

Interior Alaska History of Electricity

A Beginning

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Early Fairbanks

The Town of Fairbanks was founded in 1903, following the establishment of a trading post by E.T. Barnette on the banks of the Chena River to service the influx of placer gold miners.

The townsite of Chena, at the mouth of the Chena River where it met the Tanana River was already a bustling town.



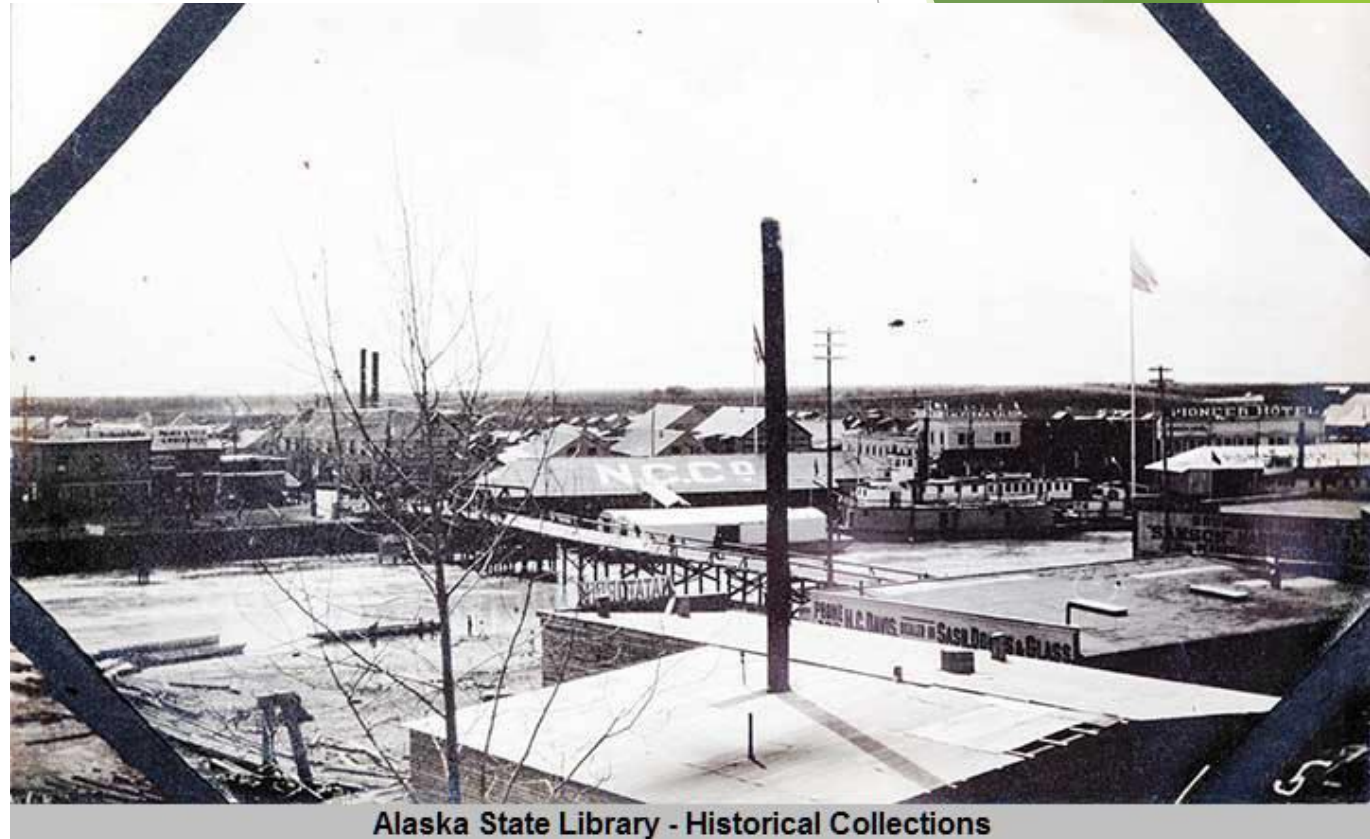
Early Fairbanks

The source of electricity and power at this time was wood. Wood also powered transportation, from the early Tanana Valley Railroad and steamboat transportation for supplies delivered via river.



