

NORTHWEST ARCTIC BOROUGH COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY



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Introduction

The Northwest Arctic Borough and the Economic Development Commission of Northwest Alaska utilized the strong working relationship with local entities, non-profits, for-profits, city and tribal councils and other regional organizations to develop and publish this Comprehensive Economic Development Strategy.

In the Arctic we face unique challenges. Adaptability and resiliency are comingled with the need for responsible development for the long-term viability, sustainability, and growth of the communities we serve. This region lacks essential infrastructure and access to basic services that many other communities take for granted. Increasing public safety, internet connectivity, transportation options, and reducing residents' cost of living will further stabilize and develop our region.



Northwest Arctic Leadership Team (NWALT), a partnership among Maniilaq Association, NANA Regional Corporation, the Northwest Arctic Borough, and the Northwest Arctic Borough School District, will maximize resources and reduce duplication of efforts to address issues affecting the people of Northwest Alaska while honoring and perpetuating our Iñupiat cultural heritage.

The leaders of the Northwest Arctic work together to:

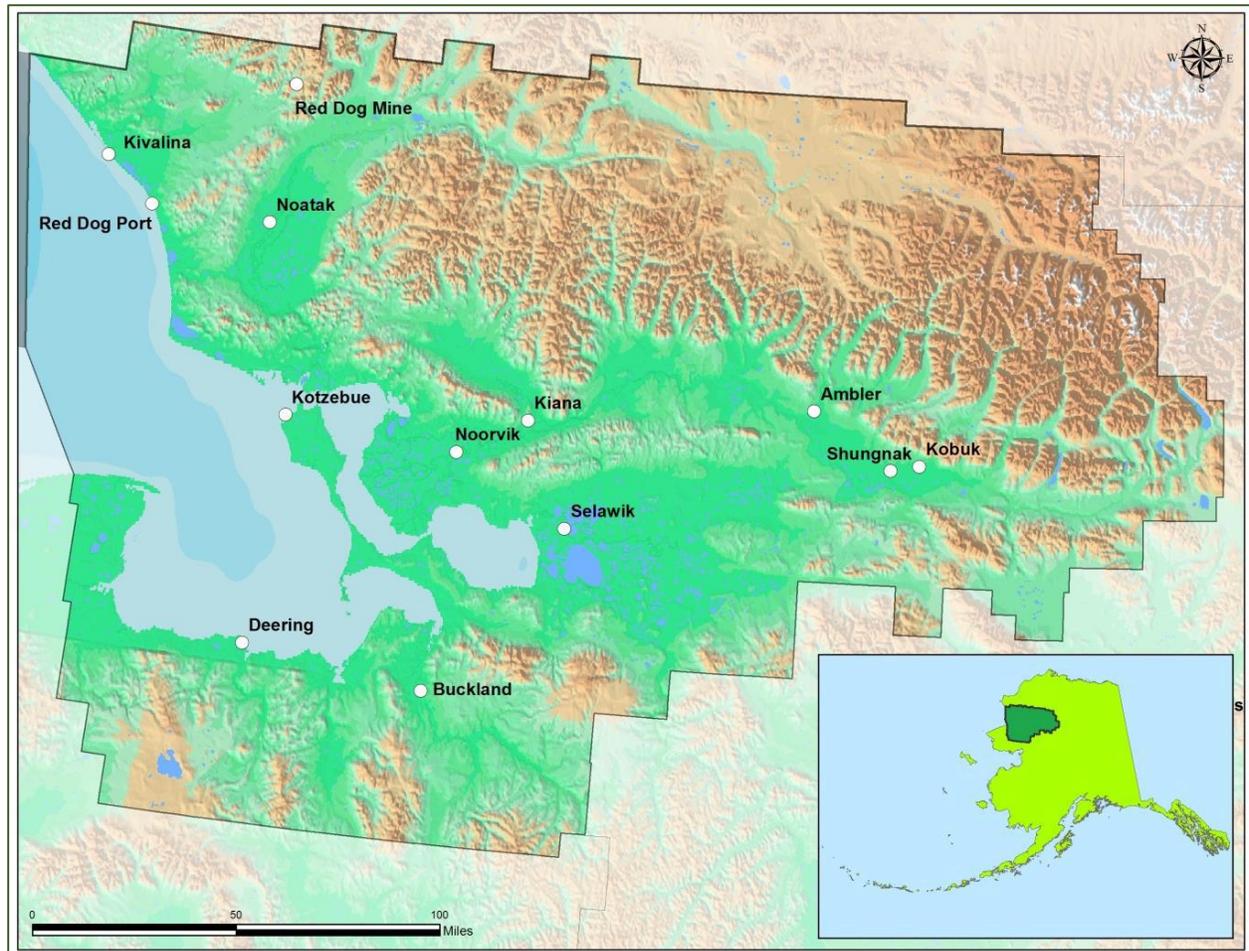
- Serve the people of the region
- Maximize resources and minimize duplication
- Promote strategies through grassroots involvement
- Be a steering committee to examine various region-wide issues
- Find solutions and recommend policy and resource allocation



Regional Economic Development:

- Regionally Developed Energy Programs to reduce the cost of living
- Alternative Energy Initiatives
- Broadband Services
- Basic Infrastructure Development
- Advancement of the Cape Blossom Port
- Village Interties
- Bulk Fuel & Bulk Fuel Storage
- Utility Development & Advancement

Regional Overview



The Northwest Arctic region is the gateway to the Arctic. It is comprised of approximately 39,000 square miles (35,898.3 square miles of land and 4,863.7 square miles of water) along the Kotzebue Sound and Wulik, Noatak, Kobuk, Selawik, Buckland and Kugruk Rivers. Much of the area is situated above the Arctic Circle. The City of Kotzebue is the "hub" of the Northwest Arctic and is the transfer point between ocean and inland shipping. Kotzebue does not have a natural harbor and is ice-free for only three months each year. Deep draft vessels must anchor 15 miles off shore, and cargo is lightered to the docking facility. Local barge services provide cargo to area communities. Ralph Wien Memorial Airport supports daily jet service and air taxis to Anchorage. The eleven villages in the region are not connected by a road system, nor is there a unified electrical grid.

The geology of the Northwest Arctic region is dominated by the Brooks Range fold-and-thrust belt to the north and the Yukon-Koyukuk basin to the south. The Brooks Range, like most of the North American Cordillera, formed during a compressional tectonic event during Jurassic-Cretaceous time (approximately 100-200 million years ago). This compressional event thrust older Paleozoic rocks over younger rocks to the north, creating the Brooks Range and the North Slope foreland basin. These Paleozoic rocks contain the zinc-lead-silver deposits at the Red Dog mine and the copper deposits at Bornite in the upper Kobuk River. Crustal extension occurred in the south part of the NANA region forming the Cretaceous Yukon-Koyukuk basin. This basin is represented by a thick package of Cretaceous marine and non-marine sedimentary rocks and includes some coal-bearing strata. Extension continued with the opening of the

Kotzebue basin in Tertiary time (40-50 million years ago). At around the same time, large volumes of basaltic lava poured onto the southern NANA region on the Seward Peninsula up until at least 5 million years ago. During the Pleistocene glaciation, large glaciers flowed out of the Brooks Range, scouring out valleys and depositing sand and gravel through the major river valleys. Large volumes of wind-blown sand and silt covered the region adjacent to the glacial sediment (Kobuk Sand Dunes) and the major rivers continued to rework these sediments as the ice receded, forming more modern features like the Kobuk delta.

The Red Dog Mine, near Kivalina, is one of the largest lead and zinc mines in North America. Areas near the Baird Mountains may contain copper, gold, lead and zinc.

Hydrology in the Northwest Arctic consists of streams and rivers that flow westward into Kotzebue Sound. The principal rivers are the Kobuk and Noatak Rivers, each of which drains an area of about 12,000 square miles. Selawik Lake, a tidal, saline lake is the largest in the region. The Noatak National Park and Preserve protects the largest pristine river basin in the United States; in 1976 it was designated as an International Biosphere Reserve by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) (Brabets, 1996).

Most of the Northwest Arctic area—including Kotzebue, Buckland, Deering, Kiana, Kivalina, Noatak, Noorvik, and Selawik—experiences a transitional climate, characterized by long, cold winters and cool summers. The more inland communities, Ambler, Kobuk and Shungnak, are in the continental climate zone, also characterized by long, cold winters but with milder summers. Temperatures in the region range from -52 to 85 °F. Total precipitation averages 9 inches per year, and average annual snowfall is 47 inches. Table 3 shows average climate data for the Northwest Arctic region. Break-up (when rivers and sea ice melt) has typically occurred around late May in recent years and freeze-up in late October in the inland communities of Ambler, Kobuk and Shungnak. Break-up and freeze-up generally occurs later in the more coastal communities.

In the past few years the regional snowfall has decreased, causing less runoff in the rivers and streams, which is needed to flush out silt. As a result, the silt has built up and prevented barge service from reaching the Upper Kobuk Sub-Region communities.

Climate change describes the variation in Earth's global and regional atmosphere over time. The impacts of climate warming in Alaska are already occurring. In the Northwest Arctic region, some of these impacts include coastal erosion, increased storm effects, sea ice retreat and permafrost melt.

The effects of climate change can potentially exacerbate natural phenomena. For example, melting permafrost contributes significantly to ground failure or destabilization of the ground in a seismic event and changing weather patterns can cause unusual and severe weather. Climate change also can cause structural failure in energy infrastructure, buildings, airports, and roads due to thawing permafrost. This leads to increased maintenance costs and disruption in services.

Adapting to the impacts of climate change before they become critical is important to the wellbeing of the people and infrastructure of the Northwest Arctic. Energy infrastructure will be vulnerable to more extreme weather events, rising sea levels, and thawing permafrost. Climate changes may result in different growth patterns of existing plant species that are used as biomass energy sources. Likewise, new species may become viable where they have not existed in the past. Strategies for adaptation to climate change will need to be developed and continually updated as new information becomes available.

Culture

Flourishing for thousands of years, the primary population of the Northwest Arctic Borough is the Inupiaq People. Subsistence resources remain central to the nutrition, economies, culture, and traditions of our communities.

Residents rely on caribou, reindeer, beluga whale, birds, four species of seals, berries, greens and fish for survival. The changing seasons give way to fall gathering, spring harvesting, summer rooting, and winter endurance.



In 2000, the Northwest Arctic Borough (NWAB) launched an art purchasing and marketing program for Inupiaq arts and crafts produced in the region's eleven villages by artists that celebrate the rich traditions and culture of this region. The purpose of the program was to encourage regional economic development by helping artists generate income through sales and marketing of their art. To this end, NWAB, NANA Regional Corporation, and Maniilaq (the regional nonprofit) provided start-up grants to develop a revolving art purchase account within the borough.



The revolving art purchase program has now grown to about \$800,000 in funds, has purchased and sold more than a million dollars' worth of art. In 2007, the Northwest Arctic Borough formalized the art program by forming the nonprofit Sulianich Association to provide a viable marketplace for local arts and crafts, as well as a safe working environment for artists and carvers. This included the construction of the arts center.

As our culture and traditions are challenged by expansion, climate change, economic instability, high cost of living, and other economic factors, the road ahead means balancing economic opportunity with the rich culture and heritage of the residents of this Borough. Through cultural awareness curricula, culture camps, language immersion education, subsistence harvesting, and elder and youth advisory programs, our traditional knowledge promises to

continue from generation to generation.

Regional Leadership



Northwest Arctic Borough (NWAB)

Assembly President, Larry Westlake
Mayor, Reggie Joule

The Northwest Arctic Borough (NAB) was formed in June 1986 as a home rule borough and the local political sub-division of the State of Alaska. With approximately 36,000 square miles of land, NAB is the second largest borough in the State and is roughly the size of the state of Indiana. NAB serves 7,500 residents of which 81.1% are Inupiaq. NAB's mission is to improve the quality of life for all residents. Product and service delivery is accomplished through three main departments of Planning, Public Services and Economic Development. Additionally, through a separate 501 (c) 3, NAB subsidizes the Sulianich Art Gallery, which promotes traditional Native arts and crafts as a reliable source of income for residents. Specialized support services are offered through the Office of the Mayor, the Clerks department and the accounting department. NAB currently has an 11-member assembly and a 38 member staff. The annual general fund appropriation is roughly \$12.5 million and from that, \$1.8 million supports education and \$6 million is appropriated for payment of bond debt. NAB received an additional \$21.9 million in the special revenue fund and capital improvement projects and appropriations.



NANA Regional Corporation, Inc. (NANA)

Board Chair, Linda Lee
President/CEO, Wayne Westlake

NANA Regional Corporation, Inc. (NANA) is one of 13 Regional Alaska Native Corporations (ANCs) created pursuant to the Alaska Native Claims Settlement Act (ANCSA). NANA's mission is to provide economic opportunities for its more than 13,000 Iñupiaq shareholders and to protect and enhance NANA lands.



Maniilaq Association (Maniilaq)

Board Chair, John Lincoln
President/CEO Tim Schuerch

For more than 30 years, Maniilaq Association (Maniilaq) has provided health, social and tribal service to residents of northwest Alaska. As a non-profit corporation, Maniilaq represents 12 federally-recognized tribes located in Northwest Alaska and manages social and health services for approximately 7,000 people within the Northwest Arctic Borough (NAB) and the village of Point Hope. Additionally, Maniilaq coordinates tribal and traditional assistance programs, as well environmental and subsistence protection service. Maniilaq is the largest employer in the region. Developing a local workforce trained in nursing and other medical fields will help Maniilaq increase local hire and diminish high turnover among transient medical staff.



Northwest Arctic Borough School District (NWABSD)

Board of Education President, Sandy Shroyer-Beaver
Superintendent, Dr. Ann-Marie O'Brien

Serving more than 2,000 children in Northwest Alaska, the Northwest Arctic Borough School District (NWABSD) employs approximately 180 teachers in the borough's 11 villages. Connected by rivers and air routes - but no roads - the villages typically are home to people practicing a subsistence life built on hunting and fishing. By supporting both Inupiat and Western standards of success in classrooms, the NWABSD prepares students to take an active role in this quickly changing corner of the Last Frontier.

Northwest Arctic Leadership Team

Timothy Schuerch,
President/CEO, Maniilaq Association
Wayne Westlake,
Board Chair, Maniilaq Association
Mayor Reggie Joule,
Northwest Arctic Borough
Dr. Ann-Marie O'Brien, Superintendent,
Northwest Arctic Borough School District

John Lincoln,
Board Chair, Maniilaq Association
Linda Lee,
Board Chair, NANA
Larry Westlake,
Assembly President, Northwest Arctic Borough
Sandy Shroyer-Beaver,
Northwest Arctic Borough School District

Northwest Arctic Economic Development Commission

Community Members

Kathleen Lansdale, Kotzebue	Delores Barr, NRC	Verna Westlake, Teck Cominco
Matt Bergan, Utility	Joseph Bias, Jr. Financial Banking Institution	Kelson Phillips, Regional Higher Education
Millie Hawley, Tribal Representative	Gladys Jones, Private Business	

Northwest Arctic Energy Steering Committee

Community Members

Morgan Johnson, Ambler Rep	Ernest Barger Sr., Buckland Rep	Daisy Weinard, Deering Rep
John Horner, Kobuk Rep	Mark Moore, Noatak Rep	Be Atoruk, Kiana Rep
Marilyn Swan, Kivalina Rep	Derek Martin, Kotzebue Rep	Kirk Sampson, Noorvik Rep
Raven Sheldon, Selawik Rep	James Commack, Shungnak Rep	

Utility Representatives

Meera Kohler, AVEC
Brad Reeve, KEA
Matt Bergen, KEA
Daisy Weinard, IEC, Deering
Dean Westlake, Director VEDC, NANA
Kathleen Lansdale, Director, ED, Northwest Arctic Borough

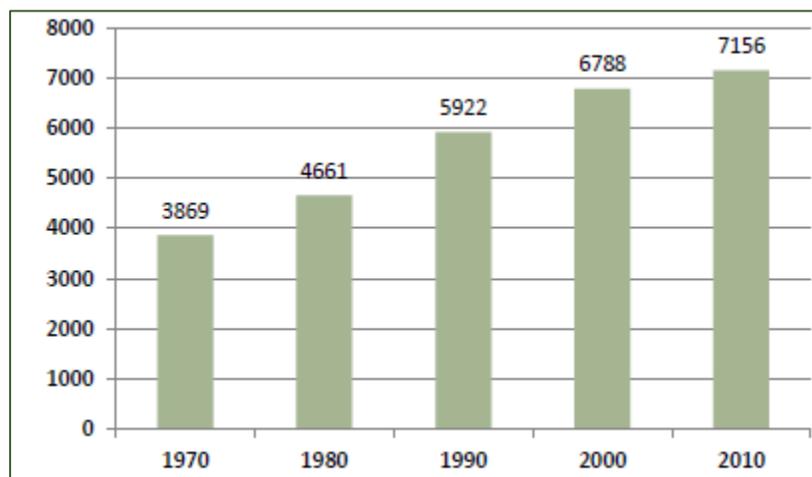
Demographics

Total Population	7,523
Percent Female	46.3%
Percent Male	53.7%
Percent Native	81.1%
Percent of population under the age of 18 [perceived as indicator of dependency]	35.3%
Percent persons ages 18 to 64 [perceived as the labor force]	58.7%
Percent of persons over the age of 65 [perceived as indicator of dependency]	6.0%
Median age of total population	25.7
Number of persons age 18 to 64 with permanent, full time employment and % of labor force	2578/74.1%
Number and percent of persons 18 to 64 who are unemployed	900/25.8%
Total number of households	1,919
Average number of persons per household	4
Total number of dwelling units	1,919
Number of vacant units	788
Number vacant due to seasonal use	542

Source: 2010 Census

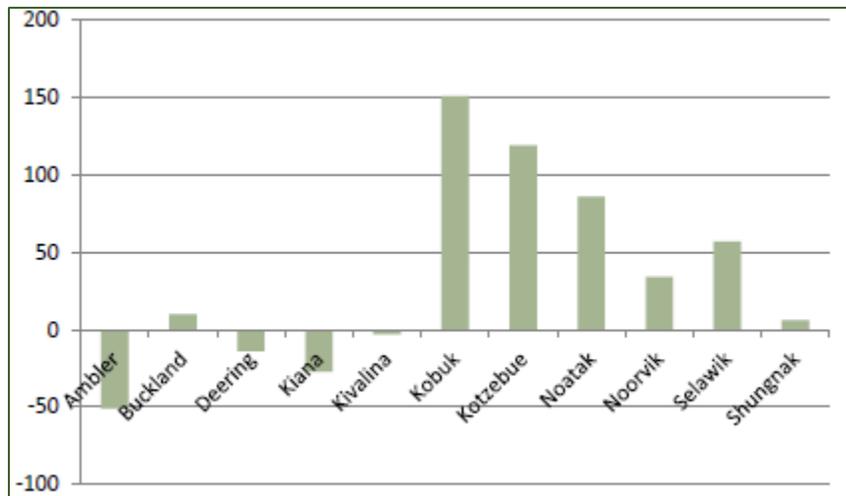
Community	Population
Ambler	258
Buckland	416
Deering	122
Kiana	361
Kivalina	374
Kotzebue	3,201
Noatak	514
Noorvik	668
Selawik	829
Kobuk	151
Shungnak	262

Source: 2010 Census



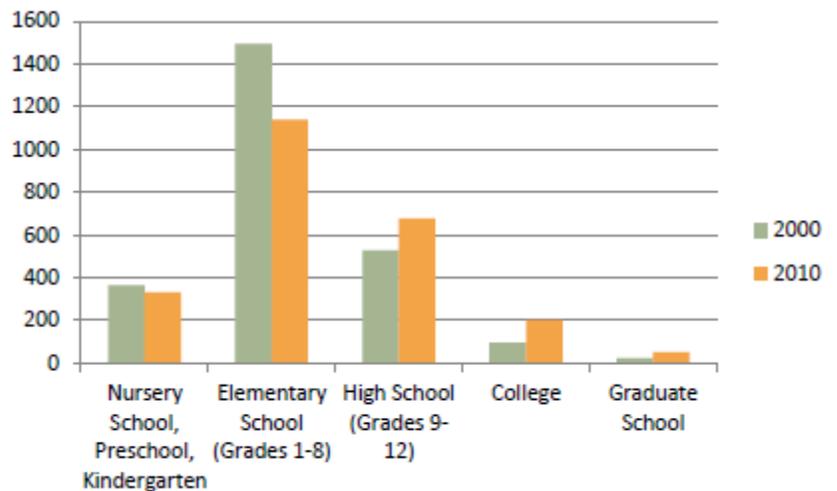
2010 US Census Population Growth

Generally, birth rates in the region are relatively high, exceeding mortality rates. Despite this, populations sometimes decline due to residents moving out of the region (outmigration), or sometimes exceed their natural population growth due to residents moving into the community (in-migration). This occurs in communities for a variety of reasons including job opportunities and social influences such as changes to family or health concerns.



US Census Population changes ranging from 2000 through 2010

The overall school population saw a decrease between 2000 and 2010 from 2,505 to 2,398 with the largest decreases occurring in the younger students (USA.com, 2013). The data also reveals a larger portion of students in high school and attending college



Source: USA.com

Economy

The Northwest Arctic Region’s population is primarily Inupiat Eskimo, and subsistence activities are a vital part of the lifestyle. Residents rely on caribou, moose, reindeer, beluga whale, birds, four species of seals, berries, greens, and fish. With the high cost of goods, subsistence resources play an integral part of our economy.

Transportation services, oil and mineral exploration, and development are the focus of economic activity in the region. The Red Dog Mine, jointly run by the Cominco Corporation and NANA Development Corporation (NDC), is the largest zinc mine in the world. It is the largest economic project in the region, providing 360 direct jobs. Maniilaq Association, the Northwest Arctic Borough School District, NDC, and the Cominco Corporation are the largest employers in the area (Maniilaq, 2003).

The Alaska Department of Labor and Workforce Development provided the following information about regional employment: NDC is the business arm of NANA Regional Corporation, Inc. All of NANA's business operations are owned by NDC. Headquartered in Anchorage, NDC employs 11,500 individuals throughout the US and around the globe. NDC operations extend from the Arctic Circle to Australia, across the continental US, to the Middle East and the South Pacific. NDC and its subsidiaries perform in a wide variety of industries including oil and gas, mining, healthcare, hospitality, and federal and tribal sectors. Through NDC’s efforts, NANA shareholders receive a wide variety of educational, training, and employment opportunities.

	Number of workers	Percent of total employed	Female	Male
Natural Resources and Mining	169	5.6	31	138
Construction	146	4.8	17	129
Manufacturing	15	0.5	0	15
Trade, Transportation and Utilities	314	10.3	139	175
Information	63	2.1	26	37
Financial Activities	127	4.2	24	103
Professional and Business Services	302	9.9	186	116
Educational and Health Services	502	16.5	345	157
Leisure and Hospitality	64	2.1	33	31
State Government	69	2.3	43	26
Local Government	1,141	37.6	562	579
Other	123	4.1	40	83
Unknown	1	0	0	1

Source: US Census

In 2012, NRC’s board of directors distributed a dividend totaling \$11.8 million dollars at a rate of \$7.72 per share. Dividends are issued annually in November. In addition, in 2012, the NANA Elders’ Settlement Trust trustees voted to issue a \$2,000 per elder distribution. This distribution totaled \$1.3 million. The trust provides a regular, modest, special distribution to assist shareholders who are 65 or older.

As with the rest of Alaska, the Permanent Fund Dividend plays an important role in the Northwest Arctic Region’s economy. The 2014 PFD paid out to each eligible adult and child in Alaska. Over the course of its history PFDs have ranged from a low of \$331.29 in 1984 to a high of \$2,069 in 2008. The PFD frequently allows residents to pay overdue or unexpected bills, and make major purchases they would otherwise be unable to afford. Some put money into college or other savings plans, as well.

Energy

The Northwest Arctic leads the United States in Arctic renewable energy exploration. As a region, we are continuously pursuing all possible ways to lower the cost of living to preserve and sustain the communities. In an effort to reduce the cost of living and dependence on diesel fuels the Borough has looked into wind and solar energy, as well as bio-mass, LED lighting, and hydrology. As we move forward, the Northwest Arctic Borough has also begun looking into the possibility of village interties to expand the options of the communities in the villages.

Wind

Wind projects in the Arctic begin with a feasibility study to determine the viability of a wind in our communities. Analytics include the cost of energy, the size of a community's electrical burden and capacity, the price of fuel, foundation costs, requirements of transmission lines and other site-specific variables. Location also plays a role in the costs associated with shipping the wind turbines to the communities for assembly and install.



*Kotzebue Electric Wind Project, Department of Energy visit
August 2015*

Six of the communities in the Northwest Arctic Region have a Wind Power Class of 3-5. A grant of \$11 million dollars from the Alaska Energy Authority allowed for the Borough to study, analyze, and install wind towers in Buckland, met towers in Noorvik, as well as begin the erection of a wind tower in Deering.

Solar



*Buckland Solar Energy Project Commissioning, August 2015
Photo Courtesy of Dean Westlake*

The Northwest Arctic has an enriched amount of sunlight in comparison to the lower 48. A project to capture that energy began with the Northwest Arctic Borough's (NAB) partnership with NANA Regional Corporation (NRC). The funding came from the Federal Coastal Impact Assistance Program for the four year project. Solar arrays were placed at community buildings, washeterias, and

water treatment plants in the Northwest Arctic. The solar PV systems will typically cost, between, \$75,000 to \$85,000. Eight communities, as of August 2015, are equipped with 10 kW solar systems. To date, approximately 76.5 megawatts have been generated by the arrays in the six communities. At an average of \$0.66/kwh, the savings to our communities have already totaled \$50,490.00.

LED Street Lighting



A project to test new LED technology has concluded. What we learned from this project is that it is possible to reduce the cost of energy for community buildings by up to 50%, just by changing the lighting used; in addition to that reduction, we were also able to lower the operating cost for the city government, reduce the amount of diesel oil imported, reduce greenhouse gas emissions like CO₂, and reduce O&M cost for the streetlights. Savings to

date are at \$120,848.00 in electricity alone.

