

Unaatuq LLC

Geothermal Technology for Pilgrim Hot Springs



Pilgrim Hot Springs Team Members

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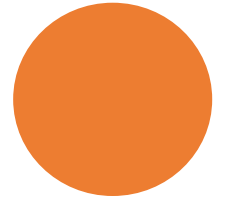


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Kawerak, Inc.

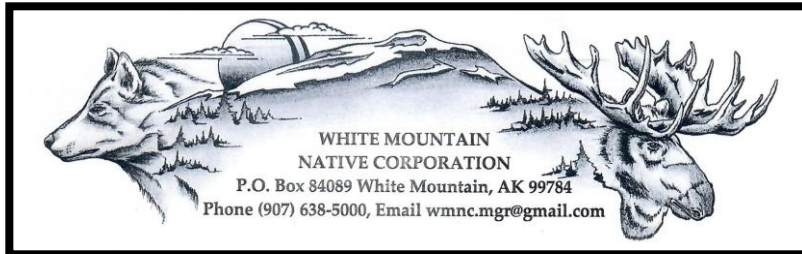
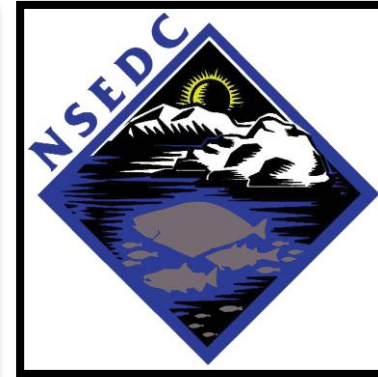
Kawerak is a non-profit tribal consortium representing 20 Alaska Native Tribes in the Bering Strait Region.

Our mission is to advance the capacity of our people and tribes for the benefit of the Bering Strait region of Alaska, which is the homeland and waters of the Yup'ik, Inupiaq and St. Lawrence Island Yupik Peoples.



KAWERAK, INC.

Unaatuq: Since 2010



Vision

A protected arctic oasis that provides for our people.

Mission

To promote the wellbeing of our people through sharing, protecting, and responsibly developing the resources of Pilgrim Hot Springs.

Unaatuq's Current Strategy



- Revive & transform a significant historical site
- Develop a sustainable business model
- Incorporate cultural values into business plan
- Support regional economic development
- All powered by **renewable energy by 2025!!**



* This village opted out of the regional organization (BSNC) when ANCSA was created (1972).

Bering Straits Region

- Located in Northwestern Alaska
- 23,000 square miles
- Population of roughly 10,000 combined
- Only accessible by plane and sea
- Shipping large items is almost entirely reliant on ocean barge routes
- All towns are off the main US Power Grid
- Regionally there are 16 diesel powered microgrids, ours will be the 17th and the ONLY 100% renewable energy-powered-microgrid



