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Hitachi shovel working at Kinross Fort Knox gold mine near Fairbanks in Alaska's Interior. Our annual Mining special section begins on page 74. The Natural Resources special section follows beginning on page 110.

Photo courtesy of Kinross Fort Knox
Cover design by David Geiger, Art Director

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Construction

Photo by Jon Dufendach

Water treatment equipment and holding tanks in a CampWater Industries nanofiltration plant.

Environmental Services

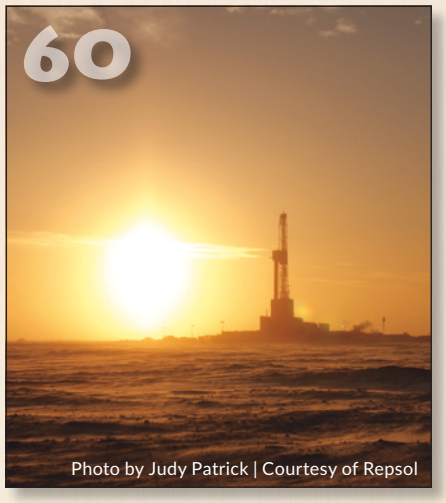

Photo by Judy Patrick | Courtesy of Repsol

Repsol Qugruk 301, east of the Colville River.

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Business

HR Matters

Expanded in Digital Edition

Marketing

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Oil & Gas

CORRECTION

In the October print edition of Alaska Business Monthly magazine, and in the slide show at the Top 49ers Awards Luncheon held at the Dena'ina Center on September 30, a photo of retired MTA, Inc. CEO Greg Berberich appeared in place of CEO Michael Burke.

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(907) 276-4373
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Fax: (907) 279-2900
www.akbizmag.com
Editorial email: editor@akbizmag.com

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Alaska Natural Resources Propel State Economy

Alaska is a natural resources state, which includes oil and gas, mining, forestry, fisheries, and tourism industries providing jobs and revenue to the overall economy as well as to state, local, and federal governments. There are two great conferences this month, and the November issue of Alaska Business Monthly is packed with natural resources articles.

We've highlighted the mining industry in our annual special section, which begins on page 74 with a message from Alaska Miners Association Executive Director Deantha Crockett: "The Future of Mining in Alaska." The organization's Fall Convention and Trade Show "Mining Alaska: Prospect to Profit" is November 1-7 at the Dena'ina Civic and Convention Center in Anchorage and is not to be missed. I've included a few details from the Alaska Miners Association.

In 2014, the Mining Industry provided:

- 4,400 direct mining jobs in Alaska
- 8,700 total direct and indirect jobs attributed to Alaska mining industry
- $620 million in total direct and indirect payroll
- $144 million in payments to Alaska Native corporations
- $119 million in state government revenue through rents, royalties, fees, and taxes
- $20 million in local government revenue through property taxes and payments in lieu of taxes

We've included a Natural Resources special section, and it begins on page 110, right after the Mining special section. Later in the month, November 18 and 19, the RDC (Resource Development Council for Alaska, Inc.) will host its 36th Annual Alaska Resources Conference, also at the Dena'ina Center—also not to be missed. The RDC is celebrating its 40th anniversary this year and its mission is "to encourage a strong, diversified private sector in Alaska and expand the state's economic base through the responsible development of our natural resources."

The RDC's 2015 Annual Report includes a brief overview of several natural resources industries—the conference will include a wealth of information. I've included a few details from the annual report.

Since 1977, the Oil & Gas Industry has provided:

- 17 billion barrels of oil, produced on Alaska's North Slope
- 90 percent of the state's General Fund unrestricted revenue
- $180 billion in total state government revenue since statehood
- 33% of Alaska jobs (direct and indirect)
- 50% of the overall economy when the spending of state revenues from oil production is considered

Forestry is beginning to make a comeback:

- 700 direct jobs supported (January-September)
- 105 federal jobs supported last year
- 153 million board feet harvested last year in Alaska

Fisheries are wild, sustainable, and globally important:

- 63,000 direct seasonal and full-time jobs
- 5.8 billion pounds of seafood was landed in Alaska in 2013
- $1.9 billion in ex-vessel value; $3.3 billion in sales to export markets
- $200 million in revenue for state and local governments
- $1.4 billion sportfishing industry provides 16,000 jobs, $545 million in income, and $125 million in state and local taxes

Tourism supports thousands of businesses:

- 39,000 direct and indirect jobs
- ~2 million visitors per year
- 86% travel in summer
- 50% arrive by cruise ship, 46% by air
- $1.8 billion spent during year ending September 2014

Something else not to be missed—free airline tickets! At press time, no one had claimed the Top 49ers awards luncheon door prizes, which include two roundtrip tickets on Ravn Alaska, among other prizes. The winning entry numbers were on the USB cards given out as swag at the luncheon; you need to plug in the drive, open the JPG file, and find the entry number. Go online to akbizmag.com/Top49erPrize and see what you've won, then contact us to redeem. One more thing you're not going to want to miss is the November issue of Alaska Business Monthly. We've put together another really great magazine. Enjoy!

—Susan Harrington, Managing Editor

ASRC's Region and People

'Bound by a common way of life'

Old buildings on the Barrow shoreline.

Photo by Tasha Anderson for Alaska Business Monthly

By Tasha Anderson

"When it comes to Arctic issues, we don't want a seat at the table: It's our table."

—Richard Glenn, ASRC Executive Vice President Lands & Natural Resources

I recently had the pleasure of visiting Barrow. Arctic Slope Regional Corporation (ASRC) offered an invitation to learn more, up close and personal, about the company and the people and the region it represents.

The trip happened to coincide with Barrow experiencing severe weather, with winds gusting around fifty miles per hour and sea swells reaching sixteen feet. Every time I exited a building or a vehicle, it was a complete gamble whether I'd be hunching down to avoid sleet driving down the collar of my coat or seeing a stunning shaft of sun breaking the clouds and illuminating the chaotic beach. Several of Barrow's roads had been washed out, and I witnessed several machines in action building up berms and attempting to address the massive flooding that was taking place.

It was a poignant contrast to the informative, calm, and confident discussion taking place within the ASRC Barrow headquarters.

A Rare Treat

It probably sounds hyperbolic, but sitting down with the ASRC officers was a rare treat. Even with my experience working with the Alaska business community—interviewing CEOs and presidents and project managers and the guy who picked up the phone when I called desperately looking for information on "I think its commercial office space on C Street" —and witnessing first-hand how down-to-earth, capable, and passionate our business community is, the level of dedication and thoughtfulness at the table was inspiring.

The ASRC team was comprised of Rex A. Rock Sr., ASRC's President and CEO; Crawford Patkotak, ASRC's Chairman of the Board and Executive Vice President of Stakeholder Engagement; Tara MacLean Sweeney, Executive Vice President of External Affairs; and Richard K. Glenn, Executive Vice President of Lands and Natural Resources.

It turns out that Glenn and Sweeney are cousins; Glenn explained that "It's a big area, and yet the people who live in this area are bound by a common way of life, common family, roots, and common heritage." While the Arctic youth of this generation may identify with one particular location on the North Slope map, merely two or three generations ago it was an entirely different story. Historically the people of the Arctic were transient; it was more typical, Glenn said, for a man from Canada to move west with the caribou, marry a woman from Barrow, and settle somewhere near Kotzebue, creating a giant web of Arctic family ties, than the opposite. "When people say that they're from the North Slope, they are, and they're not just from the little dot on the map that shows what village they happen to live in right now. We have that timeless backdrop of migration of people and relationships, and it's a spectrum," Glenn said.

This understanding of who the Inupiat people are, of what they are, clearly informs every decision that ASRC makes. There is no consideration outside that of their people, who are quite literally their family. "What it takes to keep the lights on and keep the toilets flushed and safe drinking water in our home, and the ability to have emergency response, comes at a great cost; and that's the end of the story that we want to share with you, but it's also the beginning," he said.

A big plot point of that story was the Alaska Native Claims Settlement Act (ANCSA), passed in 1971. Many know that it formed the Alaska Native Regional Corporations, but the act entailed so much more. "It extinguished [our] aboriginal title," the inherent right that any native people have to land or territory, Glenn said. "So, we don't have aboriginal title anymore, but in exchange for extinguishing our aboriginal title, they gave us the opportunity to own outright in fee title, the way legal corporations and people own land everywhere else in America." Originally, the people in the region now represented by ASRC claimed the entire North Slope, essentially all of the land north of the Arctic Circle, approximately 55 million acres. The compromise was that they actually received approximately 10 percent, or 5 million acres, and additionally a cash settlement to partially offset the loss. "With the money and the land base we were supposed to become successful, profitable corporations."

Social Experiment

"It was a social experiment," Glenn said, "the purpose of that was to avoid the mistakes of reservation America."

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Photos by Tasha Anderson for Alaska Business Monthly

From left to right, Richard Glenn, Crawford Patkotak, Rex A. Rock Sr., and Tara Sweeney at ASRC's Barrow headquarters.

"Our region was the only region in the state to oppose the land claims," Sweeney clarified. "Our early leadership wrote letters to President Nixon asking him to veto that piece of legislation because it was giving up too much and receiving too little in return."

Nevertheless, the legislation moved forward. "The movement [to recognize Alaska Native land claims] was in part born in this region, and we became the only region to oppose the version that Congress was about to pass… I think the short story there is, we made do," Glenn said.

The land issue was just the beginning of the issues that the Inupiat people had to address over the coming years.

According to Glenn, the same day that ASRC was formed, they also formed a new government, primarily for the purpose of exerting permitting and zoning guidelines, building up local educational opportunities at the middle school and high school levels, and establishing a tax base. "And then we were sued," Glenn said. "And yet the borough prevailed, and the borough became the lion in the room as far as exerting control and influence on development and benefitting from the presence of development in our region." Monies from this tax base help install sewer and water systems, doing away with honey buckets in many communities; helped with building energy efficient, well insulated homes; building schools; and more. The purpose "was to improve the quality of life in our communities, and we did it," Glenn said.

In 1991 ASRC pursued an amendment to ANCSA, addressing two areas of concern that early leaders had. Patkotak explained those issues were "keeping the corporation a closed corporation… and being able to include afterborns [Inupiat born after December 18, 1971]." Originally, ANCSA had a stipulation that after twenty years shares would become open and eligible to be sold and bought. "If the corporation had become open we would've had a hostile takeover, people buying up shares," Patkotak said. While it was important to ASRC leadership that the company not be taken out of Alaska Native hands, it was equally important that their children and grandchildren could also be shareholders in the company that would eventually represent them.

In 1976, through the influence of various environmental and animal rights groups, a moratorium was placed on the bowhead whale hunt. A new organization was formed, the Alaska Eskimo Whaling Commission, to fight for the right to continue subsistence bowhead whale hunting. Outside groups had falsely estimated that the population of whales had dropped to six hundred to eight hundred whales, while local natives estimated the number to be in the thousands. "They wouldn't accept traditional knowledge, so we had to invest millions in hiring our own scientists, our own biologists," Crawford said. The census performed in 1980 indicated that there were more than eight thousand bowhead whales, and today, Crawford said, that number has climbed to seventeen thousand (well on the path to recovery after having been decimated circa 1850 to 1910 by about two thirds by commercial whalers). "It's a good example of traditional knowledge and Western science coming together while, at the same time, being able to go to our government and having a cooperative working agreement to sustain the hunt, making sure that it's managed right and making sure the population of the bowhead whale is sustained into the future."

The shore of the Arctic Ocean as seen from ASRC's headquarters in Barrow.

Photo by Tasha Anderson
for Alaska Business Monthly

'Triangle of Balance'

It's also an excellent example of the pervasiveness of the idea of balance that ASRC leadership tries to have in every situation. Glenn said, "it's a balance, a triangle of balance between the municipalities, the ANCSA companies, and the tribal organizations." It's a balance of "development, [and] sustaining and keeping our culture and our traditions alive," Patkotak said. "They're not competing notions, environmental stewardship or responsible development… there's a balance in the Arctic, it's not necessarily a choice that you're only an environmental steward or you're pro-resource development. You can be both," added Sweeney.

To that point, ASRC is in favor of oil and gas industry development on the North Slope on- and offshore, with the understanding that it must be done responsibly, must be done safely, must be done in a way that benefits the people in the area, and must be done with input from the Inupiat people. "Nothing can replace the oil and gas exploration and development industry in our region," Glenn said, in terms of providing a tax base for sustainable quality of life improvements. "There's no agriculture, no timber, no commercial fishing."

He continued, "At the same time, we choose to control development in our region; we're benefitting from development in our region, and it sounds like a conflict, but our eyes are open to that conflict, and the whole world should be as transparent about that conflict. Everybody needs development, and everybody needs protection in the environment that they live in, a clean environment."

In past years, many people and groups on the North Slope were open to onshore development, but were against offshore oil and gas exploration or production. However, with onshore production slowing down, there are serious concerns about how infrastructure (for a metropolitan city, base level, taken-for-granted infrastructure),

Photos by Tasha Anderson for Alaska Business Monthly

Rebuilding berms along the Arctic Ocean shore during fifty mile-per-hour winds and sixteen foot swells.

View of Barrow from the Top of the World Hotel, recently rebuilt.

such as the sewers, the schools, etc., will be maintained in a challenging Arctic environment without revenue from the oil and gas industry. "The people who are in charge of keeping the lights on in each of our communities are saying: How are we going to keep TAPS [Trans Alaska Pipeline System] full?" Glenn said. "We had a day of reckoning. If we depend on development, we've got to be big enough to say that we depend on development, regardless of where it comes from."

Glenn did explain, further, that technically oil is already coming from OCS (outer continental shelf) production. The North Star Field reaches into the OCS from the Beaufort Sea side from a gravel island; "We have the Liberty Field farther east that's about to be developed that will also tap OCS resources," he said.

Patkotak said that much of the opposition is similar to original opposition to any oil and gas development—a fear of the unknown: what about the rivers and streams, fish and fauna, the caribou and their migration? "Back then these same concerns that were being voiced were addressed; [for example] caribou can migrate freely under or over buried pipe… measures were taken."

Two-Pronged Efforts

ASRC has taken steps to address current fears about offshore drilling, primarily through internal education. Glenn says the education efforts are two-pronged: disseminating information about where borough funds actually come from and providing citizens with information about the safety practices involved in offshore exploration and production. "Then they can develop a new position on offshore and not just use this old 'draw the line at offshore,'" he said.

If anything, lessons learned in the development at Prudhoe Bay have allowed ASRC to have an experienced eye when looking at offshore development. A proactive approach was taken, Patkotak said, in that ASRC approached industry early on. He was referring to the formation of Arctic Inupiat Offshore, a company comprised of ASRC and six North Slope village corporations. Arctic Inupiat Offshore announced in July of this year that it had entered into an agreement with Shell that allowed Arctic Inupiat Offshore an option to acquire an interest in Shell's activities on its Chukchi Sea leases. Glenn said, "Shell was really open to the idea. We wanted skin in the game and to have an opportunity to invest." "We approached Shell to be a part of it, knowing that we needed a seat at the table, we needed to be a part of the conversation and decision making process for offshore [development]," Patkotak said.

"We're not looking for a handout," Glenn emphasized. "We're wanting to be a part of the economy, at the same time having that right balance of living and sustaining our culture and traditions while being able to benefit from the development that's happening."

Glenn said that ASRC is tied to the oil industry for approximately one third of the corporation's bottom line. "Does that mean we could live without it? Yeah, we could, but we shouldn't, especially not while it's happening here in our region."

None of the members of the leadership team were blind or squeamish about the risks that development can present, onshore or off, in terms of blowouts, spills, and potential threats to the environment, including the overall effect that the oil and gas industry may be playing in climate change. "Sure, we thought about those things," Rock said. "But did the federal government listen anyways [to any development objections ASRC made]? People tend to miss that; they're the ones that made the sales, we've made the best of what we could out of this whole situation."

Sweeney added that if ASRC simply sits out, it's their communities that still accept all of the risks, only without any of the reward.

"It was going to happen, whether or not we became a part of it," Glenn said. "Twenty-five years from now our shareholders then will say: and you sat intentionally away from the table why?"

"Bottom line is we care about our people," Rock said. "What drives me nuts is when the federal government and other entities think that they can do a better job than us… we have always taken care of our people from day one. When you hear about our values, those values are real."

"That's why we're engaged. We're not shills for industry, we don't have an unrealistic picture of the risk or the reward of development," Glenn said.

Crawford added, "We're still concerned about the environmentalists and/or the government trying to save the world at the expense of the Inupiat people of the Arctic slope."

"You have to be careful about representation and advocacy; who's talking for who," said Glenn.

Fortunately, the ASRC team is perfectly able to articulate their corporation's bottom line. As Sweeney said, "We're not going to turn the lights off in our communities for someone in New Jersey to have peace of mind." ☼

Tasha Anderson is an Associate Editor for Alaska Business Monthly.

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The Changed Climate(s) of Barrow

By Shehla Anjum

The climate in Barrow, both natural and political, is much changed.

On my recent visit in late August an autumn storm raged in the Chukchi Sea; a hard wind blew, and the sea pounded the beach. The waves were rougher, unlike any I remembered from my years in Barrow in the early 1980s. Along the beach workers were keeping the sea at bay by piling gravel on a berm to prevent it from being washed away. Farther offshore, Royal Dutch Shell halted its exploratory drilling until the storm passed.

More than fifteen years had elapsed since my last trip to Barrow. I was back as a guest of Arctic Slope Regional Corporation (ASRC). The company hosted a group of writers to the corporation's home community to discuss Arctic issues and the importance of natural resource development, including oil and gas.

Barrow had changed greatly. It was bigger. Familiar structures were gone; others were closed or boarded up. The old Brower's Café was gone. The Top of the World Hotel and the hospital were in new facilities in Browerville. And the "top of the world" even had a coffee shack—the Arigaa Java shack, which although closed when I visited, signaled the ubiquity of coffee shacks across Alaska.

Oil & Gas Industry Welcomed

One example of the change in the political climate is a more welcoming attitude toward the oil and gas industry, which was once viewed with suspicion. ASRC and North Slope Borough officials' unified message now is that development and environmental protection can occur simultaneously. Oil and gas exploration in the Arctic, both onshore and offshore, is no longer controversial as it was in the late 1970s and 1980s.

The passage of time and industry's long presence on the North Slope might be reasons for such change. ASRC and the North Slope Borough were both incorporated in 1972. Property taxes on the Prudhoe Bay oil and gas facilities generated a large portion of the borough's budget and allowed it to fund large capital projects such roads, schools, and water and sewer improvements through sales of general obligation bonds.

Swelling ocean on the Barrow shore.

Photo by Tasha Anderson for Alaska Business Monthly

In the years since, ASRC also expanded, some of its subsidiaries began providing support services to the oil and gas industry, and it began leasing its lands for exploration.

"The oil industry is essential for us as nothing can replace it. The industry generates one-third of our income," says Richard Glenn, ASRC's executive vice president for lands and natural resources. ASRC, which is the most successful Alaskan-owned business in terms of revenue, reported gross revenues of more than $2.6 billion in 2014. One of its subsidiaries, ASRC Energy Services, is involved in the petroleum sector.

Even views about the industry's operations in the offshore have changed. "Once the ASRC leadership also opposed offshore development," says Tara Sweeney, external affairs vice president for the corporation. Sweeney also points out that in the past the corporation had requested that no offshore leasing be allowed. "But the government did not agree to that. So we had all the risk and no benefit. By being part of development we now share in both the risks and benefits," Sweeney says.

Joint Venture with Shell

The corporation decided that it could benefit from offshore development by joint venturing with Shell in its Chukchi Sea work. ASRC teamed with six of the eight North Slope village corporations to create Arctic Inupiat Offshore, which entered into a binding agreement with Shell to acquire a small share of any future oil production from the company's Chukchi leases. But, says Patkotak, "We are not looking for a handout; we want to be a part of the economy and want to sustain our culture too."

North Slope residents have voiced concerns about increased oil activities and how it might adversely impact their subsistence activities since the early days of oil production. Now there is also the fear of climate change, which is already happening. Some blame the changing climate for affecting the migration patterns of marine mammals, such as bowhead whales, which now migrate father offshore, making it more difficult to hunt them.

But such fears, while not groundless, are also tempered with increased reliance on the cash now required to secure traditional foods that are an important part of the local diet. The days of dog sleds are long gone and people now rely on snow machines for hunting on land and motor boats for going fishing or for hunting whales, seals, or walrus. ASRC's Glenn is frank when he says "subsistence needs money."

However, the corporation has worked to allay residents' concerns about the offshore by learning about offshore development. "We know that the Chukchi is shallower and so drilling there is safer, but we also did our due diligence by visiting the Gulf of Mexico operations and talking to people there," says Glenn.

"We looked at developing in the offshore dispassionately. We are engaged because were trying to be responsible to our shareholders," he says.

Another reason for the corporation's support of the oil industry lies in the continuing decline of onshore oil production. ASRC officials are worried that there have been no significant oil discoveries in recent years. They also commiserate with the oil industry in its ongoing tussles with regulations and environmentalists.

Encroaching Environmentalists

In the past environmentalists opposed certain lease sales or certain developments, such as the 1979 federal Beaufort Sea Lease

Sale that North Slope residents were also against. But in recent years environmentalists have also asked for protection for certain species, such as polar bears, which Inupiat people hunt. Crawford Patkotak, chairman of the ASRC board of directors, believes that such moves are tantamount to "systematically taking our right to hunt."

The desire for more environmental protection and regulations also affects both industry and ASRC's work, according to Patkotak. "They are pushing for regulations that overlap one another and pushing to lock up our coastal areas. That affects development and also our way of life."

While ASRC's officials look favorably toward the oil industry, they are also cognizant of their dual guardianship role. As managers of a large corporation they are responsible for generating income for their shareholders. At the same time they also have to ensure that industrial activities don't harm the land, the waters, and the animals and birds upon which they and their fellow Inupiat shareholders depend.

"We have been taking care of our people," says Rex Rock, president and CEO of ASRC. "I take those values seriously. We have survived up here for thousands of years and we have thought of these things."

Glenn also spoke with passion about those ties. "Our people were smart about the migrations of water fowl, whales, walrus and knew where they should go in relation to the migrations. Many of us still go back to the same places. Our campsites are all over this land," he says.

The sentiment is similar at the North Slope Borough, which also once worked closely with environmental groups to oppose offshore oil development. "We created the borough to regulate oil/gas industry and to take advantage of property taxes to fund operations and capital projects and to protect the environment," says Jake Adams, the borough's chief administrative officer.

No More Third World Conditions

His concerns about the local economy's dependence on the oil industry are similar to ASRC's. "It is oil that keeps the borough going and allows it to provide essential services to communities. Without oil production our economy will go down and we don't want that. We spent thirty years pulling our people out of Third World conditions," he says.

Adams spoke about the hardships of his childhood. "I grew up lacking many amenities such as adequate water and sewer. Sometime we had no heat in the middle of winter. School became our favorite place to hang out because it had heat twenty-four hours a day. We also had to leave home after eighth grade because we had no high schools." Today villages have water, sewer, and high schools, Adams says.

The oil industry's onshore production brought many changes to the North Slope, Adams says, but the future lies in what happens offshore. "The offshore production will ensure our future."

Yes, there are concerns about oil spills, but measures are in place to minimize risk, according to Adams. The Inupiat people also have a seat at the table to discuss mitigating measures to prevent impacts to marine mammal, he says.

A good working relationship now exists between the oil industry and local people, Adams says. He singled out an example, the conflict avoidance agreement where whalers work with the industry to avoid conflicts with fall whaling. "We have gone from animosity to working together to resolve problems at the local level."

It remains to be seen whether Shell's offshore exploratory program will be successful or not. But one thing is clear; the relationship between the oil industry and the North Slope residents is now stable and mutually respectful. ☼

Writer Shehla Anjum is based in Anchorage.

TDX to Power St. Paul Island with 80 Percent Renewable Energy

Photo courtesy of TDX Power | © Kevin G. Smith

TDX Power's three wind turbines on St. Paul Island.

Village Corporation subsidiary moving closer to 'ambitious' 2020 goal

By Kailee Wallis

Tanadgusix Power (TDX), a subsidiary of the village corporation Tanadgusix Corporation, has made a confident statement—St. Paul Island will be fueled by 80 percent renewable energy by 2020.

St. Paul Island is located off the southwest coast of Alaska in the Bering Sea. Grouped by four other small volcanic islands known as the Pribilofs, St. Paul is the only residential area on the island, with a population of 484 people, according to the latest US Census data.

TDX has been operating on the island since 1999, when it designed and developed a hybrid wind-diesel power plant to reduce local energy costs. Now, sixteen years later, the company has a total of six 225-kilowatt wind turbines on the island and hopes to add turbines and a microgrid to assist in its 2020 goal.

Windy Challenges

One of the largest problems communities have with renewable energy is the unreliable control of the source (wind or solar) and making stable energy with few power outages. Wind power can ramp up and down quickly, and often is not in sync with the ups and downs of the demands of the grid. TDX Power found a simple solution to this problem—renewable combined heat and power. With renewable combined heat and power, during peak hours excess energy is stored in fast-acting dispatchable loads—in the form of heat. These dispatchable loads alleviate the changes while addressing the need for grid management. This essential solution comes in the form of microgrid technology. Microgrids are sections of the utility that can be disconnected from the utility (in this case, the turbines) and still maintain power.

Recently, TDX Power was awarded $1.5 million from the US Department of Energy to be a part of the seven companies that are doing studies of the microgrid and demonstrate its functionality and necessity to large renewable utilities. St. Paul Island has been chosen to be the site for the demonstration. This project will bring valuable insights into the capability of the current utility, according to TDX.

Kord Christianson, TDX Power president, says, "Renewables are very sporadic on what their output levels are. So we make the load match what the renewable generation is." In other words, thermal storage that can be used by residents and commercial customers alike on St. Paul Island.

Alaska Energy Authority's Emerging Energy Technology Fund has provided TDX Power the money to install a flywheel that has technology capable of storing electrical energy generated by the wind turbines during peak wind speed. During periods of high wind, the flywheel can absorb energy and then recycle it back into the system during low wind speed. The flywheel, combined with microgrid technology and

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fast-acting dispatchable loads, leads to diesel-off, wind-only mode up to 35 percent of the time for St. Paul. As TDX increases St. Paul's renewable resource capability to reach its 2020 goal, the company says it will need to add additional wind turbines and effective controls, plus master fast-acting dispatchable loads.

Setting an Example

TDX Power says it hopes that with their breakthrough with the microgrid technology on St. Paul Island, the use of storage will be accepted by the utility industry as a whole—and with this success, St. Paul Island will become an example of innovative hybrid renewable energy plants—and the company can be an example across the industry.

But right now, the renewable energy only feeds to commercial customers, making it difficult for local residents to embrace the project. "We're hoping once we can push heat down to the residential level, they'll be able to see the benefits," Christianson says. "But now, if the state isn't going to invest in renewables because of tight budgets, things need to be moved around a little bit so investors get more benefits, residents get more benefits, and everything will be more equitable."

Household electricity is currently provided by St. Paul Municipal Electric Utility, which manages a diesel-powered production facility. Recently, TDX Power joined forces with the city's utility and connected two of its wind turbines to the city's power grid. That alliance reduced the electric utility's fuel usage by approximately twelve thousand gallons in two months.

Christianson adds that the lack of financial support from the government would be the largest hurdle for TDX Power to overcome. "In the past, the state of Alaska

St. Paul Island wind turbines with the airport in the background.

Photo courtesy of TDX Power | © Kevin G. Smith

made a lot of the investments in renewables through grants," Christianson says. But with budget cuts happening across the state, grants are becoming less and less available to fund projects like these. In past projects, TDX has funded most financial needs through grant money.

Funding Renewables

Chris Rose, executive director at REAP (Renewable Energy Alaska Project), agrees with Christianson that the state's fiscal situation is going to make it much harder for Alaska communities to rely on grant money to fund projects. TDX Power has been a long time member of REAP and shares the vision of REAP—that Alaska can and should be a world leader in clean energy development.

"REAP is working now to find ways to align Alaska's movement toward renewable energy with state, federal, and private financing," Rose says. "These projects pencil out by displacing significant amounts of diesel and should be able to pay back loans in a reasonable amount of time."

With the expansion of the wind turbines on St. Paul Island, TDX Power is attempting to be an innovative leader of renewable energy in Alaska, as Rose points out: "TDX's vision stands out because it is talking about energy for heat and transportation, in addition to electricity generation."

Renewable Visions

Surpassing TDX's vision for St. Paul Island to generate 80 percent of its electricity via renewables, Kodiak Electric Association now supplies, a whopping 99.7 percent renewable energy to the island, according to its website. Kodiak Electric Association supplies renewables through hydroelectric turbine generators and wind power. They supply energy to not only the City of Kodiak but also surrounding areas—like the nearby US Coast Guard base and Chiniak. The utility plans to maintain a minimum of 95 percent power generation through renewable energy.

Alaska isn't the only state with renewable energy goals. "More than thirty states in the US have mandates to produce increasing amounts of electricity from renewable sources, and often those laws exclude hydro," Rose says. "Hawaii just increased its standard to require that 100 percent of the electricity produced in the state come from renewables by 2045."

Rose says REAP hopes to support this same idea in Alaska, promote energy efficiency across the state, and keep the momentum going with the success of projects like TDX's, influencing the culture.

According to TDX, expanding the wind farm won't happen until 2018. Until then they will spend time defining their specifications of the process, studying wind farms and fuel consumption, and creating a road map to identify financial requirements.

The early stages of this project are daunting—will TDX Power finish by its own deadline? "It's ambitious, but Alaskans need to be ambitious," says Rose. "High energy costs are making significant economic development very challenging in rural Alaska. Alaskans need to be much more energy efficient and generate as much of our heat and electricity with local renewable resources that have no fuel price component. The less ambitious we are toward those goals, the more money we will export out of our economy to import fuel from somewhere else. Alaska can't afford to weaken its economy any further." ☼

Kailee Wallis is a freelance journalist living in Anchorage.

Alaska Power Association Electrifies Alaska

Advocating for electric transmission line upgrades and construction

By Kirsten Swann

Fire Island wind farm supplies Anchorage with renewable electricity.

To lay transmission across Thompson Pass, Copper Valley Electric Association used helicopters to scale the steep, mountainous terrain. In Kotzebue, the local electric association barged in a massive crane to erect wind turbines on the frozen tundra.

"When you look at what's involved in putting in the infrastructure, that in itself is a testament to some of the challenges that we face and that we've been able to overcome," says Crystal Enkvist, executive director of the Alaska Power Association.

The story of electricity in Alaska is one of perseverance, challenge, and opportunity, backed by the advocacy work of the state's oldest nonprofit electric utility trade association.

Industry Forum

Since it was founded more than sixty years ago, the Alaska Power Association (APA) has grown to include more than thirty-five members, from municipal and corporate-owned utilities to rural cooperatives. APA acts as an industry forum, an information clearinghouse, and a proponent for investment across the grid. It advocates for workforce development, electric energy-friendly policy, and legislative education.

The mission: "To assist our members in accomplishing their goals of delivering electric energy and other services at the best value to their customers."