Education/Workforce Development

Serving over 2000 children in Northwest Alaska, just north of the Arctic Circle, the Northwest Arctic Borough School District employs over 160 teachers in the regions eleven villages. By supporting both Inupiaq and Western standards of success in our classrooms, we are preparing children to take an active role in this quickly changing corner of the last frontier.

The primary function of each of the Northwest Arctic Borough School District departments is to support the overall educational process of our students. Departments work together and with individual schools to improve the services offered to our students. A continuing goal has been to broaden our curriculum by incorporating the arts into our classrooms and to offer Career Technology Education courses to our



Information on Qualifications of Teachers in the District

Teacher Qualifications				
Number of Teachers With Highest Degree:	<i>Bachelors</i>	<i>Masters</i>	<i>Ed Specialist</i>	<i>Doctorate</i>
	106	44	0	1

Percentage of Classes Taught by Highly Qualified Teachers		State Target: 100%
District All Schools	Low-Poverty Schools	High-Poverty Schools
		84.5%

secondary students (Northwest Arctic School District, 2013-2014 Report Card Data).

Attendance, Graduation and Dropout Rates

<i>Subgroup</i>	<i>Attendance Rate</i>	<i>Graduation Rate</i>	<i>Dropout Rate</i>
All Students	88.22%	57.26%	4.02%
Male	88.06%	46.30%	4.65%
Female	88.39%	66.67%	3.38%
African American	94.88%	N/A	N/A
Alaska Native/American Indian	88.00%	56.25%	3.93%
Asian/Pacific Islander	87.39%	100.00%	0.00%
Caucasian	93.12%	100.00%	3.85%
Hispanic	89.83%	N/A	N/A
Two or More Races	90.17%	0.00%	14.29%
Economically Disadvantaged	87.89%	57.47%	4.39%
Not Economically Disadvantaged	89.51%	56.67%	3.11%
Students With Disabilities	87.86%	29.41%	4.50%
Students Without Disabilities	88.28%	62.00%	3.93%
Limited English Proficient	85.83%	34.38%	5.96%
Not Limited English Proficient	88.79%	65.88%	2.87%
Migrant Students	89.46%	82.61%	2.48%
Not Migrant Students	87.24%	40.84%	5.35%

Mathematics

All Grades	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10		
<i>Subgroup</i>	<i>Advanced Count</i>	<i>Advanced Percent</i>	<i>Proficient Count</i>	<i>Proficient Percent</i>	<i>Below Proficient Count</i>	<i>Below Proficient Percent</i>	<i>Far Below Proficient Count</i>	<i>Far Below Proficient Percent</i>	<i>Total Tested</i>	<i>Percent Tested</i>
All Students	164	14.60%	317	28.23%	235	20.93%	407	36.24%	1123	98.94%
Male	73	13.08%	140	25.09%	130	23.30%	215	38.53%	558	98.59%
Female	91	16.11%	177	31.33%	105	18.58%	192	33.98%	565	99.30%
African American	2	33.33%	1	16.67%	3	50.00%	0	0.00%	6	100.00%
Alaska Native/American Indian	134	12.68%	300	28.38%	225	21.29%	398	37.65%	1057	98.88%
Asian/Pacific Islander	*	*	*	*	*	*	*	*	2	100.00%
Caucasian	22	53.66%	11	26.83%	2	4.88%	6	14.63%	41	100.00%
Two or More Races	5	29.41%	5	29.41%	4	23.53%	3	17.65%	17	100.00%
Economically Disadvantaged	104	11.75%	248	28.02%	195	22.03%	338	38.19%	885	98.99%
Not Economically Disadvantaged	60	25.21%	69	28.99%	40	16.81%	69	28.99%	238	99.58%
Students With Disabilities	3	1.94%	19	12.26%	29	18.71%	104	67.10%	155	100.00%
Disabled With Accommodations	3	2.56%	13	11.11%	20	17.09%	81	69.23%	117	100.00%
Students Without Disabilities	161	16.63%	298	30.79%	206	21.28%	303	31.30%	968	98.88%
Limited English Proficient	3	1.01%	46	15.54%	72	24.32%	175	59.12%	296	99.00%
Not Limited English Proficient	161	19.47%	271	32.77%	163	19.71%	232	28.05%	827	98.92%
Migrant Students	82	16.27%	167	33.13%	115	22.82%	140	27.78%	504	99.21%
Not Migrant Students	82	13.25%	150	24.23%	120	19.39%	267	43.13%	619	98.88%

2013-2014 Standards Based Assessments (SBA)

Reading

All Grades	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10		
<i>Subgroup</i>	<i>Advanced Count</i>	<i>Advanced Percent</i>	<i>Proficient Count</i>	<i>Proficient Percent</i>	<i>Below Proficient Count</i>	<i>Below Proficient Percent</i>	<i>Far Below Proficient Count</i>	<i>Far Below Proficient Percent</i>	<i>Total Tested</i>	<i>Percent Tested</i>
All Students	106	9.41%	420	37.30%	371	32.95%	229	20.34%	1126	99.21%
Male	41	7.32%	176	31.43%	205	36.61%	138	24.64%	560	98.94%
Female	65	11.48%	244	43.11%	166	29.33%	91	16.08%	566	99.47%
African American	1	16.67%	4	66.67%	1	16.67%	0	0.00%	6	100.00%
Alaska Native/American Indian	72	6.79%	401	37.79%	363	34.21%	225	21.21%	1061	99.25%
Asian/Pacific Islander	*	*	*	*	*	*	*	*	2	100.00%
Caucasian	27	65.85%	8	19.51%	4	9.76%	2	4.88%	41	100.00%
Two or More Races	5	31.25%	6	37.50%	3	18.75%	2	12.50%	16	100.00%
Economically Disadvantaged	53	5.98%	320	36.08%	314	35.40%	200	22.55%	887	99.22%
Not Economically Disadvantaged	53	22.18%	100	41.84%	57	23.85%	29	12.13%	239	100.00%
Students With Disabilities	0	0.00%	16	10.39%	61	39.61%	77	50.00%	154	99.35%
Disabled With Accommodations	0	0.00%	13	11.11%	48	41.03%	56	47.86%	117	100.00%
Students Without Disabilities	106	10.91%	404	41.56%	310	31.89%	152	15.64%	972	99.28%
Limited English Proficient	1	0.34%	70	23.65%	145	48.99%	80	27.03%	296	99.00%
Not Limited English Proficient	105	12.65%	350	42.17%	226	27.23%	149	17.95%	830	99.28%
Migrant Students	37	7.33%	224	44.36%	155	30.69%	89	17.62%	505	99.41%
Not Migrant Students	69	11.11%	196	31.56%	216	34.78%	140	22.54%	621	99.20%

Science

All Grades										
Grade 4										
Grade 8										
Grade 10										
Subgroup	Advanced		Proficient		Below Proficient		Far Below Proficient		Total Tested	Percent Tested
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
All Students	8	7.14%	25	22.32%	34	30.36%	45	40.18%	112	89.60%
Male	6	10.53%	14	24.56%	18	31.58%	19	33.33%	57	95.00%
Female	2	3.64%	11	20.00%	16	29.09%	26	47.27%	55	90.16%
Alaska Native/American Indian	7	6.42%	23	21.10%	34	31.19%	45	41.28%	109	90.83%
Caucasian	*	*	*	*	*	*	*	*	3	75.00%
Economically Disadvantaged	6	6.90%	15	17.24%	26	29.89%	40	45.98%	87	90.62%
Not Economically Disadvantaged	2	8.00%	10	40.00%	8	32.00%	5	20.00%	25	96.15%
Students With Disabilities	*	20% or fewer	*	20% or fewer	*	20% or fewer	*	80% or more	11	84.62%
Disabled With Accommodations	*	*	*	*	*	*	*	*	4	100.00%
Students Without Disabilities	8	7.92%	25	24.75%	32	31.68%	36	35.64%	101	94.39%
Limited English Proficient	0	0.00%	1	2.78%	11	30.56%	24	66.67%	36	92.31%
Not Limited English Proficient	8	10.53%	24	31.58%	23	30.26%	21	27.63%	76	92.68%
Migrant Students	5	10.42%	12	25.00%	15	31.25%	16	33.33%	48	100.00%
Not Migrant Students	3	4.69%	13	20.31%	19	29.69%	29	45.31%	64	85.33%

Writing

All Grades										
Grade 3										
Grade 4										
Grade 5										
Grade 6										
Grade 7										
Grade 8										
Grade 9										
Grade 10										
Subgroup	Advanced		Proficient		Below Proficient		Far Below Proficient		Total Tested	Percent Tested
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
All Students	64	5.72%	392	35.03%	492	43.97%	171	15.28%	1119	98.59%
Male	27	4.86%	143	25.72%	273	49.10%	113	20.32%	556	98.23%
Female	37	6.57%	249	44.23%	219	38.90%	58	10.30%	563	98.95%
African American	1	16.67%	4	66.67%	1	16.67%	0	0.00%	6	100.00%
Alaska Native/American Indian	46	4.36%	361	34.25%	480	45.54%	167	15.84%	1054	98.60%
Asian/Pacific Islander	*	*	*	*	*	*	*	*	2	100.00%
Caucasian	14	34.15%	20	48.78%	4	9.76%	3	7.32%	41	100.00%
Two or More Races	2	12.50%	7	43.75%	6	37.50%	1	6.25%	16	100.00%
Economically Disadvantaged	34	3.85%	286	32.43%	416	47.17%	146	16.55%	882	98.66%
Not Economically Disadvantaged	30	12.66%	106	44.73%	76	32.07%	25	10.55%	237	99.16%
Students With Disabilities	0	0.00%	15	9.80%	75	49.02%	63	41.18%	153	98.71%
Disabled With Accommodations	0	0.00%	14	11.02%	61	48.03%	52	40.94%	127	100.00%
Students Without Disabilities	64	6.63%	377	39.03%	417	43.17%	108	11.18%	966	98.67%
Limited English Proficient	1	0.34%	38	12.93%	167	56.80%	88	29.93%	294	98.33%
Not Limited English Proficient	63	7.64%	354	42.91%	325	39.39%	83	10.06%	825	98.68%
Migrant Students	25	4.95%	202	40.00%	217	42.97%	61	12.08%	505	99.41%
Not Migrant Students	39	6.35%	190	30.94%	275	44.79%	110	17.92%	614	98.08%

Two-Year School-level Trend data

(2012-2013 & 2013-2014)
STUDENTS SCORING PROFICIENT OR ABOVE BY GRADE LEVEL

Grade	Percent Proficient							
	Reading		Writing		Mathematics		Science	
	Previous	Current	Previous	Current	Previous	Current	Previous	Current
All Grades	44.54%	46.71%	40.30%	40.75%	43.06%	42.83%	21.98%	21.99%
3rd Grade	52.55%	53.01%	44.60%	48.80%	46.72%	53.01%	N/A	N/A
4th Grade	30.77%	45.71%	32.87%	46.43%	41.55%	49.29%	12.95%	15.11%
5th Grade	45.07%	38.85%	45.77%	36.23%	50.00%	40.15%	N/A	N/A
6th Grade	37.59%	40.71%	30.50%	35.00%	43.26%	44.29%	N/A	N/A
7th Grade	42.11%	37.86%	38.35%	32.14%	39.10%	33.33%	N/A	N/A
8th Grade	51.97%	61.65%	44.08%	42.42%	46.05%	41.67%	22.38%	22.90%
9th Grade	52.82%	52.70%	44.76%	39.73%	42.25%	38.51%	N/A	N/A
10th Grade	42.22%	41.67%	41.57%	44.44%	30.77%	40.34%	36.59%	29.46%

Alaska Technical Center is an adult training center serving all of Alaska and is located in Kotzebue. As a part of the Northwest Arctic Borough School District, they offer student-focused industry backed curricula preparing students for careers in Alaska’s high-demand fields. The Alaska Technical Center ensures success by providing any and all support a student needs to excel in training and work placement.



Emergency and Disaster Preparedness

The Northwest Arctic Borough Public Services Coordinator is responsible for coordinating the activities of the Northwest Arctic Local Emergency Planning Committee (NALEPC). The coordinator assists them in developing and periodically updating the borough hazards analysis, capability assessment, and emergency operations plan, and in conducting emergency exercises. The NALEPC Coordinator also receives and maintains the State of Alaska Tier II reports on behalf of the NALEPC.

Northwest Arctic Local Emergency Planning Committee



The SUPERFUND Amendments and Reauthorization Act (SARA) of 1986 was enacted into law by Congress on October 17, 1986, and contains Title III, the Emergency Planning and Community Right-to-Know Act of 1986, which establishes requirements that federal, state, and local governments and industry must implement regarding emergency planning and community right-to-know reporting on hazardous and toxic chemicals. Pursuant to Title III, the Alaska State Emergency Response Commission (SERC) has designated the area within the boundaries of the Northwest Arctic Borough as a Local Emergency planning District and has appointed a Local Emergency Planning Committee. The Committee establishes procedures for handling public requests for information, and to develop an “All Hazards” Emergency Operations Plan (EOP), which among other things must:

1. Identify all-natural hazards in the District;
2. Identify facilities containing hazardous and extremely hazardous substances (H/EHS) in reportable quantities;
3. Identify transportation routes for EHS;
4. Establish emergency response procedures for natural and man-made disasters;
5. Designate a Community Emergency Coordinator to implement the plan and register company-appointed facility representatives (for facilities not represented in the committee membership) to participate in the planning process;
6. Establish emergency notification procedures;
7. Develop methods for determining the occurrence of a release of hazardous substances;
8. Complete an inventory of community emergency equipment and identify the individual(s) responsible for it;
9. Develop evacuation plans;
10. Describe and schedule a training program for emergency response personnel;
11. Establish methods and schedules for exercising emergency response plans.

NALEPC Membership is as follows:

Category A - Elected Officials

- Seat 1. NAB Mayor - Reggie Joule
- Seat 2. Borough Assembly Designee – Peter Schaeffer

Category B - Responders

- Seat 1. Fire Department - Silvano Vivieros, Fire Chief, Kotzebue Fire Department
- Seat 2. Law Enforcement - Sgt. Duane Stone, Alaska State Troopers
- Seat 3. Emergency Medical Service - Elsie Dexter, CHA/P Maniilaq Health Services
- Seat 4. Environmental Health - John Spriggs, Maniilaq Health Center
- Seat 5. Health Provider - vacant, Maniilaq Health Center
- Seat 6. Airport/DOT – Alvin Werenke, Kotzebue Airport Manager

Category C - Media

- Seat 1. Pierre Lonewolf, KOTZ Radio Station

Category D - Community Groups

- Seat 1. Ambler - Scott Jones
- Seat 2. Buckland - Tim Gavin
- Seat 3. Deering - Ron Moto
- Seat 4. Kiana - Dan Douglas
- Seat 5. Kivalina - Austin Swan
- Seat 6. Kobuk - Alex Sheldon
- Seat 7. Kotzebue - Derek Martin
- Seat 8. Noatak - Enoch Mitchell
- Seat 9. Selawik - Joeseph Arey
- Seat 10. Noorvik - Edward “Chip” Hailstone
- Seat 11. Shungnak - Billy Lee

Category E - Facility Owner/Operator

- Seat 1. Mining - Bob Chandler, Red Dog Mine
- Seat 2. Bulk Fuel - Herman Reich, Jr., Crowley Marine Services
- Seat 3. Hospital - Barbara Spriggs, Maniilaq Health Center

Category F - Emergency Planner

- Seat 1. Aggie Jack, EMS Program Manager, Maniilaq Health Center

Category G - Transporter

- Seat 1. Commercial Transporter - VACANT

Category H - Public-at-Large

- Seat 1. NAB Citizen - Walter Downey
- Seat 2. Kristen Walker, Public Services/NALEPC Coordinator, Northwest Arctic Borough

Category J - School District

- Seat 1. John Whade

HISTORIC MUTUAL AID EMERGENCY ASSISTANCE AGREEMENT SIGNED BETWEEN THE NORTHWEST ARCTIC AND NORTH SLOPE BOROUGH

North Slope Borough and the Northwest Arctic Borough have entered into a Mutual Aid Emergency Assistance Agreement. NAB, former Assembly President Carl Weisner said, “Our Assembly recognized that under certain conditions, like an emergency disaster declaration, it is imperative to share resources to help our residents be safe.” NSB Mayor Charlotte Brower commented, “This agreement will assist in ensuring that our residents and communities are protected and declared disasters can be responded to in the most efficient and appropriate manner available. Additionally, mining has historically provided economic opportunities to our area. More mineral development is possible in the future.

The North Slope and Northwest Arctic regions have long supported each other; this agreement provides another cog in that interconnected relationship of support.” This agreement will facilitate and encourage emergency assistance between the Boroughs during a declared emergency by providing supplemental personnel, equipment, materials, or other support. NAB Mayor Reggie Joule said, “I look forward to our continued partnership with our friends and relatives to the north.”

Economic Development Opportunities, Strengths & Weaknesses **SWOT Analysis**

This region realizes the opportunities of an emerging Arctic that begins with our Borough.

There are two distinct and related opportunities for economic viability and sustainability. One opportunity is related to oil and gas exploration and development in the Chukchi Sea. This summer, Shell Oil of Alaska is exploring for oil nearby. Additionally, the North Slope of Alaska has a history of employing many of our region’s residents prior to and even during Red Dog Mine production. The oil and gas sector provides high paying jobs that allow residents to reside in their home communities and work at these remote job locations. Our residents often lack the education to fill these activities. Additionally, mining has historically provided economic opportunity to our area. More mineral development is possible in the near future.

The second opportunity of an emerging Arctic stems from the increased level of activity in the local area. The combination of federal interests related to the Coast Guard, NOAA, national defense, energy security, and availability of goods and services coming within 50 miles of our shores represent goods, increased marine and human activity, and commodities at global market prices. These combinations have the potential to increase our local market base and demand, reduce the costs of logistics from the current method of barging and air transportation, increase the demand for and partnership opportunities in the construction and development of regional and marine accessible infrastructure, such as ports. We are

proposing that a part of this will be the development of Cape Blossom. This will require a 12 mile road from the City of Kotzebue, south to a location on the southern Baldwin Peninsula. A port facility, laydown yard and bulk fuel facility would also be required.

At the proposed port, marine vessels can come into port to offload fuel, equipment, and construction supplies. Currently, those marine vessels can only get within 10 miles of Kotzebue before having to be met with shallow draft barges that pick up the cargo for that remaining short delivery. This additional handling of products and supplies increases the transportation costs of everything this region imports. The development of Cape Blossom will also accommodate the needs related to an emerging Arctic. Federal agencies, i.e., Coast Guard, defense, National Science research grantees, the international maritime transporters, and oil and mining sectors all have need to access shore based facilities. The combination of these stakeholders will expand the market base and improve the logistics of importing goods, services and commodities into northwest Alaska.

Opportunities

Emerging Arctic as a Global Asset

The Northwest region of Alaska continues to experience an increasing volume of commerce, research and development in the Arctic. The local needs of port development, energy and arctic infrastructure, transportation improvement and community development can all benefit from increased stakeholder activity and expanding the market base financing and revenue generation necessary to build large infrastructure projects.

Development of Human Capital

A critical step in a path forward is the development of human capital. There are significant economic and employment opportunities in existence where the workforce is currently imported in the education, health, and mining industries. The qualifications require college degrees and higher degrees of technical knowledge. Arctic, indigenous peoples, have survived in one of the harshest environments in the world because of the ability to be resilient and adaptive to appropriate changes. Sustainability in an emerging, global, and modern Arctic environment will require a greater degree of both traditional knowledge and Western academic achievement. This opportunity can only be realized when our youth achieve sufficient academic levels that serve as stepping stone for college, masters, doctorate, and highly trained technical degrees to qualify for employment in those available occupations.

The challenge will be to improve academic achievement across a primarily, indigenous, Alaska Native population who live in impoverished communities. The percentages of students in the local school district that currently fall below the proficient levels in reading, writing, mathematics and sciences is high. Over 60% of our children in the grades between 3rd through 10th fall below the proficient level. This limiting factor, not only challenges our youth, but creates the greatest barrier to western academic achievement and employability in the available education, healthcare, and mining industry fields.

The Northwest Arctic Borough School District provides K-12 public education in all 11 communities. Our parents, children and communities need to place a high value on education. Every child should obtain a high school diploma and a degree of academic achievement that allows him/her the ability to transition

seamlessly into college or vocational training. The Northwest Arctic School District oversees the Alaska Technical Center (ATC) and the Star of the Northwest Magnet School.

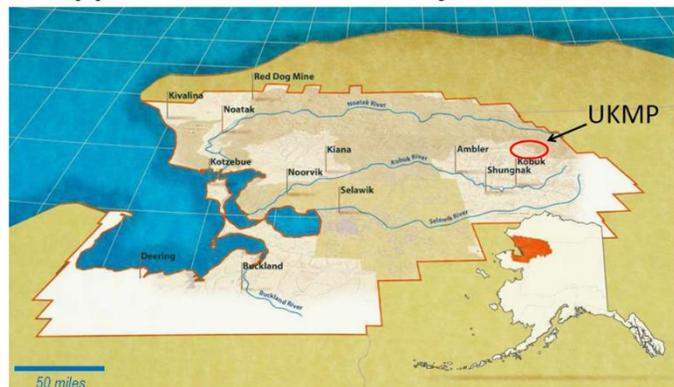
To prepare our local work force for coming development, we are in the final phases of building the Star of the Northwest Magnet School (STAR). STAR will be a residential comprehensive secondary and post-secondary school for students region-wide in grades 11 to 14. Students in the school will graduate from high school and complete up to two years of additional academic and/or vocational technical education leading to an associate of arts degree, and or vocational/technical certifications. The STAR educational curriculum was developed as a collaborative partnership between the Northwest Arctic Borough School District, Alaska Technical Center, Chukchi College, and our industry partners. The school will focus on preparing students for professional careers in our region with four career pathways to choose from; education, healthcare, resource development, and culinary arts. We plan to graduate students who are prepared for the work force by having the required skill levels needed, as well as, understanding the daily demands of a work environment. Our goal is to graduate our next generation of dedicated, driven community leaders and our own workforce.

The Alaska Technical Center established in the early 1980's has served as the only regional vocational training center, offering courses in millwright, health occupations, office occupations, construction trades, and resource development. The University of Alaska-Fairbanks has a regional outlet, the Chukchi Campus, which offers college classes locally. In addition to local course offerings, there is a wide range of on-line, audio-conference and web based classes available for any rural Alaskan. A growing number of rural Alaskans have obtained bachelor degrees without the traditional on-campus educational experience.

Mineral Extraction/Mining

This region is rich in mineral resources. There is a long history of mining and has one significant mining operation that provides private sector jobs, the Red Dog Mine. The region is highly mineralized but each project has to be large enough to financially support the development of transportation and energy infrastructure. The Alaska Industrial Development and Export Authority (AIDEA) provided a transportation link between the Red Dog Port site and the mine site to aid in the development of the Red Dog Mine. Currently AIDEA is engaged in the Environmental Impact Statement (EIS) of the Ambler Mining District Industrial Access Road (AMDIAR) which proposes a road from the Dalton Highway west into the Upper Kobuk region to aid in the development of copper and other types of mining. Mineral development in the Ambler district would be equal in size to the Red Dog Mine operation. A significant economic and local employment opportunity for a segment of our region that is impoverished.

Upper Kobuk Mineral Project Location



Since 1989, Red Dog Operations, at the mine, has been a key contributor to Alaska's economy, creating jobs, investment and revenue, and significant economic and community benefits to Alaska's Native population.

Red Dog Operations provides significant economic benefits to the State of Alaska and is a prime example of how mining benefits Alaskans through taxes, direct employment, direct purchases and shareholder dividends.

- From 1989-2009, total direct and indirect economic impacts of the mine to the regional and state economy were \$921 million. In 2009 alone, the mine provided \$116 million in federal and states taxes.
- With a total payroll in 2009 of \$52 million, Red Dog Operations provides 550 full-time family-supporting jobs for the local and regional economy. The workforce typically expands in the summer for seasonal work (primarily construction). In 2010, the mine will provide over 200 additional jobs.
- To date, the total capital investment in Red Dog Operations exceeds \$1 billion.
- Under the operating agreement between Teck Alaska Incorporated and the NANA Regional Corporation, NANA receives annual royalty payments. A total of \$471 million in royalties has been paid to NANA since the agreement was signed in 1982.
- For the last five years (2005 to 2009), royalty payments to NANA totaled \$373 million. NANA shares 62 percent of the royalty payments with other Alaska Native corporations.
- The mine is the sole taxpayer in the Northwest Arctic Borough and also serves as an important source of revenue for the borough. In 2014, the borough received about \$8.1 million in lieu of taxes as a result of its agreement with Teck Alaska. Red dog provides 60% of its revenue.

In 2009, Red Dog invested \$217 million in the local and state economy purchasing goods and services from Alaskan suppliers.

Our Region needs to pursue a range of opportunities that will increase sustainability, and household income, while decrease energy and transportation costs, development of the Ambler Mining District and realize the opportunities of an emerging Arctic to expand our market base improving the import and exports of goods.

The Economic Development strategy will pursue progress in five areas:

One: Improve the academic achievement at the K-12 public education level, so our youth to advance into the next stages of their human development, resulting in local residents obtaining the appropriate degrees of education and technical skills for employment.

Two: Develop the critical infrastructure that will lower the cost of importing goods and services, thereby lowering the cost of living. The construction of critical infrastructure will provide for the inclusion of new stakeholders in an emerging Arctic, such as federal defense/security, global marine transportation, and local resource development.

Three: Meet the challenge and adapt to environmental changes, protecting our communities and residents from the effects of climate change, and maintain resiliency in a changing Arctic. Continue to maintain environmental stewardship of our lands and waters to protect local food security.

Four: Develop long term, affordable energy supplies that decrease dependence on fossil fuels, expand use of renewable energy resources and promote sustainable communities.

Five: Develop available natural resources locally, such as minerals in the Ambler Mineral District that would provide another Red Dog size operation and an additional 250-300 long-term jobs for the long term. Additionally, continued focus would be applied to the private sector economic opportunities in commercial fisheries and tourism.

Cape Blossom Road and Arctic Regional Deep Water Port

Expansion of the Marine Highway & Port of Refuge

For more than thirty years, the City of Kotzebue and other organizations have been exploring the possibility of an Arctic deep water port that will serve not only Kotzebue, but all of Alaska. With the rising cost of living in Northwest Alaska, the regional entities are pushing aggressively to move the Cape Blossom Road and Regional Port from concept to reality.