Pilgrim Hot Springs

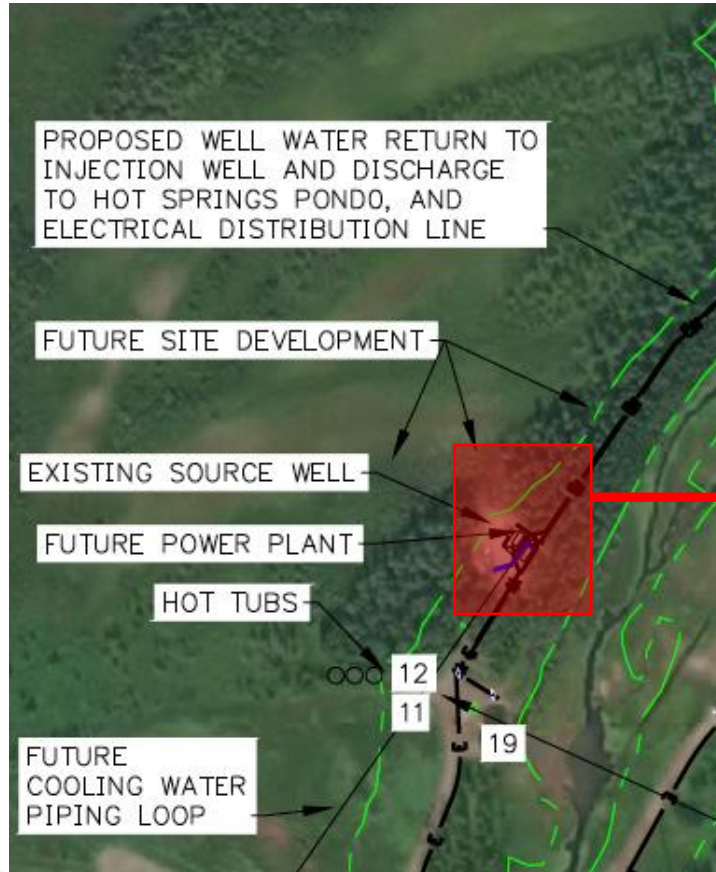
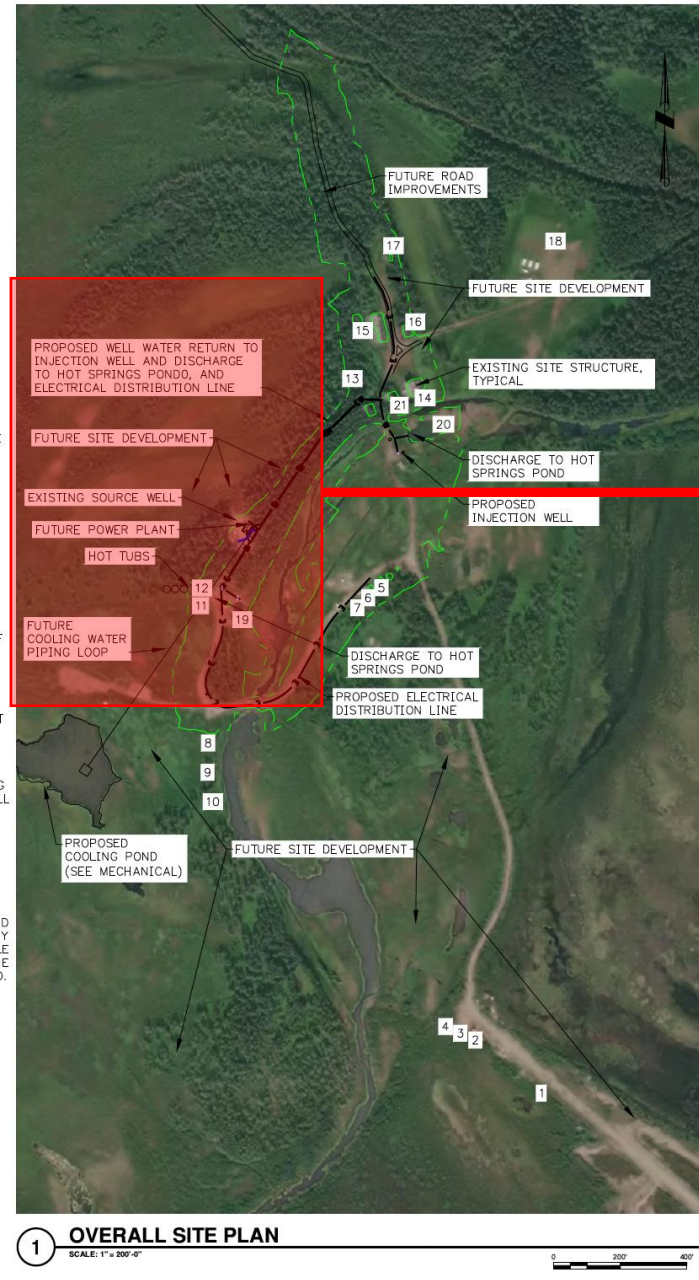
- Located 62 miles North of Nome, Alaska
- Operations for tourism and agriculture during the summer months
- Accessible by road in the summer, limited access in the winter season
- We are the only farm in a 22,000 square mile area
- Up to 2,000 visitors in our summer months to visit our Hot Springs
- Formerly a native boarding school and orphanage in the early 1900s (1918–1941)





* This village opted out of the regional organization (BSNC) when ANCSA was created (1972).

