  
- **Resource-wise: Moderate**
  - Preliminary geological analysis is encouraging; however
  - Significant exploration required to prove and size the resource

## 7. Permitting Roadblocks

- Area was studied by DNR and findings were published as part of the leasing process
- Ormat will adhere to DNR guidelines and mitigation measures
- Ormat will work with all relevant agencies to obtain the required exploration, development and construction permits
- No roadblocks or major challenges identified so far



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## Project Endorsed by:

- Future ratepayers, e.g. Mayor of Anchorage
- All Railbelt utilities, primarily Chugach Electric
- Nearest communities:
  - Tyonek
  - Kenai Peninsula Borough
- Environmental and renewable energy communities:
  - Cook Inletkeeper
  - Renewable Energy Alaska Project (REAP)
  - Homer Electric Association Members Forum (HEAMF)
  - Alaska Center for Appropriate Technology (ACAT)

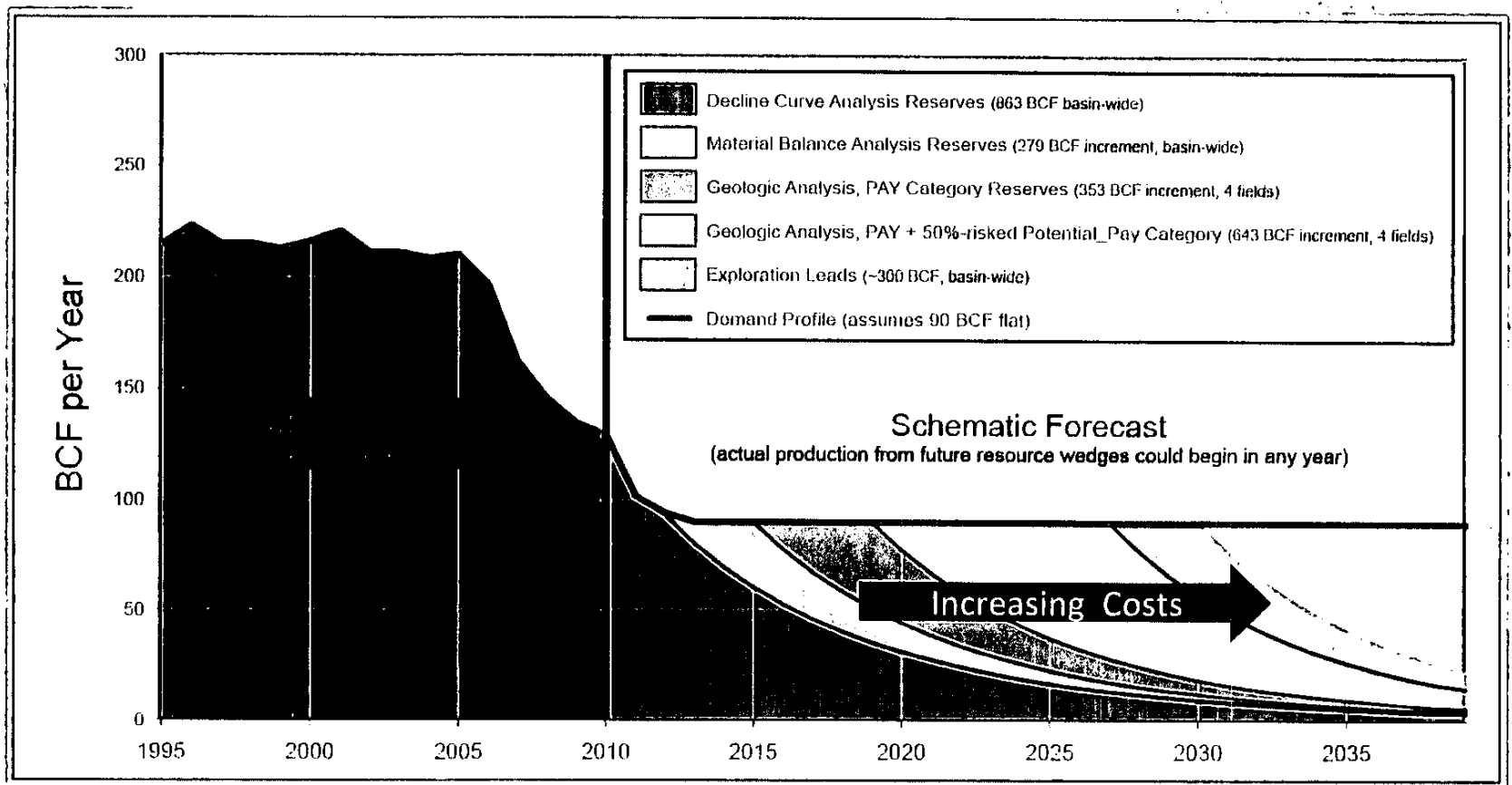