The first step in building the port is construction of a 10-mile access road from Kotzebue to Cape Blossom in order to gain access to the port site. \$20 million in funding has already been secured for this project with contributions coming from both the state and federal governments. An additional \$10 million is needed to complete the project. Construction of the road is anticipated to begin in the summer of 2013. With the road in place, the next step will be design, permitting, and construction of the port facility. The estimated cost to build the port is \$70 million.

The Cape Blossom Regional Port will help alleviate the high cost of living in the borough and provide a market access point for the abundant resources in our area. The cost of living is sixty- one percent higher in Kotzebue than in Anchorage, and costs in the outer villages are even higher. Currently Kotzebue, the hub of the Northwest Arctic Borough, receives goods by a barge and lightering service that adds significant cost to all imported goods. The Cape Blossom Regional Port will alleviate this problem and have positive economic impact on our region by reducing the cost of goods.

Kivalina Evacuation and Access Road

Kivalina is a traditional village lying precariously on a low-lying barrier island between the Chukchi Sea and



Kivalina Lagoon. The community of Kivalina will have to be relocated due to significant erosion. In the interim, a series of mitigation measures has been constructed to protect the community to the extent possible, but the community is not safe. Currently, the only way to leave the village is by plane or boat. Both of these means of escape would be dangerous, if not impossible, during a large ocean storm. Compounding the situation is the fact that the community is in a remote area, making it difficult if not impossible for outside help to reach the community in time for a successful rescue mission. The community must have a way to safely evacuate without relying on

outside help. An evacuation road meets this need. Besides being necessary to ensure the safety of our residents, this project may prevent the need for costly emergency assistance in the future.

The state has recently funded the construction of a new school on high ground near Kisimigiuktuk Hill, which is approximately eight miles inland from the existing community. There is currently no road access to the new school site. The proposed road will serve as both an evacuation road and as an access road to the new school from the village. Funding for this project is time sensitive: Kivalina has had three emergency evacuations in the past five years, two to the school for local sheltering and one out of the village entirely.

Noatak Airport and Road

The first part of this project consists of building a 28-mile gravel road that connects the village of Noatak to the Delong Mountain Transportation System, the adjacent port facilities and the Red Dog Mine. The project is known as the Noatak DMTS road project. The road will serve many useful functions, providing:

- Access to a secondary emergency airport for the mine;
- Direct transit access for the local workforce to the mine;
- Additional subsistence access to wilderness; and
- Access to bulk freight and fuel storage at the mine site.

This project is a priority of both the borough and the community of Noatak. The road will provide much needed economic relief to the area. The cost of living in Noatak is among the highest in the State because low water levels in the Noatak River prevent cheaper barge delivery of goods. Gasoline and heating oil prices range from \$10.00 to \$15.00 per gallon. The proposed road allows goods to be trucked to Noatak from the DMTS port site with huge cost savings. This road is also part of the Governor's Road to Resources program and is necessary to better support the operations of the Red Dog Mine. The estimated cost of the road project is \$50 million.

The second part of the project includes building a new runway. Due to erosion, the current Noatak airport must be relocated. Additionally, jet service to the Red Dog Mine airport is cancelled about 25% of the time due to weather conditions. To support mining in the area, the new Noatak airport should be a 7,000 foot jet-capable runway so that aircraft that supports mining could use this facility as an alternative when necessary. The project has \$13 million in funding but will need additionally money to complete it.

Tourism

The Northwest Arctic promises natural, serene, untouched landscape that lures in the adventurous and those that want to learn about the rich culture and lifestyles of the indigenous population that still reside here today. Cultural camps lay outside of these coastal communities and on the banks of rivers throughout this region. The camps offer a trip back in time demonstrating to how the indigenous Inupiaq of the North survived for thousands of years. Other opportunities include kayaking, guided boat tours, chartered flight tours, net setting, fish drying and harvesting, river rafting, walking on the Kobuk Sand Dunes, and views of the natural untouched land including some of the most stunning, fragile, and pristine areas in the United States. Within the last year, the Borough has expanded the certifications and capabilities of local entrepreneurs to enhance and grow these experiences, options, and services. As interest grows, so will the economy of our villages, and tourism opportunities in the North.

Energy

Regional priority energy actions were identified from the AEA Community Deployment scenarios, stakeholder interviews, and input from the Energy Steering Committee and public meetings. The priorities were categorized into short term (1-5 years), medium term (5-10 years) and long term (over 10 years).

The overarching energy vision for the Northwest Arctic Region is to achieve a 50 percent decrease in the use of imported diesel fuels by 2050. To achieve that end, potential projects were identified and prioritized. Each of the projects addresses issues or takes advantage of opportunities to improve energy systems and reduce energy costs. The projects have gone through initial screening recognizing that grant funding is becoming scarcer and there is a need to be creative and realistic about what can be accomplished in the 20 year planning horizon. It is important that analysis of existing wind, heat recovery, solar and other energy saving measures be done to provide lessons learned for future projects.

Every aspect of our lives is impacted by the cost of energy. Our region of the United States has among the highest costs of living, in large part because of the cost of energy. Each village currently generates electricity on a stand-alone diesel generator operated with the high cost of diesel fuel. A retail gallon of gasoline and heating fuel is as low as \$7.00 and as high as \$11.00. A kilowatt hour of electricity is as low as \$0.48 and as high as \$0.96 before the State of Alaska Power Cost Equalization subsidy that supports up to 500 kilowatt hours of household consumption per month. All local businesses receive their goods by air transportation. The cost of air freight and passenger travel is very expensive. The freight costs from Anchorage-Kotzebue, the regional hub is \$0.90 per pound. From Kotzebue to any of our local communities is an additional \$1.00 per pound. The cost of passenger travel ranges from \$324.00 roundtrip within 75 mile radius of Kotzebue to \$504.00 within 150 mile radius of Kotzebue.

Alaska's Northwest Arctic village's energy prices are much higher than the national average and among the highest in Alaska. Residents purchase diesel fuel for an average of about \$8.00 per gallon and is used as the primary heating source. With the soaring cost of energy, many villagers find themselves in a position of having to choose between heating their homes and feeding their families.

This region needs to continue to work with Teck-Red Dog Mine, its' fuel contractor, and expanded fuel storage at appropriate port locations to capitalize on the scale of economy in fuel purchasing at the Mine. The cost savings from the cooperative purchase and logistics of transporting the large volumes of fuel can reduce the cost of fuel landed in a community.

The leadership in the region has been proactive in seeking alternative sources of energy and formed an energy steering committee which has been active since 2008. Northwest Alaska has many options when it comes to producing renewable energy including wind, biomass (wood), solar, hydro and geothermal potential. The region's leaders are working together with state and federal organizations to explore and develop alternative sources of energy to reduce the energy costs in the Northwest Arctic. (NRC, 2010).⁶

Vision

The vision is for the Northwest Arctic region to be 75 percent reliant on regionally available energy sources, both renewable and non-renewable, for heating and generation purposes by the year 2030.

- 25 percent decrease of imported fossil fuels by 2015
- 50 percent decrease of imported transportation fossil fuels by 2020
- 75 percent decrease of imported fossil fuels by 2030

Weaknesses & Threats

Residents of Northwest Alaska experience some of the highest cost of living expenses in the nation. There are a wide range of factors that lead to the high costs including; a small market base, approximately 7800 residents, distributed over 11 communities that are spread over a large geographic area. These communities are isolated and the costs of operating public services such as, local government, education, public safety, water and sewer facilities, electricity services, telecommunications, transportation, local road and landfill maintenance is severely challenged.

High Cost Arena

This rural, remote region of America has one of the highest costs of living in the nation. The transportation and import of goods, fuels and supplies drive the high cost of living. Our rural, remote region is challenged by a limited market base, high cost for infrastructure development and the dependence on public funding through grants and bonding to build the necessary infrastructure that would decrease the costs of imported goods and support new resource development and economic opportunity. A small local market

of 7800 population spread out over 11 villages challenges the ability of the local market and private investment to economically develop projects in a traditional investment/recovery/profitability structure. Each of our isolated villages have challenges unique to their local, geography, and size. Four villages, Ambler, Shungnak and Kobuk on the Kobuk River and Noatak on the Noatak River have river channels that have diverted away from the village. These villages no longer get annual barge services to bring in fuel supplies, heavy equipment, building materials and other necessary supplies at the most cost effective transportation rates, instead those villages have to fly in supplies at a much higher cost. Three villages, Noorvik, Selawik and Buckland have poor soil and geologic conditions that challenges construction, operation and maintenance costs for local infrastructure. Some communities have limited access to gravel to build stable infrastructure. The addition of a regional port facility would improve the logistics of supply chains into Northwest Alaska.

Northwest Arctic Borough Regional Energy Costs					
	Gasoline/ gal.	Stove Oil/ gal.	Propane/ 23 gal.	kWh (1-500)	kWh (500-700)
Kotzebue	6.80	6.16	198.28	0.18	0.45
Ambler	11.07	11.33	N/A	0.21	0.61
Buckland	3.00	3.00	275.00	0.20	0.47
Deering	6.75	6.75	285.00	0.35	0.75
Kiana	6.50	6.00	N/A	0.21	0.57
Kivalina	6.72	6.45	404.00	0.20	0.56
Kobuk	10.03	9.53	N/A	0.21	0.60
Noatak	9.99	9.99	N/A	0.22	0.77
Noorvik	8.03	7.60	307.00	0.21	0.57
Selawik	8.25	7.99	No Current Price	0.20	0.52
Shungnak	9.00	9.00	N/A	0.21	0.60

Average Cost of Gasoline per Gallon Nationally: **\$2.77**

Average Cost of Diesel per Gallon Nationally: **\$2.82**

Average Cost of Gasoline per Gallon in Alaska: **\$3.47**

Average Cost of Diesel per Gallon in Alaska: **\$3.45**

*Source: AAA

National Average Revenue/Sales per kWh: **\$0.1264/kWh**

*Source: US Energy Information Agency

Infrastructure

The region as a whole and individual communities lack the level of infrastructure at appropriate locations to capitalize on cost effective methods to import fuel, materials, equipment and goods and export natural resources. From a regional perspective there has long been a need for a road system to a deeper marine port facility. A deep water port would reduce the cost of transportation into the region and open new opportunity. The region needs lower cost electricity, a regional power grid would allow for local renewable and non-renewable resources to generate power which can be put on the grid moved throughout the region. The region needs a transportation corridor from the interior Alaska Dalton Highway west to the Ambler mining district to support the development of the upper Kobuk Mineral Project.

Each of our isolated villages have challenges unique to their local, geography, and size. Four villages, Ambler, Shungnak and Kobuk on the Kobuk River and Noatak on the Noatak River have river channels that have diverted away from the village. These villages no longer get annual barge services to bring in fuel supplies, heavy equipment, building materials and other necessary supplies at the most cost effective transportation rates, instead those villages have to fly in supplies at a much higher cost. Three villages, Noorvik, Selawik and Buckland have poor soil and geologic conditions that challenges construction, operation and maintenance costs for local infrastructure. Some communities have limited access to gravel to build stable infrastructure.

Village Challenges

Each rural village is challenged by the high cost of fuel for home heating, unleaded gasoline, electric generation and operating public utilities and businesses. The high cost of fuel impacts every entity, household and resident in the region. About 1200 of the 8000 borough residents have no or limited barge service available so they have to get air transported fuel at a much higher cost. In those communities a retail gallon of home heating or unleaded gasoline is \$9.99. The Northwest Arctic Borough worked with Teck-Alaska, the largest regional buyer of fuel, village based fuel retailers, and marine transportation companies to organize a regional cooperative fuel purchase. We are too late for the summer 2013 season but will continue to work for the 2014 season and beyond.

High transportation costs also impacts each community construction projects of vital public facilities. There is a shortage of residential housing opportunities for young families. Public facilities such as city and tribal offices are inadequate and falling apart. Local roads primarily constructed with silt materials get damaged after each spring melt and fall rainy season. Not all communities have access to gravel sources or the heavy equipment necessary to mine gravel for local transportation improvements.

Each rural village has limited job opportunities. During the school year, the school provides the highest number of jobs. Year round employment is provided by the City government, tribal government, local public utilities for power, water and sewer, retail store employees and U.S. postal service. A varying percentage of village based employees work at the Red Dog which is remote site and amounts to about 6-8 months at the jobsite.

Climate Change, Coastal Erosion

Our Arctic area is comprised of 36,000 square miles, predominantly north of the Arctic Circle. This region of the Arctic continues to experience many changes related to climate, the environment, permafrost, seasons, in both coastal and interior regions. These climate change impacts are most commonly expressed as coastal erosion, river erosion, flooding, and areas of land subsiding as permafrost melts below the surface. One community, Kivalina, on the Northwest coastline has an eroding landmass that threatens every segment of its' community infrastructure. There are communities along river systems where large areas of riverbank have eroded into the river as permafrost is exposed to the surface. Noatak is threatened by this erosion, the riverbank is now within 200' of the airport. The airport is the lifeline for all supplies coming into the community and for medical evacuations since communities have only limited medical services.

The changing climate has also impacted temperatures, fall freeze up, the spring ice thaw, and ice thickness. Most communities and residents are dependent on the natural resources of fish, game and plants as part of the local diet. Each of the four seasons experience delays transitioning from one to the

next, thereby disrupting people, and natural resources. The fall ice freeze up is now happening in late October. The warmer temperature disrupts the migration of the caribou that residents depend on as a primary source of meat. The late freeze up and warmer temperatures does not allow the ice to freeze thick enough, making for unsafe conditions for local travel. Thick ice platforms have been the protection against coastal erosion. Those same ice platforms have also historically served as local transportation corridors.

The U.S. Global Change Research Program reports that:

1. Arctic summer sea ice is receding faster than previously projected and is expected to virtually disappear before mid-century. This is altering marine ecosystems and leading to greater ship access, offshore development opportunity, and increased community vulnerability to coastal erosion.
2. Most glaciers in Alaska and British Columbia are shrinking substantially. This trend is expected to continue and has implications for hydropower production, ocean circulation patterns, fisheries, and global sea level rise.
3. Permafrost temperatures in Alaska are rising, a thawing trend that is expected to continue, causing multiple vulnerabilities through drier landscapes, more wildfire, altered wildlife habitat, increased cost of maintaining infrastructure, and the release of heat-trapping gases that increase climate warming.
4. Current and projected increases in Alaska's ocean temperatures and changes in ocean chemistry are expected to alter the distribution and productivity of Alaska's marine fisheries, which lead the U.S. in commercial value.
5. The cumulative effects of climate change in Alaska strongly affect Native communities, which are highly vulnerable to these rapid changes but have a deep cultural history of adapting to change.

Climate Change-Infrastructure

Over the last forty years, Arctic infrastructure has expanded exponentially. Communities that once had simple log and wooden frame homes, a single school facility for grades up the 8th grade, a one room post office, a small local government office and simple health care providers offices have grown. Each of our communities now have an electric/telecommunications grid, most have piped water and wastewater systems, satellite and line of sight telecommunications, modern public school facilities, large health care facilities, airport runways, bulk fuel facilities, local government offices, and a growing number of modern residential houses. A majority of this infrastructure is 30 years old. In the ensuing years, much has been learned in the design and engineering for Arctic construction. In the Arctic, on permafrost areas there is constant ground movement. The use of constructing on piling, thermo-siphons and freeze-back pile have become more common place than the use of post and pads. The use of piling in Arctic construction creates an additional significant expense. In addition, to the cost of materials transportation, labor, mobilization and de-mobilization of equipment, and the timeframe it takes to plan and get to completed construction. Climate change adds another degree in construction uncertainty as permafrost and soils conditions continue to change.

Alaska differs from most of the rest of the U.S. in having permafrost – frozen ground that restricts water drainage and therefore strongly influences landscape water balance and the design and maintenance of infrastructure. Permafrost near the Alaskan Arctic coast has warmed 4°F to 5°F at 65 foot depth since the late 1970s and 6°F to 8°F at 3.3 foot depth since the mid-1980s. In Alaska, 80% of land is underlain by permafrost, and of this, more than 70% is vulnerable to subsidence upon thawing because of ice content that is either variable, moderate, or high. Uneven sinking of the ground in response to permafrost thaw is estimated to add between \$3.6 and \$6.1 billion (10% to 20%) to current costs of maintaining public

infrastructure such as buildings, pipelines, roads, and airports over the next 20 years. In rural Alaska, permafrost thaw will likely disrupt community water supplies and sewage systems, with negative effects on human health. (U.S. Global Change Research Program; nca2014)

Economic Development Strategy

The mission statement for economic development, as stated by the Northwest Arctic Borough Assembly & Commission, is to promote development that is consistent, whenever possible, with the traditional culture and values of the region. Despite the fact that traditional culture is based on a subsistence, non-cash culture, we believe that preservation of many of the values of that life-style are conducive to the economic well-being of the present and future residents of the Borough. Beyond that, our plan is focused on assisting local residents in filling a greater number of existing jobs, expanding the number of job opportunities, preparing our work force to take full advantage of those new opportunities, and reducing the cost of living within the region.

In the ten villages outside of Kotzebue (Kivalina, Noatak, Kiana, Noorvik, Ambler, Shungnak, Kobuk, Selawik, Buckland and Deering), 65% of the working age population does not have full-time employment at this time. These villages currently have between 15 and 45 full-time jobs available, frequently with the school, city and village governments, and/or local stores. Kotzebue, on the other hand, has an abundance of jobs, and there are generally from 40 to 60 vacant positions. The Red Dog Mine employs about 100 residents of the region, which represent about 20% of the mine's workforce. Arts and crafts provide a full-time equivalent income for less than 10 residents of the region and a supplemental income for at least 100 others. Construction jobs on a variety of projects including schools, housing, roads, and other facilities provide temporary jobs that fluctuate in number from year to year. The number of tourism-related visits to the region has declined over the last decade. In June of 2003, there were 155 open temporary assistance cases in the region and at least twice that number of food stamp recipients.

Regional Implementation Action Plan

As stated previously, in the Arctic we face unique challenges. As this Borough works toward adaptation and resiliency, we also continue the focus on the need for responsible development for the long-term viability, sustainability, and growth of our communities. This region lacks essential infrastructure and access to basic services that many other communities take for granted; however, we have formed a unique leadership team that continues to foster regional unity, strategic stewardship, and innovative action planning for growth and development.

It is through the Northwest Arctic Leadership Team (NWALT), a partnership among Maniilaq Association, NANA Regional Corporation, the Northwest Arctic Borough, and the Northwest Arctic Borough School District, that we will maximize resources and reduce duplication of efforts to address issues affecting the people of Northwest Alaska while honoring and perpetuating our Iñupiat cultural heritage. NWALT will continue to meet quarterly and review the strategic goals and objectives, as well as performance measurements and implementation plans.

Strategic Plan: Goals and Objectives

Obligation: Education & Workforce Development

Strategic Goal I

Increase graduation rates and decrease dropout rates

Action Plan:

I. Explore district curriculum for place-based education

Expected timeframe: October 2015 through October 2016

Performance Measurement: School District, Chukchi College, and Immersion Schools working grouped formed; next steps established.

Responsible Party: Northwest Arctic Borough School District, Chukchi College, and Nikaitchuat Immersion School

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, Nikaitchuat Immersion School

Impact Objective: The working group will establish next steps, priorities, tasks and responsible parties for completion of tasks. Overreaching objective is to immerses learners in heritage, cultures, backgrounds, opportunities, and experiences and use these components as an underpinning for language arts, mathematics, social studies, sciences, and other subjects across their curriculum; while emphasizing learning through participation in plans for the local school and/or the communities.

II. Increase in language and culture taught in and after school

Expected timeframe: October 2015 through October 2018

Performance Measurement: Expand immersion school to the 6th grade. Expand NAB science program to include cultural component.

Responsible Party: Northwest Arctic Borough and Nikaitchuat Immersion School

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, Nikaitchuat Immersion School

Impact Objective: Maximize the students Inupiaq language proficiency while providing a rich academic environment that will develop the students' ability to work successfully in multiple cultural settings. The immersion schools will offer a culturally diverse experience for our students that focuses on our heritages and traditions. Enrich the student's sense of belonging and self.

Strategic Goal II

Provide career pathways & accessible methods

Action Plan:

I. Implement workforce readiness program in school

Expected timeframe: October 2015- October 2017

Performance Measurement: Target one school to begin implementation of readiness program

Responsible Party: Northwest Arctic Borough and Northwest Arctic School District

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, and/or Nikaitchuat Immersion School.

Impact Objective: An established program will take into account an individual's physical, social, emotional, and intellectual development that will involve parents or guardians and will prepares children to be ready for school. Students will excel with a stronger foundation before entering grade school.

II. Explore advancement of Financial Aid Consortium

Expected timeframe: January 2016- January 2017

Performance Measurement: Workgroup formed with entities that have scholarships programs in region, next steps and priorities established

Responsible Party: Northwest Arctic Borough, Maniilaq Association, Kotzebue Electric Association, Kotzebue IRA, and NANA Regional Corporation

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, Nikaitchuat Immersion School

Impact Objective: Students that graduate from college with student loan debt or limit their education in an attempt to control costs can be prevented by increasing access to funding and scholarships. Students can focus on their careers rather than thinking about how they will repay student loans. With less debt as a concern, students will explore fields such as law or medicine that require postgraduate training. By removing financial barriers, scholarships make education and career goals easier to obtain for our regional students.

III. Provide support to increase number of residents that complete GED

Expected timeframe: January 2016- 2018

Performance Measurement: Increase GED Completion rates by 20%

Responsible Party: NANA Regional Corporation, Alaska Technical Center, Northwest Arctic School District, and Northwest Arctic Borough

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, Nikaitchuat Immersion School

Impact Objective: Most colleges and vocational schools require a GED before students can enroll in their program. By increasing the number of residents that complete their GED, post-secondary educations become more realistic; as well as students are more engaged and ready for the workforce.

Strategic Goal III

Increase local employment

Action Plan:

I. Offer opportunities for professionals to obtain additional certifications

Expected timeframe: October 2015- June 2017

Performance Measurement: Assess interest in fields of study; establish priorities.

Responsible Party: Northwest Arctic Borough, Alaska Technical Center, and the Chukchi College

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College

Impact Objective: Campaigns will strive to build new political relationships, uniting labor, community engagement, and other organizations focused on economic development, prioritizing high-level jobs, and creating new career paths for low-income residents to fulfill the labor market we have to recruit from outside for. In establishing priorities we can begin the sustainability, and engagement of residents and employers.

II. Expand ATC/Magnet School distance delivery

Expected timeframe: October 2015-July 2018

Performance Measurement: Increase enrollment by 25%.

Responsible Party: Alaska Technical Center

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, Nikaitchuat Immersion School

Impact Objective: By increasing the number of enrolled students in the magnet school, we open up the possibilities to setting requirements for local hire by having an available and ready workforce. Utilizing public funds for the advancement of low income residents will boost the regional economy. The overarching objective is to get students trained in careers that will be needed in the near future.

III. Increase Economic & Business Development

Expected timeframe: October 2015-June 2017

Performance Measurement: Increase youth participation in small business development, increase training and funding of small business loans.

Responsible Party: Wells Fargo Bank, Northwest Arctic Borough Small Business Program, NANA Regional Corporation Economic Development department, and the State of Alaska ARDOR program

Possible Funding Sources: Federal grants, State of Alaska grants, Alaska Legislative grants, Gates Foundation, Rasmussen Foundation, Humanities Forum, and the State of Alaska ARDOR program

Possible Partnerships: Northwest Arctic Borough, Northwest Arctic Borough School District, Alaska Technical Center, Kotzebue IRA/Native Village of Kotzebue, NANA Regional Corporation, Chukchi College, Nikaitchuat Immersion School, Maniilaq Association

Impact Objective: Promote sustainable and meaningful employment opportunities to regional communities. Influence access to small business funding and management. Retention of profits within region by employing and establishing small businesses locally.

Obligation: Economic Development & Energy

Strategic Goal I

Improve energy efficiency of public & residential buildings

Action Plan:

I. Educate residents on how to reduce energy costs

Expected timeframe: July 2013-January 2018

Performance Measurement: Bi-Annual Energy Education Course taught in all 11 communities. Continue to monitor use of eco-meters in Kotzebue homes.

Responsible Party: NANA, Northwest Arctic Borough, Cold Climate Housing Research Center, Rural Cap

Possible Funding Sources: Work completed to date on the installation of eco-meters has been funded by the State of Alaska and federal grants (CIAP). Additional funding possibilities include Federal Grants, State of Alaska Grants, AHFC, AIDEA, Shell Oil of Alaska, Red Dog Mine, AEA, and Teck Cominco.

Possible Partnerships: NANA Regional Corporation, Kotzebue Electric Association, Regional City and Tribal Governments, Northwest Inupiaq Housing Authority, Alaska Village Electric Coop, Kikiktagruk Inupiat Corp, Cold Climate Housing Research

Impact Objective: Reduce energy cost to residents and business by educating them about energy consumption and ways to improve structures to reduce energy use. Reduced energy costs will give residents and business money to spend on other necessities.

II. Improve design of homes & businesses to reduce energy costs

Expected timeframe: December 2015- September 2016

Performance Measurement: Complete needs assessment working with cold climate housing research center.

Responsible Party: NANA, Northwest Arctic Borough, Cold Climate Housing Research Center

Possible Funding Sources: Funding possibilities include Federal Grants, State of Alaska Grants, AHFC, AIDEA, Shell Oil of Alaska, Red Dog Mine, AEA, and Teck Cominco.

Possible Partnerships: NANA Regional Corporation, Kotzebue Electric Association, Regional City and Tribal Governments, Northwest Inupiaq Housing Authority, Alaska Village Electric Coop, Kikiktagruk Inupiat Corp, Cold Climate Housing Research

Impact Objective: Completion of the housing needs assessment will provide a framework to seek grant funds for communities. Implementation of the needs assessment will reduce energy costs to our residents and regional entities. Reduced energy costs will give residents and business money to spend on other necessities.

III. Implement LED lighting

Expected timeframe: Started May 2015 with installation of LED street lights. Expected completion date May 2016. LED public building lights project to begin May 2016 with an expected completion of May 2017.