> "When you look at what's involved in putting in the infrastructure, that in itself is a testament to some of the challenges that we face and that we've been able to overcome."
>
> —Crystal Enkvist
> Executive Director, Alaska Power Association

Courtesy of Mike Teegarden/Ruralite

"We provide information to lawmakers on the need for electric infrastructure development and why consumers benefit from that and how it enhances reliability and how it enhances our energy security and then how it enhances economic development," says Enkvist.

While the organization has a long history in Alaska, the APA name is little more than a decade old. The association was originally called the Alaska Rural Electric Cooperative Association; the group that formed the Alaska Rural Electric Cooperative Association Insurance Exchange in 1983. Today, the name has changed but APA still operates side by side with the Alaska Rural Electric Cooperative Association Insurance Exchange.

The power association is comprised of several tiers of members, each with an important role in Alaska's energy landscape. Active members include large and medium-size electric providers with minimum annual sales of at 800 megawatt-hours. Associate members are smaller utilities, while supporting members are those that provide products and services to the electric industry.

APA member utilities cross the spectrum. They include everything from the massive Chugach Electric Association, with more than eighty-two thousand customers, to smaller entities like the Naknek Electric Association, Nushagak Cooperative, Yakutat Power, and the Homer Electric Association.

There's the Alaska Village Electric Cooperative, which serves fifty-six communities in interior and western parts of the state, and the Kodiak Electric Association, powered almost entirely by renewable energy. Barrow Utilities and Electric Cooperative serves around 4,500 people on the North Slope, while the Southeast Alaska Power Agency provides more than 60 percent of the power used by the communities of Ketchikan, Petersburg, and Wrangell.

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Advocacy and Information

Besides monthly newsletters, twice-monthly reports from the executive director, frequent legislative updates, and other correspondence, the power association hosts an annual meeting to discuss some of the major topics in Alaska's energy industry.

This year's meeting took place in Ketchikan and covered economic and regulatory issues, developing technologies, and more.

An economic outlook presented by CoBank highlighted plunging oil prices and a steep decline in the effective federal funds rate. On the other hand, according to the presentation by CoBank President Mary McBride, the US economy has also experienced rebounding GDP growth and an improving jobs market.

There were presentations by the Northwest Public Power Association, the National Rural Utilities Cooperative Finance Corporation, and the Alaska Department of Environmental Conservation.

One major topic at this year's meeting: hydropower.

A presentation by the National Hydropower Association focused on the resource's role in America's renewable energy market. Hydropower accounts for more than 50 percent of all renewable electricity generation in the United States, according to NHA, yet it only makes up around 7 percent of total US electrical generation.

That leaves some major room for growth, and one of the NHA's top priorities involves driving "legislative and regulatory policies that improve the efficiency and certainty of hydropower licensing/permitting; enhance hydro's economic viability; [and] expand hydro's clean energy role."

APA is on the same page.

Hydro Power Emphasized

An update on the Susitna-Watana Hydro project came from Sara Fisher-Goad, the executive director of the Alaska Energy Authority.

The multibillion-dollar hydro project—currently in the study implementation phase—would ultimately involve building a 705-foot dam more than 180 river miles from Cook Inlet. The energy authority is currently in the midst of a lengthy federal permitting process, according to the Alaska Energy Authority.

But a statewide budget deficit has pushed pause on Alaska's next big hydro project. Approximately $103 million is necessary to advance the license application with the Federal Energy Regulatory Commission, according to Fisher-Goad, and an administrative order issued late last year temporarily halted discretionary spending on Susitna-Watana. More than $170 million has already been spent on the project, according to the Alaska Energy Authority. The entire endeavor is expected to cost nearly $5.2 billion.

With the high price tag comes a projected century of renewable energy for Alaska's Railbelt region. A study published by Northern Economics in March estimates Susitna-Watana could generate more than $11 billion in energy savings over the first fifty years of its existence. Producing around 2.8 million megawatt-hours of energy annually, the hydro project would fill around 50 percent of the Railbelt's electrical demand, according to the Alaska Energy Authority.

It's part of an ongoing statewide push toward renewable energy.

Currently, hydropower produces about 24 percent of the state's electricity.

"We would like to see that number increase, because there is a lot of hydro potential in our state," Enkvist says.

Groups like Ocean Renewable Power Company are exploring the use of tidal power along Alaska's riverbeds and shorelines. In Cordova, the Cordova Electric Cooperative produces more than 60 percent of the community's electricity through the Power Creek Hydroelectric Project and the Humpback Creek Hydroelectric Project. In Hoonah, the Inside Passage Electric Cooperative recently completed construction of a run-of-river hydroelectric project at Gartina Falls, a few miles southeast of the Hoonah Airport. The project should help decrease electric rates in Hoonah, Kake, Chilkat Valley, Angoon, and Klukwan, according to the Alaska Energy Authority.

In rural Alaska communities where diesel fuel is prohibitively expensive, hydroelectric projects can bring especially significant savings over an extended period of time. According to the state energy authority, Gartina Falls is expected to replace around 30 percent of Hoonah's diesel-generated electricity.

Wind Power Praised

Other sources of renewable energy—though not nearly as developed as hydropower—hold a wealth of opportunity for the Last Frontier. Wind power accounts for less than 5 percent of the state's electrical output, Enkvist says, so there's still plenty of room for growth.

So far in 2015, the Kodiak Electric Association has generated nearly 17 percent of its power from wind turbines at Pillar Mountain. Nearly 83 percent comes from Terror Lake Hydro, according to the Kodiak Electric Association. In Kotzebue, wind turbines capable of generating about 2.9 megawatts dot the landscape. Kotzebue

Electric Association was one of the first in the world to put turbines on tundra.

Then there's CIRI's Fire Island Wind, with eleven turbines capable of generating 17.6 megawatts, according to the company. A plan to install more turbines at Fire Island was put on hold earlier this year after the company was unable to find buyers for the power. When it comes to electricity, different regions have different needs and different capabilities.

In many places, transmission is a challenge. Alaska is a state with abundant natural resources that—in many cases—are very expensive to access.

"With the exception of the Railbelt, we're not an interconnected grid," Enkvist says.

In fact, Alaska may be the capital of microgrids. Enkvist compares it to the state's road system: sparse and fragmented. That can be a challenge when it comes to using variable energy sources like solar power or wind, she says.

Transmission Infrastructure

Because many forms of renewable energy are produced intermittently, utilities must be able to store the excess power and deploy it as needed. Building up transmission lines around the state could help make that more possible, increasing Alaska's energy security and solving some of the economics-of-scale problems that sometimes hinder development in rural areas.

Enkvist says advocating for more robust transmission infrastructure is a priority for the trade association.

Other APA legislative resolutions include support for state funding of the Renewable Energy Grant Fund, Power Cost Equalization, and the Emerging Energy Technology Fund, which helps utilities research and develop renewable energy generation. The APA is also throwing its support behind the construction of an Alaska natural gas pipeline and federal regulatory reform. It objects to a "one size fits all" approach to federal oversight.

Recently, Enkvist said says, the power association had the chance to meet Federal Energy Regulatory Commission Chairman Norman Bay to discuss the challenges and opportunities associated with hydropower in Alaska. The conversation with Bay was "a unique opportunity," Enkvist says and provided some "actionable recommendations." One suggestion: Create an online database for licensees to track the license application process and view different milestones along the way. ☼

Kirsten Swann is a freelance writer based in Anchorage.

SUBCONTRACTORS FINISH THE JOB

It's all about teamwork

By Tom Anderson

While the Alaska commercial and residential construction season is often dependent on a mix of factors like location and weather, the most critical element to completion of a project remains the availability and competence of subcontractors.

From heating and plumbing systems to window and door installation, the collaboration of specialty service providers is crucial to any project's success. Absent the teamwork and cooperation of subcontractors, Alaska's building industry would have little momentum and projects may lack running water, a roof, or a garage in which to park equipment.

Let the Game Begin

Any resident of Southcentral Alaska, from the Kenai Peninsula to the Matanuska-Susitna Borough, is sure to have been entertained in the last twenty years at Anchorage's Sullivan Arena by the thunder of a hockey game, the jubilance of Disney characters on ice, or perhaps the mischief of a holiday ice skating party with their children.

Collin Szymanski at Mantech Mechanical deserves credit for the polished, glossy sheet of ice that the UAA forward, tuxedo wearing mouse, or snowsuit garbed kid glided on.

Szymanski is a third generation Alaskan, born in Anchorage in 1948 and raised in Fairview community. After graduating from East High School he started in the construction industry helping build the Parks Highway, working later as an apprentice plumber and pipefitter on the North Slope and in Anchorage as the oil boom surfaced. He became a journeyman in the trade by the early 1970s, overseeing mechanical applications including plumbing and heating installation, with crews in construction camps from Prudhoe Bay to Valdez.

In 1982 he formed Mantech Mechanical, specializing in commercial and industrial piping systems. Mantech's methodical and deliberate evolution has been one of success because of dedicated management and employees, notes Szymanski.

Most recently Mantech's team has been working on the installation of a new CO2 refrigerated ice system for the Sullivan Arena's ice sheet. "We installed the first ice rink at the Sullivan in the 1980s, and this replacement we're installing now will be the second CO2 refrigerated ice rink ever built in the United States," says Szymanski. "The first was our installation at Harry J. McDonald Memorial Center in Eagle River last year." Szymanski explains there is a national phase-out of Freon rinks, leaving two natural refrigerants to choose from: ammonia and CO2. Mantech worked with a design team hired by the Municipality of Anchorage to install the new rink at the Sullivan.

Mantech is a statewide subcontractor with recent projects at rural sites like St. Mary's School, Deadhorse, and Galena. On the North Slope the company was a subcontractor to install a new ventilation system for exhaust, a car wash with water reclamation system, and a compressed air system, all for Brice Equipment. The company was contracted to install plumbing and a ventilation/exhaust system for a new helicopter hangar supporting services on Oooguruk Island.

Mantech was a first-responder after the 2013 Galena flood, retained by FEMA and insurance contractors to install new sanitary and heating systems for the community. Szymanski's team is in Galena this year replacing a new water treatment system destroyed by fire.

On the Kenai Peninsula in Soldotna, Mantech is a major subcontractor for the Central Peninsula Hospital's new four-story treatment center, overseeing medical gas piping system, plumbing, and heating commercial installations.

Bill O'Brien, the mechanical superintendent over the project, says the effort began in July 2014 and should be completed by March of 2016. The new facility will have oncology and procedural rooms and Mantech is providing all commercial plumbing and heating, boilers, circulation pumps, heating, and cooling system with new VRV technology (a multi-split type air conditioner for commercial buildings that uses variable refrigerant flow control). Medical gas systems in their entirety will be installed to deliver oxygen, nitrous oxide, nitrogen, carbon dioxide, and medical air to various parts of the center, steadily monitored by various computerized alarm systems.

O'Brien notes that Mantech has been a state-of-the-art subcontractor with new systems like Aquatherm, which is a polypropylene-random thermoplastic that prevents clogs, heat erosion, and malfunction of piping.

"We're able to apply this new chemical-resistant pipe technology for the medical center on the Peninsula for heating and for the Sullivan in Anchorage for cooling rather than using steel pipe, which is a great example of how Mantech works with Alaskan contractors so the most efficient, cost-effective installations are achieved," says O'Brien.

Open Sesame

Since 1990, Ram Overhead Doors LLC has been engineering garage and overhead doors for commercial and residential applications across the state.

Roger Bauer joined the company in 2002 and serves as its operations manager. Bauer had more than ten years' experience in the industry prior to moving to Alaska, now overseeing a collective of small and large projects and nearing thirty years of experience in the niche market.

Ram uses torsion springs for its commercial and residential doors, focusing on longevity in cycling so repair and replacement can be deferred as long as possible. Statewide contractors, as a result, value the company's emphasis on ensuring duration and routinely include them in bids for commercial and residential projects.

Whether overhead doors for a garage or warehouse, typically roll-up style, Ram provides the gamut of services from design and fabrication to installation and repair for contractors.

Bauer notes that the company recently installed several twenty-foot overhead doors for Era Helicopters in a week's effort. On Joint Base Elmendorf-Richardson, more than two thousand homes and units have been equipped with residential garage doors. Separate projects involving six hundred and seven hundred homes at one time were recently executed and completed in a timely fashion, which is a logistical feat at that quantity, notes Bauer.

2015's subcontracting season includes the completion of a one-hundred-garage door project at Coronado Park, Eagle River's newest neighborhood owned by Cook Inlet Housing Authority and comprised of contemporary townhomes. The Petersen Group is the primary building subcontractor with Ram covering garage door installation in that subdivision.

Bauer explains the process to secure a subcontract is fairly straightforward, typically involving an RFP and bid request, proposal, securement of contract award,

and then Ram's working hand-in-hand with the contractor and making visits to the work site, followed by schematics, fabrication, delivery, and installation.

The company has twelve technicians and works statewide, recently as a subcontractor for projects at Red Dog Mine in the Northwest Arctic Borough near Kotzebue; the US Postal Service in Kenai, Haines, and Tok; and on the North Slope for various exploration and service companies. Add to the list the US Fish & Wildlife Service for one of its plane hangars. Ram also subcontracts for Alaska Dreams, Inc. which builds tensioned membrane fabric covered steel and pre-engineered metal buildings statewide, most recently for a project on the Kenai Peninsula.

In 2016 Ram continues its commercial door projects for Cook Inlet Housing Authority, with the next installation scheduled for Anchorage's Mountain View neighborhood. The company continues to work with contractors like The Petersen Group, Hultquist Homes, Hagmeier Homes, Merit Homes Alaska, and Sumner Company Homes in Mat-Su.

With its contingent of welders, carpenters, and fabricators, Ram Overhead Doors will also be working for a freight company that has fifty commercial doors to service. Ram has a shop to fabricate doors when componentry and special specifications are needed, and door orders come in a fifty-four-foot container and twenty-four-foot slabs, often as raw component that must be designed per each unique plan.

> "We really have a tight bond with the contractors and builders we work with, and that matters."
>
> —Larry Partusch
> Partusch Plumbing & Heating

The company's tallest garage door built in Alaska was a forty-foot hangar door at Anchorage's airport for a Boeing 747. The Ram team has built small specialty doors for small equipment like ATVs and lawnmowers. In one instance a crew had to fly to Unalakleet and then take another small plane to an outlying village and then use a four-wheeler to get to the work site for an installation.

"We can design and fabricate just about any size or style of commercial and residential garage door," says Bauer. "In fact, if there's two trees standing close together we can mount a door to them, statewide," he jokes.

From Flush to Furnace

When Larry Partusch came to Alaska in 1982 he brought what he endearingly refers to as a "Midwestern work ethic" that he believes has generated positive client relations and performance results year after year for his plumbing and heating company. "The idea of fairness and hard work speaks volumes to your successes," says Partusch.

Partusch Plumbing & Heating has been providing Anchorage and surrounding communities comprehensive services since 1982, often as a subcontractor for commercial and residential buildings overseeing boiler and furnace replacement, radiant heating and snow melt system installations, and with specialization in Alaska's Home Energy Rebate Program.

The company recently finished a thirty-four-unit project for Cook Inlet Housing Authority in East Anchorage's Muldoon neighborhood over the summer of 2015, including the installation of high-efficiency boiler and rooftop units, all Americans with Disabilities Act accessible.

Partusch takes pride in his company's good relations with the general contractors

in the city and the trade associations that represent the industry, noting some of the most reputable builders like Spinell Homes, The Petersen Group, Hultquist Homes, and smaller contractors rely on his technicians. "We really have a tight bond with the contractors and builders we work with, and that matters," he adds.

Because generally anything over a triplex is considered commercial in the Municipality of Anchorage zoning rules for plumbing and heating services, Partusch deems his company as both a residential and commercial subcontractor.

Partusch recently worked on Ravens' Roost Cohousing, a custom neighborhood near Abbott Road in South Anchorage designed for a more intimate resident environment and connectivity. Partusch says with nine different complexes of different sizes and a community building with guesthouses, the plumbing and interior radiant heat systems and air-to-air installations will keep his team busy.

The company has worked on the Mark A. Ivey Building at Dimond Boulevard and Old Seward Highway in Anchorage, handling plumbing for three stories with public bathrooms including toilets, sinks, special showers, all water piping systems, and boiler heat. St. Mary's Episcopal Church has a fifteen-unit complex used by parishioners on church property that required plumbing, base-board heating systems, and disabled-friendly showers.

Partusch is cognizant of the growing senior population in Anchorage and the Mat-Su, recognizing the need for his company to be geared for serving a massive amount of long-term residency and senior centers in coming years, all of which are inextricably linked to Americans with Disabilities Act compliance.

It's not uncommon to see Partusch Plumbing & Heating logo decaled vans traversing Anchorage streets to get to the next job site. With forty-five professional technicians, thirty of whom are plumbers and fifteen are HVAC-trained, and a fleet of over thirty-three vehicles, Alaskans in Southcentral can find relief in knowing their running water and heat won't stop anytime soon thanks to a Midwesterner and his team who have the work ethic to get the job done.

Clear as Glass

When one contemplates subcontracting in construction, a component to the project often overlooked is one of the most vital parts of the project: the glass.

Stevens Glass was opened in Wasilla in 2006 by owners Lonnie and Kerri Stevens, who came to the state in 1997. Lonnie Stevens has worked in glass all of his life and

> "We're particularly proud of some of our custom design work like the mirrored walls inside the Palmer Municipal Airport. We also designed a glass enclosure for Advanced Blasting Services, and it's the care and quality of these kinds of projects that make our industry so rewarding."
>
> —Kerri Stevens
> Co-owner & Operations Manager, Stevens Glass

went from table work at Gator Glass in Anchorage to Speedy Glass in Eagle River, handling outside installs. He ultimately saw the potential for a Mat-Su glass business, which has now blossomed to statewide residential and commercial work.

As a subcontractor on many projects, Stevens Glass's menu of services includes windows, shower enclosures, mirrors, furniture glass, and shelves, all of which are integral in any building or structure.

"The benefit to our company is that whether the construction industry is prosperous or not in a given season, there is always a need for glass repair and services year-round," notes Kerri Stevens, operations manager. "That said, gaining the respect of our vendors and general contractors throughout Alaska has also grown our business and reputation. And that means jobs and supporting the economy, which is why we're in this business."

Stevens's projects run the range of size and detail, including glass partitions for physician and dental offices that can slide back-and-forth to door closures and matching hardware for commercial entrances and internal rooms.

Centric to Mat-Su but having covered subcontract projects across the state, recent contracts have included facilities in the Mat-Su Borough and School District, corporate offices, and a growing number of shower enclosures for local home builders in Anchorage and Mat-Su including Troy Davis Homes, Hall Quality Homes, Royalty Homes, and many smaller building contractors.

"We're particularly proud of some of our custom design work like the mirrored walls inside the Palmer Municipal Airport," adds Kerri Stevens. "We also designed a glass enclosure for Advanced Blasting Services, and it's the care and quality of these kinds of projects that make our industry so rewarding."

Every Building Deserves a Roof

Go to the Internet and look at Earhart Roofing Company's website and the most impressive content is the extensive list of satisfied customers and awards earned.

The art of roofing, and the vast spectrum of shapes and sizes of residential and commercial roofs, might make Frank Earhart's job complicated for any other business owner, but not for him.

Earhart started his own business ten years ago; now it has more than fifty employees at peak season. He's been at the heart of the roofing industry in Alaska since he arrived from Oregon in 1973. His company has been a subcontractor on projects across the state and is headquartered in Anchorage.

"I was in the roofing business as an employee and then supervisor for so long before I opened my own business that I made friends and professional relationships with a lot the architects, engineers, and project managers across the state," says Earhart. "As a result, our company is one of the top four roofing businesses in the state, so we're competitive and busy with projects."

Earhart focuses a majority of its roofing work on large-scale government jobs as a subcontractor. In 2015, by example, starting in late April he had crews working on a 55,000-square-foot tear-off and replace of the Soldotna Sports Center. The company handled a, 85,000-square-foot roof replacement and 120,000 square feet of a middle and high school on the Peninsula. It also replaced the 25,000-square-foot roof at the University of Alaska Kenai Campus's Walter Ward Building. All told, it was three and half months of roof replacements on the Kenai Peninsula totaling over $6 million in projects.

As comprehensive roofing goes, Earhart is clearly a go-to company by contractors based on its footprint across the state. From Nome's Readiness Center to Shungnak and Fairbanks schools; a University building in Anchorage; three public schools on the Kenai Peninsula in 2014 (Skyview, Tustumena, and Aurora Borealis); and from Valdez to Homer to Kodiak, Earhart is covering commercial and public buildings day by day.

"We'll do small patch jobs on residential homes, replacing a few shingles blown off, up to $5 million roof replacements," says Earhart.

The process includes tearing off substrate, which can range from wood to steel and sometimes even a cement deck. The company uses various types of membranes like heat welded, rubber, and occasionally hot tar systems. It used PVC (thermo plastic membrane) for several Mat-Su school projects, including Big Lake Elementary, over the last two years.

Add to its heavy commercial workload the replacement of nearly four hundred houses in Anchorage and Eagle River over the last ten years, and its evident Earhart Roofing Company has covered the subcontractor market when it comes to dependable, comprehensive roofing services.

Depending on Subcontractors

No matter the project, whether construction and repairs on a house or commercial building, subcontractors will also be the most vital part of the process.

Absent heating, plumbing, doors, windows, roofs, and the assortment of building element that define a structure's functionality, residence and commerce would be quite limited. So thank local business owners in the building trades and rest assured Alaska's subcontractors are hard at work so individuals and business can survive. ☼

Tom Anderson writes from across Alaska.

Photo by Jon Dufendach

A six thousand gallon-per-day nanofiltration drinking water system designed to treat surface water with organics ("Tundra Tea") common in Alaska. It's in an insulated Conex, designed and built for Cruz Construction Company and being loaded out for the North Slope from the CampWater Industries LLC shop in Big Delta in January. A second plant can be seen in the background to the right and was delivered later in the year.

Water & Wastewater: *Remote Camps*

Systems designed for simple sanitation

By Rindi White

The climate and geology of Alaska can make installing water and wastewater treatment systems a challenge for any community. But what happens when the community is only temporary or moves from location to location regularly?

When oil companies need a three-hundred-man camp set up on the North Slope, many contact a handful of engineering firms that specialize in providing remote and temporary water and wastewater treatment systems. A range of other temporary users need safe drinking water and waste management systems as well, including exploration, mining, and construction camps; canneries; and remote lodges.

"Regulatory oversight of those camp facilities tends to be no different than oversight to any community," says Allan Nakanishi, the lead engineer in the Alaska Department of Environmental Conservation's Division of Water, Wastewater Discharge Authorization Program on mining projects.

Some users require portable treatment systems. In many cases the systems are housed in a trailer, which can be moved from one location to another as needed.

Keep It Simple

"The goal is to try to provide a system utilizing the KISS principle—as simple as possible and as reliable as possible. You try to find that sweet balance so you can try to provide something that's going to be functional in cold weather and out in the middle of nowhere," says Jeff Garness, a former water and wastewater treatment plant operator on the North Slope, who is a professional engineer and owner of Garness Engineering Group, Limited.

Garness' company has been designing water and wastewater systems for remote users since 1990. He says about half the company's winter work comes from projects in the oilfield, at mining and construction camps, lodges, canneries, and at other facilities that require mobile or temporary water and wastewater treatment systems.

Garness has designed water and wastewater treatment systems used by seismic crews working in the oil field, for example. A seismic crew travels in rolligon vehicles designed to cross the tundra lightly, without harm to the underlying ecosystem.

Garness says some of the mobile camps use toilets that bag up the waste so it can be frozen and later incinerated, or electric toilets that burn human waste. The gray water from showers, sinks, and laundry is treated and discharged onto the tundra.

Treating 'Tundra Tea': Making Do with What's Available

Finding water for the rolligon crew to use can be tricky. In some cases, the crew fills large hoppers with snow, which is melted, filtered, and disinfected before use.

"Some might be treating from surface water. On the slope, it is common to use lake water as a source for the camp's water supply. Often, the water quality is poor," Garness

says. "We call it 'tundra tea.'"

Designing a water treatment system to work using either snow or water from a lake thick with organic material can be a challenge, he says.

"In some cases they'll have gathered water quality information from the source waters beforehand," he says. "Sometimes we'll have the water quality info and sometimes we don't, which makes it more challenging. Then you have to assume the worst case."

Water removed from surface lakes is typically treated using a number of types of processes, which might include media filters, membrane technology, cartridge filters, or some ion exchange process to remove the organics, dissolved solids, pathogens, and other contaminants such as iron and manganese. The water is then disinfected using a process such as chlorination or ultraviolet light to further kill pathogens and viruses. The finished water, which Garness says is aesthetically pleasing and safe to drink, is then transferred to a storage tank or portable water tank for distribution.

Filters and Membranes

Jon Dufendach, owner of CampWater, a Delta Junction-based company that builds water plants for communities, homes, and businesses around the state, says he's studied a variety of different water samples from surface lakes on the North Slope and come up with what he believes is the ideal treatment process.

"I use filters for pretreatment, then I'm using membranes," he says. Membranes come in four different gradations based on the molecular weight of what's being excluded.

"We've studied it to the extent that we're able to optimize performance of the filtration system to meet the type of organics we find in tundra lakes. There's a certain commonality among them where we can have success [finding a high-performance filter] and have nice-tasting water," Dufendach says.

Dufendach is a former trans-Alaska oil pipeline worker who, after retirement, got interested in making sure remote workers and residents in Alaska and around the world have access to good-quality water. While working on the pipeline in remote parts of the state, he says he and his coworkers sometimes wound up with straw-colored water for drinking and other uses. He's been called on to help fix community water systems around the state and has built water systems for use around the world.

"Water is my mission—I want to make the world a better place to live. When I see little children with worms or guys with giardia and their stomachs are torn up… my heart just aches. My life is wrapped up in making it better for them," he says.

Dufendach provided water treatment units for three Cruz Construction camps recently. The camps are mobile, so the treatment system is generally housed in an insulated Conex "sea can" or a refrigerated trailer. The water plant site is set up near the oil well drilling site, he says, so a crew looks ahead to determine what water sources might be available and sets up near them. Then a crew builds an ice road to the water source, typically a surface lake, and workers drill through the ice and haul it to the treatment plant, where it's put in the raw water tank, then processed into the potable water tank and pumped into the man camp.

Storage can be tricky, he says. He generally designs for fifty-five gallons per person, per day. That's enough water for showers, laundry, drinking, toilet usage, cooking, and anything else, Dufendach says. The tanks have to be large enough to supply the water during peak activities, like shift changes. When people wake and after people end their workday are the two spikes in water use, he says.

"You have to have enough recovery so you don't run out [at peak times]," he says.

A little extra water is built into the equation to handle unexpected events, like storms.

"One of the things I run into is if they get an arctic blow up there and can't go anywhere," he says. "If they get into a blow, they ask people to reduce their showers to under five minutes or to wait."

Designing water systems for mining camps is a little different—some mine sites are able to drill a water well. That's what Donlin Gold did, says Kurt Parkan, Donlin's external affairs manager. The mine site is shuttered now while the company works to obtain permission to operate the gold mine, an event Parkan hopes will happen in 2018.

Dufendach says in his experience, treating water at mining camps can be a challenge as well. The water often has arsenic, high iron levels, and manganese, he says. It's usable, but it takes a different treatment method to get those levels low enough to meet state drinking water standards.

Who Says the Water Is Safe?

Water supply isn't always regulated, says Lee Johnson, the northern region engineering coordinator with the Alaska Department of Environmental Conservation drinking water program.

If a crew of workers is flown in and dropped off at a remote camp and they cook for themselves and get water from a nearby river, that's not something the Alaska Department of Environmental Conservation regulates.

But if they have a so-called plush camp with running water and have a kitchen that's state-certified, then their water system must meet the drinking water regulations as well. If the crew is using equipment that is made for collecting or distributing water from a well or surface water intake for potable uses like drinking, cooking, and showering, then it has to meet state drinking water standards.

Some companies deliver potable water to camps on the North Slope or to oil platforms in Cook Inlet, he says. The water provider and hauler would be regulated, but the company receiving the water has fewer regulatory requirements.

"There are probably some levels of bottled water use also, but we don't regulate bottled water in the drinking water program," Johnson says.

Johnson says treatment options have evolved from simple cartridge or bag filter treatment several years ago to membrane filters commonly used today. Bags and cartridges remove particles from the water, he says, but membrane filters can filter it to the ionic level.

Companies like Garness and CampWater engineer the system and make sure it meets state drinking water requirements. They also train operators for their clients

to make sure the system is properly maintained, and they provide parts or assistance if something breaks down.

Keeping Wastewater Treatment Simple, Safe, and Sanitary

A few decades ago, wastewater discharge regulations were handled a lot differently, Nakanishi says.

"If you compare our regulations from the 1970s to today, the wastewater discharge regulations would probably be a pamphlet compared to the volumes we have now," he says.

Since the Clean Water Act was enacted in 1972, regulations have slowly evolved and are much more complex today. So have the treatment options, he says. Some sites near the road system might use porta-potties, with waste hauled away regularly. Road-accessible sites on the North Slope might contract with ICE Services, the company that operates the North Slope Borough's water and wastewater services. More remote sites might rely on other methods of treatment.

"It depends on the location of the project and the logistical availability," he says. "It's either transported or treated prior to disposal."

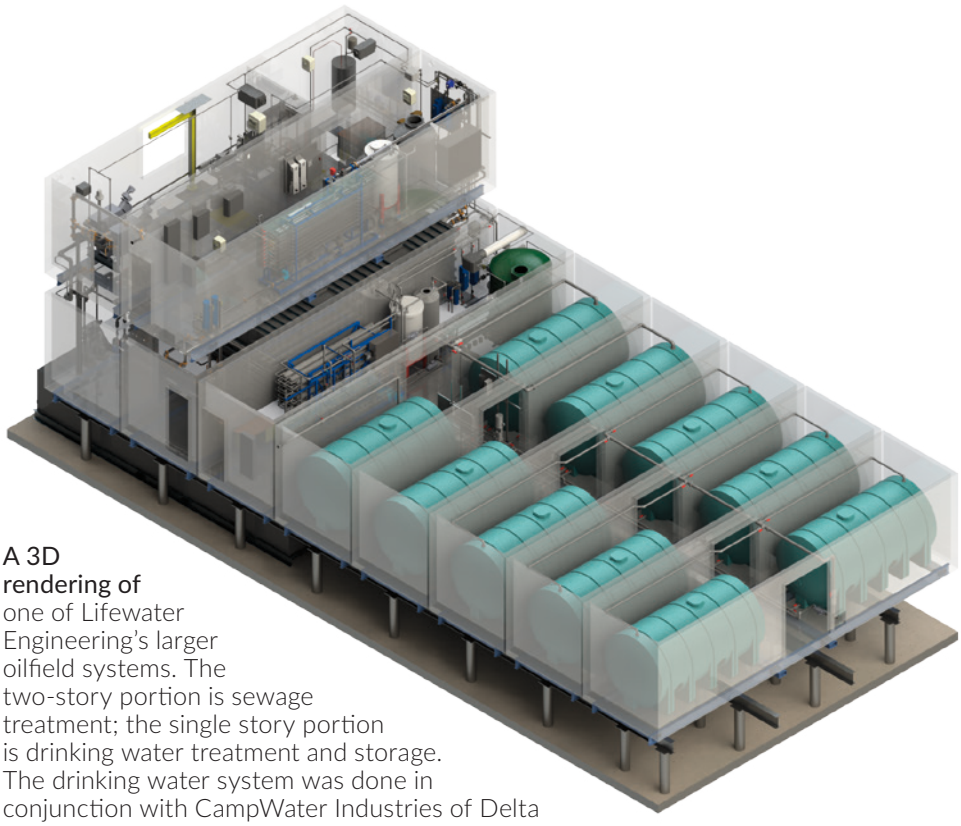
Packaged treatment plants like those designed by Garness and Fairbanks-based Lifewater Engineering Company are commonly used in cases where a septic system isn't feasible.