Early Fairbanks

The Northern Commercial Company (N.C. Co.), the major supply company to Fairbanks and several towns in Alaska at that time, was given a franchise to provide electric service to the Town of Fairbanks by the Common Council.



Alaska State Library - Historical Collections

Early Fairbanks

In 1908, there was a population of 5,000.
In 1913, the N.C. Co. burned 8,500 cords
of wood to generate electricity.

As the gold boom faded in the early
1920's, the population dropped to 1,200.

The area revived with the 1923
completion of the Alaska Railroad that
made it possible to transport coal from
Healy to Fairbanks.

1921 Electric Rates

RESOLUTION

Introduced by Councilman Ferguson.

Whereas, under Chap. IX of Ordinance No. 177 of the Town of Fairbanks it is incumbent on the Mayor and Common Council annually during the month of May to fix by ordinance or resolution the rates for light, water and heat furnished the Town and its inhabitants by James W. Hill and his successors and assigns under existing franchises,

THEREFORE BE IT RESOLVED BY THE MAYOR AND COMMON COUNCIL OF THE TOWN OF FAIRBANKS ALASKA:

That the rates for light, water, and heat to be furnished by the Northern Commercial Co. to the said Town and its inhabitants for the year beginning May 1st, 1921 be and they are hereby fixed the same as the rates in force during the last year for the same service; PROVIDED that, upon satisfactory proof of additional cost of fuel and operating expenses furnished to the Council by said Company, on and after Sept. 1, 1921 the following schedule of rates is agreed upon for said electric light and power service:

1st 50 kilowatts,	30¢ per kw;
2nd " "	29¢ " "
3rd " "	28¢ " "
4th " "	27¢ " "
5th " "	26¢ " "
6th " "	25¢ " "
All over 300 kw.	20¢ " "
Flat rate.....	\$ 3.50

PASSED BY THE COMMON COUNCIL AND APPROVED BY ME THIS 24th day of May, 1921.

Attest:

E. Harry Woodward
Mayor

Early Fairbanks

In 1923, President Warren Harding hammered the last spike in Nenana, signaling the completion of the railroad from Anchorage to Fairbanks, authorized by Congress in 1914. He died of food poisoning on the trip home.



Alaska State Library-Historical Collections

The Next Boom

In 1922, the Fairbanks Exploration Co. (F.E. Co.) began setting up giant dredging operations in the valleys surrounding Fairbanks.

Fueled by coal, their administration, operations and housing were established on Illinois St. They ran a 9.5 mw power plant serving their operations.



The Next Boom

The Town of Fairbanks continued to franchise the N.C. Co. to provide electricity in the core area of Fairbanks until 1949 when they formed the Municipal Utilities System to provide, sewer and water, telephone, and electrical generation and distribution. Beginning in 1951, MUS built a succession of coal plant generations numbered Chena 1,2,3,4,5 and 6 on lower 2nd Ave.

World War II

The war shut down the F.E. Co. exploration as it was considered non-essential. In 1940, Ladd Field (now Ft. Wainwright) was built. By 1954, they had a coal plant for heat and power, still in use, but now seeking replacement.



Eielson Air Force Base had a 20 mw coal plant in 1952, replaced with a 37 mw coal plant in 1972.

Delta-Ft. Greely

Fort Greely, just south of Delta Jct. built a nuclear power plant, taking 4 years to complete in 1962. SM-1A operated only for 10 years to supply heat and electricity.



Too expensive to operate, it has been in shutdown mode since. There is now an environmental assessment out as to how to fully decommission it and address safe disposal of the nuclear fuel, in particular. GVEA supplies electricity to Ft. Greely.