Performance Measurement: All Village and City streetlights and public buildings changed over to LED lighting

Responsible Party: Northwest Arctic Borough and Kotzebue Electric Association.

Possible Funding Sources: Phase 1 LED streetlights was funded by the State of Alaska and Conoco Philips. Seeking funding for Phase 2 public buildings. Additional funding possibilities include Federal Grants, State of Alaska Grants, AHFC, AIDEA, Shell Oil of Alaska, Red Dog Mine, AEA, and Teck Cominco.

Possible Partnerships: NANA Regional Corporation, Kotzebue Electric Association, Regional City and Tribal Governments, Alaska Village Electric Coop, Kikiktagruk Inupiat Corp

Impact Objective: The LED street lighting project is expected to save all the communities a combined \$120,000 annually. The public buildings light project is expected to save the communities 50% on their energy costs. This cost savings will allow the respective entities to utilize the funds for other public service needs.

Strategic Goal II

Reduce cost of gasoline & diesel fuel

Action Plan:

I. Increase capacity for bulk fuel by addressing bulk fuel storage, logistics & transportation issues

Expected timeframe: October 2008-January 2018

Performance Measurement: Assess needs and apply for three grants to improve bulk fuel storage, logistics and transportation concerns. Negotiate government fuel rate with Department of Energy.

Responsible Party: NANA, Northwest Arctic Borough, Department of Energy

Possible Funding Sources: Work on this project has been funded by NAB and NANA. Other possible funding opportunities include Federal Grants, State of Alaska Grants, AIDEA, Shell Oil of Alaska, Red Dog Mine, AEA, and Teck Cominco.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Vitas Marine, Crowley Marine, Federal Government, and Denali Commission.

Impact Objective: Reduce energy cost to residents and business by buying fuel in bulk and improving the fuel transportation network. Reduced energy costs will give residents and business money to spend on other essential public services and business opportunities.

Strategic Goal III

Increase integration of alternative energy

Action Plan:

I. Continue to seek funding, opportunities, and the monitoring of renewable energy projects

Expected timeframe: January 2015 to January 2017

Performance Measurement: Continue to collect wind energy data from the MET tower in Noorvik which could supply wind energy to 3 communities. Evaluate wind capacity and intertie feasibility, seek grant funding for construction.

Continue to explore biomass options and monitor completed biomass project in Kobuk. Complete biomass project at Maniilaq and the Ambler washeteria.

Continue to monitor solar arrays on water treatment plants in 8 communities and complete construction in remaining 3 communities.

Apply for at least three applications for grants/funding for alternative energy projects

Responsible Party: NANA, Northwest Arctic Borough, KEA, Bering Straits, Maniilaq, ANTHC

Possible Funding Sources: Work completed to date has been funded by State of Alaska and federal grants. Additional funding opportunities include additional Federal Grants, State of Alaska Grants, AHFC, AIDEA, Shell Oil of Alaska, Red Dog Mine, AEA, and Teck Cominco.

Possible Partnerships: NANA Regional Corporation, Kotzebue Electric Association, Regional City and Tribal Governments, Northwest Inupiaq Housing Authority, Alaska Village Electric Coop, Kikiktagruk Inupiat Corp, and the North West Energy Steering Committee.

Impact Objective: Completion of the renewable energy projects will bring cost savings to regional entities and residents. Estimated cost savings on the installed solar arrays is \$56,000 for all 8 communities. Construction and maintenance of energy projects will provide jobs in the communities as well resulting in a positive economic feedback loop.

II. Update and organize regional energy plan needs and operations and maintenance of completed projects

Expected timeframe: October 2015-October 2016

Performance Measurement: Using the completed NWA regional energy plan outline all renewable energy projects, assessment of needs, and priorities set by Energy Steering Committee. Plan for operations & maintenance to reduce overall costs once projects are operational.

Coordinate efforts by meeting with the Energy Steering Committee and other involved entities.

Responsible Party: NANA, Northwest Arctic Borough, KEA, and ANTHC.

Possible Funding Sources: Federal Grants, State of Alaska Grants, AHFC, AIDEA, Shell Oil of Alaska, Red Dog Mine, AEA, and Teck Cominco.

Possible Partnerships: NANA Regional Corporation, Kotzebue Electric Association, Regional City and Tribal Governments, Northwest Inupiaq Housing Authority, Alaska Village Electric Coop, Kikiktagruk Inupiat Corp, and the North West Energy Steering Committee.

Impact Objective: Organizing and prioritizing the renewable energy projects will ensure that the communities get wanted and useful renewable energy projects. These efforts will also make seeking grant funds easier. Implementation of the plan will result in reduced energy costs for the region which has some of the highest in the country.

Obligation: Land Use Management and Planning

Strategic Goal I

Ensure the food security of our people

Action Plan:

I. Explore wildlife management strategy

Expected timeframe: June 2016-July 2016

Performance Measurement: Strategy developed for each community.

Responsible Party: Northwest Arctic Borough and NANA Regional Corporation

Possible Funding Sources: Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Fish and Wildlife, ICC, Pew Charitable Trusts, And the Oak Foundation

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, ICC, Arctic Council

Impact Objective: It is important to identify and define the strategy each community will take to ensure food security at a regional level. By developing these strategies efforts can be directed toward our wild animal populations, relationships of their natural habitat to those wild animal populations, and the management of habitat or populations that are will be needed to follow through with those specified strategies.

II. Evaluate options for co-management

Expected timeframe: October 2015-October 2016

Performance Measurement: Legal counsel explore options for co-management.

Responsible Party: Northwest Arctic Borough Science and Legal Department

Possible Funding Sources: Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Fish and Wildlife, ICC, Pew Charitable Trusts, And the Oak Foundation

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, ICC, Arctic Council

Impact Objective: Management in our communities is a component of conservation that dictates the controlling, directing, administration, and establishment of codes, ordinances, and regulation to protect the wildlife populations and the habitats in which they live. Wildlife management will strive to sustain and, if possible, increase the wildlife population.

III. Finish & update subsistence mapping

Expected timeframe: January 2011-January 2018

Performance Measurement: Complete subsistence mapping project in all of our 11 communities

Responsible Party: Northwest Arctic Borough

Possible Funding Sources: To date the project has been funded by Shell Oil, Conoco Phillips, Oak Foundation, and US Dept. of Interior. Other possible funders include Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Fish and Wildlife, ICC, Pew Charitable Trusts, and the Oak Foundation

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, ICC, Arctic Council

Impact Objective: The subsistence mapping project documents Inuit place names and documents where people hunt and gather traditional food as well as ecological sensitive areas. This information can be used by communities and the NAB to make responsible choices regarding resource and other development. It also documents for the first time subsistence resources in our area, passing on traditional knowledge.

Strategic Goal II

Maintain sustainability & return from lands

Action Plan:

I. Survey all NAB Lands

Expected timeframe: March 2007 to July 2018

Performance Measurement: Surveys completed borough wide

Responsible Party: Northwest Arctic Borough and McLintock Surveyors

Possible Funding Sources: Work completed to date has been paid for by the NAB. Other possible funders include Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, and Other extraction industries, US Fish and Wildlife, and the ICC.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, Maniilaq Association, US Fish and Wild Life, and ICC.

Impact Objective: Communities will have accurate data on who owns what lands. Land policies can then be implemented to protect subsistence resources and build new infrastructure.

II. Review zoning districts for access & purpose

Expected timeframe: October 2015- July 2017

Performance Measurement: Legal counsel explore options for zoning districts and amend NAB code.

Responsible Party: Northwest Arctic Borough

Possible Funding Sources: Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Fish and Wildlife, and the ICC.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, Maniilaq Association, US Fish and Wild Life, and ICC.

Impact Objective: The acceleration of the local population coupled with the drastic limitations of geography and homes created a challenging situation for borough planners, business and home developers, and the community at large. By reviewing the zoning districts, the Borough maintains control over revenue generating parcels of land and may make amendments that will promote economic development and viability of areas burdened by poverty.

III. Bring landowners to table to address land use issues

Expected timeframe: January 2016 to January 2017

Performance Measurement: Host round tables or established task force to gather input.

Responsible Party: Northwest Arctic Borough, NANA, Federal and State Governments

Possible Funding Sources: Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Fish and Wildlife, and the ICC.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, Maniilaq Association, US Fish and Wild Life, and ICC.

Impact Objective: Gathering information about land issues and concerns from all involved parties will assist in outlining and resolving problems. Land policies can then be implemented to protect subsistence resources and resolve other issues.

Strategic Goal III

Clear direction, plan & strategy for the Northwest Arctic

Action Plan:

I. Review & simplify zoning

Expected timeframe: December 2016 to February 2017

Performance Measurement: New zoning ordinance approved

Responsible Party: Northwest Arctic Borough and legal counsel

Possible Funding Sources: Federal Grants, State of Alaska Grants, and Rasmussen Foundation

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, and Maniilaq Association.

Impact Objective: Impact Objective: Clear and simply zoning ordinances will make it easier for residents and regional entities to build new infrastructure in our communities.

II. Develop community comprehensive plans

Expected timeframe: August 2014-August 2016

Performance Measurement: Complete ongoing community plans.

Responsible Party: Northwest Arctic Borough, Remote Solutions

Possible Funding Sources: Work to date has been funded by the NWA Borough and state grants. Additional funding opportunities include Federal Grants, State of Alaska Grants, and Rasmussen Foundation.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, and Maniilaq Association.

Impact Objective: New community plans will help the communities prioritize needs and seek grant funding. Grant funds will be used to improve infrastructure and services.

III. Develop comprehensive regional plan

Expected timeframe: June 2014-July 2016

Performance Measurement: Complete ongoing regional comprehensive plans.

Responsible Party: Northwest Arctic Borough and the Northwest Arctic Borough Planning Committee

Possible Funding Sources: Federal Grants, State of Alaska Grants, and Rasmussen Foundation

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, and Maniilaq Association.

Impact Objective: The regional comprehensive plans will foster the vision for sustainable growth for our regional communities. The focus will highlight needs for the development of long term

transportation plans, infrastructure development and emphasize the environmental and land usages available for such development.

Obligation: Historic and Cultural Resources

Strategic Goal I

Maintain & revitalize historic use areas

Action Plan:

I. Develop in-house maps of historic resources

Expected timeframe: July 2012- July 2017

Performance Measurement: Maps completed. Legal counsel explore options for land status for historic sites and use areas. Amend code or seek federal land status change.

Responsible Party: Northwest Arctic Borough Planning Department and NANA Regional Corporation

Possible Funding Sources: Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Park Service, US Fish and Wild Life, and ICC.

Possible Partnerships: US Park Service, NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, and US Fish and Wild Life

Impact Objective: Historic community buildings, hunting grounds, food preservation and storage areas, and other historical landscapes exemplify the meanings, expectations, and lives of those who established them. They special locations tell stories about what our communities were and how we became what we have. It gives way to understanding. Preserving those stories are an important part of maintaining healthy communities.

II. Connect future generations to historic use areas

Expected timeframe: June 2015-July 2016

Performance Measurement: Cultural camps in each community with curriculum tied to historic use areas.

Responsible Party: Northwest Arctic Borough, NANA Regional Corporation, and Maniilaq

Possible Funding Sources: To date the Northwest Arctic Borough, NANA Regional Corporation, Shell Oil, Teck, Conoco Phillips, and Maniilaq have provided funds for camps. Additional funding may be available from Federal Grants, State of Alaska Grants, Shell Oil of Alaska, Red Dog Mine, Teck Cominco, Other extraction industries, US Park Service, US Fish and Wild Life, and ICC.

Possible Partnerships: US Park Service, NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough, and US Fish and Wild Life

Impact Objective: Reduced suicide and substance abuse in our communities and create a better feeling of well-being; develop ecotourism avenues to bring income to those communities that lack infrastructure and economy.

Strategic Goal II

Increase transfer of culture from one generation to the next

Action Plan:

I. Support work of Elders Council

Expected timeframe: June 2015- July 2017

Performance Measurement: Increase presence of the Elder Council in all youth activities & secure funding for operations & outreach.

Responsible Party: Northwest Arctic Borough, Regional Elder and Youth Councils, NANA Regional Corporation

Possible Funding Sources: Federal Grants, State of Alaska Grants, Alaska Legislative Grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, Immersion School, and the Northwest Arctic School District.

Impact Objective: Increase knowledge transfer, sense of past for advancement of the future. Develop plan for sustainable communities and engagement of youth.

II. Establish culture camps in all villages

Expected timeframe: July 2012-January 2017

Performance Measurement: Continue support for existing cultural camps and provide assistance to the remaining communities that do not have existing programs. Each community will have a cultural camp.

Responsible Party: NAB, NANA, and Maniilaq

Possible Funding Sources: To date the NAB, NANA, Shell Oil, Teck, Conoco Phillips, and Maniilaq have provided funds for camps. Additional opportunities may include additional Federal Grants, State of Alaska Grants, Alaska Legislative Grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, Immersion School, and the Northwest Arctic School District.

Impact Objective: Reduced suicide and substance abuse in our communities and create a better feeling of well-being.

III. Increase opportunity for school-culture connections

Expected timeframe: 2010-January 2018

Performance Measurement: Link curriculum to culture and integrate cultural camps into the academic year.

Responsible Party: NAB, NANA, Maniilaq, and NAB School District

Possible Funding Sources: Federal Grants, State of Alaska Grants, Alaska Legislative Grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum.

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, Immersion School, and the Northwest Arctic School District.

Impact Objective: Increase graduation and secondary rates in the communities by making the curriculum relevant to students. Reduced suicide and substance abuse in our communities and create a better sense of well-being.

Strategic Goal III

Increase borough wide attention to language and culture

Action Plan:

I. Commission a language & cultural task-force

Expected timeframe: January 2015- July 2016

Performance Measurement: Task force created. Develop mission and goals.

Responsible Party: NANA Regional Corporation, Maniilaq, Regional Elder and Youth Council

Possible Funding Sources: Federal Grants, State of Alaska Grants, Alaska Legislative Grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, Immersion School, and the Northwest Arctic School District

Impact Objective: The integration of language and cultural teaching are important to the sense of wellbeing of our communities. The strong tie to the culture, land, language, and people will help strengthen the communities of our region. As the economy and infrastructure are grown and developed we will also need to keep the language and cultural components as evident and strong.

II. Explore a place-based education in school system

Expected timeframe: 2013 to January 2018

Performance Measurement: Integrated cultural curriculum approved and being taught in the classrooms.

Responsible Party: Northwest Arctic Borough School District and Alaska Technical Center.

Possible Funding Sources: Federal Grants, State of Alaska Grants, Alaska Legislative Grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, Immersion School, and the Northwest Arctic School District

Impact Objective: Increase graduation and secondary rates in the communities by making the curriculum relevant to students. Reduce suicide rates and the overall well-being of students by making them feel part of their education. This will have a positive economic feedback loop in communities as young people will be more employable and healthy.

III. Establish a clearing house for promotion of language & cultural materials

Expected timeframe: March 2015-July 2016

Performance Measurement: Host round table or establish task force to set direction, action to be taken, and implementation plan.

Responsible Party: Northwest Arctic Borough and NANA Regional Corporation

Possible Funding Sources: Federal Grants, State of Alaska Grants, Alaska Legislative Grants, Gates Foundation, Rasmussen Foundation, and the Humanities Forum

Possible Partnerships: NANA Regional Corporation, Regional City and Tribal Governments, Kikiktagruk Inupiat Corporation, Northwest Arctic Borough Science Program, Maniilaq Association, Immersion School, and the Northwest Arctic School District

Impact Objective: The overarching goal and objective would be the development of the Qaqisaṅṅuam Qargia that would gather existing resources in one place and host new content. It will build on the Northwest Arctic Borough and NANA Regional Corporation's traditional place name mapping project by creating access to varying material. Qaqisaṅṅuam Qargia would act as a digital one-stop-shop for Iñupiaq language and culture multimedia learning content and resources. Purpose: The Web Portal will provide a vehicle for Iñupiaq language learning and subsistence education for NAB residents. This website would centralize resources in one place.

This project would benefit all residents of the Borough and Iñupiat everywhere. By acting as a fiscal sponsor, the NAB would help to advance key aspects of the Iñupiaq Language Revitalization plan developed in partnership with the Iñupiaq Language Commission and adopted by the NAB Assembly in August 2012 via Assembly resolution 12-47. This project would help the NAB meet its FY 2014-2020 Strategic Goals to "Increase transfer of culture from one generation to the next" and "Increase Borough-wide attention to language and culture."

Village Jobs Strategy

The Village Jobs Strategy was developed by our regional strategy committee after studying the background of the economic development status of our region that included data on our economy, population, geography, workforce development, employment, transportation, resources, and other pertinent information.

Increase the number of qualified tradesmen by:

- Providing vocational education in the areas of carpentry, plumbing, electrical work, commercial driving, and heavy equipment operation and repair
- Increasing the number of high school graduates
- Principal sources of leadership: Alaska Technical Center/NWAB School District, State of Alaska, city and tribal governments within the region

Increase the ability of village residents to fill job vacancies in Kotzebue by:

- Increase the number of affordable housing units in Kotzebue
- Improve recruitment within the villages
- Principal sources of leadership: Maniilaq Association, NIHA

Increase the number of resident placements in Red Dog Mine positions by:

- Identifying all specific jobs that are not filled by residents or non-resident NANA shareholders or spouses
- Determining job skills/training/certifications necessary to perform those jobs
- Establishing specific job training for those positions
- Recruiting residents for placement in those positions
- Principal sources of leadership: NWAB, NANA Regional Corporation, Teck Cominco, ATC/School District, Chukchi College, State of Alaska

Increase the number of residents who are certified as teachers, accountants, health care professionals and other professional occupations by

- Promoting college education
- Increasing the number of high school graduates
- Providing targeted post-secondary education in Kotzebue
- Providing scholarships for residents who attend college
- Principal sources of leadership: NWAB and NWAB School District, NANA Regional Corporation, Maniilaq Association, Chukchi College and major employers throughout the region

Increase the quality of public education in the region by

- Increasing average daily attendance
- Improving parenting skills
- Increasing community involvement within the schools
- Principal sources of leadership: NWAB School District, Maniilaq Association, city and tribal governments

Fully utilize Welfare to Work program by:

- 1) Increase parent and community participation in their children's education to decrease drop out and increase the level of academic achievement prior to graduation of high school.

- 2) Realize the development and value of the Star of the Northwest Magnet School in providing an additional two years of public school offerings to high school students resulting in additional academic, vocational, soft skills development, and career path targets.
 - 3) Increase the number of young adults pursuing and achieving higher education resulting in attainment of appropriate college degrees necessary to fill local employment opportunities in education, health, engineering, finance, and organizational administration.
 - 4) Recruit and retain local residents into the professional level employment opportunities.
- Developing and promoting job opportunities for Temporary Assistance recipients in the villages
Principal sources of leadership: Maniilaq Manpower, individual city and IRA governments, NWAB School District, individual businesses

Create new job opportunities:

- Assist communities with development and implementation of comprehensive plans for local development by:
 - Providing technical assistance with local planning efforts
 - Providing grant writing assistance
 - Providing training and support for local city and tribal administrators
- Principal sources of leadership: NWAB, Maniilaq Association, State Division of Community and Economic Development, Chukchi College, ATC/School District

Procure lands that provide maximum potential for future development in the Borough by

- Utilizing the municipal entitlement process for selection of an additional 300,000 acres of land within the region
- Principal source of leadership: NWAB

Advance Sulianich Art Center

- Creating consistent and reliable markets for art
- Promoting high quality of art
- Providing workshops instructed by highly skilled artists
- Making tools and supplies accessible to residents
- Creating efficient and healthy workplaces in each village
- Promoting art as a source of cultural and regional pride
- Principal sources of leadership in meeting these goals: NWAB, National Park Service, Chukchi College, School District

Continue the Regional Wide Alternative Energy and Resources Strategy

See Appendix

Reduce the Cost of Living for residents:

- Promote at least a partial return to self-sufficiency by:
 - Encouraging increased use of wood for fuel
 - Encouraging more use of gathered fish, game and berries for consumption
 - Promoting use of traditional clothing that is made in the region through adoption of school dress codes
 - Promoting walking as a means of transportation (and good health)
 - Discouraging consumption of commercial snack foods and drinks
- Principal sources of leadership: NWAB and School District, Maniilaq Association, city and village governments

Reduce the cost of bulk fuel and other cargo by:

- Forming partnerships to purchase fuel in large quantities
- Developing competition among fuel suppliers
- Developing larger storage facilities
- Increasing length of airport runways to accommodate larger cargo planes
- Principal sources of leadership: NWAB, State of Alaska, Federal Government

Promote energy conservation by:

- Promoting home and facility insulation/weatherization
- Developing alternative energy sources
- Principal sources of leadership: NWAB, NIHA, city and village governments, Maniilaq Association, KEA, State of Alaska, Federal government

Small Business Program Advancement:

- Increase the number of small businesses, including small engine repair and maintenance, building maintenance, retail outlets, restaurants, lodging, and tourist assistance by
- Providing small business education
- Providing start up assistance in the form of grants and loans
- Providing adult basic education in the areas of accounting, computer science, customer service and small engine repair
- Principal sources of leadership in meeting these goals: Northwest Arctic Borough, Alaska Technical Center, NWAB School District and Chukchi College

Increase the number of tourists traveling to the region by:

- Promoting traditional activities among the population in order to provide an environment that will appeal to tourists
- Promoting the region through publications and the internet
- Providing adequate facilities and services for travelers
- Principal sources of leadership: NWAB and NANA Development Corporation

Add new industries to the region by:

- Researching and examining the feasibility of water bottling, berry products, and processing and packaging of traditional foods such as caribou and moose for consumption within the region and/or export from the region
- Identifying and securing grants and loans for capitalization
- Complete feasibility study for hydroponic gardens and/or greenhouses
- Principal sources of leadership: NWAB, NANA, KIC, local IRA's

Improve the region's telecommunications by:

- Developing a fiber optic network throughout the region
- Principal sources of leadership: OTZ Telephone, NWAB, and Maniilaq Association

Reduce the cost of bulk fuel and other cargo by:

- Forming partnerships to purchase fuel in large quantities
- Developing competition among fuel suppliers
- Developing larger storage facilities
- Increasing length of airport runways to accommodate larger cargo planes

- Principal sources of leadership: NWAB, State of Alaska, Federal Government

Promote energy conservation by:

- Promoting home and facility insulation/weatherization
- Developing alternative energy sources
- Principal sources of leadership: NWAB, NIHA, city and village governments, Maniilaq Association, KEA, State of Alaska, Federal government

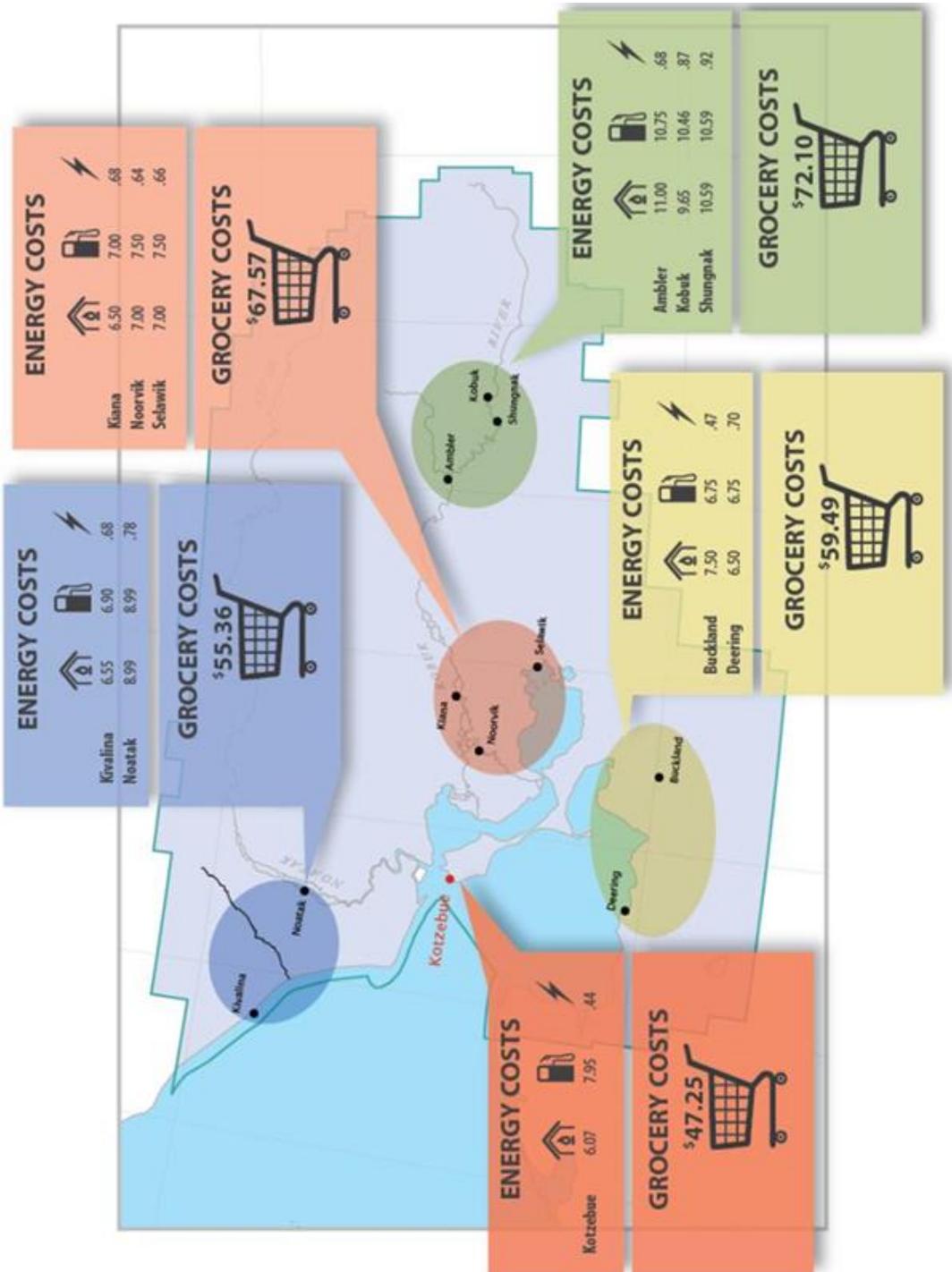
Acronyms and Abbreviations

ACEP	Alaska Center for Energy and Power
AEA	Alaska Energy Authority
AHFC	Alaska Housing Finance Corporation
AIDEA	Alaska Industrial Development and Export Authority
AMR systems	Automated Meter Reading systems
ANCSA	Alaska Native Claims Settlement Act
ANGDA	Alaska Natural Gas Development Authority
ANTHC	Alaska Native Tribal Health Consortium
APT	Alaska Power and Telephone
ARDOR	Alaska Regional Development Organizations
ARECA	Alaska Rural Electric Cooperative Association
ARIS	Alaska Retrofit Information System
ARRA	American Recovery and Reinvestment Act
ARUC	Alaska Rural Utility Collaborative
AVEC	Alaska Village Electric Cooperative
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CETF	Community Energy Task Force
CIAP	Coastal Impact Assistance Program
CFL	compact fluorescent light
EfW	Energy From Waste
DCCED	Department of Commerce, Community and Economic Development
DOE	U.S. Department of Energy
DOL	Alaska Department of Labor (and Workforce Development)
DOT&PF	Alaska Department of Transportation and Public Facilities
EPA	U.S. Environmental Protection Agency
ETF	Emerging Technology Fund
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
HUD	U.S. Department of Housing and Urban Development

HVDC	High Voltage Direct Current
ICDBG	Indian Community Development Block Grant
IPP	Independent Power Producer
ISER	Institute for Social and Economic Research
KEA	Kotzebue Electric Association
kW	Kilowatt
kWh	Kilowatt hour
MWh	Megawatt hours
NAB	Northwest Arctic Borough

Appendix

Regional Market Basket

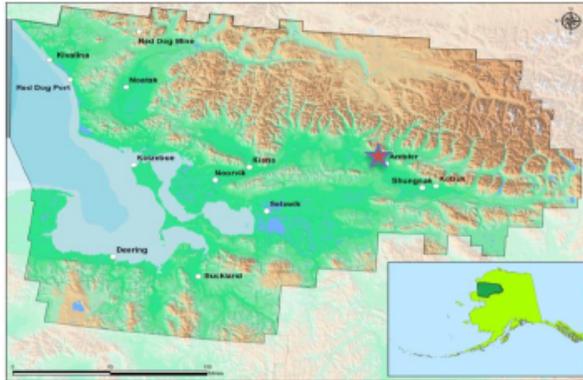


- Stove Oil / Gallons
- Gasoline / Gallons
- Electric / Kwh
- Milk, Bread, Sugar, Flour and Diapers

Community Profiles

Ambler ~ Ivisaappaat

Community Profile: Ambler (Upper Kobuk)



Alaska Native Name (definition)

Ivisaappaat "The mouth of red stone"

Historical Setting / Cultural Resources

The residents of Ambler are Kowagniat Inupiat Eskimos. Ambler is named after Dr. James M. Ambler, a U.S. Navy surgeon on the U.S.S. Jeannette, who perished in 1881 in the Lena River Delta while with the Arctic expedition under the command of Lt. Comdr. G.W. DeLong (1879-1880). Ambler was permanently settled in 1958 when people from Shungnak and Kobuk moved upstream because of the variety of fish, wild game, and spruce trees in the area. An archaeological site is located nearby at Onion Portage. A post office was established in 1963.