# IN-STATE GAS PIPELINE PROJECT UPDATE

March 11, 2010

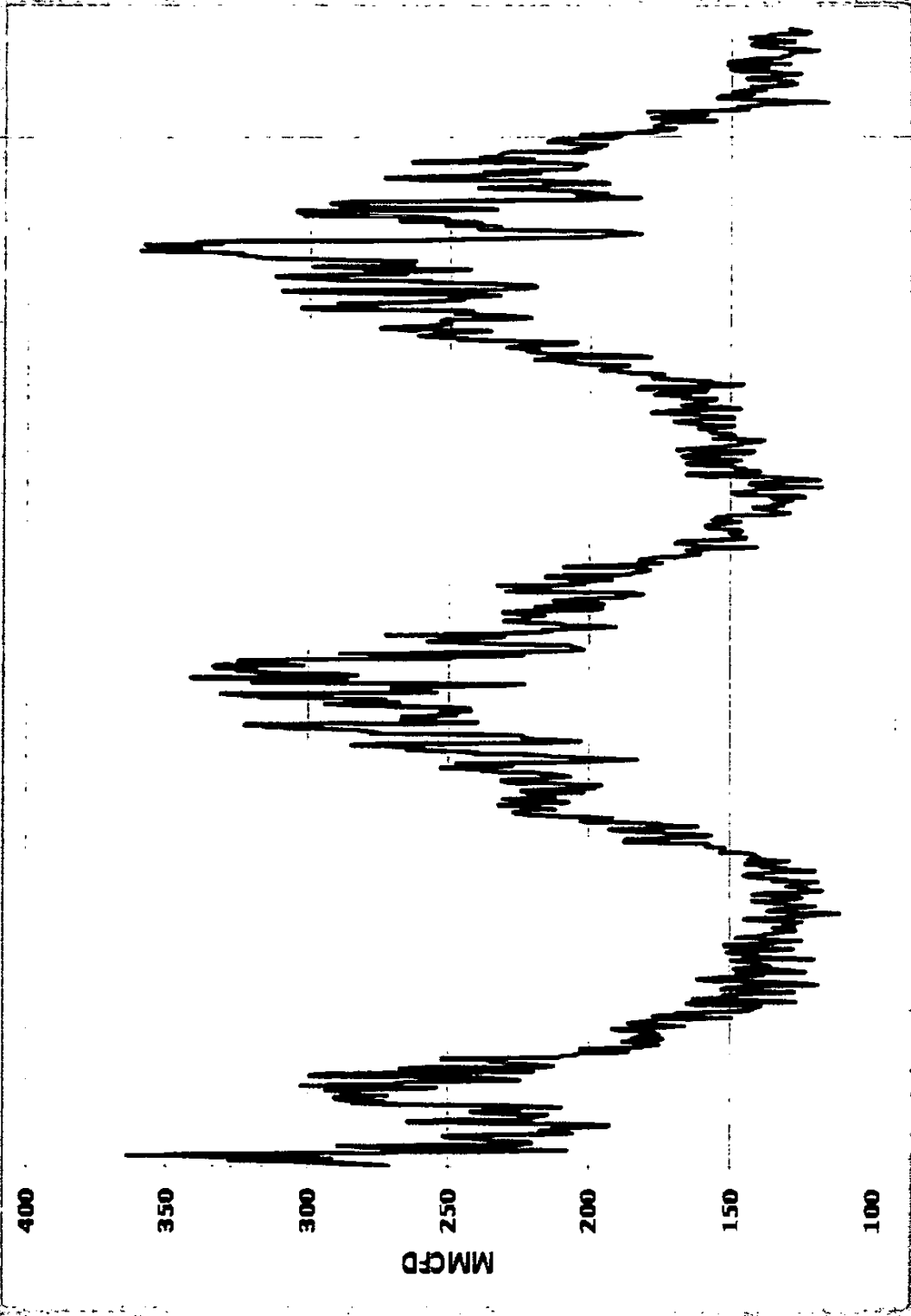
House Special Committee on Energy

# The Problem: Cook Inlet Production Forecast

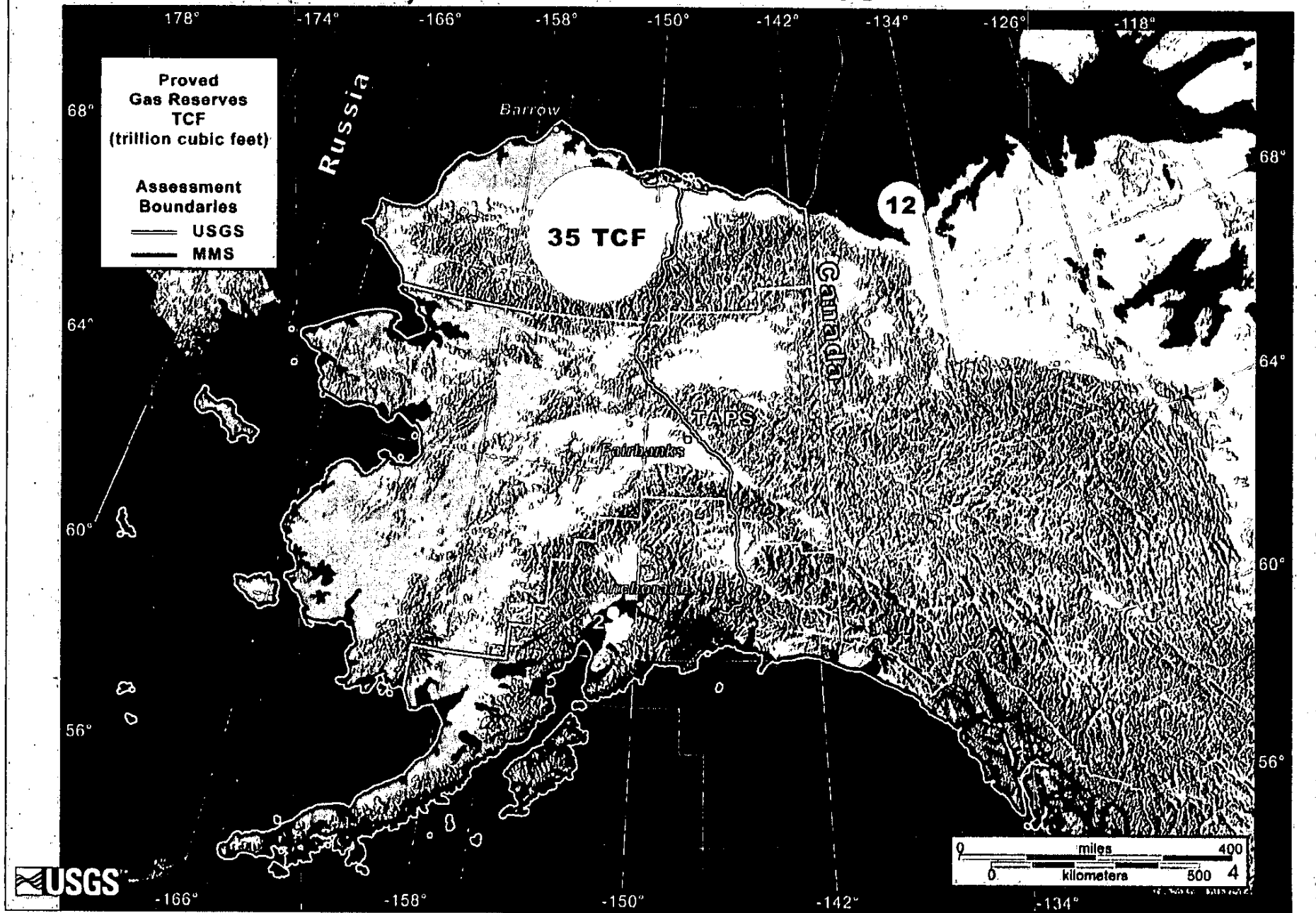


Division of Oil & Gas, Dec. 2009

# Historical Daily Gas Usage for Power and Heating in Southcentral Alaska



# Potential Solution; Proved Gas Reserves

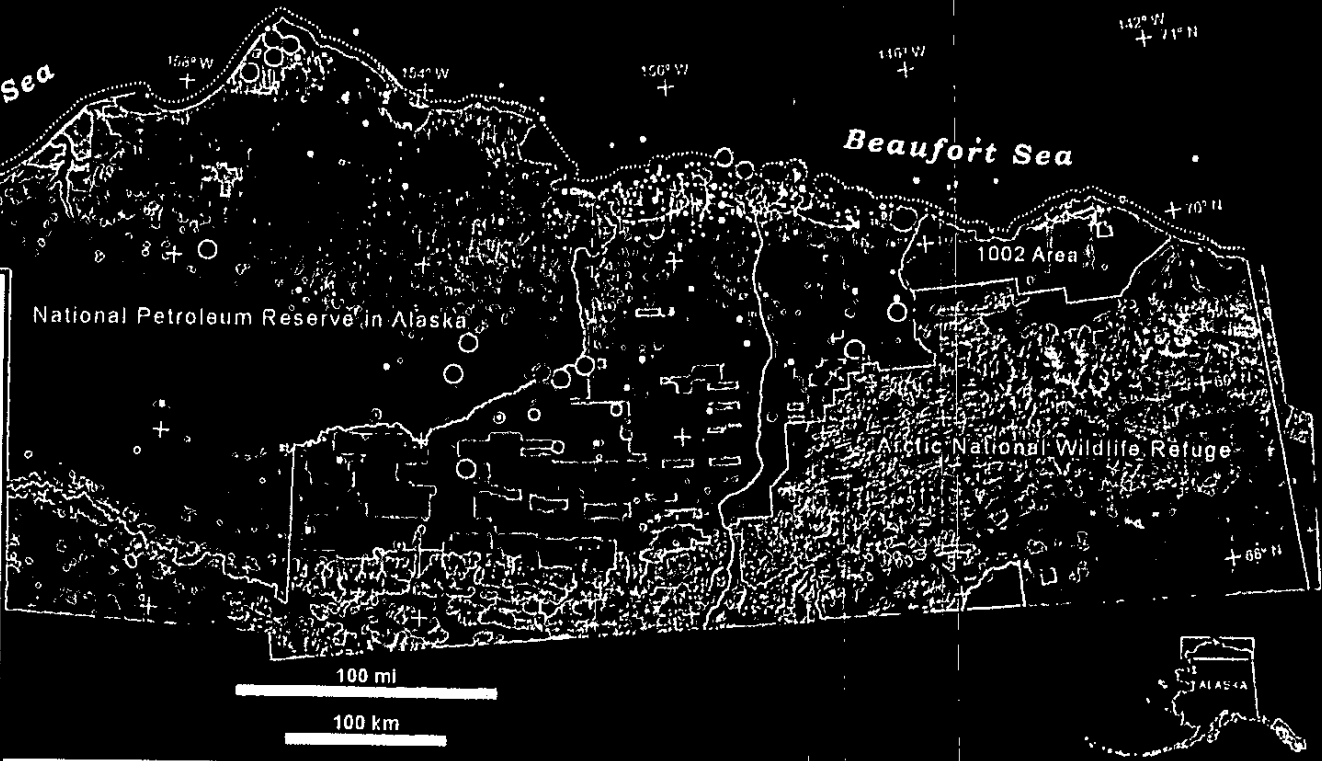


# Known Gas Accumulations in Arctic Alaska

- Explanation**
- Trans-Alaska Pipeline System
  - Federal Boundary\*
  - ..... Federal-State Water Boundary
  - Native Lands
- Known Gas Accumulations**
- Associated Gas
  - Nonassociated Gas
- Gas Shows in Exploration Wells**
- Gas Recovered in DST or RFT
  - Moderate Gas Show
  - Weak Gas Show
  - No Gas Show Reported
  - No Information

Chukchi Sea

Beaufort Sea



## Other Known Accumulations Possible Gas Reserves (BCF)

### Onshore

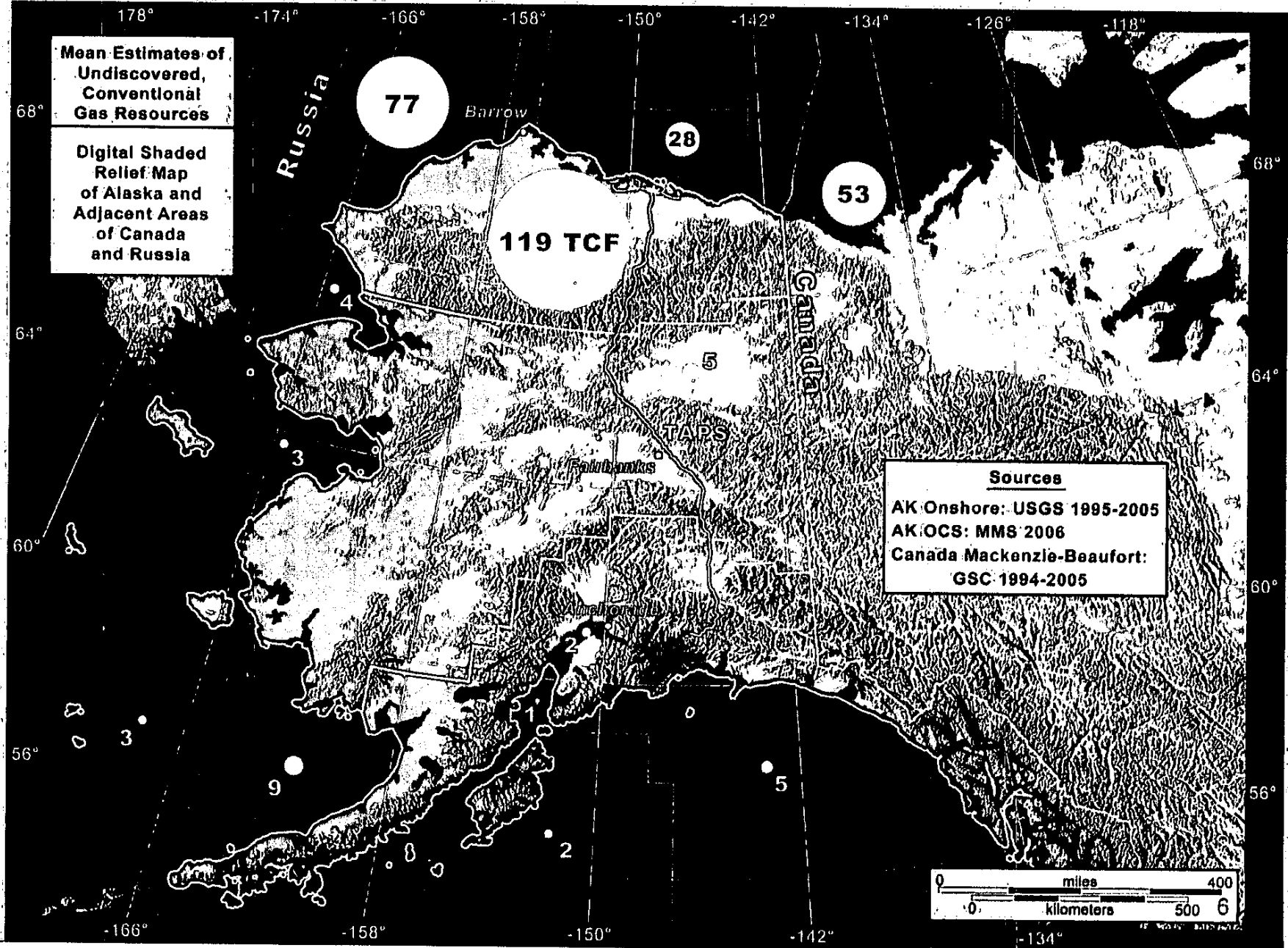
Gubik	600
Kavik	115
Square Lake	58
Meade	20
Umiat	5
East Umiat	4
East Kurupa	?
Kemik	?
Wolf Creek	?