"They use various forms of treatment, whether it be bioreactors that use the promotion of bacterial growth to help break down the waste," Nakanishi says. "Some may have a form of filtration, like nano or micro or reverse osmosis. Prior to being able to operate that kind of unit, it goes through an engineered plan review before the discharge is permitted."

Bob Tsigonis, the president of Lifewater,

Photo by Jon Dufendach

Water treatment equipment and holding tanks in a CampWater Industries nano-filtration plant built for Cruz Construction in 2007. This plant operated at Franklin Bluffs, White Hills, Umiat, and various other locations throughout Alaska and remains operational today with the originally-installed membranes.



A 3D rendering of one of Lifewater Engineering's larger oilfield systems. The two-story portion is sewage treatment; the single story portion is drinking water treatment and storage. The drinking water system was done in conjunction with CampWater Industries of Delta Junction.

Rendering courtesy of Lifewater Engineering Company

says his company has built more than two hundred wastewater treatment systems around the state since he started in 1999. Most are residential systems, he says, but the company has been building commercial systems for nearly twelve years.

Typically, he says, wastewater is treated in a multi-compartment tank. It's screened to remove solids before it goes into the tank, then aerated to allow bacteria to break down the waste and pushed through a membrane filter. After being treated, it's disinfected using ultraviolet radiation and discharged. Water typically flows through the system in one to two days, he says.

"We discharge onto natural undisturbed vegetation in a way that it can be discharged all year round without making a sheet of ice," Tsigonis says. "Natural vegetation in Alaska is pretty moist. If you can get into a forest floor or tundra, it works very well."

Lifewater designed four systems at Point Thomson recently, he says. One was developed in 2008 for a portable camp used when the ice road is built.

"It's been used all over the slope for ice road construction for a number of years," he says. "In 2012 and 2013 we built a 200-man and 340-man [system]."

The 340-man camp is a temporary construction camp used on the North Slope, Tsigonis says, while the 200-man camp is permanent. Lifewater built a fourth camp, designed for 116 people, this year.

The 340-man camp is designed to treat up to nineteen thousand gallons of waste every day. It's designed larger than needed to handle peak flows during shift changes, he says.

Tsigonis says his systems are built in Lifewater's plastic fabrication shop, where they're cut on a computer-controlled router and welded with plastic welders. Plastic doesn't corrode, lasts a long time, and is easy to clean. Since the tanks are housed inside enclosed, heated containers or trailers, breakage isn't an issue.

"We pretty much build everything offsite and ship it up to the site," he says. "Then all we have to do is connect the modules, the pipes, the wires, and the controls. We like to do plug-and-play to the extent possible."

Building it in an enclosed shop allows each section to be tested separately before it's put together, he says.

Designing for Remote Areas

Both Tsigonis and Garness say simplicity is the key when designing systems made to operate in remote areas—the systems are easier to teach operators to use and more durable in extreme conditions. ☼

Rindi White is a freelance journalist living in Palmer.

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Alaska's Seafood Processing Industry

Providing strong economics from state waters

By J. Pennelope Goforth

Courtesy of the Port of Bristol Bay Harbor Master Robert McDermott

Sprawled in towering stacks, thousands of cargo containers stuffed with the 2015 salmon pack surround the remodeled Port of Bristol Bay at Naknek. It's 4 a.m. and the Seasonal 24/7 activity is in full force with tugs, barges, and fishing vessels at the dock—trucks, cranes, and forklifts moving containers across the dock like so many Legos.

Alaska's seafood processing industry is holding a steady course as 2015 winds down. Recognition of the industry has been growing over the last decade as economic analyses reflect a more inclusive view, counting both direct and indirect fiscal impacts. Studies also show the industry includes more Native Alaskan participation than ever.

Earlier this year a Maritime Workforce Development Plan was approved to bring more Alaskans into the sector. With a few hiccups, most species of commercially valuable fish caught in Alaska waters this year came from healthy and well managed stocks even as the volume and value of exports are on the rise. Again, Alaska ports took top spots in the national lineup of landings and values.

When the numbers are all in, the tax reports will show that the seafood processing industry will likely pay in excess of $290 million in various fees and taxes to the state coffers. Overall the economic scene is strong, representing billions of dollars in revenues, higher exports, and increasing job opportunities.

A Look Back

Seafood processing has been a staple of economic activity in Alaska waters for more than two hundred years: Whaling and fishing interests from Japan, Korea, Russia, and later the American "Boston Men" fished the North Pacific, Bering Sea, and even up into the Arctic waters. Cod fishing was the first major commercially targeted species in Alaska's history, stretching back even before the cession of Russian America. San Francisco merchant Captain Matthew Turner pioneered the effort in the 1850s, bringing the first load of salt cod to the market. Cod fishing stations were established throughout Bristol Bay and the Aleutian Islands for salting the cod in the days prior to refrigeration.

Not long after the United States took possession, salmon became the red "gold" of the new territory. By the late 1880s canneries the size of small towns had sprouted up in Southeast Alaska, north along the coast, and up into Bristol Bay. Both salmon runs in the millions of fish and the efficacy of fish traps made for a thriving business. In the 1900s fleets of small fishing vessels were dispatched north annually from Seattle for halibut as well as cod and salmon.

Bilateral agreements with Japan and Russia over the abundant groundfish fisheries in the Bering Sea ended with the establishment of the Exclusive Economic Zone and the Fishery Conservation Zone in the 1980s. This enabled American seafood processors to lay exclusive claim to the world's most productive and sustainable fishing grounds. Today the largest and most successful seafood processing interests are still based in Seattle where they dominate several fisheries like groundfish (pollock), salmon, and shellfish (crab). Halibut and herring round out the five commercial fisheries in Alaska.

An Evolving Business

Today's seafood processing company is complex, vertically integrated—operating every aspect of the business from fishing to processing to shipping to marketing—and run like a corporation. While small mom n' pop outfits and local fishermen's cooperatives proliferate in Alaska, they are dwarfed in volume by the established Seattle-based seafood corporations. CEO/CFO types with international reputations sit on the boards of most seafood companies. Debt and asset management have replaced talk of gear work and the latest high-tech navigational toys in these boardrooms. And with good reason. Modern processing plants, both at-sea and shore-based, are marvels of technology with processing lines managed by computers, sophisticated heading and gutting equipment, and complicated supply chains designed to deliver the freshest product from the sea to the consumer's table within days, sometimes hours. All this top quality production costs companies millions to acquire—and many more millions to maintain the vessels, facilities, and workforce that make Alaska's wild fisheries one of the best known brands on the world market.

Alaska is the breadbasket of Ballard, the part of Seattle where most of the fishing fleet ties up in the winter and many of the seafood processing companies have offices.

However, in the age of globalization, many of the top processing companies are—on paper—mere divisions of huge global holding companies. For example, the venerable Alaska General Seafood Company, operating salmon canneries in Naknek and Ketchikan Alaska General Seafood Company is an affiliate of Canfisco, Canadian Fishing Company, which was subsumed into the Jim Pattison Group in 1984. This group is a diversified holding company made up of a plethora of businesses spanning media, food and beverage, entertainment, real estate, and agricultural equipment. The home office is in Vancouver, BC with holdings in both Canada and the United States. Pattison is listed as the second largest private company in Canada with upwards of $8.4 billion in total annual sales.

This past summer Icicle Seafoods announced a purchase deal by an Indonesian corporation. Icicle is another iconic seafood processor that traces its roots back to the old Pacific American Fisheries cannery operating in the 1890s in Petersburg. A group of local fishermen purchased the facility in 1965 and renamed it Icicle Seafoods. In 2007 Icicle was acquired (read "leveraged buyout") by Paine & Partners, a private equity firm specializing in food and agribusiness investing with headquarters in San Francisco and New York. The firm of Convergence Holdings and Dominion Catchers, owned by a wealthy Indonesian family, made a bid to purchase Icicle this summer, but following some legal difficulties the deal fell through. Paine & Partners plans to announce a resale later this year.

Despite the abundance of pollock in the Bering Sea, another major at-sea processor, American Seafoods—tagline: From the Ocean to the Plate—was pitching in rough fiscal seas for the second time in five years. In 2010 American Seafoods made a deal with the CDQ (Community Development Quota) Coastal Villages Region Fund to exchange the *Northern Hawk*, a 341-foot pollock factory trawler, and three freezer longliners for its equity shares in the company. Floating on refinancing, the company continued to upgrade its vessels. Today American Seafoods operates six high-tech factory trawlers that are "engineered to fully utilize the fishery resources of Alaska" according to their website. But the talk is not of mending cod ends or quibbling over the wholesale price of Pacific whiting. Rather, with a downgrade by Standard & Poor's earlier this year and listing badly from $900 million in debt, the company has been scrambling to put together another salvage package.

In August American Seafoods Group announced in a press release that "it has

closed a deleveraging recapitalization…including a significant equity capital infusion and a refinancing of the Company's outstanding debt…establishing stable, long-term financing…strengthening its position as a leading provider of sustainable seafood products." Simply put, in danger of defaulting on its debt, the company closed out some of its equity holdings, cashed out some noteholders at a discount, and raised more money from deeper pockets on an extended maturity schedule.

Alaska Participation

The Community Development Quota—an innovative mechanism to funnel back 10 percent of the of the total harvest quota value derived from federally managed fisheries in specific coastal regions—has created a whole new growth sector for Alaska Natives. These fisheries include shellfish, pollock, halibut, sablefish, mackerel, and cod. The six CDQs have sorted themselves out, like their sister ANCSA (Alaska Native Claims Settlement Act) for profit corporations and nonprofit organizations, into successful entities that invest money into economic development and training programs in sixty-five Western Alaska villages and towns.

Once among the most disadvantaged of rural residents, these regions are bursting out of the fiscal incubator. The influx of the CDQ allocations have funded infrastructure to accommodate more local industry, in turn providing more jobs. And, the jobs are for the people in the villages who have received scholarships, grants, and internships sponsored by the CDQs.

In just a little more than twenty years, the CDQ model has completely changed the business environment: now they invest in subsidiaries, scientific research, and joint ventures. These commercial efforts resulted in about $318 million in 2013 with assets of nearly $900 million. Some CDQ groups own their own catcher/processors, warehouses, and processing plants. Many are invested in other industries that also serve local needs.

Coastal Villages Region Fund created a Community Service Center which provides much needed maintenance and repair shops for outboard motors, all-terrain vehicles, snow machines, aluminum boats, and generators.

Norton Sound Economic Development Corporation serves nearly nine thousand residents in fifteen communities stretching from Little Diomede Island in the Bering Strait to Stebbins on the southern Norton Bay shore. Norton Sound Economic Development Corporation invests locally with a business grant of up to $35,000 to community residents to encourage innovative entrepreneurs while spurring job growth. Last year the competitive grant program received twenty-one proposals and funded four that included a repair shop in Brevig Mission, a café in Gambell, an ecotourism business in Teller, and a car dealership in Nome.

Clearly, the economic kick start provided by the CDQs has laid foundations for further growth. According to the Western Alaska Community Development Association (since disbanded) report, in 2011 alone more than $151 million had been invested in economic development and more than $2 million in "human capital investment."

On the statewide level, an Alaska Maritime Workforce Development Plan was unveiled this year. The three year joint effort among the major seafood processors, the University of Alaska, and Alaska Fish and Game, and Labor and Workforce Development departments defined the sprawling maritime industry cluster within four distinct sectors: seafood harvesting, seafood processing, fisheries research and management, and marine support industries.

The plan is expected to boost training opportunities for Alaskans, enabling them

to qualify for the higher paying jobs in the industry like metal fabrication, plant managers, engineers, and various mariner positions aboard vessels. These types of jobs provide longer term employment, good benefits, and higher wages. In the past, state efforts have aimed at getting Alaskans into entry level positions, which didn't always result in their being able to move up the career ladder without additional education and training. When implemented this year, this plan aims to remedy that situation.

Top Volume Ports

The nation's top ten commercial fishing ports ranked by the National Oceanic and Atmospheric Administration for the past few decades have always included a few in Alaska. In 2013, seven of the top ten commercial fishery landings totaling some $822 million were in Alaska.

Inching up in the rankings is Naknek-King Salmon, which National Oceanic Atmospheric Administration ranked fourth in 2010, located at the mouth of the Naknek River in Bristol Bay's lush salmon spawning neighborhood. The 2015 numbers won't be available for awhile yet, however, given the record salmon run this past summer and the extensive infrastructure development by the Port of Bristol Bay, this port may be nudging out other Aleutian ports for third place.

The Bristol Bay Borough's investment in the expansion of the Port of Bristol Bay over the past five years paid off in the speed of deliveries when a record run of 58 million sockeye salmon came in this past summer. The $16 million expansion consisted of three main segments: replacing the existing piling dock, grading down an entire hill side that backed on the port, and expanding the platform dock. With the hill reused as fill for the enlarged dock, more containers could be staged at the port level instead of being trucked up the hill to other storage areas. This increased the turnaround time, allowing more containers to be moved in shorter bursts of time. With six offshore processors and sixteen shore-based plants operating 24/7 for the season, dock time and container parking are critical, especially for refrigerated containers carrying prime headed/gutted sockeye fillets.

Still, all that activity hasn't paid off quite as well for either fishermen or processors. The Alaska Department of Fish and Game reported in the salmon season summary that this year's Bristol Bay sockeye salmon was 12 percent above the forecast of 52 million. The fish, smaller by an average of a half a pound than in previous years, were a wee bit late, causing some nail biting. The commercial harvest of all salmon species in the bay ranked the second highest in the past twenty years at 36.7 million fish. Fish and Game gave a preliminary ex-vessel value for the run at $94.8 million based on $0.50 per pound for sockeye and Chinook. Analysts expect the final price to settle at $0.75 per pound; however, this is only 50 percent of last years $1.50 per pound. Volume alone won't compensate for that price point.

Factors determining the price of fish vary with currency fluctuations, other Pacific Northwest salmon runs, and the size of the fish—to name only a few factors. This year, with an abundance of slightly smaller fish, a failed Frasier River run, and differences in the dollar and yen, the global wholesale salmon market isn't as robust as last year.

Time Certain: Exports and Taxes

Alaska exports for 2014 topped $5.5 billion, the second highest year. The US Census Bureau reported in February that nearly half of those exports were seafood products at $2.26 billion, up 2.1 percent over 2013. That number does not include the amount of seafood shipped to Seattle and other West Coast ports for further processing. In contrast, mineral ores exported totaled $1.75 billion and energy exports (Cook Inlet LNG exports to Japan) a paltry $551.9 million.

Alaska's seafood industry contributes in excess of $250 million annually in taxes and fees, coming from city/borough landings, state fees, federal fuel taxes, and documentation according to a report from United Fishermen of Alaska, a Juneau-based group. One of the first taxes of the territory was the 1899 Fisheries Business tax. Of the Alaska Department of Revenue Fisheries Business Tax at $44.2 million and the Resource Landing Tax at $13.4 million, 50 percent is shared with the communities and boroughs in which the product was landed.

Other local "raw fish" taxes collected at specific ports contribute about $25 million to the home coffers plus local property taxes, dock, and harbor fees. Research, marketing, and development taxes total $20 million. A harvester/processor corporate income tax levied up to 9.4 percent was estimated at close to $3 million for 2013. State commercial fishery permit fees, vessel registrations, and crew license fees raise another $10 million.

Federal fisheries fees of about $11 million include IFQ Cost Recovery Fees and the Observer Program. Unemployment Insurance taxes paid by processors for wage earners totaled $14.7 million. Processors also pay the usual business license fees and Alaska Department of Environmental Conservation permit fees. Another substantial source of income for the state is a marine fuel tax of $0.05 per gallon. This amounted to over $5.5 million with at least half of those taxes being paid by commercial fishers. This represents only some of dizzying array of seafood processing revenue streams.

Commercial seafood processing is embedded in the Alaska economy in a way no other raw resource extraction industry can match. It is the economic multiplier of the state driving other support sectors like tourism and transportation, providing employment growth, and local infrastructure. The seafood industry is so pervasive it is almost anonymous. From individuals at fish camp to villages and towns that depend on the revenues of fish taxes to the Seattle and New York financiers buying and selling multi-million dollar businesses, everyone is affected by the financial waves the industry generates in Alaska. As the largest private employer, record or reduced harvests have definite financial consequences at state and local levels. As long as the forces of sustainability prevail in commercial fisheries management, the industry will continue to contribute to the economic health of the state long beyond 2015. ☼

Alaskan author J. Pennelope Goforth is home ported in Anchorage.

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Job Shadowing benefits employers and students

By Bob Poe

Almost all of us had the same problem when we graduated from college. We needed to find the right job, or for that matter, any job that could get our business careers started. The problem was, all the jobs we saw advertised required a year or two of experience, and we didn't have it—if only we could find a way for employers to meet us. Employers face a similar problem: How can I interest top college grads in my industry and business without being inundated with hundreds of resumes? We've all been through the process of advertising a job opening only to get a pile of resumes, most of which aren't very close to the candidate we were seeking. This is especially true for entry-level professional positions.

Things haven't changed much; graduating students still face the dilemma of how to get that work experience, and employers still face the challenge of meeting top graduates before a competitor snatches them up. At the University of Alaska Anchorage (UAA) College of Business and Public Policy (CBPP) we get it. That is what's behind Dean Rashmi Prasad's efforts to build a variety of "experiential and community-engaged learning" opportunities for business students at CBPP.

Engaged Learning

Many Alaska Business Monthly readers may have heard about the annual Alaska Business Plan Competition, which has helped a number of student-developed and community-developed business ideas get off the ground. Our Leadership Fellows Program gives many of our top students at both the graduate and undergraduate level access to a broad range of leaders in our community. Likely, many Alaska Business Monthly readers would relish the chance to learn, as our students do, from Alaska leaders like Linda Leary, senior vice president at Alaska Communications and CBPP alumni; Jeff Kinneeveauk, president of ASRC Energy Services; or Janet Weiss, president of BP Alaska. And, through our Justice for Fraud Victims initiative, CBPP students help everyday Alaskans untangle the mess resulting from today's all-too-common problem, identity theft. The Job Shadowing program is one of our most recent additions to this experiential learning effort.

The Job Shadowing program at UAA is now entering its fifth semester and has grown to about fifty CBPP students and ten host employers each semester—about one hundred CBPP students a year. This isn't "take your kid to work day" where students are just kept busy until the day ends. This is engaged learning—the students get a first-hand look at what their future work lives might be like, and employers get to observe potential future employees in action.

Opportunity for Success

A typical student job shadowing visit, all of which happen on Fridays since most students don't have class that day, includes meeting with the CEO, or other "C Suite" executive, to get a top level view of the company, its industry, and about some of the issues currently facing the company or organization. Often the company's "new employee orientation" is presented to the students to give them a sense of what it would be like to start a job at the host employer. Usually students are also given the opportunity to meet with a variety of department managers and to see the departments in action, helping students understand various other roles in the company or organization. Often our host employers are looking to fill internships and entry level positions in their industry.

And our students show up on time and ready! Prior to their job shadowing visit they will have their resumes revised and brought up to date, they will have prepared a one minute elevator speech to introduce themselves, and they will have done the expected research on the company or organization they are about to visit. Many of our host companies have also previously hired UAA graduates, so these visits are a great chance, usually over a host-employer-provided brown bag lunch, for new graduates to meet employers and to begin building that ever-important social network in the Anchorage, and Alaska, business communities.

Based on detailed feedback from the students, we know they really get a lot out of these visits. Often, it is an eye opener for students to see what the "real world" is actually like. On one hand, they find the company visits much more interesting than they expected, and on the other hand it does help students have a dose of reality—they probably aren't going to get to be CEO by next year. Several students come away from these visits with an internship and many others have gained long-term employment through job shadowing.

Interested in participating in the **UAA CBPP Job Shadowing program?** Contact **Bob Poe** at **rpoe@uaa.alaska.edu** for more information on becoming a host employer.

Intriguing Benefits

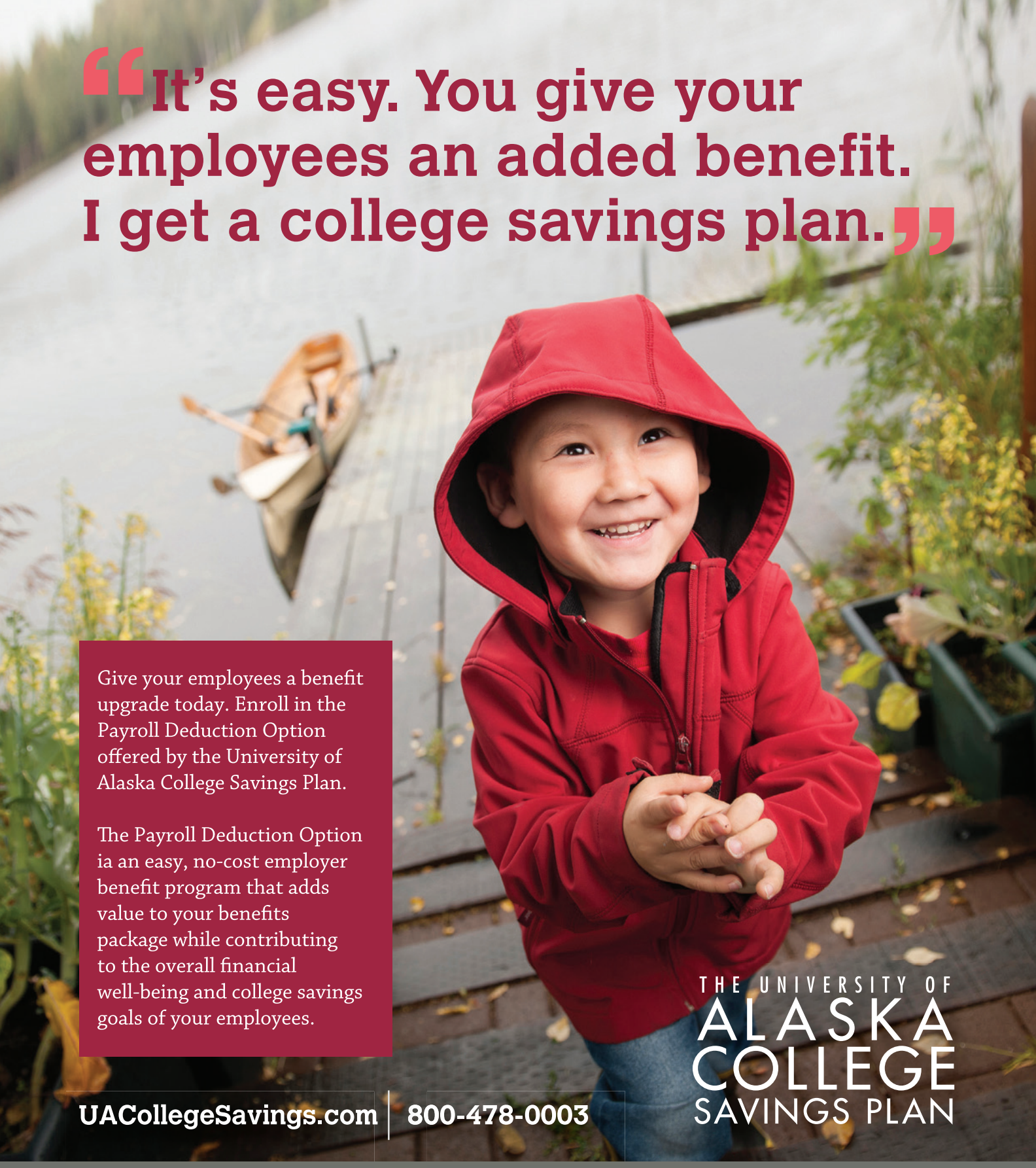
But, perhaps the more intriguing benefits are what employers are taking away from the visits. First off, employers get a first look at some of our top business students, and students get a first-hand look at a company and the larger industry. Many of our host employees work in industries that students may not have considered but offer real long-term career opportunities. Employers have told me it is really a fun experience to meet a group of students just on the starting line of their future business careers. And it keeps employers better connected with the new pool of graduates they will be hiring from.

For instance, Alaska National Insurance has been a participant in job shadowing since its beginning. When students hear insurance, they think of having to call all of their friends to sell them life insurance, but as many students have now learned, insurance is a vastly more diversified industry. Alaska National Insurance made their first long-term hire through job shadowing last semester, with hopes of more great candidates in the future.

During another job shadowing visit, a student really had their heart set on becoming an events manager. I have to admit, I wasn't too encouraging. But on her visit to the Anchorage Downtown Partnership, she marched right in to the director of Events and handed her a resume. That student now is the Events and Development director at the Anchorage Downtown Partnership.

Prasad's continued focus on experiential learning at CBPP is paying great dividends to UAA's business students and to Alaska's business community. ☼

Bob Poe has had an extensive career in Alaska holding top management positions in both the private and public sectors for more than thirty-five years. He has served five governors in a variety of cabinet and sub-cabinet roles. Today he is an Assistant Term Professor at the University of Alaska Anchorage College of Business and Public Policy where he teaches business strategy to Alaska's next generation of business leaders. As part of his role at CBPP, he oversees the Job Shadowing program. Contact him at rpoe@uaa.alaska.edu.



If you are not an Alaska resident, you should compare this plan with any 529 college savings plan offered by your home state or your beneficiary's home state and consider, before investing, any state tax or other benefits that are only available for investments in the home state's plan. You can also visit our website or call the phone number to request a Plan Disclosure Document, which includes investment objectives, risks, fees, charges and expenses, and other information. You should read the Plan Disclosure Document carefully before investing.

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The *Changing Roles* of HR

Recruit, acquire, and retain good people

It's not too surprising that the workplace keeps changing. In business, those that do not evolve and get with the change are left behind. Change flows like a wave on the ocean. Business owners can either be pounded by it or learn how to surf. Human Resources (HR) can lead the way, making sure businesses create surfers versus drowning victims, but HR's strategic roles have to evolve too. Historically, HR evolved from "personnel" and became "human resources" to meet the ever more complex rules, laws, and regulations that are required in healthy organizations.

HR was traditionally viewed as clerical and was usually attached to accounting; it often still is. Today businesses face a whole set of challenges and change that can crush even the most competitive organization—unless HR can step up and help meet these challenges. This war has three fronts that HR must address head on: talent acquisition, culture keeping, and monitoring productivity.

Every business in the United States is battling a war. The fight to attract and retain talent that will help accomplish an organization's mission is harder and harder with a shrinking pool of qualified candidates and turnover from dysfunctional teams and individuals draining the ranks. Even in Alaska, where at one time we had the youngest workforce, we are seeing more and more gray-haired workers with a distant look in their eyes towards Hawaii. So, from a shrinking pool of candidates how does a company recruit, acquire, and retain good people?

Hire for Fit

The old methods of using bloated resumes and outdated interview questions are a sure way to allow saboteurs and people who do not fit into a company's team. HR must change hiring practices and hire for fit as much, or more so, than for talent. Employees can be trained for skill, but good luck trying to change attitudes and bad people habits in a prospective employee. This means that HR must know how to assess what a team needs and be able to assess personality for fit. There are several validated business personality assessments that are reliable in predicting workplace fit. HR must seek out and acquire "good fit" people and then onboard and monitor so that they have opportunities to succeed and thrive. In order to do that they also need to have good people and teams to connect them to.

Culture Keeping

Culture keeping is the role for which HR needs to sit at the company leadership table. This means that HR must strategically lead in creating and maintaining a great place to work. The old paradigm of organizations with strict hierarchical command and control structures is outdated and does not work in a hyper-connected, hyper-competitive world. In order to meet the demands of today's workplace, collaborative and associative structures are needed. This means teams need to work across disciplines and departments, and teams and individuals need defined accountabilities and outcomes.

HR must evolve to insure that everyone treats each other with respect and to create buy-in to common shared goals. As culture keepers, HR can insure that supervisors do less supervising and instead become coaches and are accountable for their team's success.

There are some organizations in Alaska where bullies and harassers still exist and Neanderthal leadership still is the norm. Those types of companies are dying off as people are less and less tolerant and move on if issues are not addressed. When a company shifts from command and control to collaboration and association, magic starts to happen in which HR can and should play a large role. HR can help teams set values and ground rules on how they will work together and how they will handle hard times and celebrate success. HR can facilitate the building of strong work relationships that create high performing teams.

Measure to Manage

While good talent and motivated and collaborative teams are essential in today's workplace, it is not enough. People want to know how they are doing and they want to know it as it happens. This means throwing away the annual review process. It didn't work anyway and was only a tool for supervisors to beat up employees they didn't like. It rarely had anything to do with individual performance data, and if it was annual, or even quarterly, was usually too outdated to be of much value. In fact, monitoring productivity in an evolved HR role is not about how many widgets were produced or sold; it has to do with the health and productivity of a company's biggest asset, the people and teams that actually make and sell the widgets.

It also means doing away with the stereotypes of some HR departments as touchy feely places where people go when they have hurt feelings or just need help with their benefits. Those duties are important, but creating respect and accountability among teams and individuals goes a lot further in preventing problems in the first place. It would be foolish to get into a car on a bitterly cold day and drive from Anchorage to Fairbanks without headlights, a speedometer, a gas gauge, or warning lights for oil pressure and engine temperature. And yet, company "drivers" often have no clue as to how their team is performing.

HR must lead in this area and work so that performance information is readily available to all employees, so they know how their teams and they themselves are doing. It still is true that "You can't manage what you can't measure," and HR again needs to take the lead so everyone has timely facts and data to manage their performance. When teams share this data, they often start to manage themselves and take initiative to remove bottlenecks to their success.

Ever Changing

It ain't the same workplace it was even last year, and more and more change happens every day. In an ever changing world, HR will either lead the way in tuning the engine and workplace for success or it will go back to being a "personnel department." ☼

Kevin M. Dee has a master's degree from Vanderbilt University and is the president of KMD Services & Consulting. He has more than twenty-eight years of experience providing leadership development, organizational development, and human resource services in Alaska and internationally. Contact him at mail@kmdconsulting.biz.

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PEOPLE WHO DELIVER

Courtesy of Airframes Alaska

Airframes Alaska has grown from a two-person business doing about $150,000 in sales annually to a company with $6 million in annual sales and a full-time staff of forty at its Chugiak manufacturing plant. The business is Made In Alaska's Manufacturer of the Year.

Growing Alaska

Family of Alaska brands boost state economy by encouraging local shopping

By Heather A. Resz

As a brand, Alaska is red hot—and not just in the Lower 48. Alaskans love supporting Alaska brands, too.