Incorporation 2nd Class City, 1971

Location
 Ambler is located on the north bank of the Kobuk River, near the confluence of the Ambler and the Kobuk Rivers. It lies 45 miles north of the Arctic Circle. It is 138 miles northeast of Kotzebue, 30 miles northwest of Kobuk, and 30 miles downriver from Shungnak.

Longitude	Latitude
ANCSA Region	NANA Regional Corporation
Borough/CA	Northwest Arctic Borough
School District	Northwest Arctic Borough School District
AEA Region	Northwest Arctic

Taxes	Type (rate)	Per-Capita Revenue
N/A		N/A

Economy
 Residents practice a traditional subsistence lifestyle. 69% residents employed: 49% private sector, 47% local government, and 4% in state government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-10/65	Continental	N/A

Natural Hazard Plan	
All-Hazards Mitigation Plan (borough-wide)	2009

Community Plans	Year
NWAB Comprehensive Plan (borough-wide)	1993

Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorporated	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Ambler	tribemanager@ivisaappaat.org	907-445-2238	907-445-2257
City of Ambler	cityofamblerak@starband.net	907-445-2122	907-445-2174

Demographics	2000	2010	2013
Population	309	258	Percent of Residents Employed 69.00%
Median Age	22	29	Denali Commission Distressed Community No
Avg. Household Size	4	4	Percent Alaska Native/American Indian (2010) 84.50%
Median Household Income	N/A	\$38,750	Low and Moderate Income (LMI) Percent (201x) 60%

Electric Utility		Generation Sources	Interties	PCE?
Alaska Village Electric Cooperative (AVEC)		Diesel	No	Yes

Landfill	Class	Ill	Permitted?	No	Location	2 miles west of the community
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Water/Wastewater System		Homes Served	System Volume
Water	Circ	75	
Sewer	Gravity	Water/Wastewater Energy Audit? Yes	

Notes

Access	
Road	No

Air Access	Amber Airport, gravel, fair condition	Runway 1	2,400 ft. x 60 ft.	Runway 2	3,000 ft. x 60 ft.
		Runway 3	N/A	Runway 4	N/A

Dock/Port	Yes	Barge Access?	Yes, Seasonal	Ferry Service?	No
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Energy Profile: Ambler

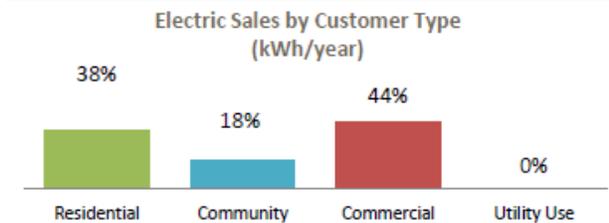
Power House

Utility	AVEC		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	Kato/4P3-1475	363	
Unit 2	Kato/6P4-2000	271	
Unit 3	Newage/HCI504C	397	
Unit 4			
Unit 5			
Line Loss		3.40%	
Heat Recovery?		Yes	
Upgrades?			
Outage History/Known Issues			

Operators	No. of Operators	Training/Certifications

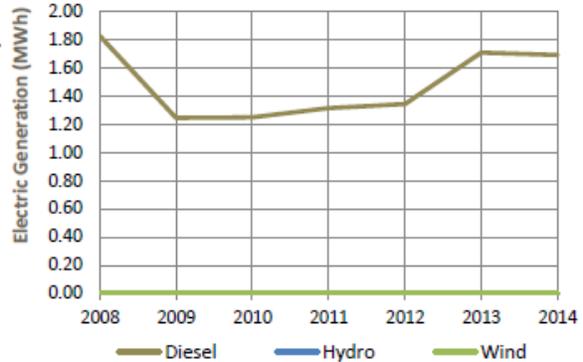
Maintenance Planning (RPSU)

Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	81	447,304	5522.271605
Community	13	214,356	16488.92308
Commercial	18	519,310	28850.55556
Utility Use	N/A		N/A



Power Production

Diesel (kWh/yr)	1,249,892	Avg. Load (kW)	147
Wind (kWh/yr)	0	Peak Load (kW)	319
Hydro (kWh/yr)	0	Efficiency (kWh/gal)	13.81
Total (kWh/yr)	1,249,892	Diesel Used (gals/y)	90,507



Electric Rates (\$/kWh)		Cost per kWh Sold (\$/kWh)	
Rate with PCE	0.21	Fuel Cost	0.53
Residential Rate	0.77	Non-fuel Cost	0.23
Commercial Rate	0.62	Total Cost	0.76

Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	11.00	5.73	
Other Fuel? (1 gal)			
Gasoline (1 gal)	10.75		
Propane (100#)	250.00		
Wood (1 cord)			
Pellets			
Discounts?			

Alternative Energy	Potential	Projects/Notes	Status
Hydroelectric	High	AVEC Cosmos Hills Hydroelectric project, conceptual design/permitting stage	
Wind Diesel	Low/Medium	Class 1-2, wind study completed 2011-12	
Biomass	High	Upper Kobuk Biomass study	
Solar	High	Water treatment plant solar PVs	
Geothermal	Low		
Oil and Gas	Low		
Coal	Low		
Emerging Tech	Unknown		
Heat Recovery	High		
Energy Efficiency	High	Homes & schools provided w/ extra TED meters 2014/2015; 2014 TED training	

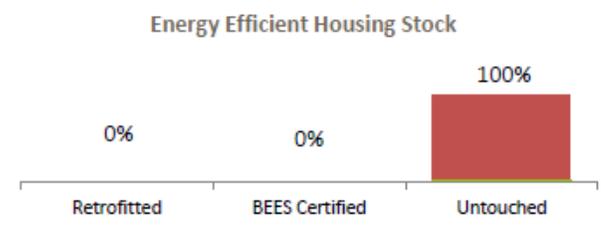
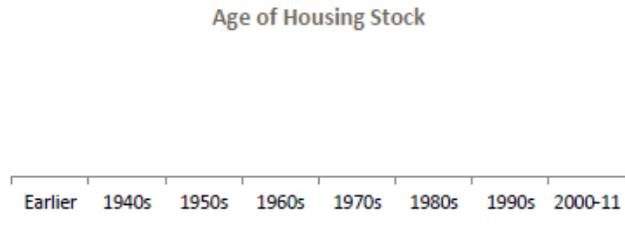
Bulk Fuel				Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
Tank Owner	Fuel Type(s)	Capacity	Age/Condition	By Barge	5	18,000	AVEC
AVEC	Diesel	98,550		By Air			

Cooperative Purchasing Agreements

Notes

Energy Profile: Ambler

Housing Units	Occupied	Vacant	% Owner-Occup.	Regional Housing Authority	Weatherization Service Provider		
	75	24	55%	NIHA	NIHA		
Housing Need	Overcrowded		1-star	Energy Use	Average Home Energy Rating	Average Square Feet	Avg. EUI (kBtu/sf)
Data Quality							

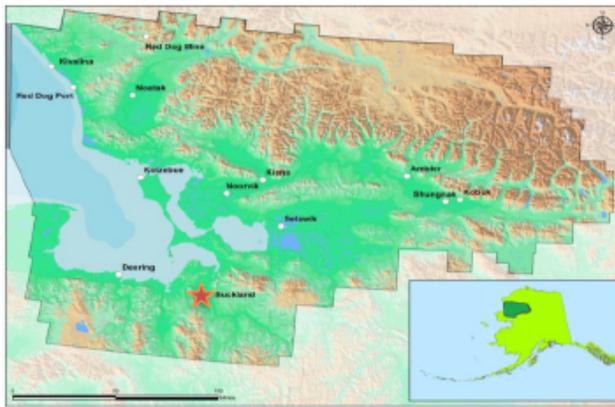


Lighting	Upgraded?	Owner	Notes
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Non-residential Building Inventory

Building Name or Location	Year Built	Square Feet	Audited?	Retrofits Done?	In ARIS?
Water Plant/Lift Station		1,728	ANTHC		No
Community Shop		150	EECBG		No
Washeteria		300	EECBG		No
AIRPORT ELECTRICAL	2000	336			No
Ambler Baptist Church					No
Ambler Clinic	2004	5000			No
Ambler Friends Church					No
Ambler Native Store					No
Ambler Post Office	1985	480			No
Boiler module	2004	1275			No
City Office Building					No
EQUIPMENT STORAGE	1992	1260			No
Ivisaapaat Tribal Council Office					No
Kobuk River Lodge	1981	2000			No
Maintenance shop		576			No
New School	2004	23444			No
Old high school	1977	13100			No
Storage building		240			No

Community Profile: Buckland (Buckland and Deering)



Alaska Native Name (definition)

Nunachiaq "New Land"

Historical Setting / Cultural Resources

The residents have moved from one site to another along the river at least five times in recent memory, to places known as Elephant Point, Old Buckland, and New Site. The presence of many fossil finds at Elephant Point indicate prehistoric occupation of the area. The Inupiaq Eskimos depend on reindeer, beluga whale, and seal for survival. The city government was incorporated in 1966.

Incorporation 2nd Class City, 1966

Location

Buckland is located on the west bank of the Buckland River, about 75 miles southeast of Kotzebue.

Longitude	-161.1231	Latitude	65.9797
ANCSA Region	NANA Regional Corporation		
Borough/CA	Northwest Arctic Borough		
School District	Northwest Arctic Borough School District		
AEA Region	Northwest Arctic		

Taxes	Type (rate)	Per-Capita Revenue
N/A		\$250

Economy

Buckland is an Inupiat Eskimo village, and subsistence activities are an important focus of the economy. 66% residents employed: 54% private sector and 46% local government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-14/60	Transitional	N/A

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide)	2009
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Community Plans

NWAB Comprehensive Plan (borough-wide)	1993
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Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorpor	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Buckland	tribeclerk@nunachiaq.org	907-494-2171	907-494-2217
City of Buckland	city_of_buckland@yahoo.com	907-494-2121	907-494-2138
Demographics	2000	2010	2013
Population	406	416	Percent of Residents Employed 66.00%
Median Age	18	20	Denali Commission Distressed Community No
Avg. Household Size	5	5	Percent Alaska Native/American Indian (2010) 95.43%
Median Household Income	N/A	\$48,281	Low and Moderate Income (LMI) Percent (201x) 66%
Electric Utility	Generation Sources		Interties
City of Buckland	Diesel, wind		No
Landfill	Class	Permitted?	Location
	III	No	1/2 mile west of the community
Water/Wastewater System	Water		Homes Served
	Washeterial, Haul		100,000
	Sewer		Water/Wastewater Energy Audit?
	Haul		Yes
Notes			
Access			
Road	No		
Air Access	Buckland Airport, gravel, fair condition		
	Runway 1	3,200 ft. x 75 ft.	Runway 2
	Runway 3	N/A	Runway 4
			N/A
Dock/Port	Yes	Barge Access?	Ferry Service?
		Yes	No

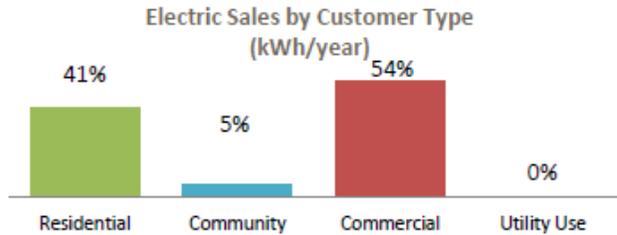
Energy Profile: Buckland

Power House

Utility City of Buckland			
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	CAT 3456	475	Good
Unit 2	CAT 3456	475	Good
Unit 3	CAT C9	175	Good
Unit 4			
Unit 5			
Line Loss		4.80%	
Heat Recovery?		Yes	
Upgrades?			
Outage History/Known Issues			
One generator has ghost has issues shutting down - controls			

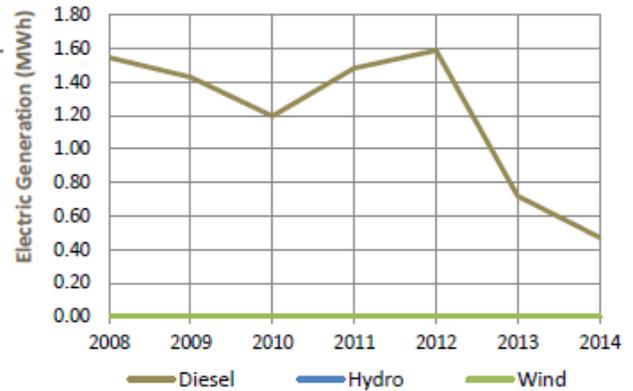
Operators	No. of Operators	Training/Certifications
	2	

Maintenance Planning (RPSU)			
Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	98	646,071	6592.561224
Community	10	85,552	8555.2
Commercial	19	841,835	44307.10526
Utility Use	N/A	N/A	N/A



Power Production

Diesel (kWh/yr)	1,693,004	Avg. Load (kW)	
Wind (kWh/yr)	0	Peak Load (kW)	650
Hydro (kWh/yr)	0	Efficiency (kWh/gal)	14.16
Total (kWh/yr)	1,693,004	Diesel Used (gals/y)	119,524



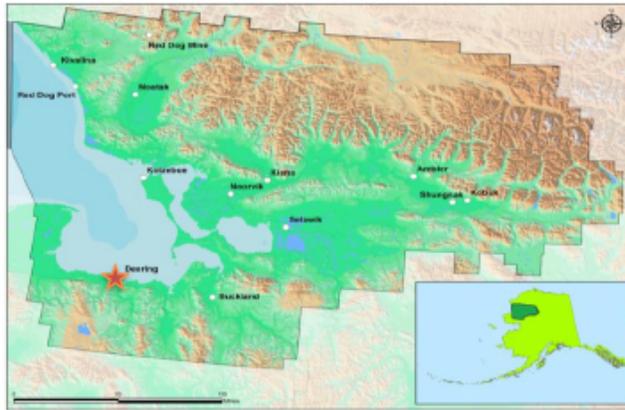
Electric Rates (\$/kWh)		Cost per kWh Sold (\$/kWh)	
Rate with PCE	0.47	Fuel Cost	0.33
Residential Rate	0.22	Non-fuel Cost	0.10
Commercial Rate		Total Cost	0.43

Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	7.00		
Other Fuel? (1 gal)			
Gasoline (1 gal)	7.00		
Propane (100#)	295.00		
Wood (1 cord)			
Pellets			
Discounts?			

Alternative Energy Potential		Projects/Notes	Status
Hydroelectric			
Wind Diesel	High	Class 4, construction 2014, two turbines installed by the City	
Biomass	Low		
Solar	High	Solar PVs planned for Buckland	
Geothermal	Medium	Resources exist 40 mi. south of Buckland at Granite Mountain Hot Springs	
Oil and Gas	Low		
Coal	Medium	Low grade resources located in the Chicago Creek Region	
Emerging Tech	Unknown		
Heat Recovery		Ongoing project in Deering through ARUC.	
Energy Efficiency	High	Additional homes & schools provided w/ TED meters	

Bulk Fuel				Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
Tank Owner	Fuel Type(s)	Capacity	Age/Condition	By Barge			
City of Buckland	Wind	200		By Air			
				Cooperative Purchasing Agreements			
				Notes			

Community Profile: Deering (Buckland and Deering)



Alaska Native Name (definition)

Inmachukmiut

Historical Setting / Cultural Resources

The village was established in 1901 as a supply station for Interior gold mining near the historic Malemiut Eskimo village of "Inmachukmiut." The name Deering was probably taken from the 90-ton schooner "Abbey Deering," which was in nearby waters around 1900. The city was incorporated in 1970.

Incorporation 2nd Class City, 1970

Location

Deering is located on Kotzebue Sound at the mouth of the Inmachuk River, 57 miles southwest of Kotzebue. It is built on a flat sand and gravel spit 300 feet wide and a half-mile long.

Longitude	Latitude
ANCSA Region	NANA Regional Corporation
Borough/CA	Northwest Arctic Borough
School District	Northwest Arctic Borough School District
AEA Region	Northwest Arctic

Taxes	Type (rate)	Per-Capita Revenue
N/A		\$140

Economy

The population of the village is primarily Inupiat Eskimo. The people are active in subsistence. 72% residents employed: 41% private sector and 59% in local government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-18/63	Transitional	15,751

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide) 2009

Community Plans

NWAB Comprehensive Plan (borough-wide) 1993

Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorporated	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Deering	tribeadmin@ipnatchiaq.org	907-363-2138	907-363-2195
City of Deering	cityofdeering@yahoo.com	907-363-2136	907-363-2156

Demographics	2000	2010	2013
Population	136	122	Percent of Residents Employed 72.00%
Median Age	27	30	Denali Commission Distressed Community No
Avg. Household Size	4	3	Percent Alaska Native/American Indian (2010) 86.89%
Median Household Income	N/A	\$47,000	Low and Moderate Income (LMI) Percent (201x) 62%

Electric Utility	Generation Sources	Interties	PCE?
Ipnatchiaq Electric Company	Diesel, wind	No	Yes

Landfill	Class	Permitted?	Location

Water/Wastewater System		Homes Served	System Volume
Water	Washeteria, water delivery		
Sewer	Vacuum, honey bucket haul	Water/Wastewater Energy Audit? No	

Notes

Access

Road	No				
Air Access	Deering Airport, gravel, fair condition	Runway 1	3,320 ft. x 75 ft.	Runway 2	2,660 ft. x 75 ft.
		Runway 3	N/A	Runway 4	N/A
Dock/Port	Yes	Barge Access?	Yes	Ferry Service?	No

Energy Profile: Deering

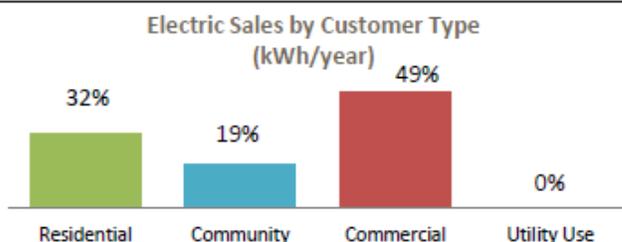
Power House

Utility	Ipnatchiaq Electric Company		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	John Deere	100	Poor
Unit 2	John Deere	137	Poor
Unit 3	Cummins	170	Poor
Unit 4	Cummins	170	Poor
Unit 5			
Line Loss			
Heat Recovery?	Yes		
Upgrades?			
Outage History/Known Issues			

Operators	No. of Operators	Training/Certifications
	2	1 certified, 1 in training

Maintenance Planning (RPSU)

Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	47	213,599	4544.659574
Community	7	123,982	17711.71429
Commercial	15	330,588	22039.2
Utility Use	N/A		



Power Production

Diesel (kWh/yr)	473,140	Avg. Load (kW)	
Wind (kWh/yr)		Peak Load (kW)	
Hydro (kWh/yr)	0	Efficiency (kWh/gal)	8.29
Total (kWh/yr)	473,140	Diesel Used (gals/y)	57,053



Electric Rates (\$/kWh)		Cost per kWh Sold (\$/kWh)	
Rate with PCE	0.26	Fuel Cost	0.39
Residential Rate	0.70	Non-fuel Cost	0.29
Commercial Rate		Total Cost	0.69

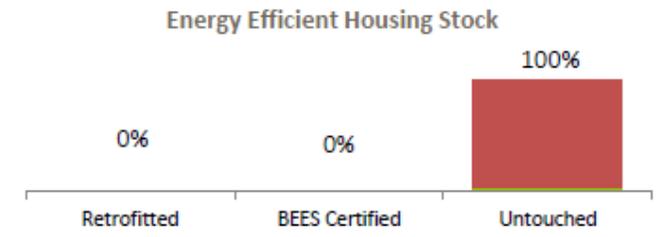
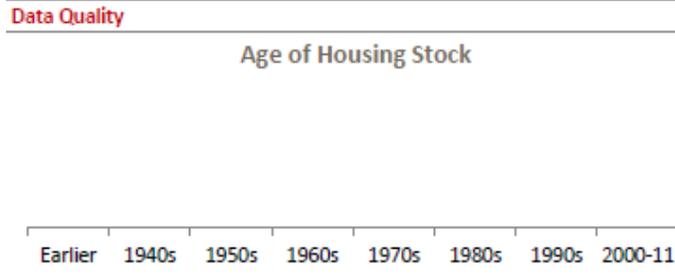
Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	6.75		
Other Fuel? (1 gal)			
Gasoline (1 gal)	6.75		
Propane (100#)	285.00		
Wood (1 cord)			
Pellets			
Discounts?			

Alternative Energy Potential	Projects/Notes	Status
Hydroelectric Low		
Wind Diesel High	Class 3 (Airport), Class 5-6 (1.5 mi. NW of Deering), 1 turbine	
Biomass Low		
Solar High	Solar PVs planned for Buckland	
Geothermal Medium	Resources exist 50 mi. south at Lava Creek, resource exploration needed	
Oil and Gas Low		
Coal Medium	Low grade resources located in the Chicago Creek Region	
Emerging Tech Unknown		
Heat Recovery High	Ongoing project in Deering through ARUC.	
Energy Efficiency High	Additional homes & schools provided w/ TED meters	

Bulk Fuel	Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
Tank Owner	Fuel Type(s)	Capacity	Age/Condition	
Ipnatchiaq	Diesel	92,000		By Barge
Native Village	Heating Oil	73,000		By Air
Native Village	Gasoline	27,000		Cooperative Purchasing Agreements
Notes				

Energy Profile: Deering

Housing Units	Occupied 44	Vacant 17	% Owner-Occup. 61%	Regional Housing Authority NIHA	Weatherization Service Provider NIHA
Housing Need	Overcrowded		1-star	Energy Use	Average Home Energy Rating
				Average Square Feet	Avg. EUI (kBtu/sf)

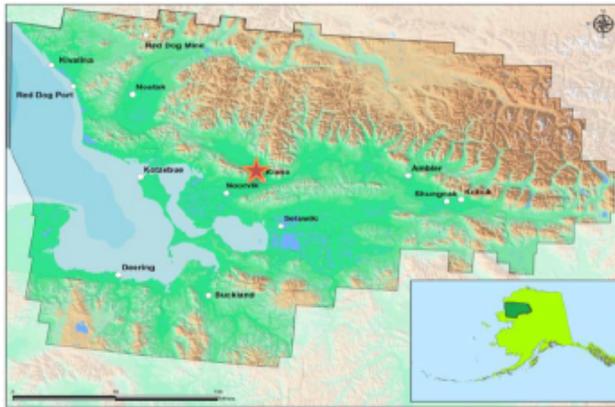


Lighting	Upgraded?	Owner	Notes
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Non-residential Building Inventory

Building Name or Location	Year Built	Square Feet	Audited?	Retrofits Done?	In ARIS?
City Office		3,003	VEEP	Yes	No
City Shop		1,440	VEEP	Yes	No
Deering Native Store		2967	VEEP	Yes	No
Ipnatchiaq Electric Power Plant		840	VEEP	Yes	No
Vacuum Sewer Building		1000	VEEP	Yes	No
Washeteria		3105	VEEP	Yes	No
AIRPORT ELECTRICAL	2000	96			No
Boiler module		160			No
City Office Building	1980	1800			No
Craft/maintenance shop		320			No
Deering Friends Church					No
Deering Native Store	1900				No
Deering Post Office	2001				No
EQUIPMENT STORAGE	1992	1760			No
Generator bldg.		288			No
Pauline Aliitchaq Barr Health Clinic	2004	5000			No
Photo lab		496			No
Pump house		98			No
School	1978	11431			No
Sprinkler van		160			No
Teacher housing duplex (teen center)		1632			No
Vacuum Sewer Building	1997	400			No
Washeteria and Water Treatment Plant	1997	1250			No

Community Profile: Kiana (Lower Kobuk)



Alaska Native Name (definition)

Katyaaq, "a place where the rivers meet"

Historical Setting / Cultural Resources

It was established long ago as the central village of the Kobuk River Kowagmiut Inupiat Eskimos. In 1909, it became a supply center for the Squirrel River placer mines. A post office was established 1915. The city government was incorporated in 1964. Prior to the formation of the Northwest Arctic Borough in 1976, the BIA high school taught students from Noatak, Shugnak, Kobuk, and Ambler, who boarded with local residents.