University of Alaska

The University was on its own for electricity. As the Agricultural College and School of Mines before becoming the University of Alaska, it was like in Fairbanks small wood fired power plants from 7 kw, to 15 kw in the 1920's, when President Bunnell authorized a 50 kw generator for heat and electricity. Later, they converted to coal.



University of Alaska

1937 saw a \$125,000 congressional appropriation to construct a concrete 64 kw power plant, built in 1938.

This was in footprint of the Rasmussen Library. I can testify that it was well constructed as, following its 1964 replacement with the \$2 mm Atkinson power plant below Alumni Drive, they used dynamite to demolish it.



1937 Power Plant (left)
Atkinson Building power plant (right)



University of Alaska

The Atkinson power plant was aging out in the mid 2010's and a major effort to replace it was undertaken.

Despite the desire to use a cleaner fuel than coal, the lack of available natural gas and the lack of

Legislative guaranteed support for annual 3x fuel cost if natural gas could be found or for fuel oil led to the current \$245+ mm new plant, capable of 17 mw. Excess electricity can be sold to GVEA.



GVEA

Golden Valley Electric Association

Post WW II, there was a marked increase in homesteading and farming, influenced by veterans serving in Alaska who decided to stay.

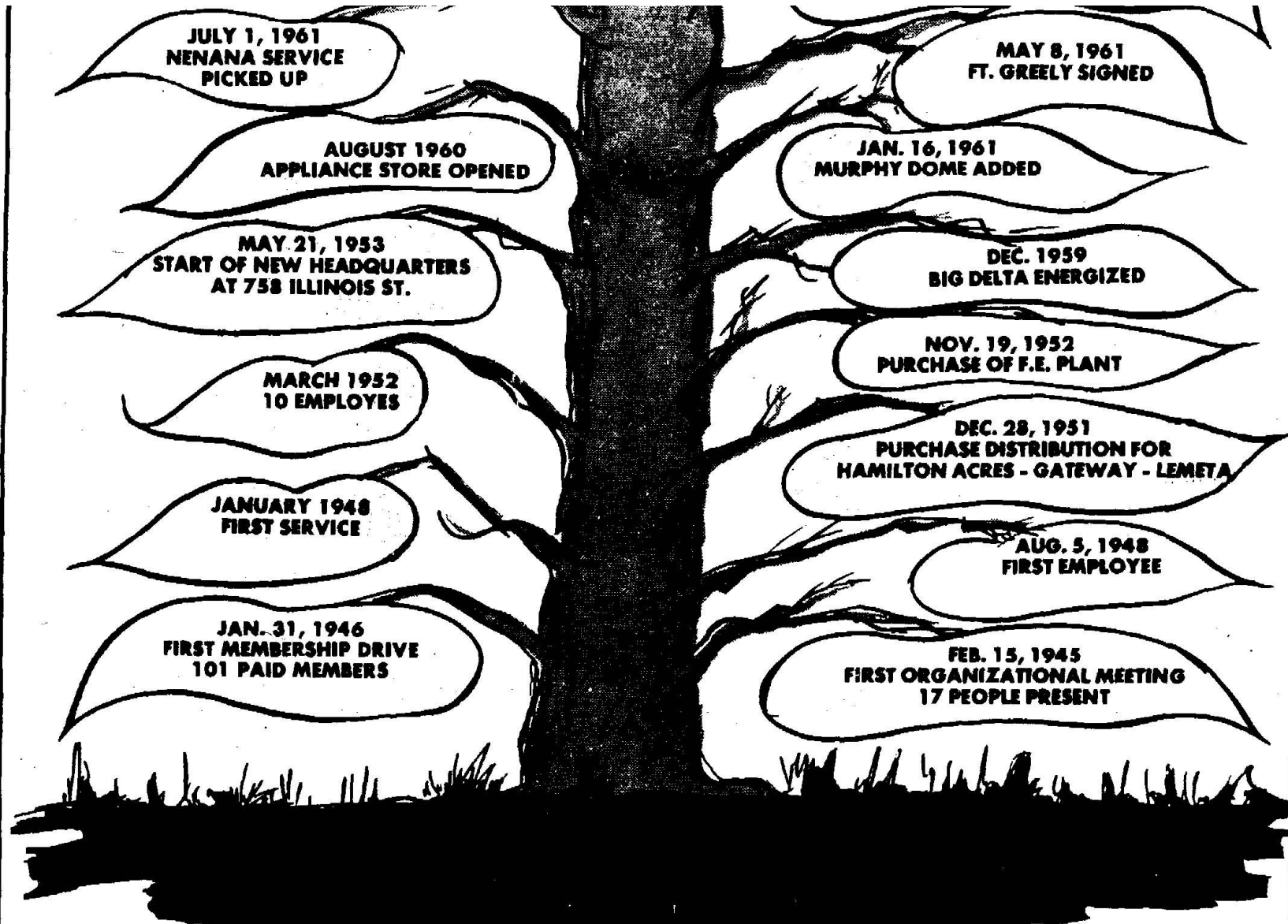
GVEA was incorporated in 1946 through the Rural Electrification Act of 1936 which sought to help fund electricity to rural areas that investor owned companies didn't find profitable enough to serve. Kind of like internet is today. GVEA was formed to provide electricity to the more rural areas outside the City of Fairbanks.