And that's great because money spent with Alaska businesses also has an outsized economic impact on the state's economy, according to Marketing and Program Specialist Jacob Taylor at the University of Alaska Anchorage Business Enterprise Institute. For example, the purchasing power of Alaskans shifting 10 percent of their purchases to Alaska businesses would add $1.1 billion and 4,400 jobs to the state's economy, he says. Taylor manages the Buy Alaska program for the Business Enterprise Institute.

"Buying local Alaskans' products and utilizing local service providers helps diversify and grow the state's economy," Taylor says.

Alaska businesses are mostly small businesses—96.5 percent—with fewer than five hundred employees, according to a 2013 report from the US Small Business Administration, Office of Advocacy. Most Alaska businesses are sole-proprietorships, or, if they have employees, they have fewer than twenty, the report says.

Still, the majority of Alaskans working in the private-sector are employees at small businesses—53.1 percent, according to the report. "Small businesses are crucial to the fiscal condition of the state and numbered 69,177 in 2010."

Celebrating Alaska as a brand while boosting its economy is the idea behind Alaska's family of brands: Alaska Grown, Buy Alaska, Made In Alaska, and the Silver Hand program, according to Alaska Department of Commerce's Division of Economic Development Manager Ethan Tyler.

He leads the group responsible for the Made In Alaska brand, which promotes products that are at least 51 percent made, manufactured, or handcrafted in the state.

"It is so important to keep Alaska dollars local and in the Alaska economy," Tyler says.

Buy Alaska is a free program that Alaska businesses can join to help promote their company and as a means to sell their goods and services directly to other Alaska businesses looking for those items or services, Taylor says.

Alaska Division of Agriculture Director Franci Havemeister says the iconic Alaska Grown logo marks food products farmed in Alaska and meets the top two grades of the industry standard. The logo also is ubiquitous in Alaska and beyond on sweatshirts and other clothing items.

The Alaska State Council's Silver Hand emblem communicates to buyers that an item was made in Alaska by a full-time Alaska resident who is at least one-quarter Alaska Native.

Alaska Grown—Fresher by Far

Check any Alaska closet or kitchen. If a resident has been in Alaska for any length of time, chances are good they've purchased a sweatshirt, a sack of potatoes, or some other food or clothing item emblazoned proudly with the familiar Alaska Grown logo.

There is no charge to apply for authorization to use the Alaska Grown logo on "local product packaging for vegetables, meat, milk, eggs, nursery products, honey, furs, and wool products," according to the program's website where businesses also can apply to participate.

Havemeister says it's become common for her to see people wearing the logo as she travels outside Alaska, too.

© Heather A. Resz

Brothers Stuart and Nik McQuillan of Palmer pose in colorful Alaska Grown shirts with their 52.9-pound cabbage after winning third-place in the 2015 Max Sherrod Junior Grower contest at the 2015 Alaska State Fair.

"Anytime you can link that T-shirt back to a product from Alaska, that's a good thing," she says.

That growing national brand recognition stands to benefit Alaskan farmers who use Alaska Grown as a way to stand out in a crowded market place, Havemeister says.

"It's a way to stamp a small farm with a big brand," she says.

Created and trademarked by the Alaska Division of Agriculture, more than four hundred people have participated in the agriculture products certification program since it was launched in 1986.

Alaska has seen steady growth in its agriculture industry during the past decade, Havemeister says. That means more Alaska Grown food is being grown by Alaska farms and sold in Alaska where it is consumed at restaurants and dinner tables around the state, she says.

Alaska Grown items also are available in most local grocery stores as well at a growing number of farmers markets. That the number of farmers markets increased from eleven in 2007 to forty-three markets in 2015 is a good sign for farmers, she says.

"Anytime demand increases, production increases," Havemeister says.

Consumers who don't find Alaska Grown vegetables in their local stores can help farmers by asking stores' produce manager to carry Alaska Grown foods, she says.

Besides saving on transportation costs by buying farm crops locally, restaurants, caterers, and food vendors that serve Alaska Grown food can save 20 percent through the Alaska Grown Restaurant Rewards Program by purchasing Alaska Grown Specialty Crops from Alaska Grown members.

That means the fried zucchini food booth at the Alaska State Fair can increase its profits by purchasing its produce from an Alaska Grown farmer, such as Bushes Bunches, which has sold Alaska Grown vegetables at the Fair at the same familiar booth on Pioneer Square since 1989.

Common Alaska Grown foods such as cabbage, carrots, potatoes, and rhubarb are all included in the long list of "specialty crops" as defined in the 2014 Farm Bill.

Herself Alaska grown, Havemeister says Alaskans' preference for eating food grown locally mirrors a national trend.

"When you go into retail stores, always ask if they sell Alaska Grown," she says. "Increasing production is going to be consumer driven."

BuyAlaska.com Gets a Facelift

Royally Awesome is a small Alaska-owned Marketing and PR agency helping Jacob Taylor with the re-launch of the Buy Alaska brand. Owner Jill Brown says the business portal also is how she landed the Buy Alaska account and several others.

She connected with Taylor after a PR workshop she presented for the Alaska Small Business Development Center; Taylor said he wanted to work with an Alaskan PR/marketing company to launch their new re-branded site.

"We were a great match," Brown says.

Buy Alaska, a nonprofit program partner of the Alaska Small Business Development Center and the University of Alaska Anchorage, began signing up businesses in 1991.

© Heather A. Resz

Silver Hand artist Anuska Nanalook of Manokotak demonstrates her art at the Gathering Place during the 2015 Alaska State Fair.

"Being a Buy Alaska registered business has helped me reach other small businesses that need marketing and PR services, and I've also been able to teach many workshops for the ASBDC [Alaska Small Business Development Center], which has helped me connect with numerous Alaska businesses across several industries," Brown says.

The Commercial Contracts tool, included in the BuyAlaska.com facelift launched in June, allows members to post contracts for bid or bid on contracts posted by other members, Taylor says. The search can be set to return results according to region (to find a general contractor in Fairbanks or a printer in Juneau) or for keywords like Made In Alaska or Alaska Grown. The website tool also includes push notifications that will notify users about open contracts that meet their specific search criteria, Brown says.

"It's a major enhancement for the business-to-business functionality of Buy Alaska," Taylor says.

Signup is free through the BuyAlaska.com website to connect with other Alaska businesses and get branding materials with the Buy Alaska logo—retail window clings, bumper stickers, website badges, etc.—to help consumers identify Alaskan owned businesses.

"We are trying to get folks to look in-state first—see if there is already a company in Alaska making that, or offering that service," Taylor says. "Before you go to Amazon, give Buy Alaska a try."

Marketing Alaska to the World

The first Friday in October is National Manufacturing Day, a celebration of modern manufacturing meant to inspire the next generation of manufacturers.

As part of Alaska's celebration, the Alaska Department of Commerce, Community, and Economic Development announced Airframes Alaska LLC of Chugiak was picked as the 2015 Made In Alaska Manufacturer of the Year.

"Airframes Alaska has earned a reputation in Alaska and around the world as a leading manufacturer of small aircraft parts," says Chris Hladick, commissioner of the Alaska Department of Commerce, Community, and Economic Development. "The company is a valuable contributor to Alaska's economy—producing quality goods and putting Alaskans to work. Airframes Alaska is an inspiring success story, and we're proud to honor the company with this award."

Airframes Alaska General Manager Sean McLaughlin says Alaska's hard-working Bush pilots are the inspiration for the company's products like Alaskan Bushwheels, Super Cub fuselages, tailwheel assemblies, and heavy-duty landing gear components.

He took over the company in 2011 when it had two employees and revenue of about $150,000. Now the company has grown to more than forty Alaskans at its shop at the Birchwood Airport and made $6 million in sales last year, he says.

"It is only fitting that we choose to manufacture these products here—with Alaskan engineers, Alaskan welders, and Alaskan craftsmen," McLaughlin says. "As a global company, we market this Alaskan aviation expertise to the world. It is a huge honor to have been selected for this award."

Made in Alaska has presented the Manu-

facturer of the Year award annually since 1991 to a permit holder demonstrating hard work, business growth, job creation, innovation, and community spirit.

Airframes Alaska is a great real-world example of a company capitalizing on the brand, Tyler says. Often people associate Made In Alaska with craft and food items, but not everything Made In Alaska fits that mold, he says.

"It's not just gifts and food products," Tyler says. "Industrial products are manufactured here, too."

Other manufactures such as Greer Tank and Welding in Fairbanks and Vigor Alaska, which operates the Ketchikan Shipyard, also use the Made In Alaska brand, Tyler says. That means the state's two new ferries scheduled for delivery in 2018 from the Ketchikan Shipyard also will be produced under the Made In Alaska brand.

The Alaska State Legislature approved $120 million in state funds for construction of two new 280-foot long ships that can seat up to three hundred passengers and carry fifty-three standard vehicles.

Administered by the Division of Economic Development, Made In Alaska was launched in 1985 and currently has nearly one thousand active participants. Businesses pay $25 to $75 to use the brand and must renew applications annually.

Doug Ward with Vigor Alaska says the plan is to weld the initials of Governor Bill Walker and First Lady Donna Walker into the ship in a prominent location, along with the Made In Alaska logo. The second vessel will feature the initials of Lieutenant Governor Byron Mallott and his wife, Toni.

Authentic Alaska Native Art

Tourists spend $40 million annually purchasing Alaska Native arts and crafts, according to the Alaska Department of Commerce, Community, and Economic Development, which estimates 75 percent to 80 percent of expenditures were for fraudulently labeled items.

Designed to reduce the quantity of fake Alaska Native art in the market, the Alaska State Council's Silver Hand is a mark of authentication for art made in Alaska by full-time Alaska residents who are at least one-quarter Alaska Native.

People who think they have purchased fraudulent art should contact law enforcement.

The Indian Arts and Crafts Board receives and refers valid complaints about violations of the Indian Arts and Crafts Act to the Federal Bureau of Investigation and to the US Department of Justice for legal action. And the Alaska Attorney General's Office investigates unfair and deceptive marketing and sales practices in Alaska.

Most people buying Alaska Native art aren't experts at distinguishing real from fraudulent Alaska Native art. The Silver Hand emblem can help buyers identify authentic items, though not all Alaska Native artists use the program. Look for the Silver Hand tag and the words "Authentic Alaska Native Art from Alaska." Each tag includes the artist's name, tribal affiliation, origin of the work, and their permit number.

But even the Silver Hand logo has been counterfeited and is found on items in the marketplace alongside authentic Alaska Native art labeled through the state program. Buyers should beware of similar logos using slightly different wording; they are not part of the state's authentication program.

Experts with the Alaska State Council on the Arts, Federal Trade Commission, US Department of Interior's Indian Arts and Crafts Board, and Alaska Attorney General's Office suggest asking for written proof of any claims the seller makes for the authenticity of the item.

"For example, if a salesperson explains the basket you're buying is baleen and ivory and handmade by an Inupiaq artist, insist

the information is included on your receipt," according to a Silver Hand brochure.

The brochure also suggests a few other tips for spotting real Alaska Native art.

- **Price**—Genuine Alaska Native art or craft items should reflect quality of craftsmanship, harmony of design, and the background of the artist. Genuine pieces produced by skilled Alaska Native artists can be expensive.
- **Type of materials**—Materials often used by Alaska Native artists include walrus ivory, soapstone, bone, alabaster, animal furs and skin, baleen, and other marine mammal materials.
- **Appearance**—Try to pick up and examine a piece before purchasing it. Some items that appear to be soapstone carvings may actually be made of resin. Real stone is cool to the touch; plastic is warm. Stone also tends to be heavier than plastic. A figure that is presented as hand-carved probably isn't if it is possible to order ten more like it that are perfectly uniform or lack surface variations.

Another good way to make sure art items are authentic is to purchase directly from Alaska Native artists at locations like the Alaska Native Heritage Center in Anchorage or the Alaska State Fair in Palmer where people can meet the artists like Anuska Nanalook of Manokotak, Sassa Peterson of Soldotna, or Buffy Meyer of Palmer.

Meyer says this was the fourth year she's sold her art at the State Fair in Palmer. When she began making art, she says, she was excited to get her Silver Hands designation.

"Mom had her Silver Hands, so I got mine right away," she says.

Meyer says she likes the program because it authenticates Alaska Native art and the tags included with each item are designed to share a bit about the artist who produced it.

Each item tagged with Meyer's Silver Hand number also includes information saying she is half Inupiaq from the Nome and Shishmaref area and her Inupiaq name.

She says the rarity of the material, the quality of the fur, the tanning process, and craftsmanship bring top prices for her art. Meyer's clothing items—such as men's vests and women's skirts—sell for more than $1,000 each. ☼

Heather A. Resz lives in Wasilla. She's told Alaska's stories for nearly twenty years.

Compiled By Tasha Anderson

NOVEMBER

Alaska Miners Association Fall Convention
November 1-7—Dena'ina Center, Anchorage: The convention includes mining specific short courses, technical sessions, various classes, the AMA Banquet, and tradeshow. *alma.memberclicks.net/schedule*

Alaska Peer Partnership Conference
November 8-10—Hilton Anchorage, Anchorage: This conference features nationally renowned speakers from the peer movement, as well as local presenters who offer workshops about innovative projects and inspiring models of recovery and wellness for all. *akpeersupport.org*

Associated General Contractors of Alaska Annual Conference
November 11-14—AGC of Alaska is a nonprofit construction trade association dedicated to improving the professional standards of the construction industry. *agcak.org*

AAMC Conference
November 15-16—Anchorage: The Alaska Association of Municipal Clerks is an organization that focuses on providing educational training and mentoring and professional growth opportunities. *alaskaclerks.org*

Annual Local Government Conference
November 16-20—Anchorage: The Alaska Municipal League is a voluntary, nonprofit, nonpartisan, statewide organization of 162 cities, boroughs, and unified municipalities, representing over 97 percent of Alaska's residents. *akml.org*

RDC Annual Conference: Alaska Resources
November 18-19—The conference provides timely updates on projects and prospects, addresses key issues and challenges and considers the implications of state and federal policies on Alaska oil and gas, mining, and other resource development sectors. *akrdc.org*

DECEMBER

ALASBO Annual Conference
December 6-9—Hotel Captain Cook, Anchorage: Annual conference of the Alaska Association of School Business Officials. *alasbo.org*

JANUARY 2016

Meet Alaska Conference
January 8—Dena'ina Center, Anchorage: Hosted by the Alliance, this is the largest one-day energy conference in Alaska and includes educational forums and a tradeshow. *alaskaalliance.com*

Alaska RTI Conference
January 23-24—Dena'ina Center, Anchorage: The theme this year is Integrating Behavior and Academics Into A Seamless Multi-Tiered System of Supports. Invited presenters included Dr. Louisa Moats, Nicole Frazier (Engaged Classrooms), Tom Hierck (Visible Learning for School Leaders) Karen Karp, Tricia Skyles, Anita Archer, and many others. *asdn.org/2015-alaska-rti-conference*

Alaska Marine Science Symposium
January 25-29—Hotel Captain Cook, Anchorage: Scientists, researchers, and students from Alaska, the Pacific Northwest, and beyond come to communicate research activities in the marine regions off Alaska. *amss.nprb.org*

Anchorage AEYC Early Childhood Conference
January 27-30—Hilton Anchorage, Anchorage: "Our Children, Our Families, Our Community: Building Resiliency." Join other early childhood community members to learn new strategies, hear about the latest research, try out a few practical techniques, and discover new tools and resources to help face any challenge. *anchorageaeyc.org*

Junior Achievement of Alaska Awards Banquet
January 28—Dena'ina Center, Anchorage: Four new Alaskans will be inducted and recognized with this prestigious award. Attended by over four hundred business representations, the program consists of a networking reception, dinner, and awards ceremony. *juniorachievement.org*

Alaska Peony Growers Association Winter Conference
January 29-31—The Alaska Peony Growers Association is a membership organization comprised of commercial peony growers as well as those interested in the emerging peony industry in Alaska. *alaskapeonies.org*

FEBRUARY 2016

Health Summit
February 2-4—Hotel Captain Cook, Anchorage: The 2016 summit tracks will be policy and advocacy, social and economic determinants of health, interdisciplinary and partnerships, research and evaluation, and health promotion/communication/education. *alaskapublichealth.org*

Alaska Statewide Special Education Conference
February 6-12—Hilton Anchorage, Anchorage: The Alaska Statewide Special Education Conference (ASSEC) is committed to providing high quality professional development relevant to the cultural, rural, and remote characteristics of our great state. *assec.org*

Alaska Forum on the Environment
February 8-12—Dena'ina Center, Anchorage: The Alaska Forum on the Environment is Alaska's largest statewide gathering of environmental professionals from government agencies, non-profit and for-profit businesses, community leaders, Alaskan youth, conservationists, biologists, and community elders. *akforum.com*

ASTE Annual Conference
February 20-23—Hotel Captain Cook, Anchorage: This is the educational technology conference of the Alaska Society for Technology in Education. This years' theme is "What if: It is Possible." *aste.org*

MARCH 2016

Alaska Anthropological Association Annual Meeting
March 2-6—Sitka Fine Arts Camp, Sitka: The annual meeting includes workshops, an evening reception for information and registration, paper presentations, and an awards banquet, business meeting, and the Belzoni meeting. *alaskaanthropology.org*

Alaska Library Association Annual Conference
March 10-13—Westmark Hotel, Fairbanks: AkLA is a nonprofit professional organization for the employees, volunteers, and advocates at academic, public, school, and special libraries of all sizes in Alaska, as well as library products and services vendors. *akla.org/fairbanks2016*

Arctic Science Summit Week
March 12-18—University of Alaska Fairbanks: Arctic Science Summit Week is the annual gathering of international organizations involved in Arctic research. *assw2016.org/about*

AFCCA Annual Child Care Conference
March 26—BP Energy Center, Anchorage: The conference includes seven hours of training, and lunch is provided. *alaskafcca.org*

APRIL 2016

ASRT Annual Meeting and Educational Conference
April 8-9—Westmark Fairbanks Hotel, Fairbanks: This annual event offers a single location for companies as well as Imaging Specialists from all modalities to network with the largest captive audience in Alaska. *aksrt.com*

AWWMA Annual Statewide Conference
April 18-21—Anchorage: This is a venue for to bring information, technology, expertise, curiosity, hunger, and thirst (for refreshment and knowledge) to the Water and Wastewater Industry Professionals in Alaska. *awwma.org*

NEA Alaska Spring Conference
April 22-24—NEA Alaska, an affiliate of the National Education Association, is an organization with over twelve thousand members who work in Alaska's public schools. *neaalaska.org*

Rural Energy Conference
April 26-28—Westmark Fairbanks Hotel, Fairbanks: The Alaska Rural Energy Conference is a three day event offering a large variety of technical sessions covering new and ongoing energy projects in Alaska, as well as new technologies and needs for Alaska's remote communities. *alaskarenewableenergy.org* ☼

Alaska Natural Resources Go to Market

Commodities ride the waves

By Kirsten Swann

Courtesy of City of Unalaska

Unalaska Marine Center.

What do pink salmon from the Gulf of Alaska have in common with crude oil from the North Slope?

They both move en masse through the Port of Valdez, loaded onto tankers and barges bound for the rest of the world. The same thing happens at other ports around the state, except instead of oil and salmon, vessels carry zinc and lead and Pollock and sand and other commodities. Alaska's natural resources are numerous, but when it comes to bringing them to outside markets, there's really only one way to go.

The state relies on marine transportation. Road and rail systems are sparse, and waterways can handle larger loads than any truck or train, so moving Alaska's natural resources happens primarily by sea. Whether it's ore, oil, or salmon, it most likely travels by tanker or tug and barge.

After moving eight hundred miles through the trans-Alaska oil pipeline, North Slope crude is loaded into tankers at the Valdez Marine Terminal. Across the water, the Port of Valdez handles millions of pounds of seafood every year. Hundreds of miles northwest, massive barges carry thousands of tons of zinc and lead concentrates.

Crude Transportation

While people travel Outside predominantly by plane, it's marine transport that keeps natural resources moving.

Many of those trips begin in Valdez. Home to the northernmost ice-free port in the United States, the Prince William Sound community is the departure point for some of Alaska's most lucrative natural resources. Every year, the city-owned port sees off tons of seafood bound for markets to the south, and the TAPS (Trans-Alaska Pipeline System) Valdez Marine Terminal loads tens of millions of barrels of oil into tankers headed out across the Pacific. While the port and the TAPS terminal share the water, they operate independently, according to port officials.

The terminal covers more than one thousand acres of land at the northeast corner of the sound, according to Alyeska Pipeline Services Company, which operates TAPS on behalf of its numerous owner companies. Besides two functional loading berths, the terminal has a power plant and a facility to purify storm water, drainage water, and ballast water, stripping hydrocarbons from the oil fluid used to stabilize tankers' hulls. There are facilities to measure the incoming oil and fourteen storage tanks to hold North Slope crude while it awaits tankers.

Once a tanker ties into berth, it takes on oil via a loading arm. The whole process takes about a day to complete, Alyeska says. Spill prevention is a priority. To mitigate the risk, Alyeska does not load crude oil in winds stronger than forty knots.

During the loading process, crews protect the delicate Prince William Sound ecosystem by placing an oil spill containment boom around the berth and tanker, according to the pipeline services company. The Ship Escort/Response Vessel System provides oil spill response capabilities and prevention, working with the US Coast Guard to monitor tanker traffic through the sound. Two tugboats—loaded with booms, skimmers, and smaller work boats—depart with every tanker, helping guide them through the Valdez Narrows and Hinchinbrook Entrance.

Ship Escort/Escort Vessel System personnel are ready to respond to a spill around the clock, 365 days a year, staged in key areas around the sound, according to Alyeska.

The pipeline service company doesn't own the tankers that carry North Slope crude through Prince William Sound: Those vessels belong to the oil companies themselves, or shipping companies contracted by the producers. Over the years, more than twenty thousand tankers have loaded oil at the Valdez Marine Terminal. Some of the largest tankers can carry up to 2 million barrels of oil.

ConocoPhillips, the state's largest oil producer, handles marine transport from Valdez with its own wholly owned subsidiary, Polar Tankers, Inc. The company's

double-hulled, Endeavor-class tankers can each hold up to a million barrels of oil, delivering their cargo to terminals in Washington, California, and Hawaii. In 2000, BP signed a contract for more than $630 million for San Diego-based NASSCO to build double-hull tankers to haul crude oil from Valdez to refineries along the West Coast. The ships—the *Alaskan Frontier*, the *Alaskan Explorer*, the *Alaskan Navigator*, and the *Alaskan Legend*—can carry approximately 1.3 million barrels of oil, according to NASSCO.

Across the water from the Valdez Marine Terminal, the city-owned Port of Valdez deals with a different kind of natural resource.

Stevedores Move Seafood

Every year, stevedores move hundreds of thousands of pounds of seafood across the Valdez docks onto waiting ships. Port of Valdez Director Diane Kinney says the resource makes up a large portion of seasonal business.

"We have Silver Bay Seafoods here in Valdez and Peter Pan Seafoods, so we export a lot of fish," Kinney says. "That's huge for us."

The port itself is relatively small: There are only four regular employees, plus a handful of summer workers to help handle the upswing in business during the fishing season, Kinney says. But the facility fills an important niche for Southcentral Alaska.

Cargo that's too bulky to move through the downtown streets of Alaska's largest city comes through Valdez rather than the Port of Anchorage. Kinney says her facility helps move everything from construction equipment to oversize supplies bound for Pogo Mine. When it comes to sending cargo outside the state, fish is perhaps the largest moneymaker.

The season picks up in July and wraps up around the end of September, the port director says. Two barge companies operate out of the port year-round—Samson Tug and Barge and Alaska Marine Lines. North Star Terminal and Stevedore Company handles the loading and unloading.

Next year, the port is expecting a bump in business, Kinney says. Silver Bay Seafoods is in the process of expanding its operations, which means more fish crossing the docks onto waiting vessels.

"That's really going to be a big thing for us," Kinney says.

This past summer, stevedores at the port loaded fish onto about one barge a week, according to Ryan Sontag, North Star's Valdez operations manager.

Each barge holds anywhere from 50 to 150 containers of fish, Sontag says. The containers are either twenty- or forty-foot freezers, and it takes a crew of about a dozen people around ten hours to load up the barge.

It was a good season, Sontag says. During the summer months, fish—primarily pink salmon—accounts for about 75 percent of the cargo moving across the docks, the operations manager says. Silver Bay Seafoods' planned expansion would only increase that number.

"Valdez seems to be growing, so as the processors expand and we get good fishery runs back, business out here at the dock grows as well," Sontag says.

The fish piles up faster than the barges can take it away, and by the end of the season it strains the port's storage capacity.

At the beginning of September, the end of the fishing season, Sontag says there were three hundred twenty-foot containers of canned salmon sitting at the Port of Valdez waiting for a lift.

Seafood Deliveries

But the amount of fish moving through Valdez is only a fraction of the weight shipped out of places like Cordova, Kodiak, or Dutch Harbor. Trident Seafood's Akutan

plant, the largest seafood processing facility in North America, is capable of handling more than 3 million pounds of seafood every day, according to the company.

Alaska Marine Lines, Samson Tug and Barge, and others all run regular service to Dutch Harbor. Without the massive barges, many of Alaska's fishing communities would have no other economical mode of bulk transport—which means shipping plays a key role in an important Alaska industry.

In 2014, the state's seafood exports grew to $3.28 billion, according to the ASMI (Alaska Seafood Marketing Institute) Alaska Seafood Export Database, compiled by the McDowell Group. China, receiving $956 million worth, was the leading seafood destination, followed by Japan, which received $672 million in Alaska exports. Canada, South Korea, and Europe were also valuable destinations last year. While fluctuating currencies could take a toll on the value of this year's exports, crews fishing Alaska waters pulled in near-record runs.

In 2015, commercial fishermen pulled in approximately 1 billion pounds of salmon, according to the ASMI. That happened only once before, during another massive harvest in 2013. This year, sockeye numbers are expected to increase for the second year running, doubling 2013 harvest levels. That may have contributed to the glut of canned fish sitting in containers at the Valdez port in early September.

Earlier this year, the US Department of Agriculture announced a plan to spend up to $30 million to purchase surplus canned Alaska sockeye salmon to benefit The Emergency Food Assistance Program. The fish, purchased with funds raised by import tariffs, will be distributed to food banks around the country. Ray Riutta, ASMI's interim executive director, praised the department's decision and its benefits for Alaska's commercial seafood market.

"These fishermen have experienced large sockeye harvests in back-to-back years and badly need to clear surplus inventory of canned sockeye salmon," Riutta says in a written statement.

Somewhere around 10 percent of all US seafood comes from Alaska, according to data published by the McDowell Group. Alaska plays an even larger role when it comes to exports. Nearly 60 percent of all US seafood exports came from Alaska in 2011, and approximately two-thirds of Alaska seafood is sent to markets abroad, the McDowell Group reported.

Dutch Harbor remains a major jumping-off point. Unalaska, which calls itself "the Number One Fishing Port in the nation," brings in more than 700 million pounds of seafood annually, according to the city.

Shipping Red Dog Ore

Far to the northwest, yet another natural resource depends on marine transportation to travel from the ground to market. Red Dog Mine's port complex, at the end of a fifty-two-mile haul road, facilitates the transfer of millions of pounds of lead and zinc ore across the Chukchi Sea.

It all takes place during a one-hundred-day shipping season. When harsh Arctic conditions prevent marine transport during the rest of the year, the concentrates are stored at the port facility in some of Alaska's largest buildings. When the season opens back up in June or July, ships take the ore to metallurgical facilities in Canada and customers in Asia and Europe, according to Teck Alaska Incorporated, the commercial mining company behind Red Dog.

Moving ore from Alaska's northwest coast to the rest of the world involves some special equipment and innovative methods. The work is handled by Seattle-based shipping giant Foss Maritime, which uses custom-designed self-loading barges to work at Red Dog's remote port. Gary Faber, the company's senior vice president, says Foss also employs roadstead loading of dry bulk cargo—the first such system in the world.

The process takes many ships and many trips. In 2010, Foss lightered 1.4 million tons of ore to twenty-seven vessels, according to the company. That involves navigating through the ice that remains in late June or early July. When conditions are rough, the massive carriers and their valuable cargo anchor in deep water. The ore must be moved before the Red Dog port freezes over again in October.

Like fishing, oil, and gas, the mining industry is a key economic driver for the state. Red Dog itself is the largest producer of zinc concentrates, according to the mine. Over the past twenty-five years, the mine operation has contributed nearly $1 billion to the local and state economy via taxes and direct and indirect impact. In 2009, Red Dog's payroll totaled $52 million and 550 full-time jobs.

The mine is operated under an agreement between Teck and NANA Regional Corporation, which owns the land itself. The regional corporation receives several benefits: NANA shareholders make up more than half of the mine's workforce, and Teck has paid more than $471 million in royalties to the Alaska Native corporation over the past thirty-three years. The mine

is also the only taxpayer in the region, providing the Northwest Arctic Borough with 60 percent of its revenue, according to Teck.

Vital Role of Tugs and Barges

The importance of Alaska mines extends across the state. Data from the Alaska Miners Association shows that in 2014, the industry accounted for 4,400 direct mining jobs. Including indirect jobs, the total number rises to 8,700. The industry includes some of the highest-paying jobs in the state, according to the Alaska Miners Association, and it generates hundreds of millions of dollars in annual revenue for local governments, Alaska Native corporations, and Alaska households. Last year, the industry fueled payrolls of approximately $620 million.

Alaska's mines produce everything from zinc, lead, gold, coal, and silver to sand, gravel, and rock. In 2012, operations including Red Dog, Greens Creek, Fort Knox, Pogo, Kensington, Nixon Fork, and Usibelli achieved approximately $3 billion in gross mineral production value, according to research published by the Council of Alaska Producers. The year prior, the products of Alaska's mines made up 38 percent of the state's total exports.

And that's where shipping comes into play. Whether they're hauling in the equipment necessary to build the mines in the first place or exporting tons of valuable raw material, Alaska's tugs and barges play a vital role in the state's lucrative natural resource sectors.

When a 2014 study by PricewaterhouseCoopers shed light on just how important marine transport is for Alaska, the state's congressional delegation came together to praise the industry's economic clout.

"As a mariner myself, I recognize the crucial role the maritime industry plays in delivering goods to communities around the globe," Representative Don Young says in a written statement. "Alaska's maritime industry is not only critical to our state's economy, it is also an important part of our state's identity."

PricewaterhouseCoopers' study found Alaska's maritime-related jobs have a $1 billion economic punch, and the state is ranked third in the nation when it comes to per-capita maritime jobs. That includes everything from vessel operators to stevedores, like Sontag in Valdez.

Domestic cargo exported from Alaska totals more than 38 million tons annually, according to the international firm. The top destinations: Washington, California, and Hawaii. Oil is a major export. More than 34 million tons of crude petroleum is shipped to other parts of the United States every year, PricewaterhouseCoopers found.

But why boats? There are some other options. Barges work for canned seafood, but the fresh fish and crab that goes for premium prices in supermarkets and restaurants around the globe can only be transported by air. Companies like the Anchorage-based FishEx offer overnight shipping for Alaska seafood products, using UPS and one of the largest FedEx hubs in the world for next-day deliveries Tuesday through Friday.