Incorporation 2nd Class City, 1964

Location

Kiana is located on the north bank of the Kobuk River, 57 air miles east of Kotzebue.

Longitude -160.4228 **Latitude** 66.975

ANCSA Region NANA Regional Corporation

Borough/CA Northwest Arctic Borough

School District Northwest Arctic Borough School District

AEA Region Northwest Arctic

Taxes	Type (rate)	Per-Capita Revenue
N/A		\$120

Economy

Residents depend on traditional subsistence activities, augmented by a cash economy. Chum salmon, freshwater fish, moose, caribou, waterfowl and berries are harvested. The school, City, and Maniilaq Association provide the majority of year-round jobs. Red Dog Mine also offers area employment. 65% residents employed: 46% private sector, 52% local government, and 2% state government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-10/60	Transitional	15,404

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide) 2009

Community Plans

	Year
NWAB Comprehensive Plan (borough-wide)	1993

Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorporated	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Kiana	tribedirector@katyaag.org	907-475-2109	907-475-2180
City of Kiana	cityclerk@cityofkiana.org		

Demographics	2000	2010	2013
Population	388	361	
Median Age	23	27	
Avg. Household Size	4	4	
Median Household Income	N/A		
Percent of Residents Employed			65.00%
Denali Commission Distressed Community			No
Percent Alaska Native/American Indian (2010)			90.30%
Low and Moderate Income (LMI) Percent (201x)			N/A

Electric Utility	Generation Sources	Interties	PCE?
Alaska Village Electric Cooperative (AVEC)	Diesel	No	Yes

Landfill	Class	III	Permitted?	No	Location

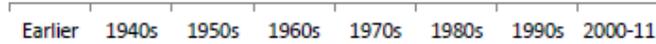
Water/Wastewater System				Homes Served	System Volume 10,000 - 50,000
Water	Circ			85	
Sewer	Gravity			Water/Wastewater Energy Audit? Yes	
Notes					

Access					
Road	No				
Air Access	Bob Baker Memorial Airport, gravel, good condition	Runway 1	3,400 ft. x 100 ft.	Runway 2	N/A
		Runway 3	N/A	Runway 4	N/A
Dock/Port	Yes	Barge Access?	Yes	Ferry Service?	No

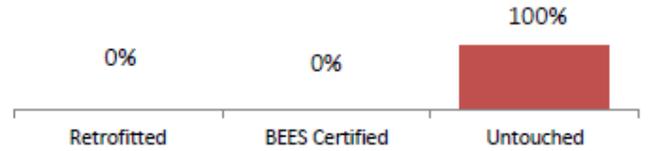
Energy Profile: Kiana

Housing Units	Occupied 101	Vacant 42	% Owner-Occup. 55%	Regional Housing Authority NIHA	Weatherization Service Provider NIHA
Housing Need	Overcrowded		1-star	Energy Use	Average Home Energy Rating
Data Quality				Average Square Feet	Avg. EUI (kBtu/sf)

Age of Housing Stock



Energy Efficient Housing Stock

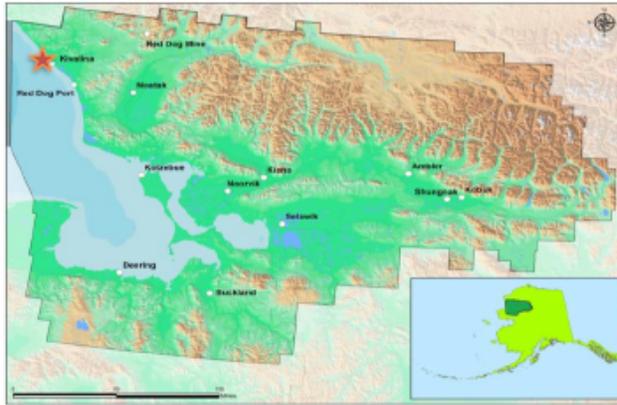


Lighting	Upgraded?	Owner	Notes
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Non-residential Building Inventory

Building Name or Location	Year Built	Square Feet	Audited?	Retrofits Done?	In ARIS?
Water Treatment Plant			ANTHC		No
AVEC Power Plant			ANTHC		No
City Office		2443	EECBG, VEEP	Yes	No
Community Building		1763	EECBG, VEEP	Yes	No
Fire Hall		1372	EECBG, VEEP	Yes	No
Friends Church			VEEP	Yes	No
Native Village Office		1840	VEEP	Yes	No
Public Safety Building		1190	VEEP	Yes	No
VPSO House		718	VEEP	Yes	No
AIRPORT ELECTRICAL	2000	96			No
City Office Building	1970	2688			No
EQUIPMENT STORAGE	1992	1260			No
Industrial arts classroom		2829			No
Kiana Baptist Church					No
Kiana Clinic	2004	5000			No
Kiana Friends Church		4000			No
Kiana Post Office	1989	480			No
Kiana Trading Post					No
New boiler module		1920			No
New school	2003	36311			No
Old boiler module		2108			No

Community Profile: Kivalina (Noatak Valley)



Alaska Native Name (definition)

Kivaliniq

Historical Setting / Cultural Resources

Kivalina has long been a stopping-off place for seasonal travelers between Arctic coastal areas and Kotzebue Sound communities. It is the only village in the Northwest Arctic Borough region where people hunt the bowhead whale. At one time, the village was located at the north end of the Kivalina Lagoon. It was reported as "Kivualinagmut" in 1847 by Lt. Zagoskin of the Russian Navy. Lt. G.M. Stoney of the U.S. Navy reported the village as "Kuveleek" in 1885. A post office was established in 1940. An airstrip was built in 1960. During the 1970s, new houses, a new school, and an electric system were constructed. Due to severe erosion and wind-driven ice damage, the city intends to relocate to a new site 2.5 miles away. Relocation alternatives have been studied, and a new site has been designed and engineered.

Incorporation 2nd Class City, 1969

Location

Kivalina is at the tip of an 8-mile barrier reef located between the Chukchi Sea and Kivalina River. It lies 80 air miles northwest of Kotzebue.

Longitude	-164.5333	Latitude	67.7269
ANCSA Region	NANA Regional Corporation		
Borough/CA	Northwest Arctic Borough		
School District	Northwest Arctic Borough School District		
AEA Region	Northwest Arctic		

Taxes	Type (rate)	Per-Capita Revenue
N/A		\$90

Economy

Kivalina's economy depends on subsistence practices. Bearded seal, walrus, bowhead whale, Dolly Varden trout, tomcods, blue cods, salmon, whitefish, and caribou are utilized. The school, city, Maniilaq Association, NANA Regional Corporation, tribal council, airlines, and local stores provide year-round jobs. The Red Dog Mine also offers some employment.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-15/57	Transitional	19,579

Natural Hazard Plan

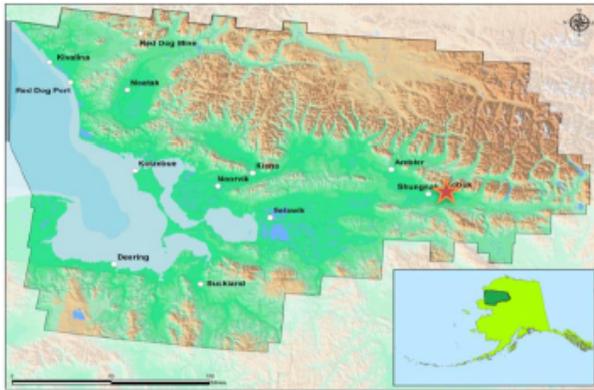
All-Hazards Mitigation Plan (borough-wide)	2009
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Community Plans

NWAB Comprehensive Plan (borough-wide)	Year
	1993

Local Contacts		Email	Phone	Fax		
NANA Regional Corporation, Incorpor		communications@nana.com	907-485-2173	907-485-2137		
Northwest Arctic Borough		info@nwabor.org	907-442-2500	907-442-2930		
Native Village of Kivalina		tribeadmin@kivaliniq.org	907-645-2153	907-645-2193		
City of Kivalina		kivalinacity@aol.com	907-645-2137	907-645-2175		
Demographics		2000	2010	2013		
Population		377	374	Percent of Residents Employed		
Median Age		21	22	Denali Commission Distressed Community		
Avg. Household Size		5	5	Percent Alaska Native/American Indian (2010)		
Median Household Income		N/A	\$59,167	Low and Moderate Income (LMI) Percent (201x)		
Electric Utility		Generation Sources	Interties	PCE?		
Alaska Village Electric Cooperative (AVEC)		Diesel	No	Yes		
Landfill	Class	III	Permitted?	No		
				Location		
				1/3 mi. north of runway		
Water/Wastewater System		Homes Served		System Volume		
Water	Haul, Washeteria		100%			
Sewer	Honeybucket		Water/Wastewater Energy Audit?	No		
Notes	School and clinic have individual water and sewer system					
Access						
Road	No					
Air Access	Kivalina Airport, gravel, fair condition		Runway 1	3,000 ft. x 60 ft.	Runway 2	N/A
			Runway 3	N/A	Runway 4	N/A
			Barge Access?		Yes	Ferry Service?
Dock/Port	Yes					

Community Profile: Kobuk (Upper Kobuk)



Alaska Native Name (definition)

Laugviik "Where they cut big logs"

Historical Setting / Cultural Resources

Kobuk was founded in 1899 as a supply point for mining activities in the Cosmos Hills to the north and was then called Shungnak. A trading post, school, and Friends mission drew area residents to the settlement. Due to river erosion and flooding, the village was relocated in the 1920s to a new site 10 miles downstream, which was called "Kochuk," now Shungnak. The few who remained at the village renamed it Kobuk. Ice jams on the river cause high water each year. In May 1973, a flood covered the entire village. In October 1973, the city was incorporated.

Incorporation 2nd Class City, 1973

Location
Kobuk is located on the right bank of the Kobuk River, about 7 miles northeast of Shungnak and 128 air miles northeast of Kotzebue. It is the smallest village in the Northwest Arctic Borough.

Longitude	Latitude
ANCSA Region	NANA Regional Corporation
Borough/CA	Northwest Arctic Borough
School District	Northwest Arctic Borough School District
AEA Region	Northwest Arctic

Taxes	Type (rate)	Per-Capita Revenue
N/A		N/A

Economy
It is an Inupiat Eskimo village practicing a traditional subsistence lifestyle. 83% residents employed: 50% private sector and 50% local government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-10/65	Continental	N/A

Natural Hazard Plan	
All-Hazards Mitigation Plan (borough-wide)	2009

Community Plans	Year
NWAB Comprehensive Plan (borough-wide)	1993

Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorporated	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Kobuk	tribeadmin@laugvik.org	907-948-2203	907-948-2123
City of Kobuk	kobukcity@yahoo.com	907-948-2217	907-948-2228

Demographics	2000	2010	2013
Population	109	151	Percent of Residents Employed 83.00%
Median Age	18	21	Denali Commission Distressed Community No
Avg. Household Size	5	5	Percent Alaska Native/American Indian (2010) 90.07%
Median Household Income	N/A	\$48,750	Low and Moderate Income (LMI) Percent (201x) 77%

Electric Utility	Generation Sources	Interties	PCE?
Alaska Village Electric Cooperative (AVEC)	Diesel	No	Yes

Landfill	Class	III	Permitted?	Yes	Location	2 road miles north of Kobuk
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Water/Wastewater System			Homes Served	System Volume
Water	Circ		42	10,000 - 50,000
Sewer	Gravity		Water/Wastewater Energy Audit? No	
Notes				

Access							
Road	No						
Air Access	Kobuk Airport, gravel, fair condition			Runway 1	4,020 ft. x 75 ft.	Runway 2	N/A
			Runway 3	N/A	Runway 4	N/A	
Dock/Port	Yes		Barge Access?	Yes	Ferry Service?	No	

Energy Profile: Kobuk

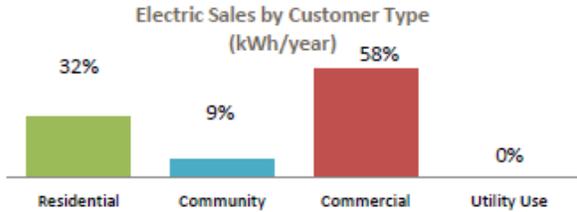
Power House

Utility	AVEC		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	Marathon/432 RSL 40i	257	
Unit 2			
Unit 3			
Unit 4			
Unit 5			
Line Loss	See Shungnak		
Heat Recovery?	See Shungnak		
Upgrades?			
Outage History/Known Issues			

Operators	No. of Operators	Training/Certifications

Maintenance Planning (RPSU)

Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	35	194,167	5547.628571
Community	0	55,951	#DIV/0!
Commercial	16	352,309	22019.3125
Utility Use	N/A	N/A	N/A

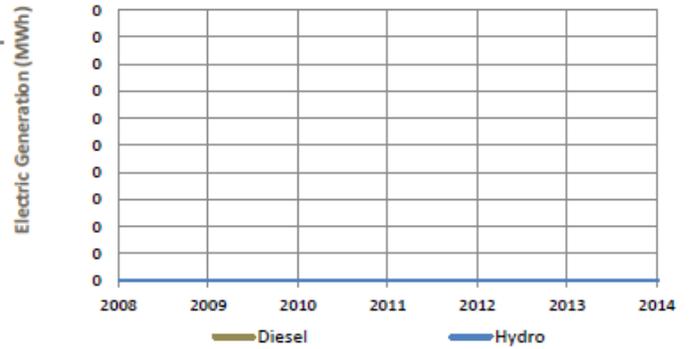


Alternative Energy Potential	Projects/Notes	Status
Hydroelectric	High AVEC Cosmos Hills Hydroelectric project	
Wind Diesel	Low/Medium Met Tower in Shungnak installed 2013, feasibility study and report completed 2014	
Biomass	High Upper Kobuk Biomass study	
Solar	High Solar PVs installed	
Geothermal	Low	
Oil and Gas	Low	
Coal	Low	
Emerging Tech	Unknown	
Heat Recovery	High	
Energy Efficiency	High Homes & schools provided w/ extra TED meters 2014/2015; 2014 TED training	

Bulk Fuel	Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
Tank Owner	Fuel Type(s)	Capacity	Age/Condition	
See Shungnak				

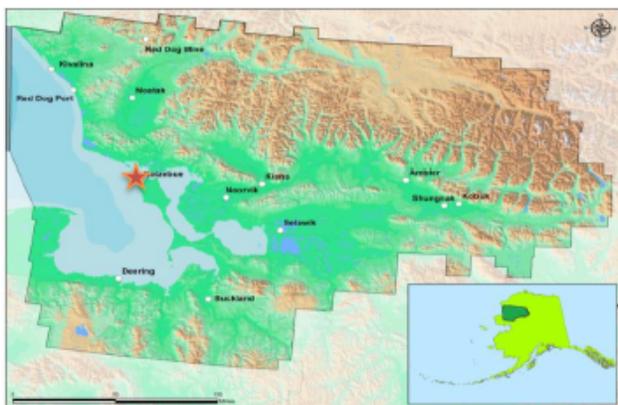
Power Production

Diesel (kWh/yr)	See Shungnak	Avg. Load (kW)	See Shungnak
Wind (kWh/yr)		0 Peak Load (kW)	136
Hydro (kWh/yr)		0 Efficiency (kWh/gal)	See Shungnak
Total (kWh/yr)	See Shungnak	Diesel Used (gals/yr)	See Shungnak



Electric Rates (\$/kWh)	Cost per kWh Sold (\$/kWh)		
Rate with PCE	0.21	Fuel Cost	
Residential Rate	0.83	Non-fuel Cost	
Commercial Rate		Total Cost	
Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	9.53		
Other Fuel? (1 gal)			
Gasoline (1 gal)	10.03		
Propane (100#)			
Wood (1 cord)			
Pellets			
Discounts?			

Community Profile: Kotzebue (Kotzebue Subregion)



Alaska Native Name (definition)

Kikiqtaruk

Historical Setting / Cultural Resources

This site has been occupied by Inupiat Eskimos for at least 600 years. "Kikiqtaruk" was the hub of ancient Arctic trading routes long before European contact, due to its coastal location near a number of rivers. The German Lt. Otto Von Kotzebue "discovered" Kotzebue Sound in 1818 for Russia. The community was named after the Kotzebue Sound in 1899 when a post office was established. Since the turn of the century, expansion of economic activities and services in the area have enabled Kotzebue to develop relatively rapidly. The city was formed in 1958. An air force base and White Alice Communications System were later constructed.

Incorporation 2nd Class City, 1958

Location

Kotzebue is on the Baldwin Peninsula in Kotzebue Sound, on a 3-mile long spit, which ranges in width from 1,100 to 3,600 feet. It is located near the discharges of the Kobuk, Noatak, and Selawick Rivers, 549 air miles northwest of Anchorage and 26 miles above the Arctic Circle.

Longitude

Latitude

ANCSA Region NANA Regional Corporation

Borough/CA Northwest Arctic Borough

School District Northwest Arctic Borough School District

AEA Region Northwest Arctic

Taxes Type (rate)

N/A

Per-Capita Revenue

\$1,340

Economy

The residents of Kotzebue are primarily Inupiat Eskimos, and subsistence activities are an integral part of the lifestyle.

Climate

Avg. Temp.

-12/58

Climate Zone

Transitional

Heating Deg. Days

16,531

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide)

2009

Community Plans

NWAB Comprehensive Plan (borough-wide)

Year

1993

Local Contacts

	Email	Phone	Fax
NANA Regional Corporation, Incorpor	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Kotzebue	executivedirectory@nana.com	907-442-3467	907-442-2162
City of Kotzebue	jgreene@kotzebue.org	907-442-3401	907-442-3742

Demographics

	2000	2010	2013
Population	3,082	3,201	Percent of Residents Employed
Median Age	26	28	68.00%
Avg. Household Size	4	4	Denali Commission Distressed Community
Median Household Income	N/A	\$81,354	No
			Percent Alaska Native/American Indian (2010)
			73.57%
			Low and Moderate Income (LMI) Percent (201x)
			49%

Electric Utility

Kotzebue Electric Association	Generation Sources	Interties	PCE?
	Diesel, wind	No	Yes

Landfill

Class	Permitted?	Location
Water/Wastewater System		
Water	Piped	Homes Served
Sewer	Piped	System Volume
Notes		500,001 - 1,000,00
		Water/Wastewater Energy Audit?

Access

Road	No				
Air Access	Ralph Wien Memorial Airport, gravel, good condition	Runway 1	5,900 ft. x 150 ft.	Runway 2	3,876 ft. x 90 ft.
		Runway 3	N/A	Runway 4	N/A
Dock/Port	Yes	Barge Access?	Yes	Ferry Service?	No

Energy Profile: Kotzebue

Power House

Utility	Kotzebue Electric Association		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1			
Unit 2			
Unit 3			
Unit 4			
Unit 5			
Line Loss		5.80%	
Heat Recovery?			
Upgrades?			
Outage History/Known Issues			

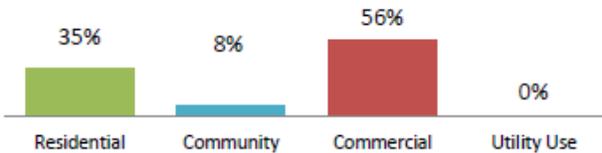
Operators

No. of Operators	Training/Certifications

Maintenance Planning (RPSU)

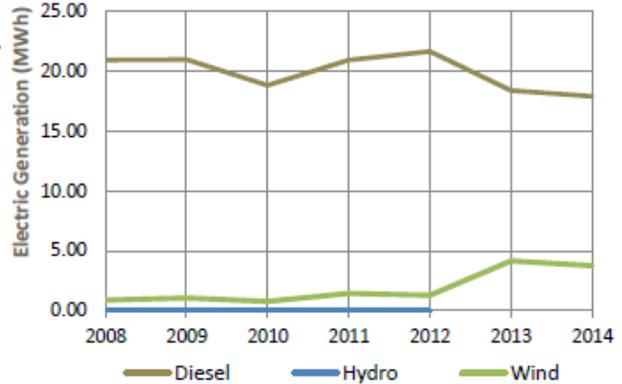
Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	1,046	7,060,641	6750.134799
Community	29	1,621,262	55905.58621
Commercial	171	11,267,237	65890.27485
Utility Use	N/A	N/A	N/A

Electric Sales by Customer Type
(kWh/year)



Power Production

Diesel (kWh/yr)	17,900,120	Avg. Load (kW)	
Wind (kWh/yr)	3,768,108	Peak Load (kW)	
Hydro (kWh/yr)	0	Efficiency (kWh/gal)	14.25
Total (kWh/yr)	21,668,228	Diesel Used (gals/y)	1,255,854



Electric Rates (\$/kWh)

Rate with PCE	0.26	Cost per kWh Sold (\$/kWh)	
Residential Rate	0.44	Fuel Cost	0.22
Commercial Rate	N/A	Non-fuel Cost	0.07
		Total Cost	0.29

Fuel Prices (\$)

	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	6.16	3.19	
Other Fuel? (1 gal)			
Gasoline (1 gal)	6.80		
Propane (100#)	198.28		
Wood (1 cord)			
Pellets			
Discounts?			

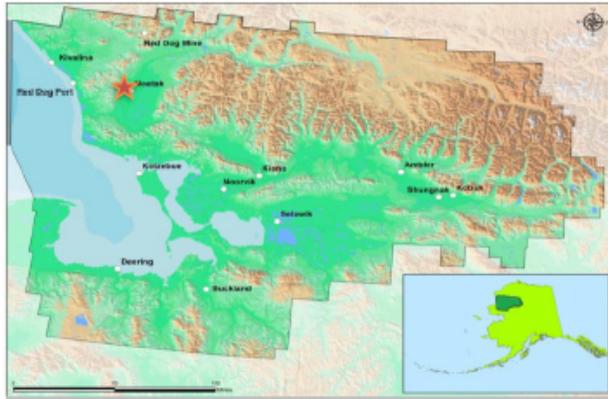
Alternative Energy Potential

Hydroelectric	Low	Projects/Notes	Status
Wind Diesel	High	Class 5, KEA has 19 turbines, Ecycle testing 2013/2014	
Biomass	Medium	Current funding request to AEA for waste to heat project construction	
Solar	High	Thermal arrays at elder's homes and planned for power plant; Solar PV planned	
Geothermal	Low		
Oil and Gas	Medium	NANA leading effort to quantify local gas resources	
Coal	Low		
Emerging Tech	Unknown		
Heat Recovery	High	Rise of fuel heating costs make heat recovery feasible for KEA power plant	
Energy Efficiency	High	NRECA/US-DOE smart grid program to install ecometers and smart-relays	

Bulk Fuel

Tank Owner	Fuel Type(s)	Capacity	Age/Condition	Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
				By Barge			
				By Air			
				Cooperative Purchasing Agreements			
				Notes			

Community Profile: Noatak (Noatak Valley)



Alaska Native Name (definition)

Noatagamut, "Inland River People"

Historical Setting / Cultural Resources

The village is Inupiat Eskimo. It was established as a fishing and hunting camp in the 19th century. The rich resources of this region enabled the camp to develop into a permanent settlement. The 1880 census listed the site as Noatagamut, which means "inland river people." A post office was established in 1940.

Incorporation Unincorporated in Northwest Arctic Borough

Location

Noatak is located on the west bank of the Noatak River, 55 miles north of Kotzebue and 70 miles north of the Arctic Circle. This is the only settlement on the 396 mile-long Noatak River, just west of the 66-million acre Noatak National Preserve.