Golden Valley Electric Association

GVEA started with some small diesel generation units, purchased the F.E. Co. 9.5 mw power plant in 1953 and eventually settled its administration/operations campus in the same Illinois St. area of the F.E. Co.

GVEA is a not-for-profit electric cooperative, member-owned with a democratically elected board of directors.

Its mission: Recognizing **GVEA's** importance to the economic, environmental and social viability of our communities, the Cooperative's **mission** is to safely provide its member-owners with reliable electric service, quality customer service and innovative energy solutions at fair and reasonable prices.



JULY 1, 1961
NENANA SERVICE
PICKED UP

AUGUST 1960
APPLIANCE STORE OPENED

MAY 21, 1953
START OF NEW HEADQUARTERS
AT 758 ILLINOIS ST.

MARCH 1952
10 EMPLOYEES

JANUARY 1948
FIRST SERVICE

JAN. 31, 1946
FIRST MEMBERSHIP DRIVE
101 PAID MEMBERS

MAY 8, 1961
FT. GREELY SIGNED

JAN. 16, 1961
MURPHY DOME ADDED

DEC. 1959
BIG DELTA ENERGIZED

NOV. 19, 1952
PURCHASE OF F.E. PLANT

DEC. 28, 1951
PURCHASE DISTRIBUTION FOR
HAMILTON ACRES - GATEWAY - LEMETA

AUG. 5, 1948
FIRST EMPLOYEE

FEB. 15, 1945
FIRST ORGANIZATIONAL MEETING
17 PEOPLE PRESENT



GOLDEN VALLEY ELECTRIC

ASSN.
INC.

758 ILLINOIS ST., FAIRBANKS

452-1151

20 YEARS OF SERVICE

1948 AND STILL GROWING 1968

1968
OVER 300 TOTAL
ELECTRIC MEMBERS

1968
225 MILE REACH
HEALY - FAIRBANKS - Past
DELTA JUNCTION

FEB. 10, 1968
HEALY PLANT
ON LINE

OCT. 17, 1966
PURCHASE OF CHATANIKA
34 KV LINE

SEPT. 17, 1962
NENANA - CLEAR LINE EXT.
CHENA HOT SPRINGS RD. EXT.
PURCHASE OF ESTER LINE

APRIL 30, 1962
EIELSON TIE-IN
ESTABLISHED

1968
1001 MILES OF
ENERGIZED LINES
500 CONSUMERS

6:20 P.M.
MAY 25, 1968
F.E. PLANT SHUT DOWN

SEPT. 18, 1967
NENANA RATE'S BECOME
FAIRBANKS RURAL RATE

FEB. 14, 1966
AGREEMENT OK'D FOR
PLANKING HEALY BRIDGE

APRIL 14, 1965
START OF HEALY POWER PLANT
CONSTRUCTION

JUNE 18, 1962
HUSAK ACRES
ADDED

JAN. 15, 1962
RATE REVISION
TOTAL ELECTRIC RATE ESTABLISHED

Electric Cooperatives

GVEA is one of about 900 electric cooperatives in the U.S., but only in Alaska and the Island of Kauai act as generation, transmission and distribution cooperatives. Most co-ops are distribution only or G&T only.