For years, there's been talk of a rail link between Alaska and Canada. In 2007, the Alaska Canada Rail Link Project published a feasibility study examining the idea. The study pegged the total cost for such a project at more than $10.5 billion, and the project has yet to move forward. So far now, in the face of looming state budget deficits and bottom-of-the-barrel oil prices, marine transportation remains king.

Moving Alaska's natural resources still takes barges, tugs, and tankers. ☼

Kirsten Swann is a freelance writer based in Anchorage.

EXPORTING LNG

Bringing gas to market for the Alaska LNG Project

By Russ Slaten

ExxonMobil sealift module onsite at Point Thomson earlier this year.

Courtesy of ExxonMobil

The Alaska LNG Project—although it may be about ten years before first gas—continues to build momentum as Alaska Governor Bill Walker attended the LNG Producer-Consumer Conference in Tokyo, Japan, during the week of September 14. Walker met with executives from Japanese companies, utilities, and governmental entities and more—including Itochu Corporation; Japan Oil, Gas and Metals Corporation; Tokyo Electric Power Company; and Tokyo Gas—during his time in Japan.

"No one is going to tell the story of Alaska like Alaska will tell the story. We're an owner-state, and it's time we act like an owner-state. What an owner-state does is show up and make sure the world is aware of the product we have available," said Walker at a press conference the Friday before his departure.

Additionally, the Alaska LNG Project reached another significant milestone in May when the US Department of Energy issued a conditional authorization to export domestically produced liquefied natural gas (LNG) to non-Free Trade Agreement (FTA) countries.

"The scale of this project holds great economic potential for Alaska, while boosting energy security for our trading partners. For example, the export volume that is anticipated in the Alaska LNG export authorization is equivalent to 22 percent of Japan's daily LNG import volumes in 2014," said Elizabeth Sherwood-Randall, Deputy Secretary of Energy, at a federal roundtable on LNG organized by US Senator Lisa Murkowski at the Loussac Library in Anchorage on May 28.

The authorization allows the project to export LNG, up to 2.55 billion standard cubic feet per day or 20 million metric tons per year for a period of thirty years, but is still subject to environmental review and final regulatory approval.

"Our long-time partner in trade, Japan, doesn't have a free trade agreement at this time, so what this allows us to do is move forward with the confidence that this project is real, that we can actually work to make commitments—to sell—Alaska's North Slope gas, and not just to Japan, but to anyone around the globe," said US Senator Lisa Murkowski at a press availability following the Alaska Oil and Gas Association Annual Luncheon on the same day.

The project's costs reached $243 million through August, with 75 percent of the initial design scope complete and about 50 percent of 2015 field work complete. Pre-FEED is expected to cost about $500 million total with work expected to be complete in mid-2016.

Foreign Markets

In November 2014 Alaska LNG received Department of Energy approval to export to nations that have existing FTAs with the United States. The state of Alaska is a 25 percent equity partner in the project through AGDC (Alaska Gasline Development Corporation) and will be shipping the state of Alaska's gas through the project. AGDC says the additional approval to export to non-FTA countries opens up the project to the broadest target market.

"There are only a small number of countries that have free trade agreements with the United States, and most are countries in which we aren't expecting to market our [the state of Alaska's] gas. There's Columbia, the Dominican Republic, El Salvador, and primarily Central American countries. The only Asian countries on that list are South Korea and Singapore, and we believe our best market will be in Asia. So the [conditional export] approval we received in May gives us an ability to export to basically everyone else," says Miles Baker, vice president of external affairs and government relations at AGDC.

The thirty-year export approval to non-FTA countries is also significant since an export period of twenty-years is more typical, Baker says.

"It's an indication that the Department of Energy understands that Alaska's gas is a little different than gas in other parts of the United States. Because of its location, the remoteness from the markets, and the abundance of gas in the Lower 48, the market for Alaska's gas is going to be outside of

the United States, and they are in essence recognizing that," Baker says.

Murkowski says the Department of Energy has had trouble in the past with a slow and burdensome application process for firms in the Lower 48 requesting export licenses of this nature, and even after the department has realigned to expedite some of those processes; it has always seen Alaska in a separate category.

"We have been given verbal confirmation that 'you're not part of this more complicated Lower 48 system.' But it's one thing to say that, and it's another thing to do it and process it," Murkowski says.

In the case of the $45 billion to $60 billion Alaska LNG Project, the thirty-year license to export to non-FTA countries begins on the first day of export or twelve years from the date the authorization was granted, Baker says. Currently in pre-FEED, or pre front-end engineering and design, the project development timeline is looking at first gas in 2025 or 2026.

Natural Gas Act

For countries without an FTA with the United States, the Department of Energy will grant an export authorization for proposed exports unless the Department of Energy finds the proposed export is not consistent with the public interest, under the Natural Gas Act. Although the Department of Energy recognizes the tremendous gas resource on the North Slope, commercializing the project just within the United States would not be possible, Baker says.

"One of the reasons the state is investing in this project is to provide a domestic supply of gas to Alaskans and that is a fundamental part of the agreement with our partners. However, at this point, the in-state market is very small, so the state will have more than enough gas to meet in-state needs," Baker says.

All the gas beyond in-state need will be liquefied and sold to outside buyers, he says.

"As we continue to evaluate this project all the way up until there's a final investment decision made—which is probably still three years off—all of the partners will be continually probing the market, making sure there's still a market, and making sure the economics of it make sense," Baker says.

Marketing LNG

When it comes to the state of Alaska's share of LNG from the proposed Alaska LNG Project, it may market that gas on its own or decide to allow one or more of the project partners to market the state's gas along with their own.

At the Alaska LNG Project's latest presentation to the Alaska Legislature in September, joint venture marketing was discussed—in which all of the project's gas would be marketed collectively—but at this point in the negotiations that approach seems unlikely, Baker says.

"The state, as a shareholder in the project, is still contemplating how it wants to best market its own gas. The state, between AGDC, the [Walker] administration, and the Department of Natural Resources, will have to decide and come to agreement on how they want to sell the state's gas," Baker says.

The project's producer partners are looking at equity marketing—in which each partner markets its own gas. If the state decides not to market directly, it could potentially market its gas through one or more of the project partners individually.

"You have to get the permitting in place, you have to get the licenses in place, you have to get the engineering and design work in place and understand all of your cost components," Baker says. "But at the end of the day you have to make sure you will still have a market for the gas—which is hard work because you're trying to identify a market for your gas ten years from now." ☼

Russ Slaten is an Associate Editor at Alaska Business Monthly.

Hard Times, Hard Decisions for LNG Projects

By Larry Persily

Larry Persily, assistant to the Kenai Peninsula Borough mayor, was invited to participate in a global LNG conference and prepared this report as part of the borough's ongoing efforts to share information about LNG market developments. The conference paid the travel expenses.

The frustrations of an oversupplied LNG (liquefied natural gas) market and low prices were evident as about one hundred LNG buyers, sellers, lenders, advisers, and goods and services suppliers gathered in London last month.

"How the hell do you plan your business in an environment like that," said David Ledesma, managing director of South-Court Ltd., a United Kingdom-based oil and gas consultancy. "How the hell are you going to go out and make final investment decisions?"

Spot-market prices for LNG cargoes delivered to Asia this fall are down two-thirds from the record $20 per million Btu in February 2014. Demand in China is not growing as much as was expected—just as new supplies are coming online from Australia and the United States—creating fears of an oversupplied market and low prices for several years.

Meanwhile, buyers are demanding shorter terms and more flexibility in their LNG supply contracts. Speakers at the fifth annual LNG Global Congress September 23 to 24 in London said the oversupply could play itself out by the 2020s, creating opportunities for new projects to meet demand, but those investment decisions are getting tougher on LNG project developers.

"Gone are the days when you can expect to get 15 percent return on your LNG plant," said Mike Fulwood, a principal in Nexant's global gas consulting practice.

Low Prices Will Help Build Demand

Conference speakers talked a lot about the price for LNG: It was way too high a couple of years ago. Now it is far too low. But the price needs to stay low enough to continue attracting new customers—which, the theory goes, would lead to increased demand and somewhat higher prices.

That means producers will need to hold down costs for new projects if they are to make money in the low-price world.

"The industry needs to find new ways to get lower costs," said Thierry Bros, senior European gas and LNG analyst for Paris-based banking and financial services company Societe Generale. "If you want to increase demand, you decrease prices."

Kazumi Takahata, deputy general manager at Tokyo Gas, had the same message: Keep the price down, and we'll buy more. In addition to lower prices, Japanese utilities are looking for a more diversified supply portfolio, Takahata said, listing North America (including Alaska), Russia, and East African nations as potential suppliers.

A conference poll showed a strong majority believe LNG prices will stay below $10 per million Btu (roughly 1,000 cubic feet of gas) through the end of the decade. Even though $10 would be a big increase from the $7 range sellers received for spot cargoes in September 2015, it's still a long way from the highly profitable prices of 2012 to 2014 that averaged over $15.

LNG Trade Has Changed

"We had this impression that the good times would never end," said Vivek Chandra, CEO of Texas LNG, a smaller liquefaction project proposed for the Texas coast. "Instead of feeling sorry for ourselves, we need to embrace change."

LNG markets used to operate in their own tradition-bound world of long-term contracts between a limited number of buyers and sellers. Now the market is behaving like any other commodity, Chandra says. Supply and demand dictate price, and price determines customer decisions.

"When I buy chocolate, I look at Swiss or Belgium… When I buy gas, I look at the price," Bros said. Gas is a commodity, and there is nothing special about one country's LNG over another. Bros said he stressed that point when he told a group of Canadians recently that their LNG is no better than anyone else's and they should not expect a premium price. Developers are promoting two dozen LNG export plants on Canada's western and eastern shores, though none have committed to construction.

The risk, many of the conference speakers said, is that developers of LNG export projects will shy away from final investment decisions this decade, setting the stage for supply shortages in the 2020s.

New Markets Developing

"Looking ahead, the current situation might delay FIDs [final investment decisions] and set the basis for the next cycle [beyond 2020] where demand grows faster than supply," said Carmen Lopez-Contreras, senior analyst for the gas and power planning team at Repsol, a Madrid-based global oil and gas company. Lower prices will accelerate demand in new markets, she said, pointing to Pakistan, Jordan, and Egypt as examples. "We have this amazing [demand] growth in Middle East countries that we have to watch." Mideast countries are increasingly turning to natural gas for power generation rather than burning oil products.

In addition to the Middle East and Pakistan, growth markets are building in Southeast Asia (particularly Thailand), the Baltic region, and Latin America, said Matthew Monteverde, vice president for generating fuels at Argus, a global energy news service.

The lower-cost and relatively quick development time (months, not years) for floating import terminals—ships that offload the cargo from an LNG carrier, store it, regasify it, and pipe it to shore-based customers as needed—is making it easier for more countries to sign up for LNG deliveries.

Several speakers, including Stephanie Wilson, managing editor of the Asian LNG team at Platts news service, repeated the possibility of a tight market by 2025 if not enough new supply is developed. But it won't be easy for developers to make investment commitments for new supplies. More buyers are demanding shorter-term contracts of three to five years, Wilson said, with diversified pricing to replace the traditional LNG price link to oil on an energy-equivalent basis.

"We know there will be shortages in the future because FIDs [final investment decisions] are not being taken," said a senior adviser to a multinational oil and gas company who stipulated that no one could attribute any statements to him by name. The deterioration of traditional long-term, take-or-pay contracts and the growth of shorter-term deals—with buyer flexibility to redirect or resell the cargo—is "uncharted territory," he said.

Therein lies the conundrum.

"The banks still will need a long-term offtake from a creditworthy customer," said Ian Catterall, senior vice president and head of natural resources at the Bank of Tokyo Mitsubishi. "Good projects will always be financed," Catterall said. "I'm not sure which projects are the good projects."

Conference speakers raised several other topics:

LNG imports have gotten so cheap for China that the average prices are less than pipeline gas deliveries from Central Asia, Platts' Wilson said. Meanwhile, smaller, private buyers are gaining access to China's LNG terminals controlled by the nation's biggest importers, providing a new market for more import cargoes.

India will take an increasing volume of LNG, as long as prices are low, Bros said. The government holds down the retail price of natural gas, putting pressure on importers to avoid high-cost contracts. India's main LNG importer is pushing Qatar to negotiate lower prices on a long-term contract that dates back to 2004.

China wants to develop its substantial shale gas resources, to help reduce its reliance on imports, but "that's moving much more slower than the official plan," said Victor Perez, a partner at consultancy A.T. Kearney's energy practice. Geology and a lack of technical expertise are the hurdles, he said. ☼

Larry Persily is the Oil and Gas Special Assistant to the Kenai Peninsula Borough Mayor's Office.

New North Slope Developments as a Result of Senate Bill 21

Photo by Judy Patrick | Courtesy of Repsol

Repsol Qugruk 301, east of the Colville River, February 2015.

By Russ Slaten

Senate Bill 21 (SB21) was signed into law May 21, 2013, by then-Governor Sean Parnell. SB21 eliminated the ACES tax structure and its complex and volatile progressivity rule and altered production tax credits, in turn spurring new production on the North Slope and throughout the state.

"Collectively companies have announced an additional $5 billion of investment, whether that's in existing fields or new projects and developments—this is on top of the investments already made [in oil and gas projects]," says Kara Moriarty, president/CEO of Alaska Oil and Gas Association.

ConocoPhillips is making multiple investments across its North Slope operations.

Caelus sanctioned the $1.2 billion new Nuna oil development project on the North Slope this March, and despite some slowdowns in the project's development, production is expected in 2017. Additionally Caelus gathered 3D seismic data last winter on leases east of Prudhoe Bay and is set to drill up to two exploration wells this winter in Smith Bay on the far western edge of the North Slope.

Repsol has invested nearly $1 billion in exploration since 2011, filed its initial permit for a development in June, and is in the early stages of putting together a project.

ConocoPhillips Alaska

"SB21 has improved the investment climate in Alaska and has been a positive factor in [ConocoPhillips'] capital investment decisions. And it's incredibly important to try to slow production decline because that is really what is fueling the long-term health of our economy," says Natalie Lowman, director of communications at ConocoPhillips Alaska.

Since the passage of SB21, ConocoPhillips has attributed several projects to the law. ConocoPhillips Alaska's 2015 capital budget is about $1.4 billion, which nearly mirrors that of the 2014 capital budget, Lowman says.

"I can't say exactly how much we'll spend next year because future investments will need to compete within the global investment portfolio, but the fact that we didn't significantly lower our budget from last year—in light of low oil prices—it reflects the quality of the opportunities we have on the North Slope, and it reflects the change in the investment climate that resulted from tax reform," Lowman says.

Since SB21, ConocoPhillips added oil rig Nabors 7ES at the Kuparuk field in May 2013 to perform rig workovers in order to increase production from existing wells, accelerating a backlog of wells that need repair. The second rotary workover rig, Nabors 9ES, began drilling in January 2014, drilling up to ten new wells at the Tarn field in addition to pumping additional oil from mature fields. The two new rigs have collectively added more than eight thousand barrels of oil per day to North Slope production, Lowman says.

In 2014 ConocoPhillips began building the first new drill site in twelve years—Drill Site 2S—in Kuparuk. First oil is expected later this year with an addition of eight thousand barrels per day of production.

"We've moved the production decline at Kuparuk from 7 percent to 1 percent by adding two additional rigs, and Drill Site 2S at Kuparuk should further impact production in a positive way," Lowman says.

Doyon Drilling is currently building a new rotary rig—Doyon 142—for ConocoPhillips, which will be the first new-build rotary rig added to Kuparuk since 2000 and will begin drilling as soon as February 2016. Additionally, ConocoPhillips has contracted Nabors to build a new coiled tubing drilling rig—CDR3—for use at Kuparuk, which is scheduled to begin drilling in late 2016, Lowman says.

ConocoPhillips is also moving forward with a new viscous oil project—1H NEWS—associated with the West Sak reservoir at the Kuparuk field. The project will require a nine-acre extension to the existing Drill Site 1H and installation of surface facilities to support five new production wells and thirteen new injection wells. The project is planned to come on line in early 2017, marking the largest investment in viscous oil at Kuparuk since 2004, Lowman says.

"This new activity alone at Kuparuk will add about twenty-five thousand barrels of new oil a day at peak production, representing an investment of over $1 billion." Lowman says. "The work is also creating hundreds of jobs during construction."

On the horizon for ConocoPhillips Alaska is the investment decision for a new development in the National Petroleum Reserve-Alaska called Greater Mooses Tooth 1. On the Western North Slope ConocoPhillips expects the Greater Mooses Tooth 1 development to bring about thirty thousand additional barrels of oil per day at peak production and is estimated to cost more than $1 billion.

Caelus Energy Alaska

Caelus Energy Alaska is an independent exploration and production company that entered Alaska in 2014 when it purchased the North Slope Oooguruk unit and operations from Pioneer Natural Resources. Caelus is the "poster child of SB21," according to President/CEO and co-founder Jim Musselman.

"Since the passage of SB21 and our entry into Alaska, we have made significant new investments across the North Slope. Caelus has been full steam ahead in enhancing current operations, as well as building new opportunities. All of which has been made more possible under the SB21 tax regime," says Casey

Cardno Shaping the Future

International professional services firm Cardno is well known for its ability to plan, design, manage and deliver sustainable projects and community programs. Founded in Brisbane, Australia in 1945, Cardno offers a broad range of resources for federal, state and local governments, as well as private clients in various industries.

Recently, Cardno expanded its presence in Alaska to include 15 employees reporting to its Anchorage office. The office, which offers cultural resource, remediation, restoration, planning, climate change and other services, will continue to grow and become more diverse.

"Our office has biologists, air quality specialists, engineers, economists, geologists, hydrologists, wetland scientists, oceanographers and other highly qualified specialists who are focused on providing long-term solutions to the problems that face industries here in Alaska, the rest of the country and abroad," says Anchorage-based Senior Consultant/Office Manager Meg Thornton.

Although Cardno's name is fairly new in Alaska, the firm has longstanding roots in the state. Cardno merged with ENTRIX, which was founded in Anchorage in 1985. After operating as Cardno ENTRIX for four years, the firm was renamed Cardno in January 2015.

With more than 250 offices worldwide, Cardno has approximately 8,100 employees and has conducted projects in 100-plus countries. Cardno also recently added offices in Canada and a new chief executive officer and managing director: Richard Wankmuller, who formerly worked in Alaska and is a previous senior executive of MWH.

With the Cardno's evolution in Alaska, Thornton emphasizes its local connection and commitment to ensuring responsible resource development. "This is our home," she says. "It's where we work, play and live, and we want to make sure it's safe for the future.

IMPROVING THE PHYSICAL, SOCIAL AND NATURAL WORLD

Cardno has a diversity of services, clients, and capabilities that allow a flexibility in the market. In Alaska, Cardno is working on the Alaska LNG Project and was selected as a team member of the Alaska Railroad Seward Master Planning Project. Cardno also provides regulatory and permitting support to oil and gas companies on the North Slope and Cook Inlet and partners with companies to work on environmental impact statements, biological assessments and wetland studies.

DRIVEN TO DO GREAT WORK

As a testament to its work, Cardno has received numerous honors. Earlier this year, the Engineering News Record listed Cardno as No. 24 of the Top 225 International Design Firms; No. 35 in the Top 150 Global Design Firms, and No. 32 in the Top 200 Environmental Firms. In 2014, Cardno received the American Council of Engineering Companies Grand Award: Cornelius Pass Road and Johnson School Road Project; the Stormwater NSW Award for Excellence: Strategic or Master Planning (Manly 2015 Raglan Street Stormwater Upgrade) and Research and Innovation (Urban Rational Method Review).

The key to Cardno's success is great people who are incredibly knowledgeable and have a passion to do great work. "We have incredibly talented people from all disciplines who are able to solve any problem facing our clients," Thornton says.

Cardno

Meg Thornton,
Senior Consultant/Office Manager
3150 C Street., Suite 240
Anchorage, Alaska 99503
907-261-7703
cardno.com

Sullivan, Caelus public affairs director.

Caelus built the Nuna project gravel pad in March, a large-scale civil project with more than 660,000 cubic yards of gravel and 27,000 loads to build. It will house the drilling rig and collection center that will be the foundation of the $1.2 billion Nuna project, Sullivan says.

Last November, Caelus was high bidder for nearly 323,000 acres in North Slope Areawide Alaska Division of Oil and Gas fall lease sales. Winning bids totaled about $15 million for tracts near the Badami Unit between Point Thomson and Prudhoe Bay. Last winter Caelus conducted two large-scale 3D seismic programs on new acreage and over some existing holdings, employing contractors that provided hundreds of jobs to complete the work.

In June Caelus acquired 75 percent working interest in NordAq's Smith Bay oil leases and will take the lead as the primary in an exploration project this winter to drill up to two exploration wells. The $150 million project currently underway is known as Tulimaniq and is located in Smith Bay on the far western edge of the North Slope, Sullivan says.

Despite its growth of activity in Alaska over the last year, Sullivan says dropping oil prices and any possible changes to SB21 creates uncertainty around Caelus's future investment decisions.

"The ongoing drop in oil prices has had a large impact on how we are pacing our projects," Sullivan says.

Repsol

Repsol E&P USA, Inc. has explored its state leases every winter since it arrived in 2011. The company has drilled sixteen wells, including side tracks, over the last four exploration seasons and intends to drill three more wells this year.

In Repsol's case, the local subsidiary of the Spain-based energy company arrived in Alaska before the passage of SB21. Repsol initially purchased federal leases in 2007 but did not invest in state leases because Alaska's state tax system was not competitive.

"There was an anticipation that the fiscal structure was about to change, which it did in 2013 with the passage of SB21. When we were presented with that opportunity, we knew it wouldn't be there forever. We had an opportunity in front of us, so we entered into a partnership with Armstrong in 2011, an established firm on the North Slope," says Bill Hardham, Alaska Operations Manager of Repsol.

Hardham sums up the ACES tax structure as not being competitive, and it did not match up to the rest of the world in terms of inviting investment from oil and gas companies. The progressive structure that increased tax liability as oil prices increased made the economics unclear in an industry that typically invests for the long-term, Hardham says. A view shared by Moriarty.

"When [producers] have more stability, they can say, 'We can move forward with this because we can forecast what our effective tax rate is going to be in a much more predictable manner over the life of the project.' So that gives the project fiscal stability. The progressivity factor created so much uncertainty because it was such a great escalator as prices went up," Moriarty says.

The passage of SB21 made Alaska competitive by removing progressivity, but by also added tax credits for new production, Hardham says.

"Now when Repsol and other companies look at opportunities around the world, it's a competitive situation, and you see the investment being drawn here [in Alaska]. Even now with the oil prices going down, Alaska is still enjoying some investment," Hardham says.

Along with production credits, SB21 increased the base tax rate to 35 percent, up from ACES' 25 percent, creating a safety net of sorts for the state.

"Looking at the structure of oil taxes today, it's much more predictable because progressivity has been eliminated," Moriarty says. "The [SB21] tax structure is now more stable, it's more predictable, and it even protects the state better at the low end [of oil prices] as we unfortunately see today."

In October, Repsol announced it was deferring this winter's drilling plan. It had filed for a permit in June. Instead, the company is shifting ownership to Armstrong in an $800 million deal. Repsol employed forty people in Alaska, plus has employed about five hundred contractors during its winter drilling projects.

Before the passage of SB21, companies were not investing billions of dollars on new developments, they were investing the minimum to keep production in nearly the same place, Moriarty says. Under ACES, the state tended to see higher taxes with higher oil prices, but less investment.

"When prices are high here, they are high everywhere, so [oil and gas companies] will evaluate the highest return on investment—and because ACES was such an onerous tax policy at the time—it made no sense to invest here," Moriarty says. "So if you're only looking at it in state revenue perspective, you may be making more money on taxes, but you need to look at what's impacting the overall economy and creating jobs and investment." ☼

Russ Slaten is an Associate Editor at Alaska Business Monthly.


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Developing NPR-A

Oil, gas, and protected ground

By Kirsten Swann

The National Petroleum Reserve-Alaska (NPR-A) is the largest single block of federally managed land in the United States: A 23 million-acre swath of arctic terrain along Alaska's North Slope.

NPR-A encompasses the Inupiaq communities of Barrow, Nuiqsut, Atqasuk, and Wainwright. The landscape is dotted with lakes, rivers, bogs, tundra foothills, and, to the south, the jagged peaks of the Brooks Range. Below the surface lies another natural treasure. NPR-A holds approximately 896 million barrels of oil and about 53 trillion cubic feet of non-associated natural gas, according to the US Geological Survey (USGS).

Oil and gas leasing within NPR-A, authorized under the Naval Petroleum Reserves Production Act of 1976, is overseen by the Bureau of Land Management (BLM). A new Integrated Activity Plan and Environmental Impact Statement was finalized in 2013. Then, in August 2015, one of Alaska's largest oil companies began drilling the first oil development in the petroleum reserve's history.

Despite economic hurdles and regulatory uncertainty, exploration and production at NPR-A continue to move forward.

The first and so far only development to commence drilling within NPR-A is Colville Delta-5 (CD5), a $1 billion investment led by ConocoPhillips. When the petroleum giant began work on its first development wells in August this year, ConocoPhillips Alaska President Joe Marushack called it a "significant milestone."

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Indiana-Sized Oil Reserve

Some perspective: The entire NPR-A is approximately the size of the state of Indiana. Established as the Naval Petroleum Reserve No. 4 in 1923, the area was intended to help supply the country's oil needs in times of national crisis, according to the USGS. In the decades since, the NPR-A has been the subject of various explorations. The US Navy, USGS, and the oil and gas industry have all taken a hard look at the area. For years, though, it wasn't considered economically viable to develop within the reserve. Early exploration efforts uncovered no commercial-size deposits, and neither did another round of test drilling conducted in the 1970s.

But advances in technology mean renewed promise for Alaska's smaller fields. Things like 3D seismic profiling, sequence stratigraphy, and wellsite development methods have lowered the cost of exploration and development, putting a new focus on NPR-A, according to USGS.

Geologically, it's a huge area made up of various strata and layered facies thousands of feet below the earth's surface. A lithostratigraphic illustration published by the USGS depicts the various formations within the NPR-A. There's the Gubik Formation, the Sagavanirktok Formation, the Seabee Formation, and the Nanushuk Formation. Then comes the Torok Formation, the Shublik Formation, and the Ivishak Formation, all layered on top of the carbonate Lisburne Group. The whole thing is interspersed with shale units and unconformities. And it may not hold as much oil and gas as once thought.

NPR-A Potential

Citing "recent exploration drilling that revealed an abrupt transition from oil to gas and reduced reservoir quality in the Alpine sandstone," a 2010 petroleum resource assessment published by USGS downplayed the estimated amount of oil and gas within the NPR-A. The exploration drilling, 3D seismic surveys, and other activities show more gas in the area than previously anticipated. Without a pipeline to carry that gas to market, interest in NPR-A has waned. But the roadblocks aren't enough to dissuade companies like ConocoPhillips, who've invested giant amounts of time and money in the federal reserve.

Since oil and gas leasing in NPR-A was authorized nearly forty years ago, tracts have been offered for sale only intermittently. There were no sales between 1984 and 1999, according to BLM. Then, in 2011, President Obama directed the Department of the Interior to conduct annual sales in the area.

BLM offers two types of oil and gas leases on federal land. Legislation passed by the US Congress in 1987 requires all public lands be offered first by competitive lease, reverting to a noncompetitive lease only if no bids are received during oral auction.

In Alaska, the maximum competitive federal lease size is 5,760 acres—more than twice as large as any in the Lower 48. Each lease lasts for ten years, renewing automatically if it holds a well capable of producing paying quantities, or if it "can receive an allocation of production from an off-lease well capable of producing in paying quantities."

NPR-A Leases

The BLM's 2015 lease map shows hundreds of tracts available for nomination. There are currently 212 leases within NPR-A, according to the bureau.

ConocoPhillips's CD5 drill site is part of the Colville River Unit, a unit operated by ConocoPhillips and co-leased by Anadarko Petroleum. First oil is expected from CD5 sometime this quarter, according to ConocoPhillips.

Development plans for the site involve drilling fifteen wells, with an expected gross peak production of sixteen thousand barrels of oil per day. Marushack says the infrastructure installed for the project—which includes a road, gravel pad, bridges, and

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The road to developing CD5 was fraught with legal challenges. First, the US Army Corps of Engineers denied a key permit for the project. ConocoPhillips appealed the federal decision, and the agency relented. Then came the lawsuit backed by seven Nuiqsut residents who hoped to invalidate the permit issued in late 2011. It wasn't until June of this year that US District Court Judge Sharon Gleason denied the plaintiff's final motion for a summary judgement, allowing the oil development to move forward unhampered.

pipelines—will help enable future development in the remote chunk of Arctic terrain.

The road to developing CD5 was fraught with legal challenges. First, the US Army Corps of Engineers denied a key permit for the project. ConocoPhillips appealed the federal decision, and the agency relented. Then came the lawsuit backed by seven Nuiqsut residents who hoped to invalidate the permit issued in late 2011. It wasn't until June of this year that US District Court Judge Sharon Gleason denied the plaintiff's final motion for a summary judgement, allowing the oil development to move forward unhampered.

CD5 isn't ConocoPhillips' only project within the bounds of NPR-A. GMT1 (Greater Mooses Tooth Unit 1), situated west of the Colville River Delta and about eleven miles outside Nuiqsut, is a satellite of the giant Alpine field. Plans for development call for a new gravel pad, a 7.7-mile road, and pipelines connecting to CD5. With the capacity for up to thirty-three wells, GMT1 would start off with eight wells, according to ConocoPhillips, and oil would be processed through Alpine's existing facilities.

But that development hit the brakes earlier this year, with the oil company announcing reduced investment in the face of permitting delays and requirements and low oil prices. A month later, BLM issued a record of decision on a supplemental environmental impact statement for GMT1, clearing the way for federal permits to be issued for the development. The bureau also asked the oil company for $8 million to "facilitate the development and implementation of a regional mitigation strategy and finance mitigation projects identified through the regional mitigation strategy process to offset unavoidable impacts of the project."

Meanwhile, ConocoPhillips continues with some geotechnical planning and engineering work in the area, according to the company.

While CD5 is the first development to move forward within the bounds of NPR-A, the petroleum reserve is no stranger to oil and gas activity.

Legacy Wells

The land is dotted with legacy wells, all drilled prior to 1982, when BLM held the first lease sale for the area. All told, 136 exploratory oil wells, core test, and temperature monitoring wells were drilled within and adjacent to NPR-A, according to the Department of the Interior. They dot the expanse of the reserve, clustered around

Cape Simpson and the western edge of Smith Bay.

Those legacy wells helped gather geologic data and monitor permafrost temperature.

This past summer, BLM completed some surface cleanup at three legacy well sites at Cape Simpson on the northern edge of the reserve. Crews gathered around 135 cubic yards of debris—bentonite clay, wood and scrap metal, concrete, oily debris, and drums were all removed from the site, according to the bureau. In the spring, BLM plugged three more legacy wells at Umiat, cutting off well casings below ground level and removing wellheads.

As annual lease sales within the NPR-A continue, a large chunk of the reserve remains off-limits to drilling. Just take a look at the latest lease sale map published by the BLM: Tracts are offered across the length of the reserve, but the entire north coast and a vast area to the southwest remain closed to new leases.