Longitude	-162.9653	Latitude	67.5711
ANCSA Region	NANA Regional Corporation		
Borough/CA	Northwest Arctic Borough		
School District	Northwest Arctic Borough School District		
AEA Region	Northwest Arctic		

Taxes	Type (rate)	Per-Capita Revenue
N/A		N/A

Economy

Subsistence activities are the central focus of the culture, and families travel to fish camps during the summer. 68% residents employed: 71% private sector, 28% local government, and 1% state government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-21/60	Arctic	15,229

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide)	2009
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Community Plans

NWAB Comprehensive Plan (borough-wide)	1993
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Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorpor	communications@nana.com	907-485-2173	907-485-2137
Native Village of Noatak	tribeadmin@nautaaq.org	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930

Demographics	2000	2010	2013
Population	428	514	Percent of Residents Employed 68.00%
Median Age	23	23	Denali Commission Distressed Community No
Avg. Household Size	5	5	Percent Alaska Native/American Indian (2010) 94.75%
Median Household Income	N/A	\$58,250	Low and Moderate Income (LMI) Percent (201x) N/A

Electric Utility	Generation Sources	Interties	PCE?
Alaska Village Electric Cooperative (AVEC)	Diesel	No	Yes

Landfill	Class	III	Permitted?	No	Location	Gravel road north of runway
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Water/Wastewater System	Homes Served	77	System Volume	50,001 - 100,000
Water	Circ/heated system		Water/Wastewater Energy Audit?	No
Sewer	Gravity			
Notes	1/2 homes not served by water/wastewater system			

Access

Road	No				
Air Access	Noatak Airport, gravel, good condition	Runway 1	3,992 ft. x 60 ft.	Runway 2	N/A
		Runway 3	N/A	Runway 4	N/A
Dock/Port	No	Barge Access?	No	Ferry Service?	No

Energy Profile: Noatak

Power House

Utility	AVEC		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	Kato/4P3-1475	314 kW	
Unit 2	Newage/HCI534F1	499 kW	
Unit 3	Newage/HCI534CI	397 kW	
Unit 4			
Unit 5			
Line Loss		4.50%	
Heat Recovery?		No	
Upgrades?			
Outage History/Known Issues			

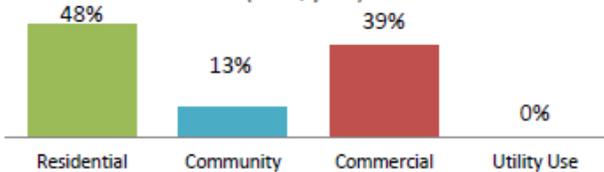
Operators

No. of Operators	Training/Certifications

Maintenance Planning (RPSU)

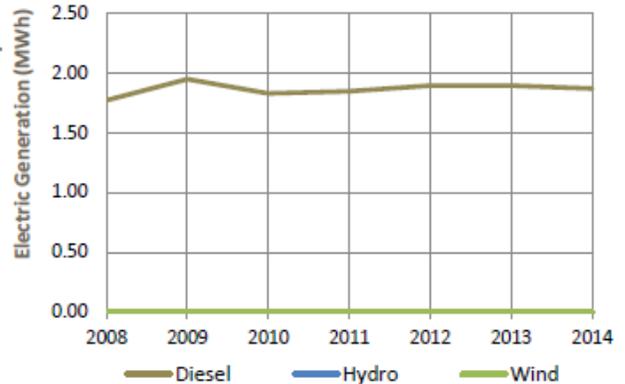
Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	117	837601	7158.982906
Community	9	223474	24830.44444
Commercial	26	679652	26140.46154
Utility Use	N/A	N/A	

Electric Sales by Customer Type
(kWh/year)



Power Production

Diesel (kWh/yr)	1,869,341	Avg. Load (kW)	219
Wind (kWh/yr)	0	Peak Load (kW)	443
Hydro (kWh/yr)	0	Efficiency (kWh/gal)	14.57
Total (kWh/yr)	1,869,341	Diesel Used (gals/yr)	128,286



Electric Rates (\$/kWh)

Rate with PCE	0.22	Fuel Cost	0.55
Residential Rate	0.88	Non-fuel Cost	0.23
Commercial Rate	0.87	Total Cost	0.78

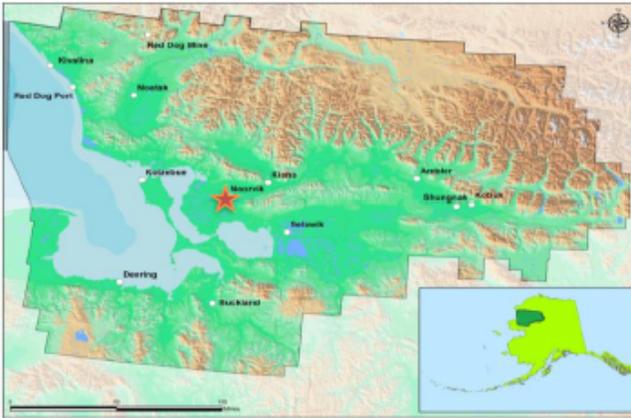
Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	9.99	6.76	
Other Fuel? (1 gal)			
Gasoline (1 gal)	9.99		
Propane (100#)			
Wood (1 cord)			
Pellets			
Discounts?			

Alternative Energy Potential	Projects/Notes	Status
Hydroelectric	Low	
Wind Diesel	Low	Class 4, Met Tower, feasibility study complete
Biomass	Medium	Pre-feasibility study recommended; AWEDG would provide study at no cost
Solar	High	Solar PVs planned for Noatak, high potential for solar farm
Geothermal	Low	
Oil and Gas	Low	
Coal	Low	
Emerging Tech	Unknown	
Heat Recovery	High	
Energy Efficiency	High	Homes & schools provided w/ extra TED meters 2014/2015; 2014 TED training

Bulk Fuel	Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
Tank Owner	Fuel Type(s)	Capacity	Age/Condition	
AVEC	Diesel	99,800		
IRA	Diesel	91,800		
School	Diesel	89,500		
	By Barge	28	125,770	AVEC
	By Air			
	Cooperative Purchasing Agreements			

Notes

Community Profile: Noorvik (Lower Kobuk)



Alaska Native Name (definition)

Noorvik, "a place that is moved to"

Historical Setting / Cultural Resources

The village was established by Kowagmuit Inupiat Eskimo fishermen and hunters from Deering in the early 1900s. The village was also settled by people from Oksik, a few miles upriver. A post office was established in 1937.

Incorporation 2nd Class City, 1964

Location

Noorvik is located on the right bank of the Nazuruk Channel of the Kobuk River, 33 miles northwest of Selawik and 45 miles east of Kotzebue. The village is downriver from the 1.7-million acre Kobuk Valley National Park.

Longitude -161.0328 **Latitude** 66.8383

ANCSA Region NANA Regional Corporation

Borough/CA Northwest Arctic Borough

School District Northwest Arctic Borough School District

AEA Region Northwest Arctic

Taxes	Type (rate)	Per-Capita Revenue
N/A		\$70

Economy

The primary local employers are the school district, the City, the Maniilaq health clinic, and two stores. Seasonal employment found at the Red Dog Mine, BLM fire fighting, or work in Kotzebue supplements incomes. 60% residents employed: 47% private sector, 51% local government, and 2% state government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-10/65	Transitional	15,812

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide)	2009
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Community Plans

NWAB Comprehensive Plan (borough-wide)	1993
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Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorpor	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Noorvik Native Community	tribemanager@nuurvik.org	907-636-2144	907-636-2284

Demographics	2000	2010	2013
Population	634	668	
Median Age	22	22	
Avg. Household Size	5	5	
Median Household Income	N/A	\$54,375	
Percent of Residents Employed			60.00%
Denali Commission Distressed Community			No
Percent Alaska Native/American Indian (2010)			88.32%
Low and Moderate Income (LMI) Percent (201x)			55%

Electric Utility	Generation Sources	Interties	PCE?
Alaska Village Electric Cooperative (AVEC)	Diesel	No	Yes

Landfill	Class	III	Permitted?	Yes	Location	2.6 mile east
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Water/Wastewater System	Homes Served	System Volume
Water Pressure, Circ		50,001 - 100,000
Sewer Vacuum		
Water/Wastewater Energy Audit?	No	

Notes

Access

Road	No				
Air Access	Robert Curtis Memorial Airport, gravel, fair condition	Runway 1	4,000 ft. x 100 ft.	Runway 2	N/A
		Runway 3	N/A	Runway 4	N/A
Dock/Port	Yes	Barge Access?	Avg. Temp.	Ferry Service?	No

Energy Profile: Noorvik

Power House

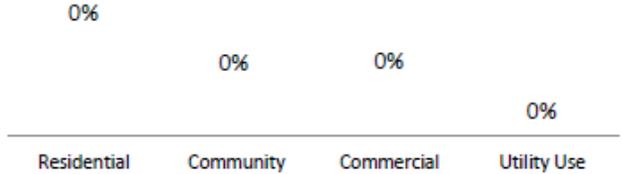
Utility	AVEC		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	Newage/HCI504C1	363	
Unit 2	Newage/HCI504F1	499	
Unit 3	Marathon/750ROZD	710	
Unit 4			
Unit 5			
Line Loss	2.70%		
Heat Recovery?	*Was project implemented?		
Upgrades?			
Outage History/Known Issues			

Operators	No. of Operators	Training/Certifications

Maintenance Planning (RPSU)

Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential			#DIV/0!
Community			#DIV/0!
Commercial			#DIV/0!
Utility Use	N/A		

**Electric Sales by Customer Type
(kWh/year)**

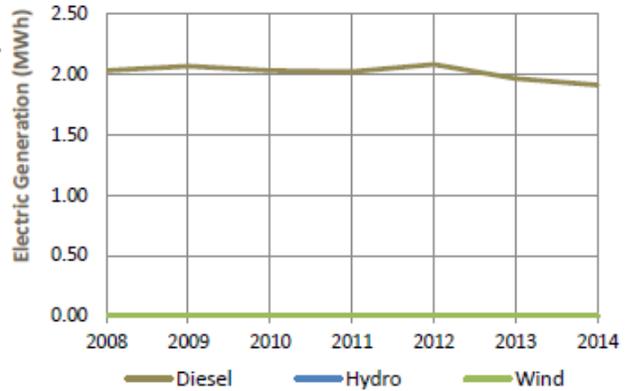


Alternative Energy Potential		Projects/Notes	Status
Hydroelectric	Low		
Wind Diesel	Low/Medium	Class 3, feasibility study, construction 2014	
Biomass	Medium	Resources investigated in Noorvik	
Solar	Medium to High	Solar PVs planned for Noorvik	
Geothermal	Low		
Oil and Gas	Low		
Coal	Medium	Further study on resource potential needed	
Emerging Tech	Unknown		
Heat Recovery	High	Design for system was scheduled for 2014 fall construction	
Energy Efficiency	High	Homes & schools provided w/ extra TED meters 2014/2015; 2014 TED training	

Bulk Fuel			
Tank Owner	Fuel Type(s)	Capacity	Age/Condition
AVEC	Diesel	202,944	

Power Production

Diesel (kWh/yr)	1,911,548	Avg. Load (kW)	224
Wind (kWh/yr)	N/A	Peak Load (kW)	474
Hydro (kWh/yr)	N/A	Efficiency (kWh/gal)	12.78
Total (kWh/yr)	1,911,548	Diesel Used (gals/y)	149,548



Electric Rates (\$/kWh)		Cost per kWh Sold (\$/kWh)	
Rate with PCE	0.20	Fuel Cost	0.35
Residential Rate	0.65	Non-fuel Cost	0.23
Commercial Rate	0.65	Total Cost	0.58

Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	7.60	3.69	
Other Fuel? (1 gal)			
Gasoline (1 gal)	8.03		
Propane (100#)	307.00		
Wood (1 cord)			
Pellets			
Discounts?			

Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
By Barge	1	96,946	AVEC
By Air			
Cooperative Purchasing Agreements			
Notes			

Energy Profile: Selawik

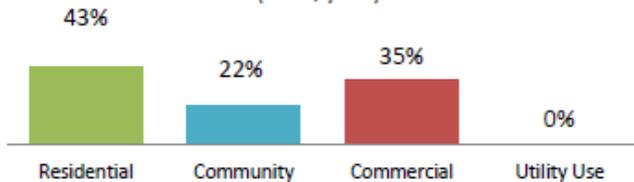
Power House

Utility	AVEC		
Generators	Make/Model	Rated Capacity	Condition/Hrs
Unit 1	arathon/572RSL40	363	
Unit 2	Newage/HCI544F	499	
Unit 3	Newage/HCI604J1	824	
Unit 4			
Unit 5			
Line Loss	2.80%		
Heat Recovery?	Yes		
Upgrades?			
Outage History/Known Issues			

Operators	No. of Operators	Training/Certifications

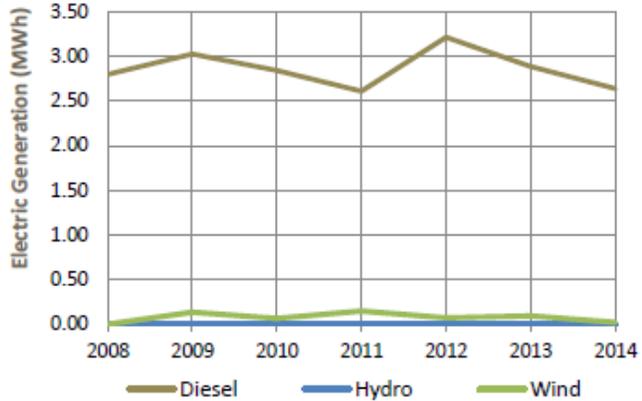
Maintenance Planning (RPSU)			
Electric Sales	No. of Customers	kWh/year	kWh/Customer
Residential	179	1,098,976	6139.530726
Community	17	550,009	32353.47059
Commercial	50	894,373	17887.46
Utility Use	N/A		

Electric Sales by Customer Type
(kWh/year)



Power Production

Diesel (kWh/yr)	1,098,976	Avg. Load (kW)	332
Wind (kWh/yr)	21,408	Peak Load (kW)	725
Hydro (kWh/yr)	0	Efficiency (kWh/gal)	13.85
Total (kWh/yr)	2,665,515	Diesel Used (gals/y)	190,956

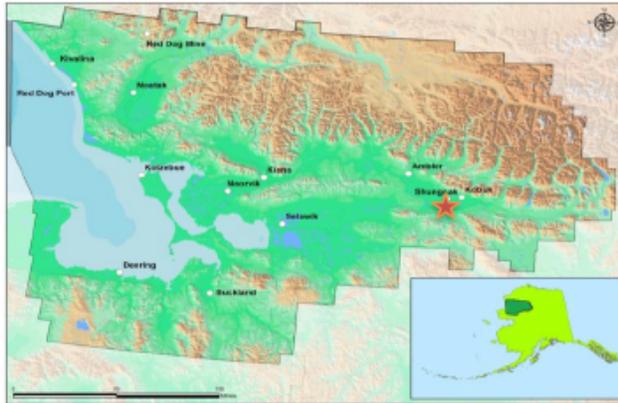


Electric Rates (\$/kWh)		Cost per kWh Sold (\$/kWh)	
Rate with PCE	0.20	Fuel Cost	0.32
Residential Rate	0.61	Non-fuel Cost	0.23
Commercial Rate	0.62	Total Cost	0.55
Fuel Prices (\$)	Utility/Wholesale	Retail	Senior
Diesel (1 gal)	7.99	3.41	
Other Fuel? (1 gal)			
Gasoline (1 gal)	8.25		
Propane (100#)	320.19		
Wood (1 cord)			
Pellets			
Discounts?			

Alternative Energy Potential	Projects/Notes	Status
Hydroelectric	Low	
Wind Diesel	Low/Medium	Class 2-3, Four AOC 15/50 wind turbines integrated into power system
Biomass	Low	
Solar	Medium to High	Solar PVs planned for Selawik
Geothermal	Low	
Oil and Gas	Low	
Coal	Medium	Coal resources identified in the Hockley Hills between Kiana and Selawik
Emerging Tech	Unknown	
Heat Recovery	High	AVEC working with ANTHC to renovate system
Energy Efficiency	High	Homes & schools provided w/ extra TED meters 2014/2015; 2014 TED training

Bulk Fuel			
Tank Owner	Fuel Type(s)	Capacity	Age/Condition
AVEC	Diesel	273,878	
Purchasing	Deliveries/Year	Gallons/Delivery	Vendor(s)
By Barge	3	230,572	AVEC
By Air			
Cooperative Purchasing Agreements			
Notes			

Community Profile: Shungnak (Upper Kobuk)



Alaska Native Name (definition)

Issingnak "Jade"

Historical Setting / Cultural Resources

It is a traditional Inupiat Eskimo village with a subsistence lifestyle. Founded in 1899 as a supply point for mining activities in the Cosmos Hills, this Inupiat Eskimo village was forced to move in the 1920s because of river erosion and flooding. The old site, 10 miles upstream, was renamed Kobuk by those who remained there. The new village was named "Kochuk" but later reverted to Shungnak. This name is derived from the Eskimo word "Issingnak," which means jade, a stone found extensively throughout the surrounding hills. The city government was incorporated in 1967.

Incorporation 2nd Class City,

Location

Shungnak is located on the west bank of the Kobuk River, about 150 miles east of Kotzebue. The original settlement was 10 miles further upstream at Kobuk.

Longitude	Latitude
ANCSA Region	NANA Regional Corporation
Borough/CA	Northwest Arctic Borough
School District	Northwest Arctic Borough School District
AEA Region	Northwest Arctic

Taxes Type (rate)	Per-Capita Revenue
N/A	\$140

Economy

Shungnak subsists mainly on fishing, seasonal employment, hunting and trapping. Food sources include sheefish, whitefish, caribou, moose, ducks and berries. Most full-time employment is with the school district, City, Maniilaq Association, two stores and a lodge. 65% residents employed: 62% private sector, 38% local government.

Climate	Avg. Temp.	Climate Zone	Heating Deg. Days
	-10/65	Transitional	N/A

Natural Hazard Plan

All-Hazards Mitigation Plan (borough-wide)	2009
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Community Plans

NWAB Comprehensive Plan (borough-wide)	1993
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Local Contacts	Email	Phone	Fax
NANA Regional Corporation, Incorpor	communications@nana.com	907-485-2173	907-485-2137
Northwest Arctic Borough	info@nwabor.org	907-442-2500	907-442-2930
Native Village of Shungnak	tribeclerk@issingnak.org	907-437-2163	907-437-2183
City of Shungnak		907-437-2161	907-437-2176

Demographics	2000	2010	2013
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Population	Percent of Residents Employed
Median Age	Denali Commission Distressed Community
Avg. Household Size	No
Median Household Income	Percent Alaska Native/American Indian (2010)
	Low and Moderate Income (LMI) Percent (201x)
	66%

Electric Utility	Generation Sources	Interties	PCE?
Alaska Village Electric Cooperative (AVEC)	Diesel	No	Yes

Landfill	Class	III	Permitted?	No	Location	1 mile southwest of the community
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Water/Wastewater System		Homes Served	System Volume 10,000 - 50,000
Water	Circ	61	
Sewer	Gravity	Water/Wastewater Energy Audit? No	
Notes	Honey Buckets		

Access

Road	No				
Air Access	Shungnak Airport, gravel, fair condition	Runway 1	4,001 ft. x 60 ft.	Runway 2	N/A
		Runway 3	N/A	Runway 4	N/A
Dock/Port	Yes	Barge Access?	Yes	Ferry Service?	No

Short Term Priority Energy Actions for the Northwest Arctic Region

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Energy Efficiency				
Noorvik, Kiana, Selawik, Noatak, Kivalina - TED meters (2014)	Ongoing	Install meters	NANA, NAB	NAB/CIAP grant funded
Ambler, Deering, Selawik (2013), Noorvik (2014) - Heat recovery system upgrade and energy efficiency improvements	Ongoing	Construction	AVEC, ANTHC	Ambler, Deering, Selawik - AEA funded, Noorvik likely funded
Ambler - Shungnak intertie	Ongoing	Apply for AEA REF round 7 funding	AVEC, City, Tribes, NANA, NAB	Miet tower funded
Kotzebue - Smart grid	Ongoing	Install grid	KEA, NAB	NRECA/DOE funded
Noorvik heat recovery	Ongoing	Complete project	ANTHC	Funded
Kivalina heat recovery at water treatment plant	Identified	Pursue funding		None
Retrofit current structures to improve energy efficiency.	Identified	Identify project champion, seek funding	NIHA, ANTHC, NANA, Rural Cap	None
Fill data gaps: metering, fuel consumption, space heating, etc., at the building, local and regional levels	Identified	Identify project champion, seek funding	AEA, DOE	None

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Add insulation to above ground water and wastewater system	Identified	Identify project champion, seek funding	ANTHC, DOE, AEA	None
Seek funding, design and construct additional cold climate houses	Identified	Identify project champion, coordinate with NW Inupiat Housing Authority and Cold Climate Research Center	NIHA, NAB, CCHRC	None
Replace approximately 750 street lights in region	Ongoing	Apply for VEEP funding	AVEC, NAB	Applied in 2013 for VEEP funds
Buckland – electrical assessment study	Identified	Seek funding	NAB, NANA, local officials	None
Solar				
NWABSD solar thermal - install commercial grade solar thermal units for school district buildings	Identified	Identify project champion	NWABSD	None
Solar PV at WTP - Kobuk, Noatak, Moorvik, Shungnak, Deering, Ambler (2013 - installed)	Ongoing	Construction	NAB, ANTHC, Local government, KEA, City of Kotzebue	CIAP funded
Solar PV at WTP - Buckland, Kiana, Kivalina, Kotzebue, Selawik (2014)	Ongoing	Construction	NAB, ANTHC, Local government, KEA, City of Kotzebue	CIAP funded
Residential solar thermal and electrical	Identified	Identify champion, seek funding	NAB, local officials, NANA	None
Noatak, Kiana, Moorvik - complete solar farm feasibility study	Identified	Seek funding	NAB, NANA, local officials	None
Solar/Wind kits for fish camps	Identified	Identify champion, seek funding	NAB, local officials, NANA	None
Biomass				
Kivalina, Kiana, Moorvik biomass feasibility study	Identified	Seek funding	NAB, NANA, local officials	None
Upper Kobuk biomass project	Ongoing	Complete conceptual design	Local governments, ANTHC, NAB, NANA	AEA funded

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Kobuk - Install and test biomass boiler at WTP (2014)	Ongoing	Construction	Local governments, ANTHC, NAB, NANA	ANTHC funded
Wind				
Shungnak/Kobuk – Wind diesel Feasibility study and conceptual design (\$150,000)	Ongoing	AEA Renewable Energy Fund Round 7 funded	AVEC, NAB, NANA, local governments	None (met tower installed)
Kiana - Wind study (\$150,000)	Ongoing	Apply for round seven funding	AVEC, City of Kiana	None
Buckland/Deering/Noorvik wind diesel final design (\$20,000)	Ongoing	Complete final design, construction and environmental documents	AVEC, NAB, NANA, local governments	AEA funded
Noorvik power plant upgrade to incorporate wind (\$800,000)	Ongoing	USDA Rural Development request in process	AVEC	USDA RD request \$800,000
Noorvik wind diesel design and construction	Ongoing			AEA \$3.4 M
Cosmos Hills wind resource and intertie assessment	Ongoing	Complete study, apply for funding for construction	AVEC, NANA, NAB	AEA funded
Kotzebue - EWT turbine integration (wind) (2013-2014)	Ongoing	Completed project	KEA, KIC, NANA	Funded
Red Dog port site - Kivalina transmission feasibility study (May 2014)	Ongoing	Pursue funding for next steps	AVEC/Teck/NANA/NAB	AVEC funded
Kivalina Wind Feasibility at NEW school site	Identified	Seek funding	AVEC, NAB, NANA, local officials	None
Selawik - Repower wind diesel (2014)	Ongoing	Complete project	AVEC, NAB, NANA, local governments	Funded
Hydroelectric				
Upper Kobuk Cosmos Hills hydroelectric feasibility study (completed 2013), design and construction	Ongoing	Design and construction	AVEC, NANA, NAB	AEA funded feasibility study
Emerging Technology				
Kotzebue – Waste to energy biofuel (2014)	Ongoing	Identify project champion, seek funding	KEA, City of Kotzebue	None

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Kotzebue - Eocycle turbine testing	Ongoing	Complete project	KEA, NAB	Funded
Noatak Red Dog port fuel haul project (\$425,000)	Ongoing	Business development for village of Noatak	State of Alaska, NAB, NANA, Cruz Construction, Native Village of Noatak, Teck	State of Alaska funded
HVDC demonstration project	Ongoing	Identify project champion, seek funding	AVEC	None
Fuel Storage				
Implement a bulk fuel buying program to utilize economy of scale/may include regional tank farm	Ongoing	Identify project champion, coordinate with Teck	AIDEA, Teck, NOSI, NANA	None
Conduct feasibility study of local tank farms, including inspection, deficiencies, capacity and implement recommendations	Identified	Identify project champion, seek funding for study	NAB, NANA, EPA, ICDBG	None
Maintenance				
Buckland, Deering, Noatak Energy Audits/Repairs	Ongoing	Complete energy upgrades	ANTHC, Noatak IRA	DOE Funded
Buckland, Deering, Noatak - ARUC membership	Identified	Identify champion	ANTHC, local governments, local operator, NAB	None
Conduct utility operator training	Ongoing	Identify project champions, operators and communities that could benefit from training	ARUC, ANTHC, AVEC, NAB, DOL, NANA, Cities, KEA, BIA, Chukchi College Tech Center, Delta Career Advancement Center, local operators	None
Upgrade water/wastewater systems	Ongoing	Seek additional funding to monitor energy use, system operating pressures, flows, temperature, pump power loads, and feedback control loops.	ARUC, ANTHC, NAB, NANA, local operator	None
Employ full-time WTP operators in winter	Identified	Identify project champion	ARUC, ANTHC, NAB, NANA	None
Conduct water/wastewater operator training	Ongoing	Identify project champion	ARUC, ANTHC, NAB, NANA, local operator	None

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Noatak - power plant relocation	Ongoing	Obtain land from NANA, apply for funding	AVEC, Noatak IRA, NANA NAB	None
Educate all residential users on the operation of their heating system and how to perform basic system maintenance	Identified	Identify champion, seek funding	Rural CAP, NANA, AEA, utility providers, DOE	None
Develop and distribute a resource list of contacts for users in case of system problems	Identified	Identify champion, seek funding	Rural CAP, NANA, AEA, utility providers, DOE	None
Develop and distribute a user's manual for home maintenance of household energy/heating system	Identified	Identify champion, seek funding	Rural CAP, NANA, AEA, utility providers, DOE	None
Funding				
Make AHFC revolving loan program more accessible by lobbying for variances on Level 3 audit requirements	Ongoing	Identify project champion	AHFC, NIHA, NANA, NWALT, Rural CAP	None
Continue to lobby for congressional changes to the HUD funding eligibility requirements	Ongoing	Identify project champion	All regional partners	None
Seek match funding and coordinate projects to reduce costs where feasible	Ongoing	Identify project champion	All regional partners	None
Consider forming a regional energy authority or independent power producer (IPP) to access bond funding	Identified	Identify project champion	All regional partners	None
Communication				
Continue the Energy Steering Committee efforts	Ongoing	Seek funding to continue meeting	All regional partners	None
Present the draft regional energy plan in local public meetings	Ongoing	Seek funding to continue meeting	All regional partners	Some money available through AEA
Review and update energy plan on a regular basis and present to communities	Ongoing	Seek funding to continue planning	All regional partners	None

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Integrate energy planning with village comprehensive plans	Ongoing	Coordinate with NAB Economic Development office	NAB, NANA, local Governments	NAB is funding Comp. Plans. Due for completion 2014
Seek input from residents regarding their energy and heating needs and best solutions for their homes	Identified	Seek funding to continue meeting	All Regional Partners	None
Education				
Implement K-12 Alaska Smart Energy curriculum	Ongoing	Lobby school district personnel to provide energy education in the schools	NAB, NANA, Energy Steering Committee, NWABSD, NWALT, UAF, ACEP, AEA, DOE	None
Train educators in energy efficiency practices and promote energy efficiency through energy fairs in the schools	Identified	Identify project champion	NAB, NANA, Energy Steering Committee, NWABSD, NWALT, UAF, ACEP, AEA, DOE, Rural CAP	None
Seek funding for and implement local energy education and continuation of the Energy Wise program	Identified	NAB/NANA to seek funding	Rural CAP, NANA, AEA, DOE, Denali Commission	None
Transportation				
Connect Kotzebue to Cape Blossom via road with adequate right of way to accommodate all utilities	Identified	Complete design, City, tribe, KIC meetings with DOT&PF	DOT&PF, City of Kotzebue, Kotzebue IRA, FHWA, NAB, KEA, NANA, NWALT	Design funded
Identify roads or ice roads to connect villages to energy/fuel distribution points	Identified	Identify project champion, coordinate with NANA	NAB, NANA, DOT&PF, Maniilaq, village councils, cities	None
Potential Game Changers				

PROJECTS	PROJECTS STATUS	NEXT STEPS	PARTNERS	FUNDING STATUS
Remain informed and participate in meetings that have long term energy implications such as road or pipeline access into the region	Ongoing	Identify project champion	All regional partners	N/A
Identify and analyze future resource development projects that will require power	Ongoing	Identify project champion, coordinate with NAMA	All regional partners	N/A
Reassess natural gas resources in the region	Ongoing	Identify project champion, coordinate with NAMA	NANA, NOSI	N/A

Capital & Top Regional Mega Projects

Just off our coastline, Shell is exploring for oil and natural gas in the Chukchi Sea. Additionally, with anticipated ice-free Arctic waters during the summer, our area will play a key role in the emerging Arctic economy. The Northwest Arctic Borough wants to be ready for the future, with the right infrastructure in place to support economic growth and sustainable communities.