### Offshore - OCS

Burger	14,000
Sandpiper	?

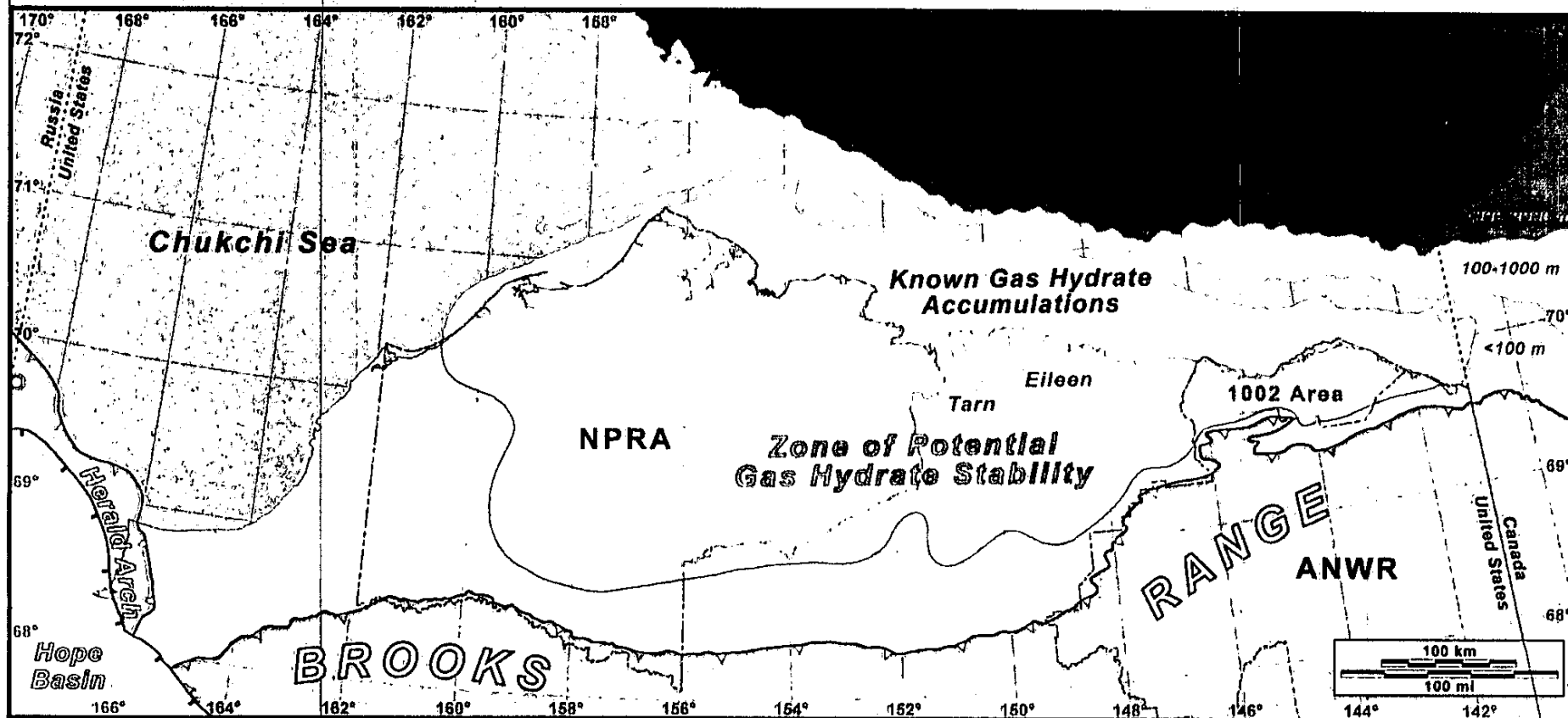
Data from Thomas et al., 1996 (DOE)  
 Craig & Sherwood, 2004 (MMS)  
 Bird, pers. comm., 2008 (USGS)

# Undiscovered Conventional Gas Potential



# Gas Hydrates

## Northern Alaska Zone of Potential Hydrate Stability



Information from Tim Collett (USGS)

## Potential Infrastructure; Small Diameter In-State Pipeline

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### Alternate Routes Evaluated

- Spur Routes

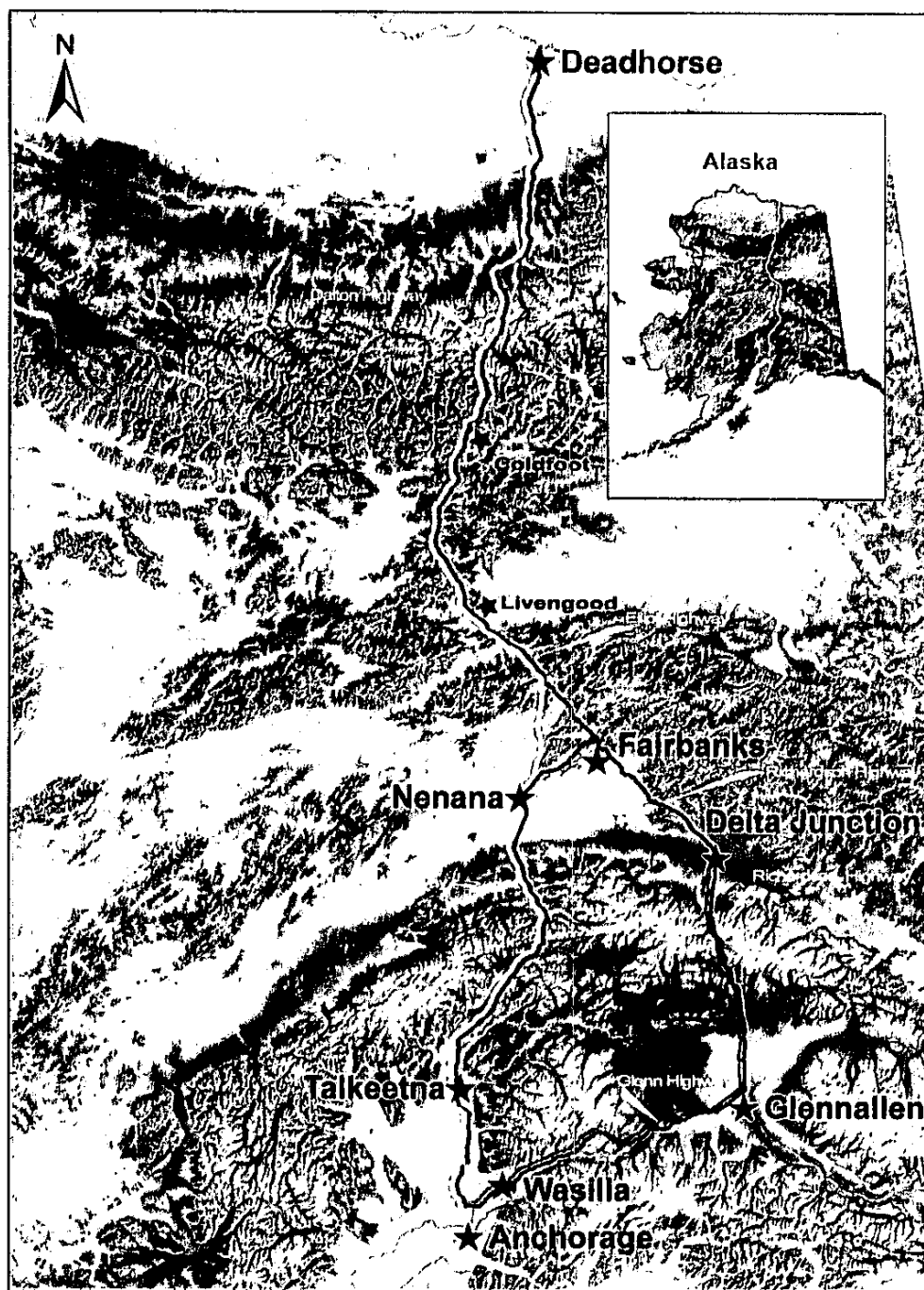
- Richardson
- Parks

- Stand Alone

- Richardson
- Parks

- Pre- Build

- Richardson
- Parks



## Purpose of the State's effort

- Evaluate a Stand-Alone gas pipeline project that transports gas from the North Slope to tidewater at Cook Inlet
- Provide back-up plan for Large diameter gas line with spur lines to southcentral for in-state use
- Reduce risk to potential project by acquiring major permits, determining cost of transport, and economic feasibility
- Prepare permit and project data package to transfer project to pipeline developer

# Methodology

The Program was set-up to Reduce Risk by:

- Defining Costs
- Acquiring Major Permits
- Acquiring Letters of Intent
  - Bring Buyer/Sellers together
  - Let the market place decide scope and timing

# Work Completed

- Route Alternative Analysis - Parks and Richardson Highway routes:
  - Associated comparative pipeline cost estimates
  - Environmental Surveys
- Initial Project Description (for permitting)
- Commercial Group Scoping Document
- Initial Review of ENSTAR Capital Cost Estimate – Pipeline
- Major permits applied for

# Work Underway

- Updating pipeline cost estimates
- Developing cost of facilities
- Cost of transport analysis
- Preparing detailed project description
- Continued engineering support for EIS and ROW process
- Identify commercial entities to finalize costing and permitting for construction sanction
- Developing data package for full economic analysis
- Work with producer group and identify new market potential.