> "The president likes to say he supports production, but his actions tell a different story, and under his leadership, fully half of the 23.5-million-acre NPR-A is off limits."
>
> —Senator Lisa Murkowski
> Chairman of the Senate Committee on Energy and Natural Resources

Some Alaska lawmakers are sharply critical of the closures. Senator Lisa Murkowski, chairman of the Senate Committee on Energy and Natural Resources, called the 2014 NPR-A lease sale "a diversion."

"The president likes to say he supports production, but his actions tell a different story," Murkowski said in a written statement. "And under his leadership, fully half of the 23.5-million-acre NPR-A is off limits."

So what does the future hold for the barely-developed petroleum reserve? The entire area holds only about 10 percent of the oil and gas reserves once estimated. Without a pipeline to carry natural gas from the North Slope, much of NPR-A's holdings remain out of reach, according to the USGS. For now, the future of production within the petroleum reserve remains uncertain. ☼

Kirsten Swann is a freelance writer based in Anchorage.

Alaska-Based Manufacturing for Oil and Gas

Fabricators supply mining, construction, and other industries

By Tasha Anderson

An operator at the controls of STEELFAB's new Messer MPC2000 in the company's Anchorage warehouse.

Photos courtesy of STEELFAB

When it comes to the oil and gas industry, the terms "oil" and "gas" don't even nearly describe the myriad components that must come together to find, produce, store, transport, and process oil and gas. Much of what the industry needs to function day to day is brought in from Outside, either from the Lower 48 or even international markets for specialty or oversized products. Within Alaska there are skilled manufacturers with extensive histories working to support not just oil and gas but mining, construction, and other industries.

Greer Tank & Welding

Greer Tank & Welding doesn't just operate in Alaska, it was born here. It was established in Fairbanks in 1952 by Glen and Ruth Greer, who moved to Alaska after World War II, having met at an Army air base in Kansas. Ruth, according to General Manager Mark Greer, was a "regular 'Rosie the Riveter,' and Glen was an operator/welder."

Since then Greer has expanded within Alaska and to the Outside: in Anchorage in 1972 and in Tacoma, Washington, in 1995. "Greer now has two steel manufacturing plants and a polyethylene molding facility in Fairbanks and two tank manufacturing facilities in Anchorage, along with facilities in Palmer and Wasilla," Greer says. Their largest facility is the one in Washington state, now located in Lakewood, which is on the outskirts of Tacoma. All together Greer employs ninety-nine people, seventy-two in Alaska and twenty-seven in Washington.

Facilities

The "main shop" in Fairbanks, as Greer calls it, manufactures residential and commercial tanks; provides welding and repair, industrial fabrication, sandblasting, coatings, and steel processing services; provides support for polyethylene tank manufacturing; and has retail and wholesale sales.

"Greer stocks virtually every tank we sell—hundreds of various items," Greer says. "These are produced year-round at all of our facilities. Many of our sales are also custom projects, from power plant fabrications and fuel farm assemblies to fabrications for the various oilfields on the North Slope and in Cook Inlet."

The "old shop," Greer's original location, does "mostly oilfield work," and "projects are of high QC [quality control] requirements," Greer says; it also does recycled sandblasting and coating operations. The third Fairbanks operation is the polyethylene facility, which has been in operation for sixteen years. "We have two rotational ovens where we produce a variety of aboveground storage tanks, truck tanks, and underground water

and septic tanks," Greer says. In addition, the plant molds ATV trailers, "complete with the axle and tire assemblies installed that we can retail and wholesale to customers and vendors." Greer says that the molds used at this facility have been specifically engineered for the Alaska environment, and Greer "uses materials of a higher grade than other tank manufacturers to enable our tanks to be installed underground without water counterweight and to make sure our polyethylene tanks do not crack and break up during Alaska's cold winters."

The Washington plant manufactures tanks "for all the Alaskan coastal areas accessible only from the Pacific Northwest," Greer says. Additionally it produces steel products for handrails, stairs, and miscellaneous brackets for a variety of uses. One advantage of the plant in Washington is that Greer has close access to Seattle-based galvanizers that can perform hot-dip galvanizing, as the Washington plant produces products with standard coatings as well as those that are destined for galvanizing. "Greer recently completed a $1.8 million expansion this summer at [the Washington] facility, adding fabrication area and installing a complete state-of-the-art coating and sandblasting recycling facility. This is the third major expansion at this location," Greer says.

Alaska Work

Greer had a huge hand in the construction of the Fairbanks Courthouse located at 101 Lacey Street. "The Fairbanks Courthouse building was completely fabricated in Greer's Fairbanks shop. Every column, steel beam, staircase and handrail was supplied by Greer to the erector, along with the polished stainless steel decorative lobby handrails we installed ourselves. Greer also oversaw on site the installation of key structural beams and stair assemblies to insure proper installation," Greer says.

In terms of the oil and gas industry, "Greer has fabricated many of the tanks in use on the slope today," such as custom insulated frac tanks, tiger tanks, stand up gauging tanks, pipeline bleed tanks, and corrosion control tanks. In addition, "Greer has the quality control procedures needed" for carbon steel assemblies, stainless steel assemblies, and heated/insulated assemblies requiring the quality control environment that oil companies demand.

While the company has a branch located in the Pacific Northwest, its reach goes far beyond. "We have shipped tanks as far away as Guam, Hawaii, Texas, and Greenland," Greer says.

Manufacturing in Alaska has both benefits and challenges. "As a manufacturer in Alaska, you find you have to do more than just a trade-specific line of work—you may not be able to subcontract out many of the project requirements. You study, learn, and get your business certified or licensed so you are qualified to perform the various tasks," according to Greer. Additionally, being far away from suppliers complicates logistics, and the state's physical isolation has an influence on how many skilled workers are available for this kind of technical work. "Training a workforce of young, ambitious individuals and training your future welders and workers from the surrounding areas is always a challenge." Greer says.

But their location here is definitely a boon for the industries that rely on Greer for quality products. "Our locations in Fairbanks and Anchorage give us the ability to produce and deliver quickly for our customers," and their facilities can fill orders that are too large for shipping logistics.

STEELFAB

Richard Faulkner is the owner and president of STEELFAB, which he says is the oldest steel company in Alaska, having been established in 1948 by the Swalling family. Faulkner purchased the company in 1988, and STEELFAB has been growing ever since. "When we purchased the

company there was about eight-thousand-square-feet of facility, and at the present time we're running at about eighty-five-thousand-square-feet of facility," Faulkner says, all of which is located in Anchorage. The company currently has forty employees, though when oil prices were higher they had a crew of about sixty.

STEELFAB's Services

STEELFAB is a service center, a warehouse, and does fabrication. Being a service center "means we sell steel—nuts, bolts, etc.—just like going to a hardware store," Faulkner says. But STEELFAB goes way beyond products found at any corner store, also selling steel angles, channels, flats, beams, pipe, square and rectangular tube, and plate. "Processing is part of the warehouse portion of the business," Faulkner says. "Nobody needs an eight-foot by forty-foot chunk of plate, they need it cut up into some other piece," or otherwise modified, he says. As far as fabrication goes, Faulkner says, "we make pressure vessels, we build buildings, we build anything."

STEELFAB also does painting and coating, which includes metalizing with aluminum, zinc, or zinc-aluminum. Faulkner says there's no hot-dip galvanizing tank in Alaska, so the only in-state method of zinc coating is through metalizing. "A hot-dip is simply that: they melt zinc and then they drop steel into it." Before dipping the steel, it's put in an acid bath to remove rust and other impurities and then into a flux bath, which helps the zinc stick, Faulkner says. Alternatively, STEELFAB takes a steel product and "sandblasts it white," Faulkner says, producing a jagged profile to which the zinc will mechanically stick. "It's the same product; it's all zinc, the same grade of zinc that the hot-dip uses," he clarifies.

New Capabilities

STEELFAB recently acquired a new piece of equipment, greatly expanding their fabrication and processing capabilities. It's a 400 High Def plasma cutter from Messer. "Plasma is basically air and electricity," Faulkner says. The new machine has a bevel head on it, which means it can cut a bevel, a double bevel, or a bevel with a land on it; "it'll cut holes: round holes, slotted holes" and has a thirty-seven horsepower drill. It's capable of piercing and cutting 2 inch plate and can edge cut 3.5 inch plate. Also, it's huge, the biggest machine of its kind in Alaska. It has "a seventeen-foot-wide bed by fifty-five-foot long cut, so it is rather large," Faulkner says. It also has an inkjet marker, "so if you need part numbers, heat numbers, pictures, anything," it can be printed right on the steel.

Before the machine ever arrived in Alaska, STEELFAB sent employees to Minnesota to train in the programming process as well as the operation of the machine. Once it arrived, it had to be installed. "That was a month-long process," Faulkner says. "The machine is just a cutting machine… We had to build a table for it." During operation, the cutter produces smoke, which needs to be managed. STEELFAB settled on building and utilizing a table filled with water, as the smoke will dissipate into the water. An alternative solution was using a vacuum table that would suction away the smoke. "In the process, in the middle of winter in Alaska, it also sucks all the heat out of the building," Faulkner points out. "That was a major consideration in going with the water table as opposed to the suction table."

STEELFAB custom designed the water table to suit their needs and had the plans reviewed by an engineering company. The table design was not "overly complicated," Faulkner says, but it was seventeen feet wide, sixty feet long, full of ten inches of water, and needed to support steel being placed on it while the machine works as well as accommodate a 450 pound clamp that holds the material in place.

Steel Fabrication

"We're basically a job shop," Faulkner says, meaning that in most cases, project plans are sent to STEELFAB and they manufacture according to the plan. "We get into some design/build processes, in a sense, that we will have it engineered and submit to [the client] and they approve it and then we build."

STEELFAB is a code shop, maintaining American Society of Mechanical Engineers code, National Board Code, American Institute of Steel Construction code, Underwriters Laboratories code, and operating under standards of the US Transportation and Defense departments—"any of the lettered agencies," Faulkner says.

Any travelers who have flown into Ted Stevens Anchorage International Airport that then drive into Anchorage have an opportunity to see a STEELFAB project, the railroad bridge, which left the shop in one piece. The warehouse facility has two large doors at one end, twenty-four feet wide and twenty feet tall. There's a knockout section between the two doors, providing a maximum opening of fifty-three feet wide and nineteen feet and six inches tall, allowing huge items to be assembled on site.

One of the projects they worked on specifically in the oil and gas industry was for Shell. Shell had ordered material for a drill, anticipating a certain size, which ended up being too long. "So they brought it in and we cut it off and spliced it back together," Faulkner says. In April they engineered and constructed a re-locatable shop for Doyon Drilling that, when fully assembled, is thirty feet wide, fifty feet long, twenty-six feet tall, and contains a standard five-ton crane.

Faulkner says that STEELFAB is also careful to produce products that will withstand the Alaska environment, and has seen instances where cheaper options from Outside don't quite meet the mark. In addition, having an in-state location allows clients to keep a close eye on their projects. "They can just drive across town and look at it," he says. Plus, being in Alaska allows STEELFAB to accommodate tight timelines that wouldn't be possible if there were a time consuming shipping process. Like Greer, STEELFAB essentially does whatever needs doing. "We build drilling equipment, we build mining equipment, we build construction equipment," Faulkner says. "We build products for construction, we build things we haven't got a clue what it is, they just send us a drawing and we build it." ☼

Tasha Anderson is an Associate Editor for Alaska Business Monthly.

LNG Plant Construction

A huge undertaking

By Larry Persily

This update, provided by the Kenai Peninsula Borough mayor's office, is part of an ongoing effort to help keep the public informed about the Alaska LNG project.

Proposed liquefied natural gas (LNG) plant and massive LNG storage tanks in Nikiski.

Alaska LNG project teams played it by the numbers—really big numbers—in a presentation on construction plans to federal, state, and municipal officials.

Site preparations for the proposed liquefied natural gas (LNG) plant and massive LNG storage tanks in Nikiski would require stripping up to 4 million cubic yards of loose soil, soft peat moss, and other vegetation. That's more than enough to cover a rough trail ten feet wide and a foot deep from New York City to Houston.

Crews would then need to excavate as much as 6 million cubic yards of frost-susceptible material—up to six feet deep in some areas—to prepare the site for construction. Some of the material could be reused as fill, while other material would need to be trucked in to complete the base.

The two domed LNG storage tanks would each measure 305 feet in diameter, more than large enough for a Boeing 747 to spin around inside without scraping its wings.

All of the numbers are approximate and subject to change as the project teams refine the design, they reminded participants at workshops held September 2 and 3 in Anchorage. More than twenty Alaska LNG project team members were at the workshops to brief government agency officials and answer questions.

Add in the jetty, the twin loading berths for LNG carriers, and other components of the Nikiski project, and the preliminary numbers continue adding up:

The project would use eight hundred thousand cubic yards of gravel, three hundred thousand cubic yards of concrete, three hundred thousand cubic yards of armor rock, one hundred thousand tons of structural steel, 6,500 pilings, seven miles of electrical wiring, almost two hundred miles of aboveground piping, and twenty miles of buried pipe.

The trestle to reach the loading berths could be as much as 3,200 feet long—more than half a mile—to reach water deep enough for the LNG carriers to safely maneuver.

Though no substantial dredging would be needed for the jetty and loading berths, an estimated 1 million to 2 million cubic yards of dredging would be required at the temporary dock that would be built for offloading materials from barges and heavy-lift vessels during construction.

The 250-megawatt, gas-fired power plant at the LNG plant site would generate enough electricity to run a city of several tens of thousands of homes.

Peak construction workforce at the Nikiski site would be four thousand to six thousand workers.

Planning Work Continues

The LNG team reported that ongoing engineering and construction planning includes several goals: limit truck traffic in the area as much as possible, limit dredging as much as possible, and maintain public access throughout the area as much as possible.

The informational workshops were part of a series provided by Alaska LNG for regulatory agencies. The project partners—ExxonMobil, BP, ConocoPhillips, TransCanada, and the state of Alaska—plan to submit their second draft of environmental and engineering reports to the Federal Energy Regulatory Commission in first-quarter 2016. The final reports and complete project application could come third-quarter 2016 as the partners work through regulatory and permit issues for the $45 billion to $65 billion project to move Alaska North Slope gas to market.

In addition to the LNG plant at Nikiski, the project includes 806 miles of pipeline to reach the plant site from North Slope gas fields and a gas treatment plant to remove carbon dioxide and other impurities before the gas enters the pipeline.

Alaska LNG has been buying up property around the proposed plant site in Nikiski, accumulating ownership or options on about six hundred acres of the eight hundred to nine hundred acres needed for the operation. Team members reported that demolition could start later this month on some structures. They also are doubling their security patrols in the area in response to community concerns.

The actual footprint for the LNG plant, storage tanks, power plant, and other support buildings would total approximately two hundred to three hundred acres. The teams explained that the rest of the land is to provide a safety, noise, and light buffer for neighboring property owners, plus workspace to support the construction effort.

If the partners give the go-ahead to start construction after completing their regulatory work, commercial negotiations, and financing, the mobilization, fabrication of modules, site work, and construction would take several years, with the first LNG production coming in the seventh year after a final investment decision to proceed, the teams explained. If the project proceeds under the current schedule, the first LNG carriers would load up in 2025.

Offloading Facility Comes First

There is a lot of work to get to that first cargo.

Before significant construction could begin, the material offloading facility

would need to be built. The current plan, subject to change, has it just north of the LNG carrier jetty. With a 1,500-foot-wide frontage for offloading from heavy-lift vessels (called lift-on, lift-off) and a side facility with a 500-foot face for roll-on, roll-off deliveries, the freight dock could see 250 LNG plant modules delivered by sixty ships over a three-year period. Riprap—heavy rocks stacked atop each other—would be installed on either side of the facility to protect the shoreline.

Each prebuilt module could weigh as much as six thousand tons. Self-propelled modular trailers would haul the huge pieces to the plant site.

The freight dock would be dismantled at the end of the project.

Water depth at the proposed site for the offloading facility is only about 15 feet and would need to be dredged to 30 feet, the teams said. Estimates are that would require moving 1 million to 2 million cubic yards from the seabed. "We are continuing to study how we can minimize that," a team leader said. The dredged area would measure about 3,200 feet by 1,500 feet, depending on the final design and seabed slope.

The project continues to collect data on currents, waves, sediment, sea floor bathymetry, and other conditions in the area. There are plans to excavate a sample pit in the seabed in the second quarter 2016 to measure how much and how quickly it fills in.

Disposal sites for any dredging material are still being considered, including upland and at sea. Upland disposal could be used to protect the shoreline from erosion or for fill at the project site. Any decisions on disposal sites will be based on the composition of the dredged spoils and in close consultation with government agencies.

In an effort to limit truck traffic on heavily traveled Kenai Peninsula highways, the teams reported that, as much as possible, construction materials arriving in Anchorage or Seward would be barged to Nikiski.

Construction Site Services

Even before the material offloading facility is under full construction, Alaska LNG would build "pioneer camps" at the plant site, the first housing for the first work crews. During construction, until the project builds its own power generating plant, Alaska LNG may buy electricity from a local provider—that's one of the issues still undecided.

Currently, Alaska LNG plans to drill its own water wells, estimating its maximum needs during peak construction at almost four hundred thousand gallons a day, or enough for four thousand to five thousand people, according to US government water-use estimates.

Current plans indicate no water would be withdrawn from Cook Inlet for plant operations, the teams said. The liquefaction equipment would be air-cooled, not water-cooled.

Alaska LNG plans to build a secondary-level treatment plant on site for domestic sewage and is still looking at options for proper disposal of industrial waste.

The mission statement for handling construction waste is "reduce, reuse, and recycle," with the teams reporting there could be an estimated 7,500 tons of wood waste in addition to the 4 million cubic yards of vegetation from site clearing. The teams are working to determine "what can be handled locally, what can be handled on site, and what has to be hauled away."

Jetty Design Continues

The jetty stretching out to the loading berths would be built in an area suffering from coastal erosion. The teams gathered geotechnical data this summer and plan to include "positive erosion control" in the project design, such as rock armor. "It needs engineering attention," they said.

By going out 3,200 feet with the jetty, the project can avoid dredging at the loading berths. The fifteen to twenty LNG carriers that would call at Nikiski each month could range up to 1,100 feet long, with a width of 165 feet and a 39-foot draft. Because sea ice moves through the area, Alaska LNG has ice experts looking at building "ice mitigation structures"—large concrete caissons—in the water that would break up the ice as it flows by. The teams are still evaluating the options and running models on ice build-up and currents.

A service vessel facility may be built off to the side of the loading jetty to accommodate the four tugs the project anticipates would be needed for docking the LNG carriers, along with other smaller service vessels.

Air Quality, Safety Considerations

On land, the project continues gathering data on air quality levels, noting that the LNG plant would need to stay within emissions limits for the industrial area that already includes a refinery (Tesoro), a fertilizer manufacturing plant (Agrium, which is considering reopening the closed plant), and a small LNG plant (ConocoPhillips) that has operated since 1969.

The LNG plant would require safety flares for pressure release or other emergency use. The teams reported the current plan is to avoid a single tall flare tower, and instead install a ground flare system behind thirty-foot-high barriers to help block the noise and light.

The liquefaction process itself "is a giant refrigeration system," a team leader explained, "not much different from an air conditioner." In addition to supercooling the methane down to minus 260 degrees Fahrenheit to reduce it to a liquid 1/600th the volume of its gaseous state, the plant would remove any remaining water in the gas stream that made it through the North Slope treatment plant.

The LNG plant would take down the water to 0.1 parts per million. Water in the gas stream turns into ice in the liquefaction equipment—not a good thing.

Prudhoe Bay Dock Expansion

Though Nikiski-area residents are certainly focused on their end of the project, similar dredging, dock, and delivery planning is underway at the north end of the project—at Prudhoe Bay.

The current plan is to expand what is called West Dock No. 2 at Prudhoe Bay to accommodate the larger production modules that would be delivered there for the gas treatment plant, along with other construction materials. The heaviest of those modules could weigh nine thousand tons and measure three hundred feet by ninety feet.

The sealift could take four years, delivering a total of three hundred thousand tons of modules and equipment.

Dredging would be required to accommodate the delivery barges, looking to clear a 14,000-foot-long channel, 280 feet wide at a 16-foot depth to reach the dock, with an 800-foot by 1,000-foot turning basin at the front of the dock, Alaska LNG teams explained. Dredging volume could total 2 million to 2.5 million cubic yards.

Dredging could be done in the winter by cutting, excavating, and removing sea ice and then staging excavators on the ice to reach out and dredge below.

Alaska LNG continues sedimentation and seabed studies in the area.

In addition to dredging, work would include expanding West Dock No. 2 an additional fourteen acres, adding three berths to the two already at the dock, and widening the road and causeway between the dockhead and land. Plans also could include an onshore staging area of twenty to sixty acres to move equipment to clear the dock as fast as possible. ☼

Larry Persily is the Oil and Gas Special Assistant to the Kenai Peninsula Borough Mayor's Office.

The Future of Mining in Alaska

Challenging times with tremendous potential

By Deantha Crockett

In my role at Alaska's trade association representing the mining industry, I am frequently approached with inquiries all bearing the same theme: "How are things in the mining industry?" Especially in today's environment of low commodity prices, reduced state and federal government spending, and layoffs in the multi-industry support sector, Alaskans and Americans are interested in learning what the future of mining may look like and how the industry may impact the economy.

In preparation for an upcoming presentation I plan to deliver, I recently polled approximately fifty AMA (Alaska Miners Association) members, ranging from diverse backgrounds within the mining industry, to obtain broad answers to the following three questions:

- How is the mining industry changing globally and in Alaska?
- How is your company responding to any affects felt by the lower price of oil?
- What are the biggest obstacles facing the mining industry in 2016?

I was awed with the extent of similarities from every single response I received. Miners that operate in Alaska, and many of whom represent entities with operations all over the world, described the same challenges and opportunities, ideas and experiences, and predictions for the future of mining in Alaska.

I will be honest with you, readers. It is a particularly challenging time in the mining industry. Globally, the industry is experiencing hurdles and facing even larger ones in coming years, and belt-tightening is occurring at varying levels of operations and businesses. Here at home, every Alaska miner knows the hurdles I speak of. The downturn in worldwide mining activity is being felt in all areas of the industry.

Industry Rocked by Prices

A sharp decline in commodity prices has, well, rocked our industry in the past year. At the time of writing this column, both precious (gold, silver) and base (zinc, lead) metals have seen prices plunge by 25 percent or more. Meanwhile, the operating costs have not dropped. This has squeezed the profitability of existing mining operations, and now many companies are operating under extremely conservative budgets. Some companies have begun to eliminate any excess or discretionary costs (which unfortunately results in reductions in workforce), cutting new project spending almost entirely, performing exploration activity only close to existing operations, and administering financial management to reduce debt and maintain cash flow.

With a discouraging revenue situation, investors are looking towards jurisdictions with a timely return on investment, i.e., a reasonable permitting regime. That's not to say companies are looking for a swift approval process for mining projects. However, project timelines have evolved such that today it could take a large mining project one to two decades to complete permitting and be constructed in the United States. Large development projects, as many know, are evaluated under the NEPA (National Environmental Policy Act) process, a process under which hundreds of factors must be examined and decided upon by the project proponent, numerous state and federal regulatory agencies, the general public, and policymakers. A mining project that completes the NEPA process has undergone review of hundreds of environmental, safety, human health, wildlife, cultural, and socioeconomic issues throughout its duration. The process has been hailed by national environmental advocacy groups and welcomed by resource developers alike.

Numerous Barriers

However, the barriers that come before, during, and after NEPA are so numerous that I pray my high school English teacher never reads this article and sees the run-on sentence I must print to describe the situation. Quite frankly, the disconnect of the American public (and increasingly, the federal government) between our dependence on mined products and the stringent environmental standards applied to US mining projects has resulted in an increasing perception that mining is "bad." This disconnect is the root cause of unrealistic regulatory burdens on mining projects; hostile anti-development campaigns that use Alaska as a fundraising tool and are not held accountable for their distribution of misinformation; frequent and frivolous litigation against companies and regulatory agencies for every minor permit decision throughout the process which significantly delays project decisions; ballot measures creating arbitrary laws against resource development projects; and a general media that doesn't accurately portray or bother to truly investigate technical mining issues. I'd better stop there, although I could go on, as I am truly afraid Mrs. Hensley from Bartlett High School will see this and wonder where she went wrong with me.

The extensive list of barriers is a fairly graphic description as to why Alaska does not enjoy a first place ranking among jurisdictions that provide a timely return on their investment.

Federal Regime

Many will argue that perhaps an even larger challenge than low commodity prices are the increasing unpredictable, unreasonable, and unjustified actions by the federal government relating to the regulatory process. I can again commit a massive grammatical faux pas when providing examples of changes within our federal permitting regime that make mining more difficult without added environmental benefit. This is particularly true for Alaska's placer miners—in many cases, federal land managers and permitting agencies have made major changes in requirements that necessitate more paperwork, create more expense, and impose more restrictions with no justification and no existing problem requiring correction. Even worse, some changes have prescribed methodologies for how miners should operate, when in many cases, miners with multiple generations of experience have attested the methods are negatively impacting the environment.

I could fill this entire issue with examples of the punitive and unreasonable federal regulation changes this country is seeing, and again, it is causing those considering investing in our country, and in our state, to think twice.

Tremendous Potential

Please, don't let me leave you with the sole impression of gloom and doom. I and many others believe that the mining industry is cyclical and that our future is bright, even if we are in a different place today. Mining has a fantastic reputation to Alaskans—the general public, lawmakers (including our state administration and Legislature as well as our Congressional Delegation), and the permitting agencies based in Alaska look favorably upon the mining industry's stellar track record of environmental responsibility, safety, and community support. The industry and educational community has adopted a commitment to make workforce development a priority, and training entities are focusing on identifying labor needs across all industries. Finally, Alaska remains a shining star in one very vital category: the mineral potential in the state, both explored and not, is quite simply tremendous. The opportunities for world-class mineral deposits in Alaska remain attractive to the global mining industry, and at some point, I believe the challenges will be resolved and Alaska will be a prominent investment destination.

AMA will hold its Annual Convention the first week of November at the Dena'ina Center in Anchorage. The issues discussed in this article, and many more, will be examined over the course of the week. We'd love to have you there with us. Please visit alaskaminers.org for more information. ☼

Deantha Crockett is the Executive Director of the Alaska Miners Association, which advocates for and promotes responsible mineral development in the state of Alaska. She was born and raised in Alaska and came to AMA from the Resource Development Council, where she led issues and policy for the mining and tourism industries for seven years.

Northwest Alaska Minerals Potential

Transportation needed for a century of development

By Andrew T. Metzger

During the last several years, various media outlets in Alaska have been rife with discussion of the potential for economic development in the US Arctic, which is essentially northern Alaska. Much of this discussion has been tied to opportunities for resource development and has included numerous policy forums on development and the impact it will have on Alaska's environment, people, and economy. Infrastructure is pervasive in all of these discussions, and there is much conjecture on exactly what should be built where. Topics raised in brainstorming sessions include the need for an Arctic port (or several of them), building roads to resources, the possibility of Adak as a gateway to the Arctic, ardent pleas for a new icebreaker (or a few), and the list goes on.

This leads to examining the pivotal question: "What should be built where?" It's important to construct a framework for an objective assessment of what infrastructure will be needed where for a given development scenario, given that there is such vast resource potential in northwest Alaska.

Resources

The North Slope holds a vast amount of resources, including the following:

- Chukchi offshore lease area (oil, gas)
- Northern Alaska-Slope Coal Province (coal: bituminous, subbituminous)
- The Ambler District (copper, zinc, lead, gold, silver)
- Red Dog Mine (zinc, lead, silver)
- Lost River prospect (fluorspar (fluorite), tin, tungsten)
- Graphite Creek (large flake graphite)

Coal

A truly vast (inferred) supply of coal is located in the Northern Alaska-Slope Coal Province—over 120 billion tons of bituminous and subbituminous coal by one study—so much so that for a developer, given the ton/year rates, mining all the coal in even one hundred years is unrealistic. The disparity in value between bituminous and subbituminous coal is significant. Omitting the subbituminous coal reduces the development tonnage to about 19 billion tons of the highest quality coal in the Northern Alaska-Slope Coal Province. (There is also coal located at Kobuk, unaccounted for in this figure, known to be bituminous coal of significant quality; it was omitted from this discussion due to lack of information about the deposit.) Based on production rates in Australia, an indicator of what can be achieved with respect to production rates, and the limitations of transportation infrastructure that could be built in this region, a theoretical target production rate of between 400,000 and 240,000 tons per day (about 132 million and 77 million tons per year, based on a 330 day production year) could be expected. This extends the development horizon for the inferred bituminous coal deposit from the Northern Alaska-Slope Coal Province to about 150 to 250 years, respectively.

Crude Oil and Natural Gas

Despite the recent, and drastic, change in the position of Royal Dutch Shell, the fact remains that a 2006 assessment by the Minerals Management Service, now known as the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement, in the Chukchi Offshore Lease area there are 15.38 billion barrels of oil and 76.77 trillion mcf (thousand cubic feet) of gas that are technically recoverable, figures which are higher than what is economically recoverable.

Based off of the technically recoverable figures, the development horizon for both oil and gas is forty years. These horizons are based on cited sources, taken anecdotally from persons active in industry, or inferred from previous development. The latter has been used primarily relative to crude oil production based on TAPS (Trans Alaska Pipeline System) history.

Mines

For the Red Dog Mine, which is already in production, it will be assumed the mine is approximately halfway through its development life, and it will again yield the amount it has formerly produced. Thus another 13.6 billion pounds of zinc, valued at $0.95 per pound; 3.7 billion pounds of lead, valued at $0.82 per pound; and 6.7 million pounds of silver, valued at $256 per pound, are available for future production for approximately another twenty-five years.

The Nova Copper prospect in the Ambler District, in addition to 1.8 billion pounds of zinc, 288 million pounds of lead, and 1.9 million pounds of silver, also contains copper and gold. The amount of copper estimated to be available for production is 1.5 billion pounds, valued at $2.72 per pound, and gold is 21,750 pounds, valued at $18,912 per pound. It's estimated the prospect would have a development horizon of twelve years.

Fluorspar, tin, and tungsten are located at the Lost River prospect, which is estimated to be in operation for twenty years. Fluorspar is valued at $400 per ton, and there are an estimated 6.4 million tons available; for tin, valued at $6.50 per ound, there is an estimated 222 million pounds; and tungsten, with estimates of 34.7 million pounds, is valued at $34 per pound.

The final mining prospect is Graphite Creek, which would be a large flake graphite mine. There estimated tonnage is 11.4 million, valued at $1,600 per ton with an estimated development horizon of one hundred years.

Comparative Market Value

All monetary values contained within this article are estimates at press time. This assessment of North Slope commodities and their values indicates there is on the order of $3.3 trillion of commodities available at the major deposits cited. The total value of the "developable" commodities for the major deposits considered is about $1.3 trillion at a development rate of approximately $13.2 billion (gross value) per year. The latter value is intended to be a lower bound estimate for the value of known and inferred commodities. The actual value of what can be developed is likely somewhere between the two estimates.