Three things are key for further development in our area:

1. Access:

There has to be a way to get products to market. The Governor's Roads to Resources initiative is working to solve this problem. An important part of the plan is to build a road that connects the mineral-rich area around Ambler with the Dalton Highway. There is also the possibility of a road from the Upper Kobuk area west to a new Arctic port located at Cape Blossom. An Arctic port can serve as a support area for the oil and gas industries and for the U.S. Coast Guard, both of which have ships in the area during the summer drilling season. For the mining industry a port can provide a market access point. Next summer construction of a road from Kotzebue to the proposed port site will begin. Funding for development of the port itself is still needed and an additional \$10 million is needed to complete the road.

2. Affordable Energy:

The cost of energy has already made some mining projects uneconomical at this time. The Cosmos Hills Hydro Project presents an opportunity for a large hydro project in the Upper Kobuk area that would reduce the cost of energy, making development more feasible while reducing the cost of living for residents. Near Kotzebue, NANA Regional Corporation wants to explore for natural gas, which could help spur the local economy by providing local families more discretionary income. This project is in the final permitting phase and needs additional funding.

3. Local Support for Resource Development:

The success of the Red Dog mine has made locals more supportive of development in the area. However, development must be mutually beneficial. Locals expect jobs, reduced energy costs, protection of local game and fish stocks for subsistence use, and the infrastructure needed to adequately support development. We recognize the need for jobs in our area and around the state. In order to succeed, industry and state government must engage the local community and work to build support and enthusiasm. We are eager to work cooperatively with industry.

We are not alone in our mission. Our partners in the region include:

NANA Regional Corporation

City of Kotzebue

Maniilaq Association

Northwest Arctic Borough School District

Northwest Inupiat Housing Association

Kikiktagrut Inupiat Corporation

Kotzebue IRA

Village communities and tribal councils



Cosmos Hills Hydro Project and Intertie:

In order to stabilize energy costs associated with generating electricity, the Northwest Arctic Borough and Alaska Village Electric Cooperative (AVEC) are proposing an area-wide system of upgrades in the Upper Kobuk region. Ambler, Shungnak, and Kobuk have the highest energy costs out of all of AVEC's 54 villages. Fuel costs are often very high because in recent years the Kobuk River has been too shallow for barges to deliver fuel, requiring it to be flown in at added expense.

This project funds construction of an integrated power delivery system that uses both diesel and hydroelectric power generation for the Cosmos Hill Region. The project entails building a large joint power plant and bulk fuel facility in Ambler to provide low-cost electricity to Ambler, Kobuk and Shungnak. Currently, diesel-fuel power generation is the only source of electricity for these three communities. Run-of-river hydro sites in this area could provide electricity from about mid-April until early November, although the Kogoluktuk River may be able to provide power later into the winter and earlier in the spring. The small hydroelectric plants would supplement the expensive diesel fuel when river conditions allow.

Run-of-river hydroelectric plants do not require a large dam, relying instead on the natural flow volume of the stream or river. Such facilities tend to have far less environmental impacts compared to conventional dam-storage hydroelectric plants because of the lack of a large artificial reservoir. With proper siting, construction techniques, and operation and maintenance, run-of-river hydropower in the region could have minimal impacts on fisheries and other subsistence resources. Lower energy costs will benefit local residents and have the added benefit of spurring further mineral development.

The NAB is requesting construction funding for a new 25 mile overhead intertie between Ambler and Shungnak, and a standby backup generator for Shungnak that could back-feed power to Ambler and Kobuk in the event of an emergency. Funding would also allow repairs to the existing 20-year-old, 11-mile overhead transmission line between Shungnak and Kobuk. The proposed projects will be constructed concurrently to maximize efficiency. AVEC has already completed hydroelectric reconnaissance and feasibility work. NANA Regional Corporation has several years of river flow data as well.

Total funding for this portion of the project is estimated at \$30 million, with \$3 million needed for the next phase, which includes the final permitting and design of the Cosmos Hills Hydroelectric Project for the Upper Kobuk region.

Cape Blossom Road and Arctic Regional Deep Water Port:

For more than thirty years, the City of Kotzebue and other organizations have been exploring the

Possibility of an Arctic deep water port that will serve not only Kotzebue, but all of Alaska. With the rising cost of living in Northwest Alaska, the regional entities are pushing aggressively to move the Cape Blossom Road and Regional Port from concept to reality.

The first step in building the port is construction of a 10-mile access road from Kotzebue to Cape Blossom in order to gain access to the port site. \$21.5 million in funding has already been secured for this project, with contributions coming from both the state and federal governments. An additional \$10 million is needed to complete the project. Construction of the road is anticipated to begin in the summer of 2013. With the road in place, the next step will be design, permitting, and construction of the port facility. The estimated cost to build the port is \$90 million.

The Cape Blossom Regional Port will help alleviate the high cost of living in the borough and provide a market access point for the abundant resources in our area. The cost of living is 61 percent higher in Kotzebue than in Anchorage, and costs in the outer villages are even higher. Currently Kotzebue, the hub of the Northwest Arctic Borough, receives goods by a barge and lightering service that adds significant cost to all imported goods. The Cape Blossom Regional Port will alleviate this problem and have the following positive economic impacts on our region:

- reduce the cost of shipping;
- increase the Borough's bulk fuel storage capacity;
- increase access to lands needed to alleviate the housing shortage and for other community expansion; and
- provide a shipping and delivery access point for resource development.

Construction of a port will spur economic development in our area and will have a positive influence on the economies of the urban areas where most of our purchased goods come from.

Just off our coastline, the retreat of Arctic sea ice in the summer has cleared the way for more shipping and other vessel traffic in the area, as well as oil and gas exploration on the outer continental shelf of the Chukchi Sea. Already, the oil industry and the U.S. Coast Guard have ships in the area during the summer drilling season, although the nearest Coast Guard base is several days away in Kodiak. A port in the safe harbor area available at Cape Blossom will serve as a support area for the oil and gas industry, the mining industries, and the Coast Guard. The Cape Blossom Regional Port will provide moorage, an access route to markets, and a staging area to respond to ship groundings, vessel emergencies, and oil spills in the Arctic in a timely manner.

The people of Northwest Alaska eagerly look forward to participating in the growing Arctic economic prosperity, while ensuring that development happens in a safe and sustainable way. Development of the port is one avenue to move this vision forward.

Noatak Airport, Road and Bulk Fuel Storage:

The first part of this project consists of building a 28-mile gravel road that connects the village of Noatak to the Delong Mountain Road, the adjacent port facilities, and the Red Dog Mine. The project is known as the Noatak DMTS road project. The road will serve many useful functions, providing:

- Access to a secondary emergency airport for the mine;
- Direct transit access for the local workforce to the mine;
- Additional subsistence access to wilderness; and

- Access to bulk freight and fuel storage at the mine site.

This project is a priority of both the borough and the community of Noatak. The road will provide much needed economic relief to the area. The cost of living in Noatak is among the highest in the State because low water levels in the Noatak River prevent cheaper barge delivery of goods. Gasoline and heating oil prices range from \$10.00 to \$15.00 per gallon. The proposed road allows goods to be trucked to Noatak from the DMTS port site with an estimated fuel savings of \$9.00 per gallon. This road is also part of the Governor's Road to Resources program and is necessary to better support the operations of the Red Dog Mine. The estimated cost of the road project is \$50 million.

The second part of the project includes building a new runway. Due to erosion, the current Noatak airport must be relocated. Additionally, jet service to the Red Dog Mine airport is cancelled about 25% of the time due to weather conditions. The new Noatak airport should be a 7,000-foot jet-capable runway, so that mining support aircraft could use this facility as an alternative when necessary. The project has \$13 million in funding but will need additional money for completion.

Recently, the FAA informed the NAB that the bulk fuel storage tanks must be relocated because they are located too close to the airport. The tanks are also threatened by encroaching erosion. In the very near future they will need to be strategically located near the community.



TOP COMMUNITY PROJECTS:

Borough-Wide Public Buildings LED Light Project: \$200,000:



The Northwest Arctic Borough experiences one of the highest costs of living in the State, with many residents spending 30% or more of their income on energy. With fuel prices ranging from \$6.00 up towards \$11.00 per gallon and electric rates of \$0.45 - 0.85 per kilowatt/hour, the cost of operations for our city governments has reached a critical tipping point. Our 11 communities are remote and mainly connected by air transportation, making most changes to the existing energy infrastructure expensive to implement. Any changes that can be made in the cost of energy will be extremely beneficial.

The Borough is actively pursuing all possible ways to assist our local governments in reducing their costs and relieving some of the financial stress they face. To help reduce energy costs, we are hoping to replace all lighting in public facilities with LED equivalents. Testing of the new technology has been done in previous years and shown that up to a 62% savings could be achieved if the new technology were adopted borough-wide. Over the next 25 years, this would amount to a substantial savings for the region.

The ten communities that will benefit from the public facilities LED lighting replacements are Ambler, Kobuk Shungnak, Kiana, Noorvik, Selawik, Buckland, Deering, Kivalina, and Noatak.

This project will lower operational, maintenance, and energy costs for each community. These goals are in line with the State of Alaska's and the region's long term energy strategy.

Borough-Wide Erosion: \$5 million:

Coastal erosion rates in the Arctic over the past half century have been among the highest in the world. In some areas erosion has already doubled since 2000. Loss of land-fast ice, thawing permafrost, and briefer seasonal freezing are making coastal soils increasingly susceptible to erosion. The communities in the Northwest Arctic Borough are no exception to these changes. We are seeing increasing erosion issues in all of our communities, but have few resources to address our needs. This funding will provide the Borough with a resource to begin addressing our erosion issues. Virtually all eleven communities within the Borough have erosion issues; highlighted below are a few of them.

Ambler:

Ambler is struggling with major erosion issues. Ambler is located on the north bank of the Kobuk River, near the confluence of the Ambler and the Kobuk Rivers. Around 258 people called this community home.

In Ambler, flooding and ice movement during this year's spring thaw significantly damaged the river front road. As a result of the erosion, public infrastructure is now at risk, including a main water line that is only 3 feet from the most recent erosion and several power poles. The boat ramp has also washed out, making it difficult to safely launch boats for hunting and recreation. This infrastructure helps provide basic vital services to our residents. If mitigating measures are not taken it is likely that the public infrastructure will be damaged and the community seriously impacted with a possible loss of water and sewer services and electricity. Additionally, two multi-family dwelling units need to be moved or they will fall off the bluff in the next several years. Like many rural communities, Ambler already suffers from a housing shortage and would be negatively impacted by the loss of more housing. The community declared a disaster in May 2011. The estimated amount needed for erosion mitigation is \$1 million.

Deering:

The community of Deering sits on a sandy spit on the Seward Peninsula where the Inmachuk River flows into the Kotzebue Sound. It is 57 miles southwest of Kotzebue with a population of 122. Deering has both coastal and river erosion caused by high tides, storm surges, wind and waves, and possibly melting permafrost that impacts approximately 3,000 feet of beachfront and shoreline. The city reports that typically some form of erosion event occurs each year. In 2001, the shoreline reportedly eroded 61 feet (survey unclear if distance was lateral or inland), and during a 2006 event the shoreline reportedly eroded 50 feet (survey unclear as to direction of erosion). The community estimates the rate of ongoing erosion at about 3 feet per year, with the shoreline height in the eroding areas at approximately 11 feet.

During this year's spring thaw, the road to the airport was flooded by the adjacent river, damaging the road and existing flood control systems. In remote areas of the state airport access is imperative as this is the only access to emergency medical care, goods and services, and oftentimes fuel. Access to the airport was cut off for five days. Without improvements to the airport access road, the community remains vulnerable to a similar or worse event occurring again next spring. For safety reasons the community also needs an evacuation road in emergencies. The estimated amount needed for erosion control is \$1 million.

Selawik:

The Selawik area is known in Iñupiaq as "Akuligaq," which means "where the river meets together," and "Siktagvik," or "a place for shooting." Because of a rich year-round fishery, the area has been used as a



winter camp for thousands of years. The community incorporated in 1974. In 1980, the 3400 square mile Selawik National Wildlife Refuge was established under the Alaska National Interest Lands Conservation Act (ANILCA) to conserve the fish, wildlife, and habitat resources of the region. Selawik is the only community located within the Refuge boundaries. The town itself is built above marshy ground on pilings and pads. Raised boardwalks connect the residential areas and a small island in the middle. Three

separate neighborhoods are referred to as "school side," "church side," and "airport side". Two large structural bridges span separate branches of the Selawik River. In all areas the elevation is quite low, ranging from sea level to as high as 60 feet above mean sea level. No roads lead to Selawik and the community relies on the river for transportation all year round.

Erosion is occurring on all of the riverbanks in Selawik. An estimated 36 homes in Selawik are vulnerable to bank erosion, with some areas losing several feet of riverbank each year. Erosion prevention has been used successfully in the past and should be reconsidered for the future based on a bank soils study. Without immediate mitigation measures some houses will need to be moved before they flood or fall into the river. Additionally, the bridges and boardwalks that connect the community need to be reinforced and stabilized because eroding banks have impacted their integrity, creating safety issues.

Selawik has initiated an erosion mitigation project. The project will determine the extent and causes of erosion in the community and take steps to control negative impacts of erosion on the community's critical infrastructure. The project is estimated to cost \$350,000.00

Noatak:

Noatak is 55 miles north of Kotzebue and 70 miles north of the Arctic Circle. It is located on the west bank of the Noatak River and is the only settlement on the 400-mile-long river. The current population of Noatak is 489. Noatak is primarily accessed by air. The Red Dog Mine lies just 30 miles south of Noatak and is one of the main revenue sources in the area. Accounting for 10 percent of global zinc production, the mine is the world's largest producer of zinc and has the world's largest zinc reserves. In 2008 Red Dog accounted for 55 percent of the mineral value produced in Alaska. The community wants to provide support services to the mine.

Due to river erosion, the current Noatak airport must be relocated. From 2012 to 2013, the area by the airport lost another ten feet. As it turns out, jet service to the nearby Red Dog Mine airport is cancelled about 25% of the time due to weather conditions. Noatak would like their new airport to be used as an alternate airport to the Red Dog mine airport. The new Noatak airport should be a 7,000-foot jet-capable runway so that mining support aircraft could use this facility as an alternative when necessary. The project has \$13 million in funding but will need additional money for completion.

Kiana:

Kiana is a small Inupiat Eskimo community located on the north bank of Kobuk Lake.

It is located about 30 miles north of the Arctic Circle, 57 air miles east of Kotzebue and about the same distance upriver from where the Kobuk River terminates into Selawik Lake.

Infrastructure in Kiana is being affected by thawing permafrost. Drainage ditches designed to handle seasonal overflow and storm water runoff are particularly vulnerable. Deep erosion ravines have developed on the southwest side of the runway and to the north of the sewage lagoon as the result of storm water runoff or wastewater discharges. Water and sewer main breaks have been attributed to ground movement caused by thawing permafrost. Over four feet of riverbank has eroded in the past year.



At the current rate, houses and infrastructure located on the bluffs will be vulnerable to damage and landslides over the next decade. The beach access road has significantly eroded and a separate evacuation road is needed as well. Work on the beach access road has started with the joint efforts of NANA and the local governments. The road has been surveyed, designed, and partially constructed. Funding in the amount of \$500,000 is needed to complete the project.

Buckland:

Buckland is an Inupiat Eskimo village, located on the west bank of the Buckland River, about 75 miles southeast of Kotzebue. The city government was incorporated in 1966 and about 478 people call Buckland home. The residents have moved from one site to another along the river at least five times in recent memory, to places known as Elephant Point, Old Buckland, and New Site. In recent years, ice jams and flooding have been an increasing problem for the community. River erosion and decreased water levels have increased the impact of ice jams and flooding.

Kobuk:

Kobuk is an Inupiat Eskimo village practicing a traditional subsistence lifestyle. Kobuk is located on the right bank of the Kobuk River, about 7 miles northeast of Shungnak and 128 air miles northeast of Kotzebue. It is the smallest village in the Northwest Arctic Borough with a population of 148. The Kobuk River is navigable from the end of May through October. Kobuk was founded in 1899 as a supply point for mining activities in the Cosmos Hills area to the north. In October 1973, the city was incorporated. Ice jams on the river cause high water each year. In May 1973, a flood covered the entire village and in June 2013 the community was significantly flooded again. River erosion and decreased water levels have increased the impact of ice jams and flooding.



Kotzebue Seawall Protection



Kivalina House

Kiana Water and Sewer Extension \$3,077,000.00:

Like many rural communities, Kiana faces a serious housing shortage. According to the 2010 census, Kiana has 351 residents and is projected to have 445 residents by 2031. However, the community is now fully “built,” and there are no longer any vacant lots along the existing water and sewer lines to accommodate new construction. Looking to the future, Kiana platted the new Valley View Subdivision to meet future population growth by providing new building lots. The subdivision still lacks utility services and no homes have yet been built in it. Working with the local housing authority, Kiana recently built five new houses. The five new houses were built in close proximity to the new subdivision but currently still lack connection to a water and sewer system. The houses can’t be occupied until they are connected to water and sewer.

Most existing homes in Kiana are plumbed and receive piped water and sewer services. Water is derived from two groundwater wells. The water is treated at a local plant, held in storage tanks, and then piped to residents through two circulating water distribution loops. Wastewater is collected through collection mains and flows by gravity to a community lift station. The lift station pumps clarified effluent to a sewage treatment lagoon. All facilities are maintained and operated by the City.

The proposed funding would be used to expand the existing water and sewer system by building a gravity sewer line along Schuerch Street with a lift station to connect to the five new homes. The proposed plan has the potential to serve 38 homes upon completion. It is essential for the future growth of the community and public health to provide new houses with access to piped water and sewer services.

Public Safety Housing \$200,000:

The Northwest Arctic Borough 5-year public safety plan focuses on increasing and retaining public safety personnel in the Borough's 11 villages. Housing continues to be the biggest barrier to recruitment and retention of officers in Borough villages. Stationing officers in communities versus providing services rotationally strengthens public safety in rural communities and ensures that public safety officers are available to the community at all times. The Assembly has also made providing public safety to all Borough communities a top priority. All of our communities have expressed their desire for public safety services as well. All residents should feel safe in their communities and have some form of police service.

Currently, the Borough has nine Alaska State Troopers stationed in Kotzebue that are dispatched out to communities when help is needed. These troopers are covering 38,000 square miles. Additionally, the Borough currently has 8 VPSO's and 10 VPO's. The VPSO's and VPO's provide basic local community policing but due to the lack of housing retention of our officers is difficult. Currently, several of our communities don't have a permanent public safety presence at all but only receive services on a rotational basis. The Borough has had situations where local residents have had to restrain a suspected criminal or have had to assist an officer in restraining a suspected criminal. In other situations, suspected criminals have had to be held by local residents for several days until an Alaska State Trooper can get to the community due to weather. These problems could be alleviated if there were more adequate housing for VPSO's and VPO's.

The Borough has received an AHFC VPSO Housing grant for \$782,000 for the community of Ambler. The Borough is also seeking funding for VPSO housing for other communities. The Borough is seeking \$200,000.00 to leverage as matching grant funds for construction of public safety housing in any of our 11 communities.

Ambler Shungnak Intertie \$200,000:

In order to stabilize energy costs associated with generating electricity, the Northwest Arctic Borough and Alaska Village Electric Cooperative (AVEC) are proposing an area-wide system of upgrades in the Upper Kobuk region. Ambler, Shungnak, and Kobuk have the highest energy costs out of all of AVEC's 54 villages. Fuel costs are often very high because in recent years the Kobuk River has been too shallow for barges to deliver fuel, requiring it to be flown in at added expense. A CDR has been completed to determine regional power generation and fuel capacity needs.

The region would be served by an integrated power delivery system that uses both diesel and hydro-electric power generation for the Upper Kobuk. The project entails building a large joint power plant and bulk fuel facility in Ambler to provide low-cost electricity to Ambler, Kobuk and Shungnak. Currently, diesel-fuel power generation is the only source of electricity for these three communities. To start the project the underlying infrastructure needs to be upgraded, starting with the transmission lines which are 20 years old. The transmission line between Ambler and Shungnak is 25 miles long and 11 miles long between Shungnak and Kobuk. An intertie between Ambler and Shungnak will allow three communities, including Kobuk, to be served by a single power plant. The intertie lays the ground work for a hydroelectric project in the future.

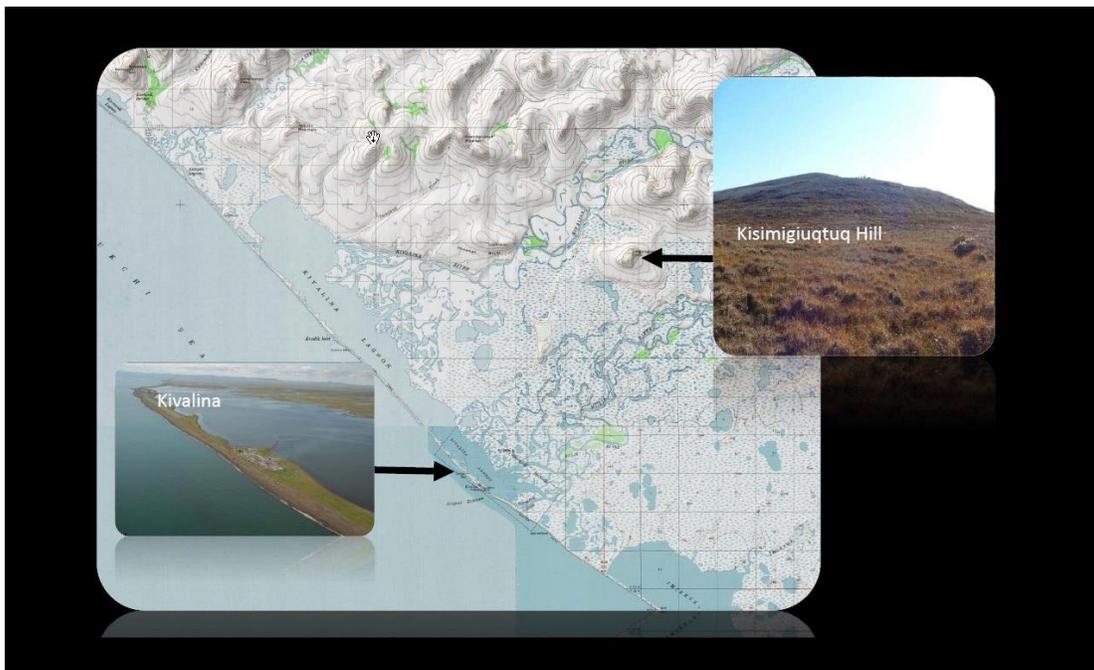
In 2013, NANA granted AVEC a zone easement between Ambler and Shungnak. The intertie will be installed within this easement. A good next step would be to develop the bid ready design. The bid ready design allows AVEC to more accurately estimate the total cost of the project. The cost of the bid ready design is \$200,000.00.

Kivalina Evacuation and Access Road \$2.5 million:

Kivalina is a traditional village lying precariously on a low-lying barrier island between the Chukchi Sea and Kivalina Lagoon. The community of Kivalina will have to be relocated due to significant erosion. In the interim, a series of mitigation measures have been constructed to protect the community to the extent possible, but the community is not safe. Currently, the only way to leave the village is by plane or boat. Both of these means of escape would be dangerous, if not impossible, during a large ocean storm. An evacuation road is necessary to ensure the safety of our residents.

The state has recently funded the construction of a new school on high ground near Kisimigiuktuk Hill, which is approximately eight miles inland from the existing community. There is currently no road access to the new school site. The proposed road will serve as both an evacuation road and as an access road to the new school from the village. The U.S. Army Corps of Engineers has done some initial field work and testing of the soil. DOWL has recently been hired to provide project management services. Work by both entities will continue next summer.

Funding for this project is time sensitive; Kivalina has had three emergency evacuations in the past five years, two to the school for local sheltering and one out of the village entirely. The Governor’s budget has provided \$2.5 million in funding for this much needed project.



(Photo of the community of Kivalina and the proposed new school site)

SUMMARY:

Our region is busy working together toward our common vision, one that is bright with opportunity. To get there we need to invest in some basic infrastructure that will support our region and our partners as we develop the wealth that lies within our boundaries. We invite you to be part of our journey.