Over time, GVEA has developed the most fuel diverse electric utility in Alaska and was the first comprehensive electric company in Interior Alaska. GVEA and FMUS were often at odds in coordinating power sharing and service areas, as the City boundaries expanded.

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How Dependable Electricity Reaches You

It's easy to take reliable electric power for granted. But there's a lot involved in getting that power to you, and the path of electricity starts well before a light switch is flipped.

Power Plant

At a generating plant, water is heated to steam using fuels such as natural gas, coal and oil; the steam turns turbines that turn generators to produce electric energy. In some areas, nuclear power or water flowing through hydroelectric dams powers the turbines.

Step-Up Substation

Transformers at the generating plant increase the voltage up to 345,000 volts, so it can travel long distances over high-voltage transmission lines.

High-Voltage Transmission Lines

These lines carry the electric energy over long distances. Insulators on the towers prevent the power from flowing to the towers or the ground.

Transmission Substation

Transformers reduce the electric energy up to 69,000 volts, making it suitable for high-volume delivery over short distances.

Large Industrial User

Most industries need 2,400 to 4,160 volts to run heavy machinery. They usually have their own substation at the facility.

Consumer-Owned Renewable Generation

A wind turbine, solar panel array or methane digester is interconnected to the co-op's lines through a cutoff switch and other equipment. The switch disconnects the turbine from the line to ensure the safety of linemen working during outages and regular maintenance projects.

Distribution Lines

Lines belonging to local electric co-ops carry electricity to transformers that reduce power levels to 120/240 or 120/208 volts for use in schools, farms, homes and small businesses.

Local Distribution Substation

Local electric co-ops operate several of these substations to reduce electricity to 7,200-14,400 volts for distribution to their members.

Schools

Farms

Homes

Small
Businesses

GVEA's Diverse Mix

- 1953 F.E. Coal Plant on Illinois St. 9.5 mw
- 1967 Healy 1 Coal Plant 25 mw (nuclear considered)
- 1971-72 Zehnder G.E. Frame 5 Power Plant (2 x 18 mw diesel)
- 1976 North Pole G.E. Frame 7 Power Plants 2 x 60 mw diesel
- 1985 Northern Transmission Intertie - allows 70 mw from South Central utilities and Bradley Lake Hydro
- 1991 Bradley Lake Hydro (Homer) - 20 mw of 120 total
- 1997 - Delta Power Plant, former Chena 6, acquired from FMUS) - 27 mw diesel

GVEA's Diverse Mix (cont)

- 2003 - Battery Energy Storage (BESS) - 24 mw backup for 15 min.
- 2006 - North Pole LM 6000 Co-Gen Plant - 65 mw naptha
- 2013 - Eva Creek Wind Farm - 24 mw max
- 2018 - Demonstration Solar Farm 564 kw max

Purchased Power

- 1997 & 2006 - Aurora Energy (formerly FMUS)
- Up to 80 mw across the Intertie from other utilities + Bradley Hydro (20 mw)
- Delta Wind - 2 mw

The Big Picture

Even prior to statehood in 1959, Alaska was seen as a resource breadbasket. The first one in Interior Alaska was the proposed Rampart Dam to generate up to 6 gw and stimulate such industry as aluminum smelting. Proposed in the mid-1950's, the final nail in the coffin was in 1978 from the federal OMB to the Secretary of the Army

The Chief of Engineers concludes that improvement of the Rampart Canyon Site, Yukon River Basin, Alaska, in the interest of hydroelectric power and other water uses is not advisable at this time.