## Facilities Scenarios Identified

- CGF Residue Gas only, North Slope Gas Conditioning, Cook Inlet NGL Extraction
- CGF Residue Gas only, Cook Inlet Gas Conditioning and NGL Extraction
- CGF Residue Gas Only, North Slope Gas Conditioning, North Slope NGL Extraction
- CGF Residue Gas spiked with CGF Stabilizer Overhead Gas, North Slope Gas Conditioning, Cook Inlet NGL Extraction
- Each scenario evaluated at 250, 500, 750 and 1000 MMscfd

# Cost of Transport Analysis

- 16 Material Balances
  - 4 Scenarios
  - 4 Flow Rates per scenario (250mmscfd each)
- Match Facility Component Cost to Each Balance
- Generate Annual Schedules for Capital Outlays, Revenues and Expenses
- Feeds Data To Economic Analysis

# Permit Status

- **U.S. Army Corps of Engineers Section 404/10**
  - Filed November 16, 2009
  - Expect 404/10 permits shortly after NEPA Record of Decision
- **State of Alaska Title 38 Right-of-Way**
  - Filed November 25, 2009
  - Review timeline undefined
- **Bureau of Land Management Right-of-Way**
  - Filed November 25, 2009
  - Expect ROW approval shortly after NEPA Record of Decision

## State's share of Project Costs

- FY10 -- \$8.3 mm (projected)
- FY 11 -- \$ 6.5 mm (requested)
- Negotiated use of ENSTAR data
- Expenses reimbursed upon transfer to commercial entity

# Time Line Ranges

## Stand Alone Gas Pipeline Project

DRAFT

Fast Track Schedule\*

SCHEDULE	2009	2010	2011	2012	2013	2014	2015	2016
Engineering Support								
Design Basis								
Conceptual Design								
Alternatives Analysis								
Final Project Description								
Cost Estimate & Logistics								
Project Decommission Package								
Permitting								
COE Job								
Permit and State ROW		X						
DEP EIS								
Final EIS								
Assumes Permit and NITP's								
Project Review & Submittal								
Contingency EIS Outline								
Preparation of Reports								
Project Initiation				X				
Detailed Engineering Design								
Pipeline								
Facilities								
Cost Estimate & Logistics								
GCP Construction								
Order Equipment					X			
Fabricate Measures								
Pre-construction Preparation								
Mobile Site-10								
Install & Testing								
Compressor Stations								
Order Equipment					X			
Fabricate Station								
Pre-Construction Preparation								
Construction & Testing								
Pipeline								
Order Pile and Valves					X			
Pre-construction Preparation								
Construction & Testing								
MGE PUMP & STORAGE								
Order Equipment					X			
Fabricate Pumps								
Pre-Construction Preparation								
Construction & Testing								
Start-up								
Start-up & Operations								

\* Assumes timely availability of fabrication facilities, equipment, and craftsmen for GCP

# Time Line Ranges

Stand Alone Gas Pipeline Project

Alternative Schedule\*

DRAFT

SCHEDULE	2009	2010	2011	2012	2013	2014	2015	2016	2017
Engineering Support									
Conceptual Design									
Final Project Description (Final)									
Final Project Description									
Final Estimate & Logistics									
Final Documentation Package									
Permitting									
COE 404									
Final and State ROW									
Final EIS									
Address Permits and NEPA									
Project Reviewer & Sanction									
Company Case Disposal									
Transfer of Permits									
Project Selection									
Detailed Engineering Design									
Pipeline									
Facilities									
Cost Estimate & Logistics									
O&P Construction									
Order Equipment									
Fabricate Modules									
Pre-construction Preparation									
Modules are set									
Install & Testing									
Compressor Stations									
Order Equipment									
Fabricate Skids									
Pre-construction Preparation									
Construction & Testing									
Pipeline									
Order Pipe and Valves									
Pre-construction Preparation									
Construction & Testing									
NGL Plant & Storage									
Order Equipment									
Fabricate Skids									
Pre-construction Preparation									
Construction & Testing									
Start-up									
Start-up & Operations									

\* Assumes timely availability of fabrication facilities, equipment and contractor for GCP

# Time Line Ranges

## Stand Alone Gas Pipeline Project

Extended Schedule\*

DRAFT

SCHEDULE	2009				2010				2011				2012				2013				2014				2015				2016				2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
<b>Engineering Support</b>																																								
Design Basis	=>																																							
Contract Allocation	=>																																							
Conceptual Design	=>	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====				
Alternative Package	=====																																							
Process Simulation (P&ID)	=>	=====																																						
Final Project Description	=>	=====																																						
Final Estimate & Logistics	=>	=====																																						
Process Construction Package																																								
<b>Permitting</b>																																								
CEC/UDA		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====				
Federal and State ROW		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====			
Local EIS					X																																			
Final EIS									X																															
Submission of Plans to NEPA																																								
<b>Project Review &amp; Contract</b>																																								
Company Share Agreement**																																								
Transfer of Permits																																								
Project Contract																																								
<b>Detailed Engineering Design</b>																																								
Process																																								
Pack List																																								
Cost Estimate & Logistics																																								
<b>GCP Construction</b>																																								
Order Equipment																																								
Material Mobilize																																								
Pre-construction Preparation																																								
Material Mobilize																																								
Construction & Testing																																								
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Pre-construction Preparation																																								
Construction & Testing																																								
<b>Start-up</b>																																								
Startup & Commissioning**																																								

\* Assumes limited availability of fabrication facilities, equipment and craftsmen for GCP due to competition with other stand projects  
 \*\* Assumes longer time frame for private industry decision to proceed with project  
 \*\*\* Assumes start up delays of GCP and NGL Plant