Site Overview



Geothermal PP Location

Geothermal Exploration History

- 1917 – Mineral Springs of Alaska report, Kruzgamepa Springs identified as unique resource
- 1979–1981 Geothermal Exploration (Geophysical Institute) – four deep wells drilled (later sealed in 2011)
- 2010–2014 Geothermal exploration (UAF–ACEP, Department of Energy, Alaska Energy Authority, City of Nome, Unaatuq, Investor)
- 2013 Large production well + two smaller wells finished



Geothermal Resource

- Hottest water temperature at 196°F
- Powerplant production well at 180°F
- Geothermometry results indicate temperatures as high as 293°F
- Drilling core samples indicate temperatures as high as 302°F
- Current potential of the site is estimated at 2 MW for electric power generation
- Surface geothermal and shallow subsurface potential approximately 20–40 MW thermal





Scope of Work

- The project will build a small binary power plant capable of generating power from the available geothermal resource using an Organic Rankine Cycle (ORC) with a rated capacity of 75kW for baseload power to the Pilgrim Hot Springs site while trying to minimize reliance on imported diesel fuel.
- The project will support Unaatuq's and the broader region's vision of reestablishing permanent tribal management and development of the traditional site, facilitating creation of a wellness and education center, food production facility, and tourist destination.

Scalability

The project will use the binary geothermal power plant to electrify and heat approximately 18 tribal buildings initially.

The project is scaled to meet current seasonal needs with plans for future expansion as the site grows toward additional infrastructure and eventual full-time operation.



Project Objectives

- The primary objectives of the project include scalability, clean energy, reliable baseload power, and sustainability.
- The secondary objectives, consistent with Unaatuq's priorities and goals, include tribal participation in economic development for the region, enhancing food security, and providing training and educational opportunities for tribal members.