Rampart Dam Could Alter Climate Here

Interior Alaska may grow warmer and have more rainfall when the Rampart Dam backs up a lake 10 times the size of Lake Erie in the Yukon River Valley.

The effect of "The Big One" on Alaska's climate and economy was described to the Alaska Rural Electric Association convention yesterday, by Harold L. Moats of the

Alaska District Engineer, U. S. Army, staff.

The chief of the civil works planning branch at Anchorage spoke on the Rampart Canyon project, 100 air miles north of Fairbanks, and the Army nuclear plant at Fort Greely.

Moats said the Senate Public Works Committee, at the request of Sen. Ernest Gruen-

ing (D-Alaska) directed the Corps of Engineers to make a detailed study of the Rampart Canyon hydroelectric site.

"We anticipate that this study will require four years to complete and that we will receive an initial allotment of funds to start the work this fiscal year," Moats said.

Moats said the Rampart

Canyon dam would have only about three-fourths of the volume of the Grand Coulee dam, but will impound enough water to warrant an installed capacity of 4,750,000 kilowatts, about two and one-half times the installed capacity of Grand Coulee.

The reservoir would:

—Cover 10,700 square miles,

an area 10 times greater than Lake Erie.

—Store about 1,300,000,000 (that's billion) acre feet of water, better than 40 times the storage at Lake Mead behind Hoover Dam.

—Cause the mean annual temperature to rise, perhaps three or four degrees, and produce a longer growing season.

"It has been said," Moats commented, "that the reservoir area contains enough timber to sustain a small pulp mill during the filling period."

Power will be developed by 17 generators, each of 250,000 kilowatt capacity. The construction plan is to build the entire dam and initially to

install four or five of the generators.

Installation of the remaining generators would follow as the load develops.

"It is anticipated that ultra high voltage transmission, probably about 500,000 volts, will serve ice free industrial sites at Valdez, Anchorage, Whittier and Seward," Moats said.

Fairbanks and other Interior communities, as well as many mining operations will be served by conventional transmission lines."

Estimates of cost indicate that the initial installation, including transmission to one ice-free tidewater industrial area will be about \$200,000. The delivered cost of power

(Continued on Page 2, Col. 5)



Daily News - Miner

"America's Farthest North Daily Newspaper" . . . Member of The Associated Press



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RAMPART . . .

(Continued From Page 1)

would be about five mills per kilowatt hour.

The total installation will cost about \$1,300,000,000 and the kilowatt hour cost at the tidewater sites mentioned will be reduced to about three and one-half mills.

Moats also spoke on the Army nuclear power plant currently under construction at Fort Greely. He said it is the second of its type, known as the Army Package Power Reactor. The first was built at Fort Belvoir, Va., and has been in operation since 1957.

He said the net output of the first plant has been utilized to supplement the Fort Belvoir power distribution system.

It has served as a training station for men of all three military services in operating such plants in the future.

"Contrary to popular belief, scientists are not required to run such a nuclear plant. The operating crews of the Fort Belvoir plant consist of responsible non-commissioned officers, each of whom has completed high school with a good record," Moats said.