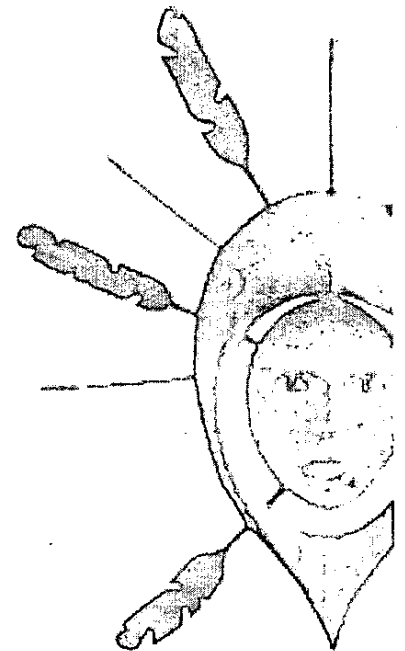
# Questions / Comments

**State House Special Committee on Energy**  
Briefing

**COOK INLET REGION INC.**

An **Alaska Native** corporation

March 11, 2010



**State House Special Committee on Energy**  
Briefing

**COOK INLET REGION INC.**

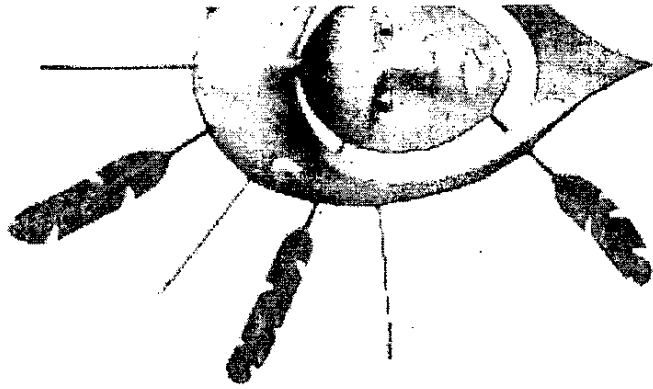
An **Alaska Native** corporation

March 11, 2010





# FIRE ISLAND WIND

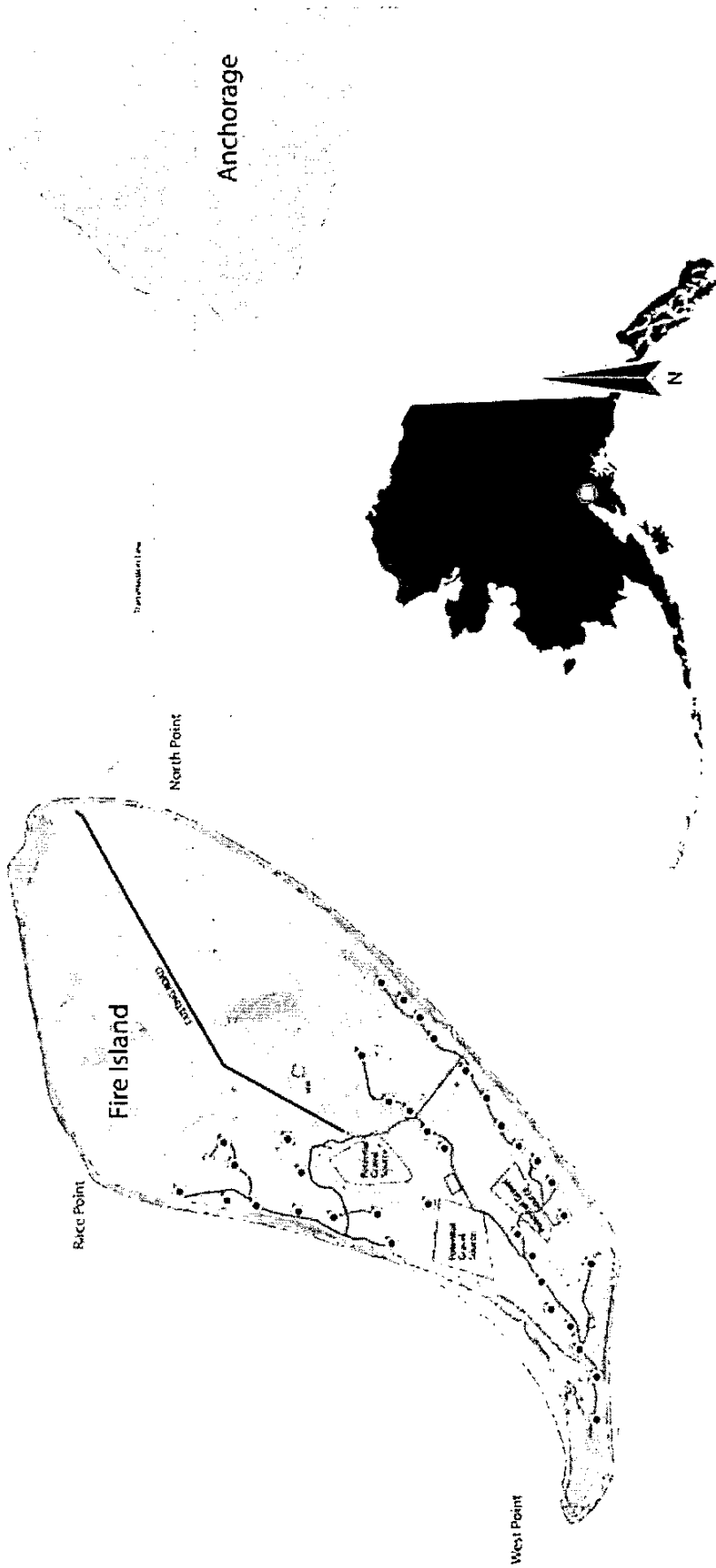


# Fire Island Wind Project

Alaska's first commercial-scale wind project

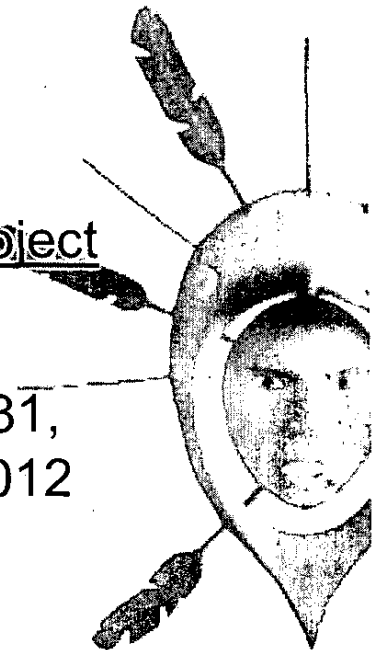
- Located on Fire Island, 3 miles west of Anchorage
- 36 1.5 megawatt GE wind turbine generators with a total nameplate capacity of 54 MWs
- 33% capacity factor
- Parallel 34.5kV subsea transmission line to RSS
- 50,000 MW per year
- Displaces 1.5 Bcf of natural gas annually
- Meet demand for 18,000 Alaskan households





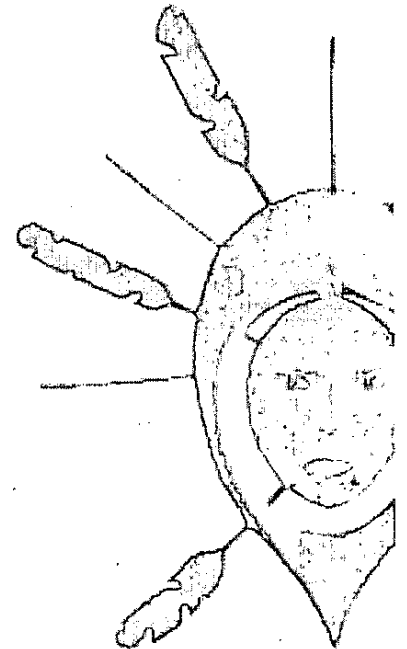
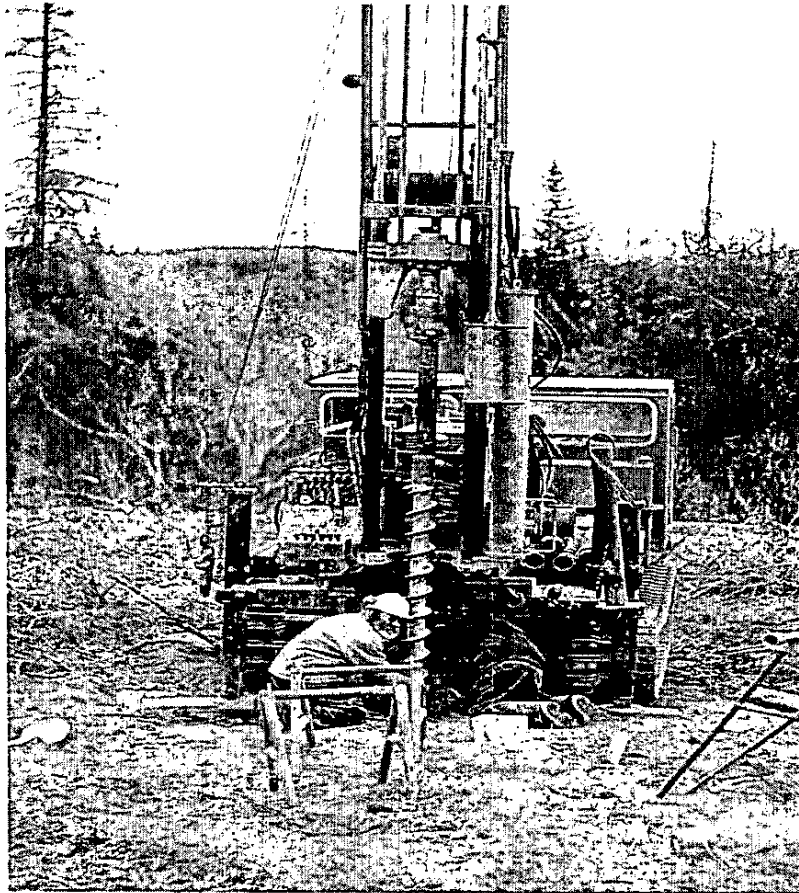
# The Time Is Now

- Southcentral Alaska faces imminent shortages of local natural gas for heat and electricity
- Federal financial incentives in the Recovery Act signed into law by President Obama in February 2009
- CIRI will apply for cash grant in lieu of claiming federal production or investment tax credits
- 100% of federal dollars will be credited to cost of the project and will result in a lower cost of power to utilities
- Available for projects under construction by December 31, 2010 and commercially operational by December 31, 2012