PROJECT PARTICIPANTS



Unaatuq, LLC
TEDO / LANDOWNER



Kawerak, Inc.
GRANTEE



Kawerak Staff
PILGRIM HOT SPRINGS



CRW Engineering
DESIGN AND
ENGINEERING FIRM



**Alaska Center for
Energy & Power**
UNIVERSITY
PARTNER



**DeerStone
Consulting**
PROJECT
MANAGEMENT



**Stampede Ventures,
Inc.**
CONSTRUCTION
CONTRACTOR

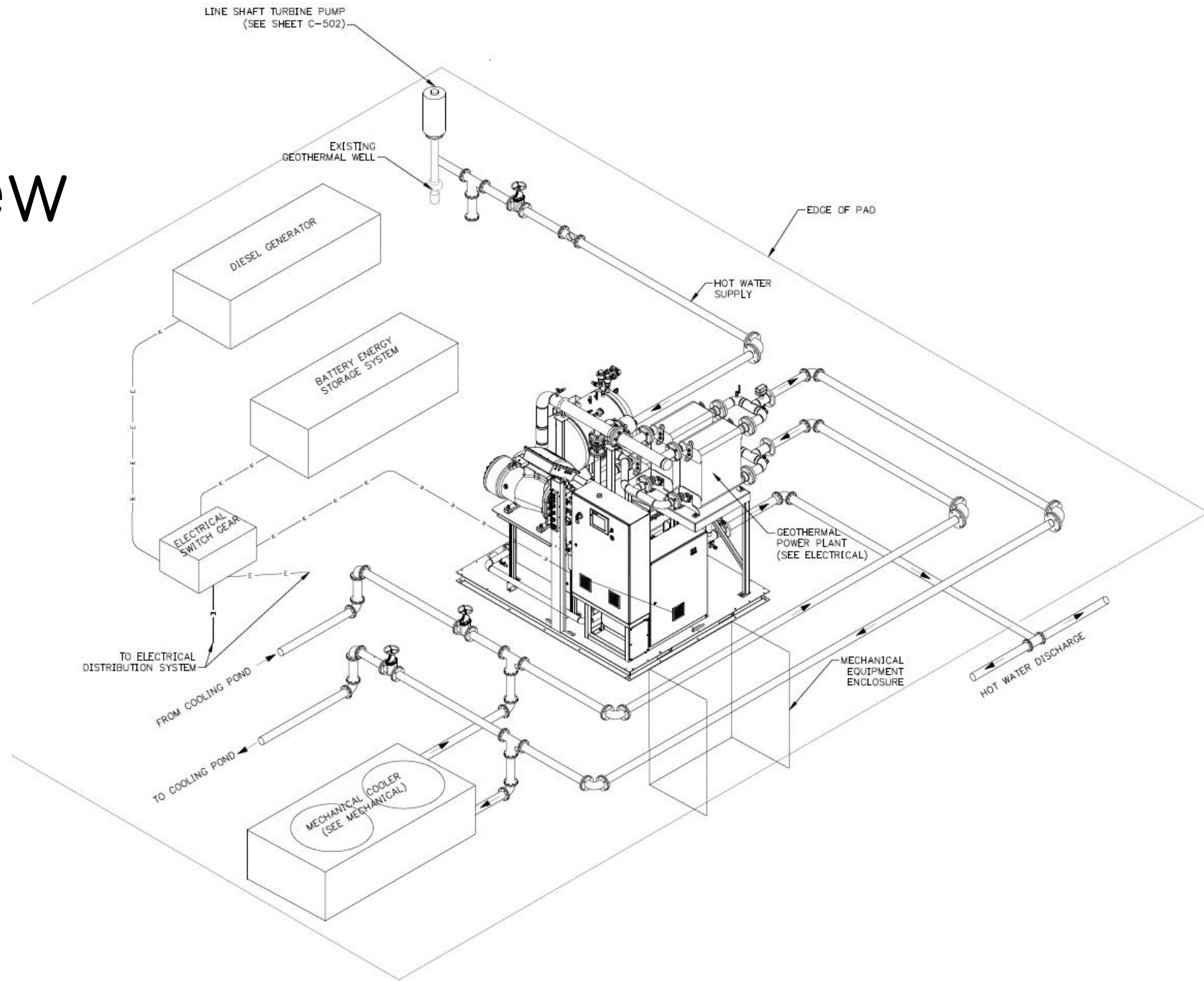
Progress to Date

- Grant Agreement signed November 2022
- February 2023 Kick-Off Meeting
- July 2023 Site Surveys
- August 2023 NEPA Review Meetings
- September 2023 Well Reinjection Testing
- October 2023 Electrical One-Line and Site Load Updates
- October 2023 NEPA Review Meetings and Section 106 Preparation with SHPO
- November 2023 65% Design – moving to 95% Design



Design Overview

- PS 13-1 Geothermal Well
- Organic Rankine Cycle ElectraTherm 75B Power Module
- Cooling Loop in Pond/
Mechanical Air Cooler
- Battery Energy Storage System (BESS)
- Diesel Generator (Back-Up)
- Electrical Switch Gear
- Discharge to pools/heating loops/reinjection well 13-2





Project Benefits & Community Impact



What's Next

- Design review, comments, and edits to move to 95%
- NEPA Review – Categorical Exclusion or Environmental Assessment
- Section 106 Review – State Historic Preservation Office
- Permitting with local, state, federal agencies
- Finish Contract with Construction Contractor
- Begin procurement process and factory acceptance testing

THE FUTURE

- 24/7 Clean Power =
- Wellness Retreat
- Recreation Destination
- Cultural Revitalization
- Historic Preservation
- Agriculture Expansion
- Food Security for Region
- Employment Opportunities
- Unlimited Possibilities





Quyanna, supporting organizations!



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ACEP
Alaska Center for Energy and Power



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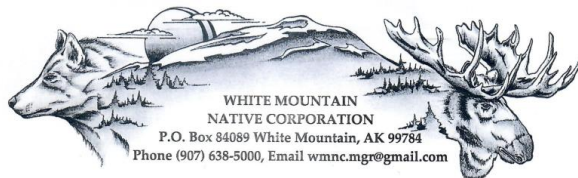
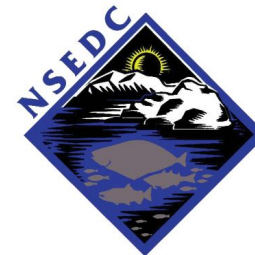




Photo by Chris Pike, ACEP, 2013



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Quyanna / Igamsiqanaghalek / Quyaana Caknek / Thank you!*



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