Needed Transportation Service

These values provide an assessment of what could theoretically be realized by develop-

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A New Look at Coal

By Andrew T. Metzger and Ron Sheardown

The extraordinary resource that lies in the Northern Alaska-Slope Coal Province is difficult to grasp, conceptually. At 400,000 tons per day, 330 days per year, it would theoretically take about 900 years to move the inferred quantity of coal. Could coal play a significant role in the long-term economic security of Alaska long after North Slope oil has been depleted? Given the abundance of coal in Alaska, investigation of the following might benefit the greater Alaska community:

Processes for On-Site Decontamination of Coal

Currently, contaminates within coal products are distributed with the coal. The prevailing philosophy is to capture contaminates after the coal has been burned, as if catching smoke from a campfire. However, mining processes for most other types of materials separate undesirable material from the product and then contain that non-commercial material at the site. Can this be accomplished with coal in Alaska?

Custom Coal Products

It might be possible to mass produce coal briquettes that are designed to burn more efficiently or to specification. This concept is similar to charcoal-grill briquettes, only the product would be designed for combustion in an industrial furnace. By varying the grain size, bulk density (the amount of space/air between grains), and geometry of the briquette, could combustion of the product be tailored to needs of coal customers? It would be a significant benefit to Alaska if coal could be processed to add value in stat. Could this concept dovetail with the concept above? Coal briquetting technology already exists. Alaska my benefit from improving it.

Liquefied Coal Products

Processing coal into liquid fuel, like gasoline and jet fuel, is technically feasible. Are there markets for liquid fuel derived from Alaskan coal?

The Northern Alaska-Slope Coal Province is located in an area where a subsea pipeline from the Chukchi lease area could make landfall. Thus, it's worth exploring if it is possible to inject a liquefied coal product into the crude oil stream to the benefit of the producers and state tax revenue. ☼

ing northwest Alaska mineral resources. These figures are vital as they would be compared to costs of building a transportation system to see if it makes sense to do so. Estimating the cost of building a transportation system is beyond the scope of this article, but we can now begin to delve in to what its requirements may be, based on commodities available.

Oil and gas prospects represent a need for bulk transportation of fluids—both liquid and gas. The quantities are of such magnitude that road or rail would be cumbersome and inefficient. Pipelines are the most practical solution here. The empirical evidence for this is TAPS; approximately 17 billion barrels of crude oil have been transported over thirty-eight years, with an average conveyance of about 1.2 million barrels/day. These figures are consistent with the mean technically recoverable quantity for the Chukchi lease areas and the level of production that might be expected.

Mining products require dry-bulk transportation. Overland, this may be achieved via road or rail. However, it has been demonstrated that moving large quantities of dry bulk material over an extended development horizon, and in a regional transport mode, is far more efficient by rail than road. On a ton-mile/gallon (of fuel) basis, rail is on the order of five-times more efficient; on a fuel cost/ton-mile basis, rail is about six-times more efficient, according to "Analysis of Alaska Transportation Sector to Assess Energy Use and Impacts of Price Shocks and Climate Change Legislation," a 2013 report produced by the Institute of Social and Economic Research (ISER) at the University of Alaska Anchorage. There is also considerable anecdotal evidence supporting rail. Basically, this is what "everyone else" is building for Arctic resource development; for examples, look at the ongoing development of the Northern Latitudinal Route railway in Russia, the Churchill Gateway rail corridor in Canada, or proposals for a Finland-Norway rail corridor.

At some point, the products will have to be transported to market. Currently, there is considerable demand for mining products in Asia. In addition, given the nature by which oil is currently transported from the state, and the business plan for proposed LNG (liquefied natural gas) export, infrastructure to support shipping will be required.

In conclusion, the major components of a transportation system to support comprehensive development in northwest Alaska will include:

- Oil pipeline infrastructure
- Natural gas pipeline infrastructure
- Rail infrastructure
- Port infrastructure

An Integrated Approach

A pipeline following a north-south transportation corridor in northwest Alaska would track through areas of great mining potential. With a thoughtful corridor layout, the economic prominence of one commodity could make development of others possible. Where would the oil and other commodities go in this scenario? To a port on the west coast of Alaska. One reasonable choice for exporting bulk materials as described is Port Clarence. Being naturally deep-draft at its mouth, along with the natural protection afforded by Point Jackson (the actual port site in this scenario if one considers the natural bathymetry of Port Clarence) makes this location a strong candidate for an export port on the west/northwest Alaska coast. The benefit of this location is augmented by the fact that, being south of the Bering Strait, vessels transporting products would avoid the most severe ice conditions that can occur in US Arctic waters.

Such a port would have to operate year-round. Some question the feasibility of that, but a Canadian interest has worked out a strategy to move iron ore nearly year-round in an area that experiences ice cover in eastern Arctic waters. In addition, there are already examples of ice-class commercial vessels (e.g. an ice-class LNG tanker), and more merchant vessels are being planned. This may be the beginnings of a polar class commercial fleet that could service a location like Port Clarence. The critical question for the arctic port/polar class fleet scenario is whether it can it be accomplished economically in Alaska. In order for that to be possible, developers will need to consider a long-term economic strategy. Combined, the known and inferred mineral resources of northwest Alaska represent potential economic returns for a century or more. Development scenarios should be tabled with this in mind. A fifty to one-hundred year planning horizon is appropriate. "Long-term shipping contracts build polar class ships."

To realize the potential of the region, a transportation system that can accommodate the needs of the major sources of revenue will have to be contrived. It will require pipeline, rail, and port services. What exactly that would look like is an in-depth question, based on what levels of service would be required, and best addressed in a future article.

What can be said, in conclusion, is that natural resource development should not be a series of one-off projects, but will require a web of commodity-based transportation infrastructure. On the North Slope, coal, oil, and gas would be anchors of the system, adding stability. Red Dog, Ambler, and Lost River projects can be seen as enablers, representing a near-term source of revenue assisting with starting-up the system. Coal and graphite are both long term, adding a sense of longevity to the value of development. Developing a port authority in the region isn't just an opportunity for shipping, but creates an entity to manage build-out and administration of a transportation system themed on exporting natural resources.

Initial Glance at Funding

It would be a mistake to assume federal funds will contribute to a commercial transportation system in the Arctic. Page six of the National Strategy for the Arctic Region states the federal government plans to carefully tailor regional infrastructure to evolving commercial activity. In other words: federal sources will not capacitate development. Strategies of state and private funding would be necessary. At least conceptually, an option for this could be in the form of a bond syndicate formed by the state partnering with private investment banks. This represents a public-private partnership that could underwrite bonds offered by a separate third party, say a Western Arctic Port Authority.

The bond sale would be used to raise funds necessary to build the transportation system. Bonds would then be redeemed at maturity with revenue from tariffs on commodities that pass through the transportation system. With an assumed $950 billion worth of commodities available over a fifty year period, this is a solution that might pencil out. ☼

Andrew T. Metzger, PhD, PE, is an Assistant Professor in the Civil Engineering Department at the University of Alaska Anchorage College of Engineering. Contact him at atmetzger@alaska.edu.

Chignik Area Mining Exploration

Courtesy of Millrock Resources

A drilling unit near Chignik on the Alaska Peninsula where Millrock Resources, Inc. is exploring for copper and gold through an agreement with Bristol Bay Native Corporation.

Millrock and BBNC partner in search for copper and gold

By Jessa S. Joehnk

The Chignik area exemplifies remote rural Alaska: it is difficult to reach, has a very small population, and is still completely wild. The people there survive mostly on subsistence fishing, with commercial fishing and fishing tours being the basis of their economic life. It is the home of some of the earliest canneries in Alaska, and salmon processing still takes place in the area. But fishing may not be the only resource of interest there.

Mining is one of the biggest industries in Alaska and has been for some time. There are projects ongoing in Alaska, and new ones are always exciting prospects for the area. One of these newer projects getting attention is the initial exploration being done in the Chignik area of the Alaska Peninsula, which has had only occasional exploration due to its rough weather. Chignik means "big wind" in Alutiiq, referencing the huge coastal storms that occur there, sweeping through the land as well. And that isn't the only complication for exploration—the land is owned by several Alaska Native corporations, all of which must agree to the exploration. Despite the odds, agreements were made, and initial exploration has been ongoing for a few years now.

Promising Exploration Leads to Joint Venture

Millrock Resources, Inc. and Bristol Bay Native Corporation (BBNC) entered into their exploration and option to lease agreement back in May 2013, searching for copper and gold occurrences in the Chignik area. The agreement covers an area of about 360,000 acres, half the size of Rhode Island, and is broken into three basic areas: The Kawisgag prospect, the Mallard Duck Bay prospect, and Bee Creek (now Dry Creek) prospect. The Dry Creek prospect had been explored by Bear Creek Mining in 1976, when they drilled five holes. It then went unexplored for several decades, until 2005 and 2006 when Metallica Resources, Inc. and Full Metal Minerals Limited surveyed and drilled two additional holes. The Kawisgag and Mallard Duck Bay prospects had been sampled and surveyed in the past, but holes had never been drilled to see if there is anything under the surface. Ultimately, the entire area had been explored only lightly due to weather and topography issues.

In 2014, funding for surveying was provided by First Quantum Minerals Limited with the chance to enter into an Option to Joint Venture Agreement with Millrock. Gregory A. Beischer, president and CEO of Millrock, says, "First Quantum came on board, and last year they funded the surface work where we collected rock samples and soil samples and did geophysical measurements."

Once the initial surface exploration, sampling, and surveying were done, radiometric and airborne magnetic surveys were completed, showing much promise for the area. "The goal right now is to determine if there's copper and gold mineralization below the surface of the earth," says Beischer. "We can see some signs; there is actually some copper minerals in the rock at the surface, but we're drilling below the surface to see if that mineralization continues." Because of these signs, the Joint Venture Agreement was announced in December 2014, cementing the relationship between Millrock and First Quantum and providing the needed funding for the exploration drilling done this summer. "We liked what we saw from those results, they [First Quantum] liked what they saw, and so they continued to fund the bigger program this year: drill testing the targets that we developed last year, Beischer says. "So it's good! You know, you have to drill a lot of holes in order to find the valuable mineral deposits, and this is just the first pass at drilling."

Summer Drilling Season Completed for 2015

With a budget of $2 million, Millrock began drilling exploration of two of the initially explored areas: the Mallard Duck Bay and Dry Creek prospects. "These are small, lightweight portable drill rigs, but drill a hole that's two to two and a half inches in diameter and collects rock cores from up to

350 meters [1,148 feet] below the surface," says Beischer. What already seems like it could be a potentially complicated process, drilling down so deep, is further complicated in these remote areas of Alaska.

However, drilling commenced this summer, and it went well. "We drilled eight holes in total and the work went very smoothly, which is a little surprising because Chignik is not known for its good weather,"Beischer says.

The rough winds from the coastal storms are only part of the picture. The Chignik area is known for rapidly-changing weather, with locals describing it as changing sometimes as many as four times in a single day. The storms sweep in as gales, pouring down rain as they go. "And we're moving the drill with a helicopter, so often the case is that we're waylaid by weather when working environments like the Chignik area," Beischer says. "But in this case, it went very, very well. We had good production. We got all our planned holes drilled and on budget and we're happy with that."

With the chance of weather changing so rapidly and the area already being so far from everywhere else, it is no wonder they are happy with getting the initial work done. But all the groups are staying quiet about what they may or may not have found. "I can't say anything right now as to the results or success of the drilling program because we have to disclose that properly in a public press release first, and we won't do that until we've received our samples back from the laboratory where we're having the rock core samples analyzed," says Beischer.

This sentiment is echoed by Jason Metrokin, president and CEO of BBNC, who says that "it's too soon to tell if this is working out as expected, as this is early stage exploration."

Wait and See

The initial work is done, with these eight core samples being analyzed to see if there is reason to continue with further exploration or if the project should be abandoned. "It's 'Well, we didn't intersect any copper or gold,' and First Quantum walks away and the project ends, Beischer says. "The opposite is that we could discover some quite valuable copper mineralization and we'll have to drill a whole bunch more holes to try to delineate the extent of that copper mineralization. That's the best case scenario for us. Chances are, it's going to be somewhere in between there, where we hit interesting rocks with some minerals in them and scratch our heads and try to figure out well, where do we go next? And it'll be uncertain at that point whether we all continue with the project." Depending on the outcome, further exploration drilling might happen in the area.

It is not often that these remote areas of Alaska are explored, especially so extensively. Eight holes drilled is already the largest venture for Chignik, so these core samples will determine a lot. Excitement is high, however, with Millrock and BBNC both appreciating the partnerships so far. "They've [BBNC] been a good business partner. I personally have a long history with them. I worked for the Native corporation as a business consultant for seven years. I like all the people and we enjoy doing business with them. We don't know at this point whether the current business relationship will continue or whether we'll build up other ones. I'd be open to it for sure," Beischer says.

Metrokin agrees that BBNC is happy with how things are going at the moment. "The relationship is fine, we are continuing to receive updates from Millrock and the Chigniks," Metrokin says.

Ultimately, this is a project to keep an eye on in the next few months. The findings for the core samples will be announced as will the decision on which step to take next. No matter the outcome, the rural area will undoubtedly continue to draw attention with its rough weather and wild Alaska opportunities. ☼

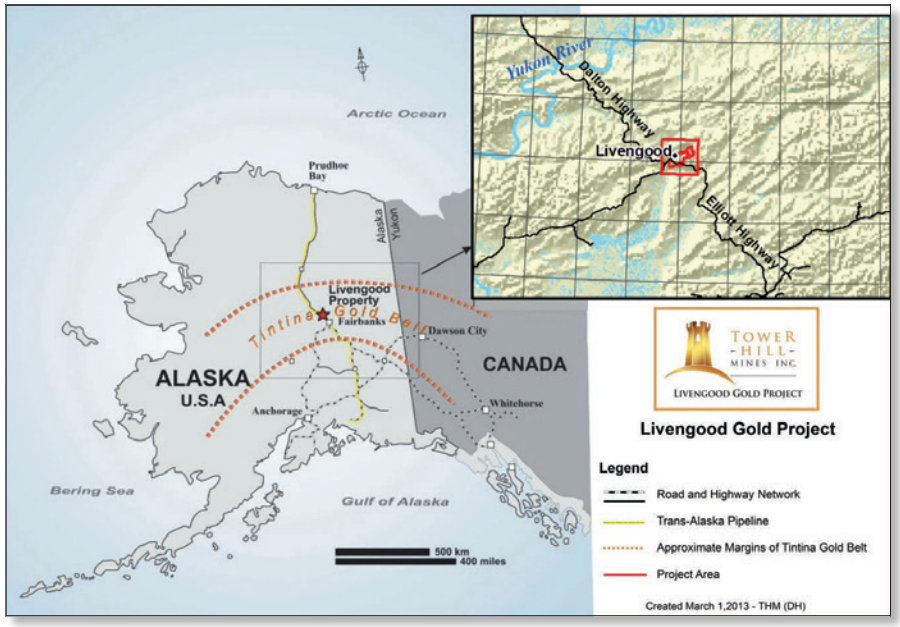
Freelancer Jessa S. Joehnk writes from Anchorage.

LIVENGOOD UPDATE

By Julie Stricker

Seventy miles north of Fairbanks, an 1,800-foot hill overlooks a valley that has yielded 500,000 ounces of gold over the last century. The hill, optimistically called Money Knob, sits atop another 20 million ounces of gold, but getting it out of the ground safely and economically is a long process. That's what a group of Alaska mining experts is working on right now.

The Livengood Gold Project has been under way since 2006, when International Tower Hill Mines Ltd. (ITH), a Canadian junior mining company, acquired the rights to the core area from AngloGold Ashanti.



Courtesy of Tower Hill Mines, Inc.

Map of Alaska showing the proximity of the Livengood Gold Project in the Tintina Gold Belt.

Opportunities

The project has several things going for it.

First of all is the gold, with 15.7 million ounces of measured and indicated gold resources and another 4.4 million ounces of gold inferred. That's enough ore to support an annual production rate of about 577,600 ounces over a projected fourteen-year lifespan. It's one of the largest independent and undeveloped gold deposits in the world.

In the first five years, ITH managers estimate production would average 698,500 ounces. That's significantly more than the state's two current largest gold sources: Fort Knox, which produced 379,453 ounces of gold in 2014, and Pogo Gold Mine, which produced 342,147 ounces.

It's on the road system. The Elliott Highway, which is paved, runs right next to the mine site, giving operators easy access to Fairbanks and a link to the Alaska Railroad.

It's located in a stable, mining-friendly region that has been actively mined for gold for the past 101 years. Mining is designated as the primary surface land use in the region.

It has access to a highly skilled workforce.

It has a great team. The Alaska operation is led by men and women with major mining expertise. They helped bring Fort Knox and Pogo through the permitting process and into development. They have also worked with Red Dog zinc mine in northwest Alaska, Kensington gold mine in southeast Alaska, and the Donlin Creek prospect, under development in southwest Alaska.

President and CEO Tom Irwin, a former commissioner of the Alaska Department of Natural Resources, and Chief Operating Officer Karl Hanneman together have more than seventy years of mining experience.

The corporate offices of Tower Hills Mines LLC, an indirect subsidiary of International Tower Hill Mines Ltd., are now in Fairbanks. Major shareholders include Paulson & Company, Inc., Tocqueville Asset Management L.P., and AngloGold Ashanti Ltd.

"It's an Alaskan project and we believe it belongs here," he says.

Challenges

Even with all that going for it, a feasibility study released in 2013 showed the mine, as then designed, was not economically workable. Even with gold at $1,500 per ounce, the project was marginal and prices have dropped since then. Energy costs alone are expected to account for one-third of mine expenditures.

To date, ITH has spent about $220 million on the Livengood project. When built, it is expected to provide about 425 full-time jobs.

Irwin says his team is reworking and optimizing the project to find ways to reduce both operating and capital costs. In late 2014, ITH held a private placement to raise money from investors for further exploration and studies. That money funded operations through the early part of 2016. Their next step is to complete the optimization project and be able to put a stake in the ground and say, "this is our best project."

Everything is on the table, Irwin says.

"Are we sure we're putting the facilities in the right location?" he says is one of the questions they've been asking. "Is it the correct location for the dam? Everything is being looked at, where we can save money and how."

As originally designed, the ore would be mined from a surface pit, processed through a gravity circuit, followed by a whole ore in carbon leach surface. The ore body is about three times that of Fort Knox, and initial plans are to mine Livengood on a scale reflecting that. That would put about 90,000 tons of ore through the mill daily. The goal is to find the "sweet spot" that make the most of economies of scale without undue costs.

"We've been doing a lot of modeling on the ore body, how to efficiently mine it," Irwin says.

One focus is the design of the main pit and whether a steeper slope design that would enable workers to reach the ore faster would be stable. The goal is to get the best grades out early, find the best place to stockpile the lower-grade ore, and find where to pile the waste rock. They're looking at how best to optimize the whole process, from how big to grind the rock to the design of the gravity circuit and how to design the leach field.

Metallurgical tests show the ore is of even higher grade than core samples indicated, Irwin says. The site averages 0.61 grams of gold per ton of ore, with some areas grading higher. Most of the gold is microscopic, but the precious metal is visible in some core samples.

The site contains about nine different

kinds of gold-bearing rock. Those are being tested to see how they respond to different processes to remove the gold.

More gold has been found outside the main deposit, representing significant potential for future expansion. The current resource covers only about one square mile of the seventy-five square miles ITH controls in the Livengood area. To date, 792 holes have been drilled totaling 714,900 feet to define the deposit.

"We're very much into optimizing the circuit," he says. "We know that power is 30 percent of our cost, so we're making sure we use power efficiently."

Irwin says ITH has been working very closely with other companies to come up with the most efficient ways to grind the ore to extract the gold, the design and size of the mill, as well as column leaching. As the price of gold has dropped from its high of $1,814 per ounce in 2011 to about $1,130 per ounce in late September, gold producers around the world are optimizing their operations.

Power

Power is a big variable. Livengood is about fifty miles from the end of Golden Valley Electric Association's transmission lines. It would be relatively easy to extend to those lines to Livengood and all of the technical environmental studies of that route are complete, Irwin says.

However, a less expensive alternative would be natural gas. The company is strongly supportive of efforts to bring LNG to Fairbanks. If a natural gas pipeline is built, or natural gas becomes available in Interior Alaska by some other method, Irwin says building a gas-powered generation plant in Livengood is another possibility.

Another question was whether to build a camp for workers. Livengood is about an hour-and-a-half drive from Fairbanks, so allowing the workers to commute is feasible, but in the end, not the best option, Irwin says.

"We've looked at what others have done in Alaska and what others have done in the Lower 48," Irwin says. "It would be cost-effective not to have a camp, but we as a company feel the safety of our workers comes first, and we will not compromise that."

As for timetables, Irwin in late September said the metallurgical work should be wrapped up by the end of the year. "That's going very well," he says. "I'm very pleased with the results."

The next step is to continue the engineering work, figuring out the optimum size of the mine. From that, they'll figure out the new operating and capital costs. Baseline environmental studies are ongoing.

"What we will do is make sure that what we design is what we take into permitting," Irwin says. "We will get there."

The demand for gold isn't going to go away, and Irwin points to Interior Alaska's other two large gold mines as examples of mining done right.

"The quality of the work that Kinross is doing with Fort Knox and Sumitomo with Pogo is really helping us," Irwin says. "They're clearly showing to the world and our current and potential investors that you really can mine here, and you can do it safely. Look at the job they're doing to protect the environment, and then they're still making money."

Once the metallurgical and engineering work is completed and a workable feasibility study is produced, it will still be years before any gold is produced. The permitting will take three or four years, plus another two years of construction. The project will need market support to get through those steps, but Irwin believes things will all work out in the end.

"The bottom line is we're doing what we said we'd do, and we're getting it done on time." ☼

Julie Stricker is a journalist living near Fairbanks.

Fort Knox Reclamation

Photo courtesy of Kinross Gold Corporation

Reclamation of the True North gold mine is nearly complete.

Journey began before mining started

By Julie Stricker

From the side of a hill northeast of Fairbanks, the view stretches for miles with waves of rolling green hills just starting to pale with autumn colors. A stiff breeze bounces cloud shadows across the landscape; the rustle of trees and grass and the occasional twitter of birds are the only sound except for the idling of our truck.

Although this region has been a hub of mining for more than a century, no buildings or roads are visible. But just more than a decade ago, this site on the side of Pedro Dome was carved into roads, piled with rocks, and bustling with traffic as huge shovels and dozers carved into the bedrock in search of gold. A steady parade of oversize trucks carried the ore to the mill at Fort Knox a few miles to the south.

This is the site of the True North gold mine. Between 2001 and 2004 it produced approximately 530,000 ounces of gold. More than 36 million tons of ore were moved in its brief lifespan.

Today, it's one of the few road-accessible sites in Alaska where it's possible to see the process of reclamation from start to finish, says Jennifer Pyecha, senior environmental engineer for Fairbanks Gold Mining, Inc., a wholly-owned subsidiary of Toronto-based Kinross Gold Corporation, which operates True North and Fort Knox.

The reclamation of the True North gold mine is nearly complete. In a few years, trees will cover the hillside, and aside from the road leading to it, it will be virtually indistinguishable from the hills around it. The process from industry to nature is a long and expensive one, a journey that begins even before mining starts.

Under Alaska law, mines must post a bond to cover the costs of reclamation, and reclamation plans must be approved by the Alaska Department of Natural Resources. The plans must be updated whenever there is a change to mining operations.

Reclaiming True North was a fairly straightforward operation, according to Pyecha and Fort Knox environmental manager Bartly Kleven. All the mining at True North was done above the water table. The only buildings on the site were for equipment maintenance. Because all the ore was trucked to Fort Knox for processing, no mill was necessary.

A Matter of Scale

But the process at True North is a snapshot of what Fairbanks Gold Mining will be undertaking when Fort Knox shuts down, a process that could start as early as 2018. Like nearly everything to do with Fort Knox, it's a matter of scale. Fairbanks Gold Mining posted a $3.6 million bond for True North reclamation. For Fort Knox, it was required to post a $96 million bond.

The goal is to return the mine to a stabilized and near-natural condition and ensure the long-term protection of land and water, Pyecha says.

"We want to try to match the contours of the original topography," Pyecha says.

The reclamation plan for True North encompasses an eight-year window, which began in 2009 after the final shutdown, although some work was started in 2005 when operations were first suspended. At that time, the site contained roads and multiple waste rock dumps. Wetlands abutted some areas, which took special efforts to protect. Old trails that had once traced the site were re-established. During the permitting process, the mine plan had been altered to avoid the historic Davidson Ditch and reduce the impacts to wetlands.

Reclamation efforts began with recontouring the landscape and scarifying the surface. Scarifying creates eighteen-inch-deep ridges that trap moisture and minimize erosion. It also makes it easier for seeds to germinate and develop. But to plant seeds, you need soil, says Kleven.

"Topsoil is kind of a rare commodity on Alaska," she says. For that reason, mine operators had stockpiled the thin layer of organic material at the site when the mine was first developed. All organic material at Fort Knox is also piled into a big hill that visitors pass on the way into the mine site to be used for future reclamation projects.

The next step is to figure out what to plant. Kleven had previously worked at Usibelli Coal Mine near Healy, where she oversaw reclamation efforts, including aerial seeding. That gave her a good idea of where to start. Working with Alaska agricultural officials, Kleven's team came up with a combination of four grass seeds that would thrive in the cold climate, help build up the thin soils, and prevent erosion.

The mixture of 50 percent Arctic fescue; 20 percent Gruening alpine bluegrass; 20 percent tundra glaucus bluegrass; and 10 percent Nortran tufted hairgrass was broadcast over the site at the rate of nine pounds per acre. The area was fertilized in spring and fall.

Planting trees was the next big step.

Harvesting Local Seeds

Kleven says that when they started looking for seedlings in 2010, they could find none locally. So they approached Risse Greenhouse, located on Chena Hot Springs Road a few miles northeast of Fairbanks. Owner Glen Risse Jr. worked with an arborist at the

University of Alaska Fairbanks to come up with a plan to harvest local seeds from black spruce, white spruce, birch, and alder trees.

In Interior Alaska's harsh climate, location is paramount when it comes to plant survival. The elevation of a site, whether it faces north or south, and if it is exposed or relatively sheltered play a large role in deciding what tree to plant and where to plant it.

"The big thing with plants, birch plants, is when you get seeds from about the same elevation, it works much better," Pyecha says.

The seeds were gathered between October 2011 and February 2012 and germinated in March, growing in ten-cubic-inch tubes. The trees were delivered later that summer and Fairbanks Gold found it had another problem: "We had all these trees—who's going to plant them?" Pyecha says.

After looking outside Alaska and around the state, Pyecha says they found a company just a few miles from Risse Greenhouse called Future Forests to plant the seedlings. The effort resulted in 12,700 black spruce, 8,400 white spruce, 6,000 birch, 3,000 alder, and 2,150 other seedlings grown as trials.

"It really looks nice," Kleven says. "We want hunters to come back and trail users to come back."

The majority of True North's restoration is complete and the state has returned $3.1 million of Fairbanks Gold's bond money. Another $600,000 is outstanding, with three more years left on the reclamation clock.

In late August, the only indication of the former mine were a few pieces of metal pipe waiting to be hauled off. The eight-mile road from Fort Knox ends at a locked gate, becoming a grassy trail a few hundred feet inside the mine before vanishing over a hill amid waves of fescue. Alders and willows, some planted, some of which had seeded themselves, grow on the hillside. The ground is treacherous, as the ridges from the scarifying process are hidden under knee-high grass.

Already, local berry pickers have started foraging over the site, which is still closed to the public. Fox and sandhill cranes are frequent visitors, and a wolf den is located in one corner of the former mine.

"We've done a lot of work on the trail systems to make sure the trails are as good or better than they were," Kleven says.

The reclamation work at True North is just a warm-up for what is to come at Fort Knox.

Fort Knox Reclamation

However, at Fort Knox reclamation began even before the mine was built. The mine is just a few miles from where Italian miner Felix Pedro first found gold in Fish Creek in 1902, the discovery that led to the formation of Fairbanks. Over the following decades, Fish Creek and the surrounding drainages were heavily mined. When the sites were mined out, they were left as they were. Sediment concentration, uncontrolled run-off, and erosion seriously undermined wildlife habitat. Old mining equipment and mining shafts dotted the valleys.

In the early 1990s, Amax Gold, Inc., which developed the Fort Knox gold mine, used the opportunity to fix decades of mining damage and restore wildlife habitat. Working with the Alaska Department of Fish and Game, Amax's goal was to create viable populations of grayling within ten years. They met their goal in two.

The environmental work continued as Fort Knox was built and mining began. Kinross acquired Fort Knox in 1998 when it merged with Amax. Over the years, mine officials have continued to work closely with Fish and Game on restoration of the wetlands in the Fish Creek valley, downstream from the Fort Knox tailings storage facility.

In 2009, Fort Knox and Fish and Game were jointly awarded the prestigious Tileston Award for the Fish Creek reclamation. The award is presented by the Alaska Conservation Alliance and the Resource Development Council and recognizes proj-

Ore-loaded trucks at Fort Knox gold mine.

ects that are good for both the environment and the economy.

Today, the Fish Creek wetlands support thriving populations of grayling and burbot, as well as moose, beavers, and bald eagles. Fort Knox has produced more than 6 million ounces of gold, to date, but time may be running out. While Fort Knox produced 379,453 ounces of gold in 2014, with similar amounts forecast for the next couple of years, there may not be enough higher-grade ore to make running the mill feasible past 2017.

According to Anna Atchison, Fort Knox manager for community and government affairs, the current mine plan shows the mill to be shut down in early 2018. Workers will continue to mine lower-grade ore, stacking it on the Walter Creek heap leach through about 2020. The heap-leach will be operated as long as it is economically feasible.

Once the heap leach is shut down, reclamation plans will begin in earnest. During active mining, the tailings facility is a zero discharge facility. After the mine closes, and once water quality levels are maintained, a spillway will allow water to flow into Fish Creek.

Based on the current mine schedule, reclamation of waste rock dumps will begin in 2021. That will entail contouring the heaps of rock and adding organic material, scarifying, and seeding, as was done at True North. "Large boulders that are uncovered during sloping may be left on the surface to provide topographic diversity, microhabitats for wildlife and vegetation, and to break the linear appearance of the final slope," according to Kinross' 2015 technical report on Fort Knox. The goal is to achieve 70 percent of the area to be covered by vegetation within three years of the final seeding and application of fertilizer.

Some buildings may remain at the site and reused for other purposes.

The pit, which is about a half-mile deep and a mile wide, will be allowed to fill with water. However, it may take decades for it to fill completely.

The water supply reservoir and Solo Creek causeway will remain in place for long-term recreational use and to maintain wetlands.

The lake, however, won't be available for public use until final reclamation is complete and a period of post-closure monitoring, expected to be about ten years.

The reclamation process will take years. But once it's done, the site will return to state ownership and be used as a recreational area overseen by Alaska State Parks, says an Alaska Fish and Game official.

But, if history is any guide, any reclamation should not be written in stone. Fort Knox was originally forecast to produce only 4 million ounces of gold and last for a decade. Under the current plan, that lifespan and production have been more than doubled. Kinross is actively exploring the Gil prospect a few miles from the mine, and things could change, Atchison says.