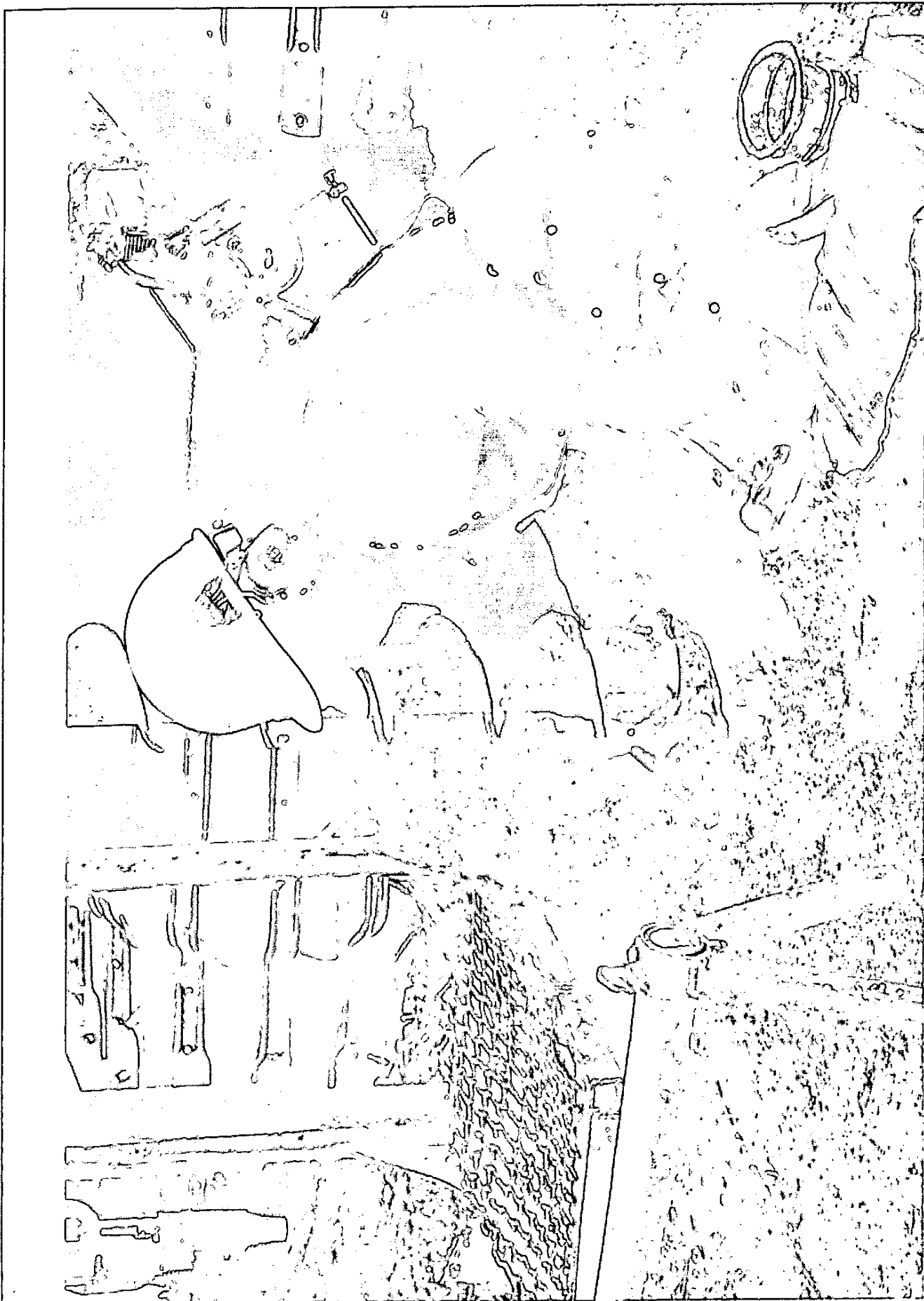


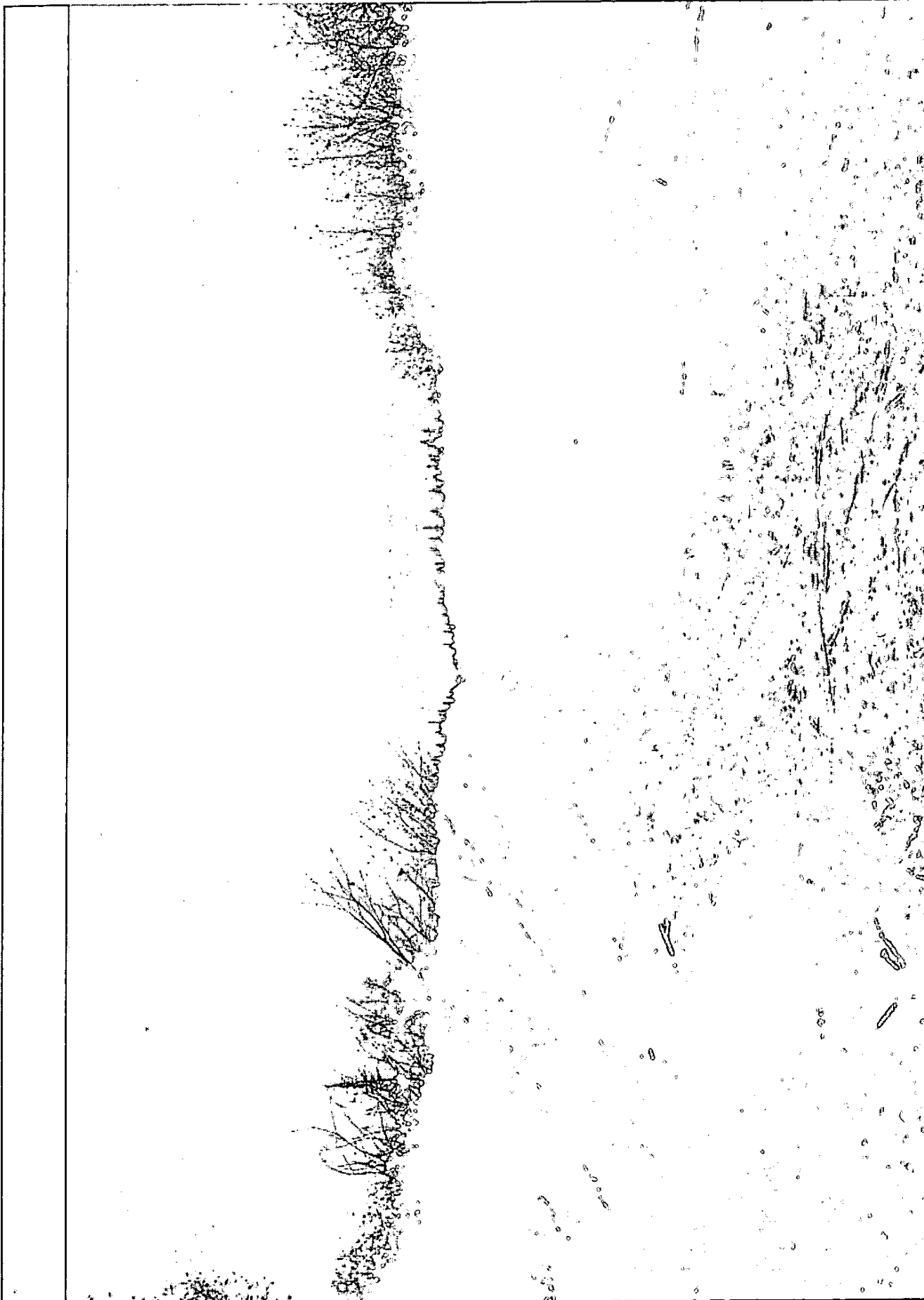
# 2009 Milestones

- Wind resource assessment – 33 percent capacity factor
- Micrositing
- Clearing
- Geotech









# Critical Path Timeline

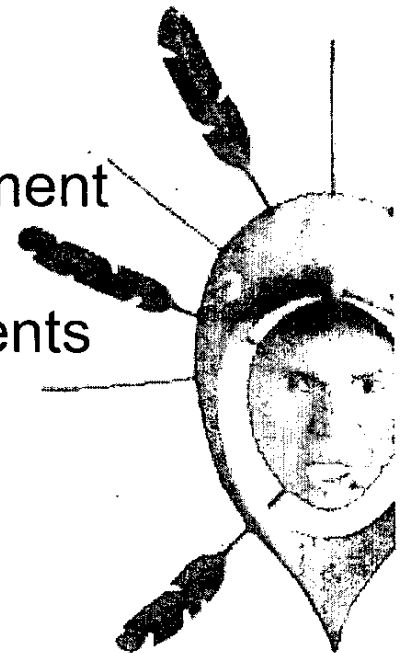
**NOV 2009:** Fieldwork completed

**DEC 2009:** Geotech results

**MAR 2010:** 35 percent design completion

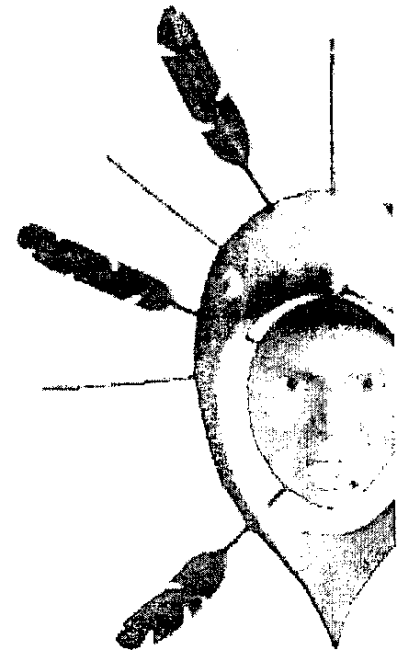
**MAY 2010:** Integration/interconnection agreement

**JUNE 2010:** Execute power purchase agreements



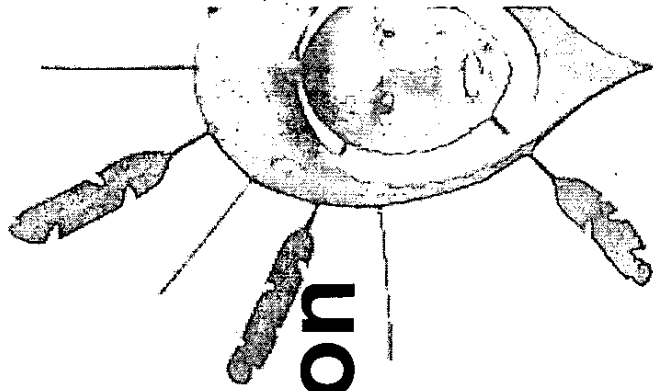
# Project Timeline

- Authorize/mobilize contractors to achieve >5 percent spend in 2010 to qualify for Safe Harbor provision
- Secure Federal Cash Grant for up to 30 percent eligible cost of project
- Construct roads, prepare pad sites, electrical collection system, DVOR construction at AIA
- Tower erection, transmission line, commercial operation Q4 2011