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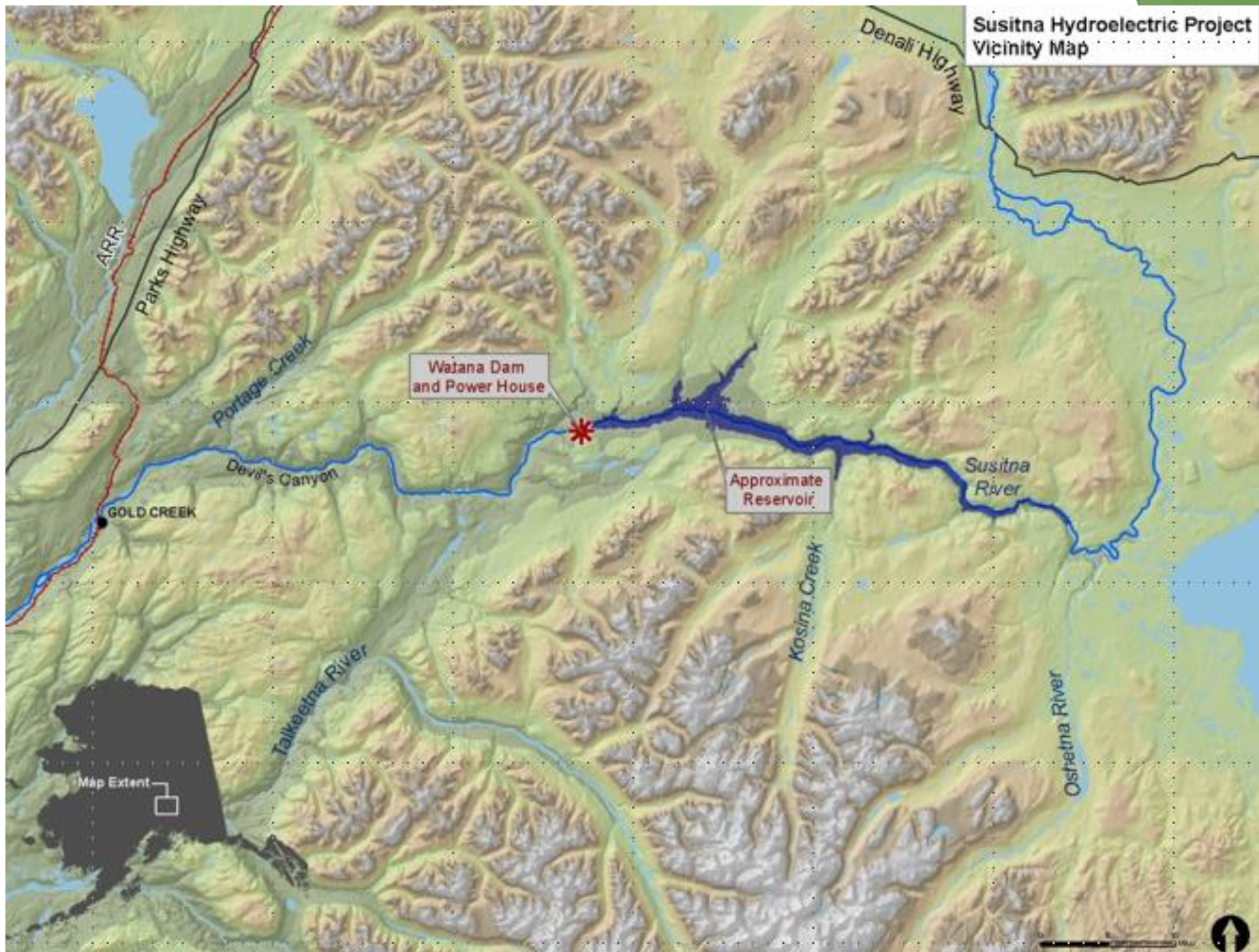
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The Big Picture

The next big thing was a two dam proposal on the upper Susitna River. It would have generated 1.2 gw of energy, about twice what the entire Railbelt needed. The excess again was to subsidize aluminum smelting probably at Pt. MacKenzie across from Anchorage. Sucking up a lot of state funding in studies, it met great opposition and was put to sleep, only to be revived as a scaled back one dam 600 mw proposal still needing \$100 mm to complete the studies necessary to apply for the federal license. Cost is at least \$6 billion.