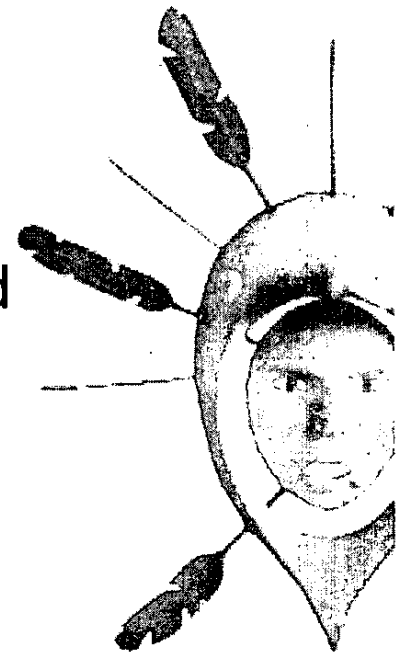


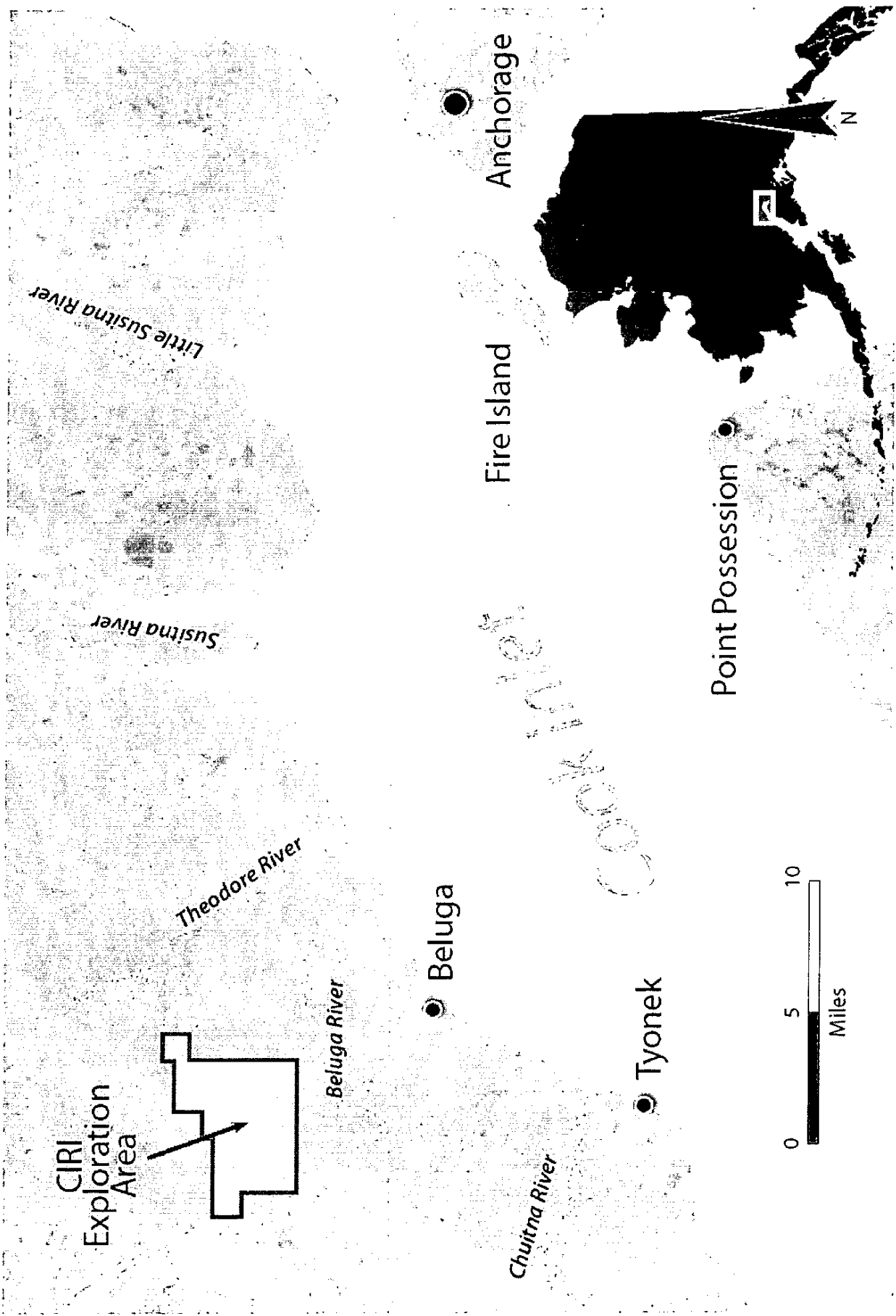
# Underground Coal Gasification



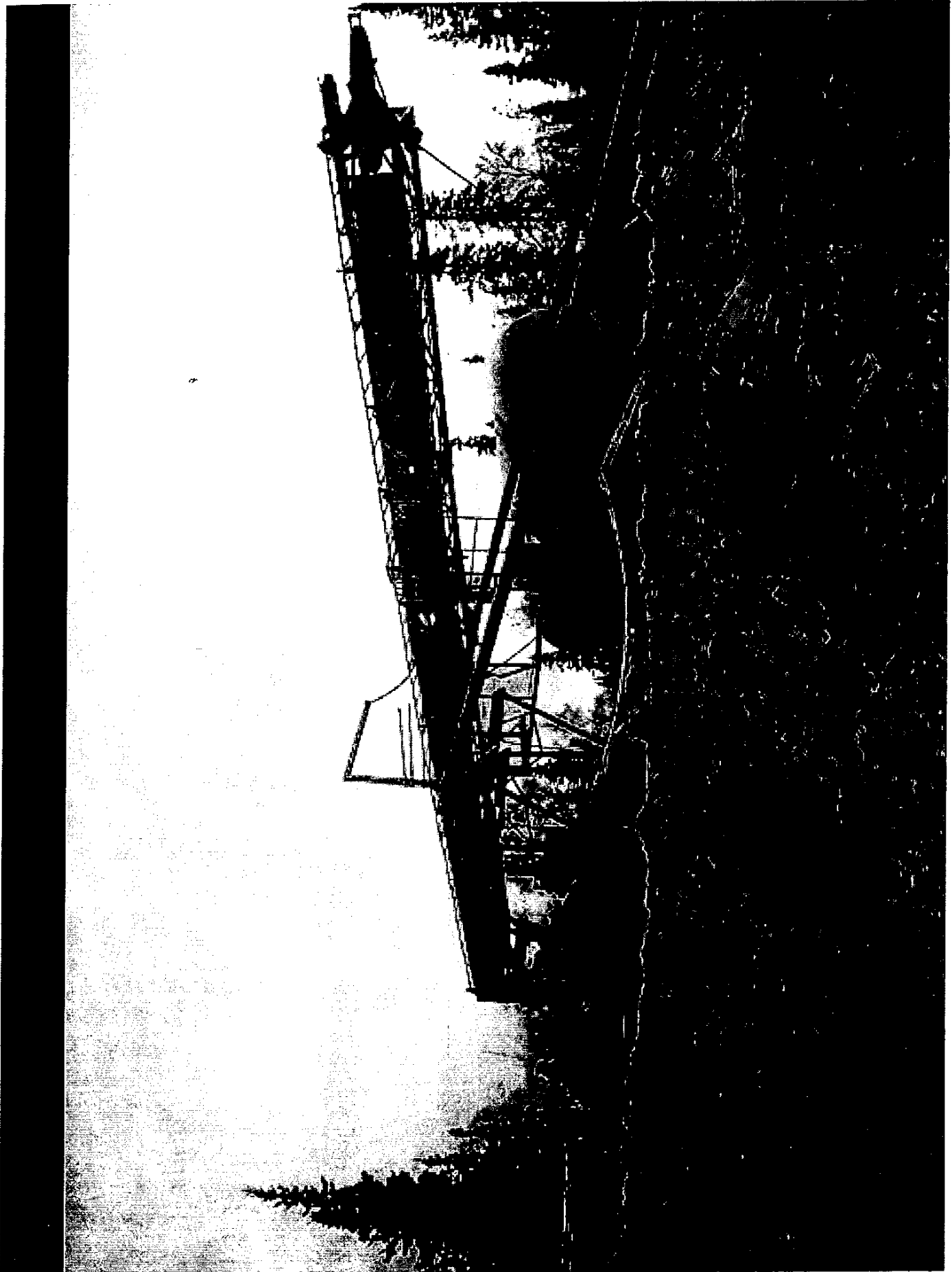
# CIRI's UCG project

- Designed to produce alternative power source by 2014 that meets demand for reliable energy
- Underground coal gasification (UCG + CCS) project sized to fuel a new 100-MW combined-cycle power plant
- Create syngas (also know as a synthesis gas), which can be used to generate electricity or upgraded to synthetic natural gas or clean liquid fuels

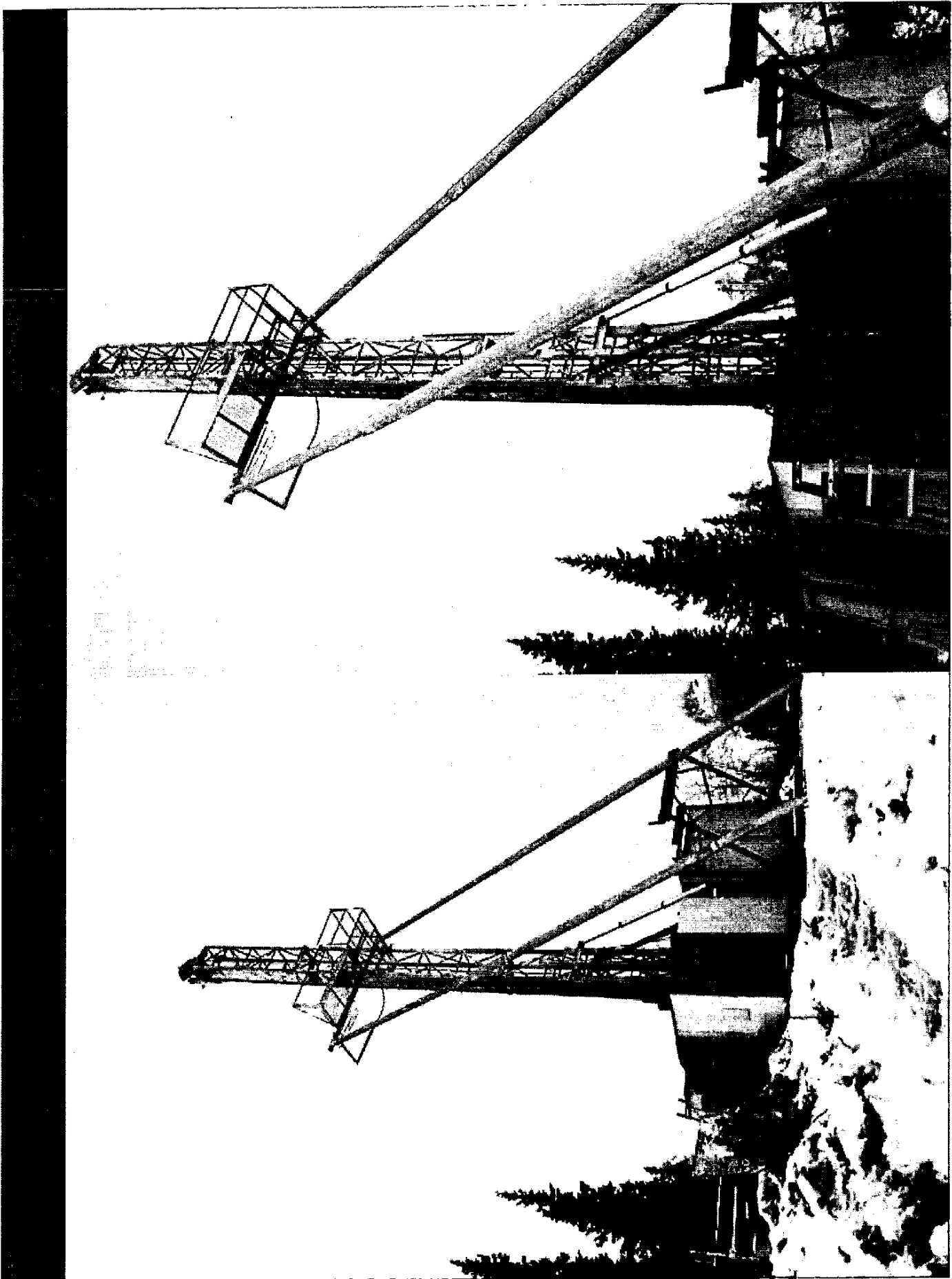


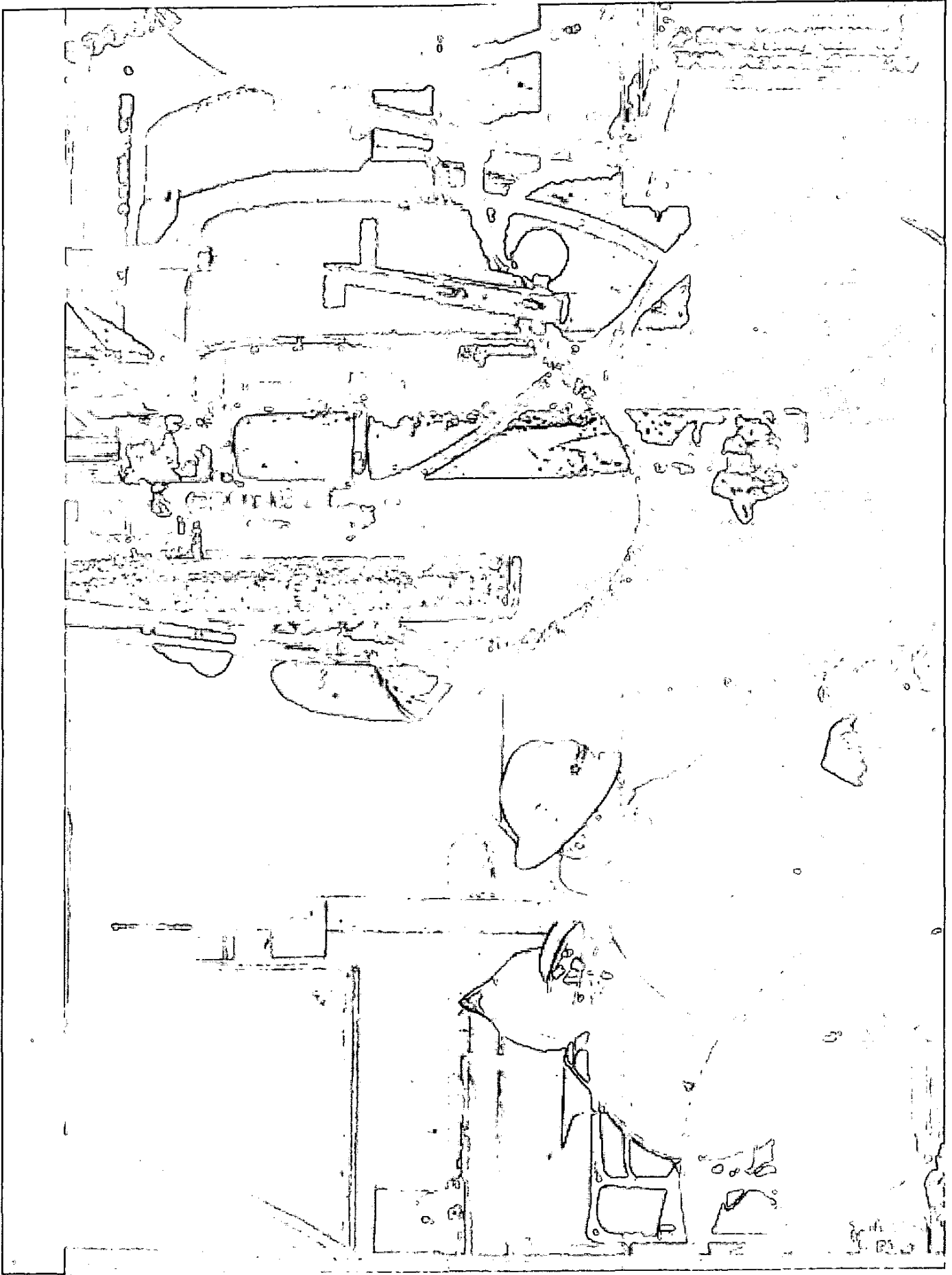






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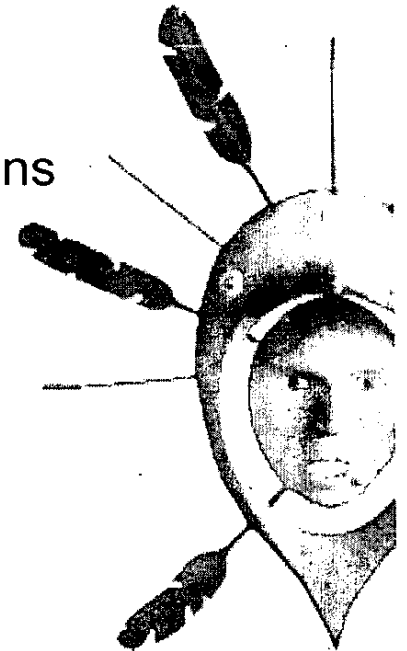
# Why CIRI & UCG

- Company committed to energy leadership and responsible environmental stewardship in addition to ownership of significant favorable coal resources
- Diversified portfolio of successful investments and developments
- Safe, reliable, proven technology that responsibly harnesses an abundant domestic energy resource
- Strong business investment that supports corporate goals and community needs



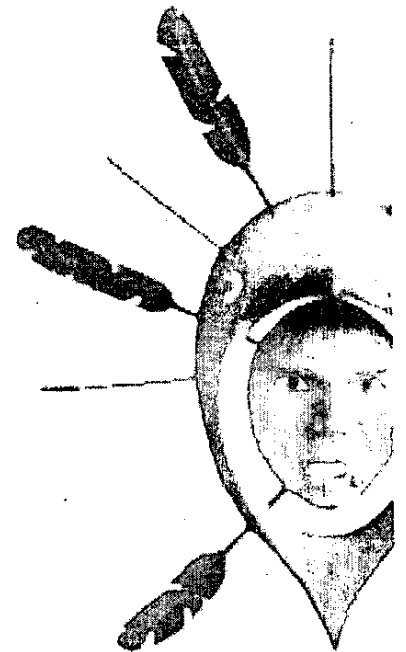
# Current timeline

- Feb. 2009:** Resource Assessment drilling begins
- Apr. 2010:** Preliminary Resource Assessment results;  
Preliminary site selection
- May 2010:** Pre-feasibility drilling begins
- Oct. 2010:** Site characterization drilling begins
- Dec. 2010:** Project permit application preparation begins
- Dec. 2012:** Project permits received
- Jan. 2013:** Above-ground project construction begins
- Jan. 2014:** Commercial operations begin



# Development challenges

- Carbon management – compatible commercial scale carbon capture technology in exploratory stage
- Undefined regulatory regime – no precedent exists for permitting UCG as a commercial project at federal or state levels
- Alternative financing structures – early stage UCG technology requires investment capital, not traditional project finance



# Opportunities

- Previously inaccessible resources converted to productive energy sources with existing, proven technology
- UCG with carbon capture results in lower emissions than combined-cycle natural gas power plant
- Potential increase 300-400 percent in recoverable coal reserves; CIRI owns significant coal reserves suitable for UCG development
- Scalable operations with value-added upgrade for export



# CIRI Ownership