Watana footprint



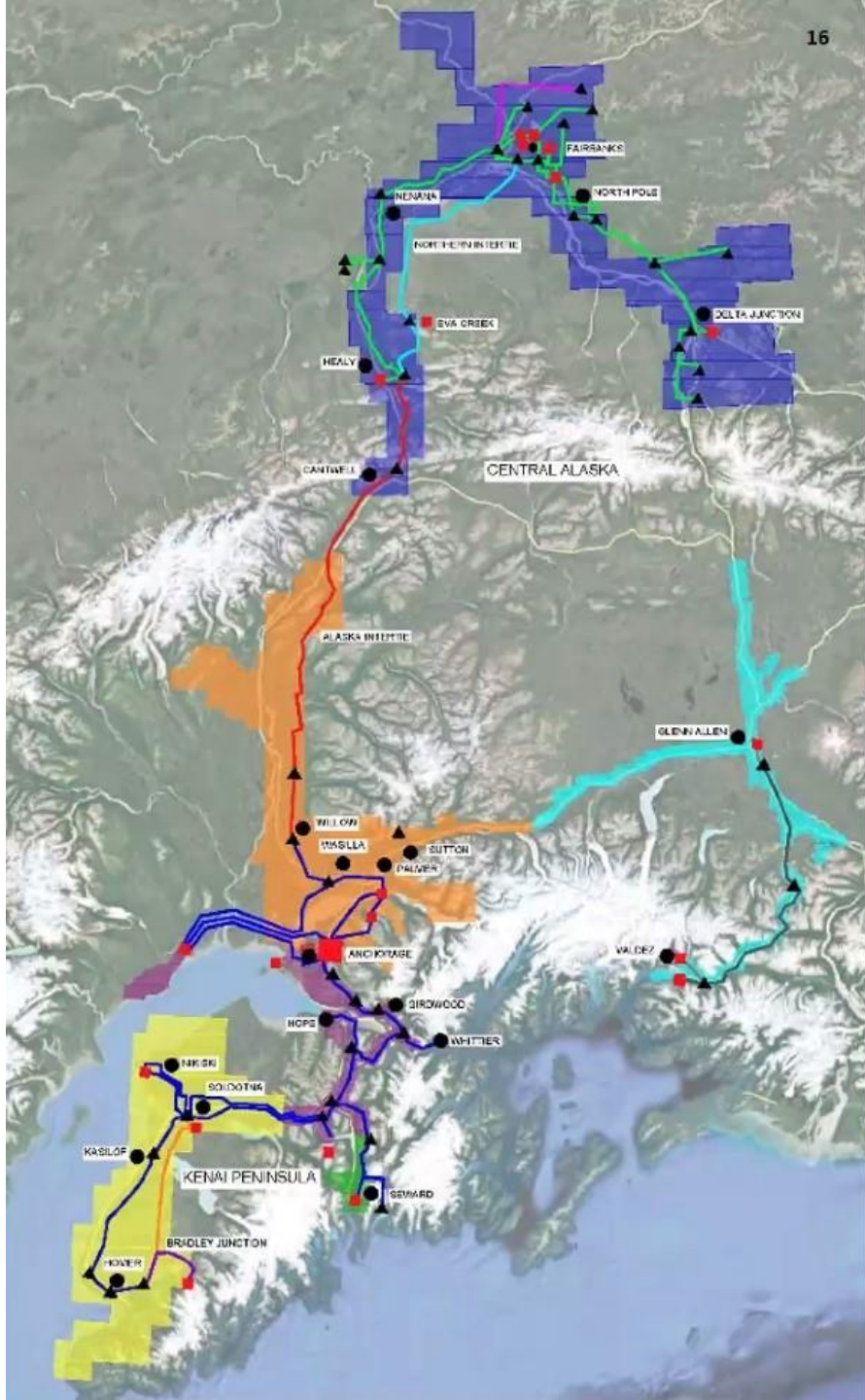
The Big Picture - It's the Railbelt

As the Railbelt from Homer to Fairbanks has developed, it has long been recognized there needs to be coordination among the electric utilities that serve these areas. Numerous plans and efforts have been made for decades.

In 2020, after 5 years of investigation, the Legislature passed SB123 which instructed the Regulatory Commission of Alaska to come up with regulations to firmly encourage Railbelt utilities to cooperate more in areas of transmission and dispatch. This process is still on-going and history is being made.

Railbelt Transmission Map

Need to do an
Integrated
Resource Plan for
the entire
Railbelt



The Big Picture - Future Paths

Another time

Thanks for listening