"We're going to do everything we can to keep mining as long as possible," she says. ☼

Julie Stricker is a journalist living near Fairbanks.

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Pour, cool, and hold. Pogo General Manager Chris Kennedy holds the 3-millionth ounce of gold produced at Pogo Mine northwest of Delta Junction.

Photos courtesy of Pogo Mine

Pogo Mine Reaches Two Milestones

Safety and production advance hand in hand

By Tasha Anderson

On September 30 Sumitomo Metal Mining Pogo LLC announced that Pogo Mine, located near Delta Junction, had produced its 3-millionth ounce of gold. In the announcement, General Manager Chris Kennedy said, "The journey to 3 million ounces has taken ten years of planning and permitting and more than nine years of operation. Producing 3 million ounces is a huge accomplishment and I am proud of the team at Pogo." To recognize the milestone, Pogo has created commemorative coins, hoodies, posters, and banners.

Pogo was initially permitted with an expected mine life of ten years, an anniversary that the mine will reach in February 2016; however, the mine is permitted for operations through 2019, and according to a 2012 reserves report, Pogo mine had a total of 4.973 million ounces of gold available. Additionally, External Affairs Manager Lorna Shaw says, "We have a robust exploration program working hard to extend the mine life."

Currently, the mine produces more than three hundred thousand ounces of gold annually, making it the second largest gold producer in Alaska. "Pogo Mine poured the 1-millionth ounce of gold in October 2009 and the 2-millionth ounce in July 2012," according to the release.

Safety Milestone

But no less significant, the mine is not just producing gold, it's doing so safely. In August 2014 Pogo Mine achieved a one-year streak without a lost time incident; the pattern of safety continued, hitting 1 million man-hours worked without a lost time incident in December of 2014, and has extended through this year, with August signifying two years without a lost time injury.

On-site celebrations have been planned to celebrate both production and safety milestones. "While safety and production are expectations, it is important that we celebrate our success," Shaw says.

The mine's camp services group planned to bring in a special chef to create the celebratory meals taking place on-site. Duplicate events were planned to make sure all of the mine's more than three hundred workers have the opportunity to attend, since Pogo Mine is operated as a camp facility and employees are on rotating work schedules. Specifically to celebrate the safety record, the company awarded mine employees high quality, high powered, inscribed flashlights and customized ball caps, Shaw says. Events were planned for early October. ☼

Tasha Anderson is an Associate Editor at Alaska Business Monthly.

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ALASKA 2015 MINING IN REVIEW

Millrock Resources drilling operations at the Bee Creek Prospect, now called the Dry Creek Prospect, earlier this year in search of copper and gold through an agreement with Bristol Bay Native Corporation.

By Curtis J. Freeman

What started out looking like a strong recovery year for Alaska's mining industry turned into another year of treading water, if not actually ingesting a bit of it. Precious and base metal prices plumbed multi-year lows, affecting cash flow and profit margins at Alaska metal mines. That said, the large metal and coal mines in Alaska weathered the storm well and continued to produce coal, zinc, lead, silver, and gold. Advanced exploration continued at Donlin (gold), Bokan-Dotson Ridge (rare earths), and Arctic (polymetallic), while several other advanced projects were either on hold or advancing with more limited budgets. The mineral exploration sector was once again hit hard by lack of venture capital and lackluster commodities prices. As a consequence, of the nearly sixty exploration projects with budgets in excess of $100,000 that were active in Alaska just two years ago, only about 20 percent of them are active in 2015. Of these, over half were gold projects and a third were base metal projects. Total expenditures out of this lot will be lucky to break $75 million in 2015, the lowest level since 2004. Despite these negative vectors, major companies have once again started acquiring interests in Alaska mineral properties, a clear sign that at least some of the producing companies feel we have reached the bottom of the current cycle and wish to acquire high quality Alaska projects before the inevitable price inflation sets in.

Western Alaska

Teck Resources Limited and partner **NANA Regional Corporation** announced year-end 2014 and first-half 2015 results from its **Red Dog** mine. For 2014 the mine produced a record 596,000 tonnes of zinc in concentrate from ore grading 16.7% zinc with recoveries of 84.6%. The mine also produced 122,500 tonnes of lead in concentrate from ore grading 4.3% lead with mill recoveries of 78.9%. Gross operating profit for 2014 was **$574 million,** and mill throughput was a record 4.3 million tonnes due in part to softer ore, both of which contributed to the better zinc and lead recoveries. During 2014 the mine paid partner **NANA Development Corp.** and the **State of Alaska** royalties of **$215 million.** The 2016 concentrate shipments totaled 1.025 million tonnes of zinc concentrates and 205,000 tonnes of lead concentrate. Production for the first quarter of 2015 included 145,900 tonnes of zinc in concentrate from ore grading to 16.5%, with mill recoveries 83.4%. The mine also produced 30,700 tonnes of lead in concentrate in the first quarter from ore grading 4.6%, with mill recoveries of 62.2%. For the second quarter of 2015, the mine produced 154,700 tonnes of zinc in concentrate from ore grading 16.5%, with mill recoveries of 85.8%. The

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In 1990, Truckwell emerged as a small operation that sold truck accessories and snow plows. Today, the company is a leading fabricator of work-duty vehicle equipment for Alaska's oil and transportation industries. In 2007, Truckwell was recognized as the country's largest distributor of VMAC truck-mounted mobile air compressors—selling more than $1 million in product.

Truckwell can customize any vehicle used for any work purpose, whether it's retrofitting a truck with a flatbed or installing a full cold weather package to protect workers and vehicles during inclement weather. A cold weather package might include installing a battery heater, a component to keep open truck doors from being ripped off by strong winds, or an air heater that maximizes fuel efficiency and saves thousands of dollars annually.

"We can do pretty much anything you want to do with a truck outside the engine," says Marketing Director Brad Hurd.

Local Support

Truckwell—which is also the master distributor for Webasto heaters—is a valuable Alaska-based resource for organizations requiring any type of customization to work vehicles. The local support that it provides helps differentiate Truckwell from its competitors and helps eliminate shipping and reduces overall costs. In addition, Truckwell's resident fabricators and retrofitters have a wide range of skills that enable projects to be expertly completed at the company's freshly-remodeled Anchorage location. "We have an elite level of craftsmanship," Hurd says. "We pay very close attention to the little details that go into customizing."

TRUCKWELL

Due to its extensive capabilities, Truckwell is able to cater to a broad base of clients. The company's customers range from oil and mining corporations to communications organizations to self-employed snow plow business owners. Truckwell, which is the Boss Snow Plow Distributor for the state, helps Alaska's snowplow owners ensure they have the right snow removal equipment and that it's properly installed. Truckwell offers a variety of service plans to help them keep their equipment operating, from individual upkeep to commercial maintenance.

Large clients of Truckwell include ConocoPhillips, BP and CH2M Hill. Currently, Truckwell is assisting ConocoPhillips with a massive project to transition their entire fleet to gas vehicles.

Creative Solutions

Because Truckwell has such a diverse client base, its staff of 20 employees has accumulated a great deal of broad experience. This allows them to quickly comprehend customers' needs and educate them about their options. Additionally, Truckwell is continually growing with its customers. Team members in its 10,000-square-foot workshop are passionate about their work and welcome challenging projects that require innovative solutions. "When they can get creative and do something that's not just a by-the-numbers installation, they really get excited about it," Hurd says. "It really helps us expand our abilities."

Hurd adds that Truckwell is willing to go above and beyond to satisfy its clients. "We will do whatever it takes to get you the answers you need," he says.

Truckwell also adapts to the changing interests and needs of its customers. For example, over the last ten years, there has been a directional shift toward renewable energy. "As that type of mindset plays a bigger role, we are adopting those attitudes," Hurd says. "It's exciting to try and keep pace with the changing market."

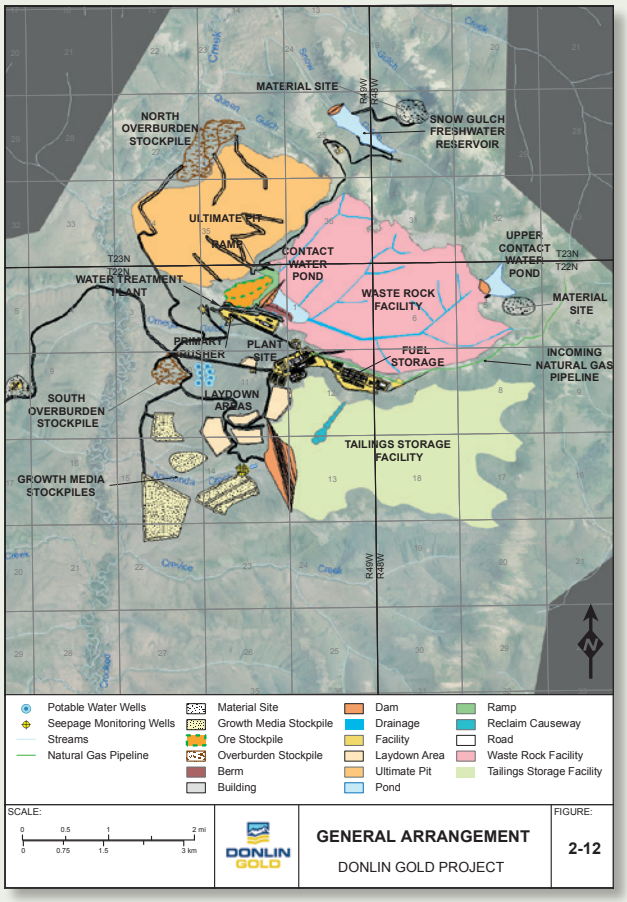
Truckwell
Brad Hurd, Marketing Director
5801 Silverado Way
Anchorage, Alaska 99518
907-349-8845
truckwell.com

mine also produced 31,000 tonnes of lead in concentrate from ore grading 4.8%, with mill recoveries of 58.8%. The mine posted operating profits of **$108 million** and **$84 million** for the 1st and 2nd quarters of 2015, respectively. Royalty costs were **$36 million** and **$6 million** during the 1st and 2nd quarters of 2015, respectively. The mine's production of contained metal in 2015 is expected to be 540,000 to 565,000 tonnes of zinc and 90,000 to 95,000 tonnes of lead.

Graphite One Resources, Inc. announced final 2014 drill results, new mineral processing test results, and an updated resource estimate for its 100% owned **Graphite Creek project** located near Nome. The results of the final ten diamond core holes from 2014 include 42.81 meters of 6.27% graphite carbon in hole 14GCH102, 24.56 meters of 6.76% graphite carbon in hole 14GCH120, and 38.80 meters of 7.80% graphite carbon in hole 14GCH016. All ten holes intercepted significant widths of near surface graphite mineralization along 700 meters strike, and drilling continued to show good continuity along strike and down dip. The company also updated its resources which now include indicated resources of 17.95 million tonnes at 6.3% graphite carbon and inferred resources of 154.36 million tonnes of 5.7% graphite carbon, both at 3% cutoff grade. This resource is 14% higher grade than the previously announced resource and makes the **Graphite Creek deposit** the largest published graphite resource in the United States. The results of additional mineral processing test work revealed the existence of distinctive properties of the mineralization described as Spheroidal, Thin, Aggregate, and Expanded, or STAX. This recent work on drill-hole concentrate samples revealed that naturally occurring graphite occurs in the shape of spheres and close to the size ranges of interest for lithium ion battery-grade graphite. Screening analysis and optical microscopy also demonstrated significant proportions (7-10% or more) of thin, coarse, large flake graphite (+20 mesh, +25-30 mesh). As a result of this new information, the company suspended work on its Preliminary Economic Assessment in order to evaluate and incorporate the findings from this new work.

Northern Dynasty Minerals Ltd. got some welcome legal news at its **Pebble copper-molybdenum-gold project** in 2015. Early in the year a federal court rejected an EPA motion to dismiss the **Pebble Partnership's** law suit that accuses the EPA of violating the Federal Advisory Committee Act in advancing its Bristol Bay Watershed Assessment study and a subsequent pre-emptive veto under Section 404(c) of the Clean Water Act. This leaves in place a Preliminary Injunction granted in November 2014 that forbids the EPA from advancing any action under 404(c) affecting the **Pebble project** until the case in question runs its course. Later in the year, the Alaska Supreme Court ruled that the Lake and Peninsula Borough's 2011 initiative seeking to restrict large-scale mining in the Bristol Bay region seriously impedes a regulatory process set out in state law and is therefore unenforceable. The initiative would have prevented development and mining at the **Pebble project** and other large scale projects. In its decision, the Supreme Court found the initiative impedes implementation of state law that place Alaska's Department of Natural Resources in charge of matters affecting the exploration, development, and mining of state mineral resources because the initiative "purports to give the borough veto power over mining projects on state lands within its borders."

Millrock Resources, Inc. announced that **First Quantum Minerals Ltd.**



Map: Donlin Gold

Donlin Gold

NovaGold Resources, Inc. and 50:50 joint venture partner **Barrick Gold** continued permitting activities on the **Donlin gold project.** The project is located on lands leased from Alaska Native regional corporation **Calista Corporation.** By mid-2015 the process had reached a point where the **US Army Corps of Engineers,** the lead permitting agency for the venture, had addressed all initial comments from the six cooperating agencies prior to completing the **Donlin Gold** preliminary draft environmental impact statement (EIS), a major step in the National Environmental Policy Act permitting process leading to the publication of the draft EIS. The partners also continued their community outreach and workforce development initiatives in Alaska. The Corps is working toward the publication of the draft EIS around year-end 2015 and continues to anticipate issuance of the final **Donlin Gold** EIS in early 2017. The company is working with other agencies on major permit applications for the project, including the air quality permit; the water discharge and use permits; the rights-of-way and lease applications for the gas pipeline; the engineering design, evaluation, and authorization of the dams proposed for the project, including the tailings storage facility dam; and the Clean Water Act section 404 and 10 permits, including finalizing the determination of the impacts on wetland areas and proposing options for compensatory mitigation. Total expenditures at the project in 2014 were approximately **$27.8 million,** and in 2015 the partners anticipate spending approximately **$25.2 million** to fund continuing permitting and related expenditures as well as **$3 million** for technical studies to identify potential design and execution enhancements. ☼

has exercised its option to joint venture the **Alaska Peninsula copper-gold project** from **Millrock.** The 2015 exploration budget of **$2 million** was focused on an eight-hole, 2,400-meter drilling program on the **Dry Creek** and the **MDB porphyry copper-gold prospects.** Surface and airborne surveys conducted by partners in 2014 identified and characterized zoned rock alteration and metallic mineral distribution patterns typical of this deposit type. Drilling will be carried out on surface lands owned by **Far West, Inc.** and **Chignik Lagoon Native Corporation,** two Alaska Native corporations with which **Millrock** has made surface access agreements. **Bristol Bay Native Corporation,** with whom **Millrock** has an exploration agreement, owns the subsurface mineral rights and surface rights at certain locations. Results for the 2015 exploration program are pending.

In late 2014 **Redstar Gold Corporation** announced that it had agreed to assume the obligations of **Full Metal Minerals Ltd.** under its agreement with **Aleut Corporation** in the **Unga gold project** near Sand Point. In 2015 the company completed new exploration work on the project including an eight-hole drill program completed at the **Shumagin zone,** one of two

large epithermal vein systems on the project. The first phase of drilling consisted of eight diamond drill holes totaling approximately 1,450 meters. Highlights included hole 15SH011 which intersected 1.9 meters grading 202 grams of gold per tonne and 82 grams of silver per tonne, hole 15SH012 which intersected 2 meters grading 35.3 grams of gold per tonne and 209 grams of silver per tonne and an additional 3 meters grading 16.95 grams of gold per tonne and 183 grams of silver per tonne, drill hole 15SH013 which intersected 4 meters grading 11.62 grams of gold per tonne and 95.6 grams of silver per tonne, and drill hole 15SH018 which intersected 5 meters grading 9.35 grams of gold per tonne and 27.62 grams of silver per tonne. Overall the precious metal-bearing **Shumagin vein system** has a strike extent of over 1.2 kilometers and a depth of at least 330 meters as outlined by drilling and surface trenching. Drill results indicate that the thickest portions of the **Shumagin vein system** consists of a zone of coalesced veins and vein breccias comprising an "internal breccia vein" that ranges from approximately 7-10 meters in true thickness and is fringed on both the hangingwall and footwall by stockwork and subsidiary breccia veins that expand the width of the vein system in areas to approximately 12-20 meters in true thickness. The internal breccia vein normally exhibits the highest gold-silver grades and the highest overall grade thicknesses, but high-grade mineralization has also been observed to be associated with syn-mineral dikes within the vein system. Overall, the system exhibits evidence of multiple hydrothermal events with distinctive mineralization associated with each event. Additional work was planned for 2015, including continued step-out drilling towards the northeast for an additional 350 meters where exposures of the **Shumagin vein system** returned high-grade intercepts at shallow depths from drilling during the 1980s.

Interior Alaska

Kinross Gold announced year end 2014 results and first-half 2015 results from its **Fort Knox mine.** During 2014 the mine produced 379,453 ounces of gold at a cost of **$712 per ounce.** During the year, mill-grade ore ranged from 0.50 to 0.86 grams of gold per tonne while heap leach grades varied from 0.27 to 0.30 grams of gold per tonne. Year-end 2014 proven and probable reserves at the mine were 163,844,000 tonnes grading 0.46 grams of gold per tonne (2,398,000 ounces). Measured and indicated resources at the mine were 105,453,000 tonnes grading 0.43 grams of gold per tonne (1,446,000 ounces). Inferred mineral resources were 13,500,000 tonnes grading 0.44 grams of gold per tonne (189,000 ounces). During the first quarter of 2015 the mine produced 82,673 ounces at a cash cost of **$672 per ounce** while second quarter 2015 production came in at 116,061 ounces of gold at a cost of **$606 per ounce.** The second quarter production increase was due to higher grade mill material and the seasonal impact of warmer weather on heap leach performance. Costs decreased in part due to lower fuel and power costs. The mill is expected to produce 58.9% of the gold produced in 2015 with the remainder coming from the heap leach. The gold recovery from the heap leach ore was 49.9% to date at the end of December 2014 and is predicted to reach 65% at the conclusion of the operation. The operation's capital expenses for the next five years are estimates at **$325 million.** Through the middle of 2015, the mine has recovered 6,545,020 ounces of gold since start-up in 1996. In 2019 the pit is expected to be mined out and ore haulage to the heap leach facility will cease. Leaching will continue through 2027 with recovered gold declining each year.

Marking a Milestone

Teck's Red Dog Operations, one of the world's largest zinc mines, is celebrating over 25 years as a model of responsible development.

Since 1989, Red Dog has been an economic engine for the state, injecting more than $1.5 billion into the Alaskan economy and supporting over 600 jobs in northwest Alaska.

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Kinross Gold also published an updated resource estimate for the **Gil deposit** near its **Fort Knox** operations. The **Gil deposit** has been defined by a total of 738 drill holes (comprising 581 RC, 154 core, and 25 rotary holes) totaling 73,876 meters. Resources at **Gil** at the end of 2014 included indicated resources of 29,515,000 tonnes grading 0.56 grams of gold per tonne (532,700 ounces) and inferred resources of 4,026,000 tonnes grading 0.49 grams of gold per tonne (62,800 ounces).

Freegold Ventures Limited announced an update on its **Golden Summit project.** Bottle roll and column leach cyanidation tests were completed on the oxide component of the mineralization at its 6.5 million ounce **Dolphin-Cleary deposit.** Results indicate gold extractions over 80% within fourteen days on coarse crushed material (80% passing 25 millimeters). The column test was permitted to run for sixty-five days and final gold extractions were 85%. These tests suggest that the recovery on the oxide component does not appear to be sensitive to grind size. These results compare favorably with the earlier bottle roll test results on coarse crushed material. Sodium cyanide consumption in the column test was 0.69 kilograms per metric tonne. Optimization of cyanide dosing in future test work programs will focus on potential improvement in both kinetics and cyanide consumption. Head grades of the oxide material were 1.0 gram of gold per tonne and 10 grams of silver per tonne. Results of these tests will now be incorporated into the Preliminary Economic Assessment that is currently underway.

International Tower Hill Mines Ltd. announced progress made toward optimization of its **Livengood gold project.** In addition to the mine production scheduling and detailed metallurgical test work review, power supply alternatives were reviewed to determine how changing energy supply dynamics might impact the project assumptions regarding electrical generation. Construction and operations camp alternatives were reviewed to better define the costs of supporting the manpower requirements for the project. The company has also continued to advance environmental baseline work. Revised production schedules were run at throughputs ranging from 11,250 to 90,000 tonnes per day. At the upper level of production, the mine would produce approximately 7.7 million ounces of gold over its twelve year mine life from ore ranging from 0.50 to 0.92 grams of gold per tonne. The impact of just this scheduling change would in-

crease the Net Present Value of the project by **$305 million** (at **5%** and **$1500/ounce** gold). Integrating a 45 degree slope into the mine plan for the first five years and then reverting to the design slopes used in the September 2013 feasibility study would result in an additional Net Present Value increase of **$95 million** (at **5%** and **$1500/ounce** gold). Re-evaluation of metallurgical tests determined that the observed calculated head grades from the 250-300 kilogram composite samples of the five primary rock types of the deposit met or exceeded the drill assay grades used in the feasibility study by a ratio of 1.00 to 1.43, depending on rock type. Additional metallurgical recovery work will be required, but if a higher head grade can be confirmed, its effect would be a significant improvement on project economics. Due to the potential importance of the 2014 head grade evaluation to the project, a multi-phase **metallurgical test work program** was commenced in 2015 to validate the observed higher calculated head grades. The objectives of the 2015 metallurgical test program are to optimize the gravity circuit, optimize the grind size and power consumption, optimize the reagent consumption, optimize the leach retention time, confirm the overall recoveries by rock type, and provide additional confirmation of the head grades. In addition the company will continue to advance the environmental baseline and to evaluate alternatives for fresh water supply with potential to reduce project costs. Results of this work are pending.

Freegold Ventures Limited announced results from its 2014 **geochemical and geophysical programs** and 2015 drill plans for its **Shorty Creek copper-gold project** in the Livengood-Tolovana District. The company's 2014 programs have consisted of 28.6 line kilometers of induced polarization surveys, collection of 354 soil geochemical samples, and staking of additional claims that bring the property claim position to 26,087 acres. Results show a strong chargeability anomaly which is over a 2 by 1 kilometer area in the northwestern area of the grid. Copper values (up to 669 ppm) and molybdenum (up to 235 ppm) were coincident with the geophysical anomaly. In the southern portion of the grid, where previous drilling in 1989-1990 was completed, a significant chargeability zone was identified. Previous limited drilling in the area appears to have targeted the higher resistivity with some of the best copper grades appearing to be associated with the increasing chargeability to the southwest. Strongly anomalous gold (up to 480 ppb) and bismuth (up to 276 ppm) are associated with the area of increasing chargeability. In September 2015 the company commenced a 3,000 meter core drilling program to follow-up previous reverse circulation drilling that had returned significant intervals of gold mineralization. The area of drilling in 1989 and 1990 was restricted to a 500 meter by 200 meter area. A total of 2,094 meters of past drilling were completed with a maximum hole depth of 152 meters. The presence of copper mineralization in conjunction with gold mineralization was noted at depth in most of the historic drill holes. Additional mapping has confirmed the presence of quartz porphyry in the creek 30 meters below the depth of previous drilling. Ground geophysics and soil sampling completed by the company in the vicinity of the drilling has now expanded the target area by another 500 meters to the southwest and 400 meters to the northeast. Results of the 2015 program are pending.

Alaska newcomers **Northern Empire Resources Corporation** and **Sonoro Metals Corporation** announced that they had signed an option agreement on the **Hilltop prospect** on the western end of

Empire's Richardson gold project southeast of Fairbanks. **Sonoro** can earn a 60% interest in the 31,720 acre Hilltop project by spending **$3 million** on exploration activities and issuing **Northern Empire** 1 million **Sonoro** shares prior to December 31, 2019. Phase 1 work in 2015 included submission and receipt of a multi-year exploration permit; 13.2 kilometers of road improvement; excavation; mapping and sampling of eight trenches over a total strike extent of 213 meters; completion of six test pits in areas with prospective geology and/or hosting anomalous historic results from previous exploration, prospecting, and reconnaissance work; and collection of 228 rock samples and 397 soil samples including 61 due diligence top-of-bedrock soil samples and 336 B-horizon enzyme leach soil samples. Results of the **$250,000 Phase 1 program** were not released, but the partners approved and conducted a follow-up **$100,000 Phase 2 program** designed to expand upon previous efforts. Results for the 2015 work are pending.

Corvus Gold, Inc. announced updated resource estimates for its **LMS gold project** in the Goodpaster District. The resource estimate was calculated incorporating new drilling conducted in 2010 and 2011 by **First Star Resources, Inc.,** the company's former joint venture partner. At a 0.5 gram of gold per tonne cutoff, the new resource estimate contains 8,320,000 tonnes grading 1.0 gram of gold per tonne, for 267,000 ounces of gold. Previous efforts on the project targeted a folded stratiform breccia horizon. However, high-grade vein mineralization (>5 grams of gold per tonne) has been encountered in the rock unit below this zone in every drilling campaign. Review of these data suggest the presence of an upright fold in the breccia horizon and the distribution of higher grade veins in a series of axial planar folds within the footwall gneiss. These northwest trending high grade target zones constitute high priority future drilling targets. **Corvus** also announced that it had granted **Millrock** a Right of First Refusal to acquire the **LMS gold project** under agreed upon terms until September 1, 2015.

Millrock Resources, Inc. announced that it had acquired the **West Pogo gold property** from a subsidiary of **Corvus Gold.** The claims cover the projection of a favorable structure that passes through **Sumitomo's Pogo mine** located three kilometers to the south. Under terms of the deal, **Millrock** will pay **$20,000** for a 100% interest with **Corvus** retaining a 3% net smelter returns production royalty on precious metals and 1% royalty on base metals. **Millrock** has also purchased an extensive, district-wide proprietary database of geological information generated by **Anglogold-Ashanti** and **International Tower Hill Mines.** It is estimated that data represents in excess of **$5 million** in exploration work. The purchase price for the database is **$100,000.** A royalty of 1% net smelter returns production royalty in favor of **Corvus** will be payable for any claims staked by **Millrock** within a defined area of interest in the coming five years. The royalty may be reduced to 0.5% by payment of $2 million.

Contango ORE, Inc. announced that it completed the formation of a joint venture with **Royal Alaska LLC,** a wholly-owned subsidiary of **Royal Gold, Inc.,** to advance exploration and development on the **Tetlin project** near Tok. **Royal Gold's** initial investment of **$5 million** will fund exploration activity, and **Royal Gold** will have the option to earn up to a 40% economic interest in the joint venture by investing up to **$30 million** (inclusive of the initial **$5 million** investment) prior to October 2018. During 2015 the partners completed 7,500 meters of drilling in its first phase of

exploration to test new exploration targets, as well as a deeper test under the previously discovered Peak zone. The joint venture then approved and commenced a second phase of exploration drilling, targeted at 6,000 meters, to follow up on encouraging Phase 1 results. Drill results from the project were not released.

Alaska Range

Alaska's only operating coal mine, **Usibelli Coal Mine,** recently released updated economic impact numbers for its **Healy mine** operations. The privately-owned mine, in its 72nd consecutive year of operations, employs 140 fully time direct employees and created 278 indirect jobs along with 222 down-stream coal-fired power plant jobs. It pays **$14.7 million** in direct wages and is responsible for **$48.7 million** in combined direct, indirect, and down-stream wages. An impressive 100% of its employees are Alaskan residents. The operation pays **$3 million** per year in State rents and royalties, contributes **$618,000** per year to the Alaska Permanent Fund, and it pays **$130,000** per year to seven local and borough governments. Its operations provide coal to six coal-fired power plants, and its rail shipments generate approximately 20% of the Alaska Railroad's freight revenue. The mine produces approximately two million tons of low sulfur, low ash, low mercury coal per year with about half of this production consumed in Alaska and the other half exported through the Seward export facility.

PacRim Coal recently presented an update on its **Chuitna coal project** in Southcentral Alaska. The project is looking to recover an estimated 300 million tons of sub-bituminous ultra-low sulfur, low ash, low mercury coal. The market for this coal is the Pacific Rim where it will be used to blend with other sources of coal to improve air quality and combustion aspects. The project, located on Mental Health Trust land, is expected to provide up to 500 direct jobs during construction, up to 350 direct, full-time, year-round jobs during the twenty-five-year operating life of the mine, and up to an estimated 1,200 indirect jobs. Production is expected to average 12 million metric tons per year from a surface mining operation linked by an innovative, low impact overland conveyor system to a loading port on Cook Inlet. This new design will result in a reduction of affected wetlands from 103 acres down to 29 acres, a 72% reduction. One of the most impressive segments of the presentation is related to a wetland survey recently undertaken by the company. The professional wetlands survey team identified a pond within the project footprint as a high priority wetland area, not realizing that the pond and nearby environment was a reclaimed coal test pit from a 1980s testing program.

Brazil Resources, Inc. announced that it has completed the acquisition of 100% of the **Whistler gold-copper project** and certain related assets from **Kiska Metals Corporation. Brazil** issued 3.5 million shares valued at **$1.61 million** to acquire the project, which includes 304 State mining claims, a fifty-person all season exploration camp, airstrip, and assorted equipment. The project is underlain by a volcano-sedimentary sequence of the Jura-Cretaceous Kahiltna Assemblage that has been intruded by the Late Cretaceous Whistler Intrusive Suite with associated gold-copper porphyry and epithermal mineralization, and the Late Cretaceous to Paleocene Composite Intrusive Suite with associated intrusion-related gold mineralization. Resource estimates are based on 48 drill holes (19,870 meters) and, using 1.3:1 waste to ore stripping ratio at a 0.3 grams of gold per tonne cut-off, indicated resources include 79.2 million tonnes grading 0.51

grams of gold per tonne, 1.97 grams of silver per tonne, and 0.17% copper. Inferred resources come in at 145.8 million tonnes grading 0.40 grams of gold per tonne, 1.75 grams of silver per tonne, and 0.15% copper. Other prospective exploration plays in the project area include the Whistler Orbit, Muddy Creek, and Island Mountain.

Coventry Resources, Inc. announced that it has signed an agreement that allowed it to acquire 80% interest in the road accessible **Caribou Dome copper project** in the Valdez Creek District. Under terms of the agreement, **Coventry** can earn its interest by making cash payments and conducting work on the ground to earn their rights from a series of companies that control the property through agreements with claim owner C-D Development Corporation who retains a 5% net smelter return production royalty. The project, previously known as the **Denali copper prospect,** hosts near-surface sediment-hosted stratiform copper mineralization. Following the staking of 11,040 acres of new claims around the existing 10,240 acre project area, the company commenced surface geochemical and geophysical exploration and conducted the first core drilling on the project in decades. Outcrops of sediment-hosted copper mineralization have been identified over a 15 kilometer extent, suggesting that the previously drill-tested 750 meters of mineralization is part of a much larger mineralized system. Initial results from three-dimensional Induced Polarization geophysical surveys have extended over approximately 1,500 meters of strike. This survey has highlighted multiple highly chargeable zones that coincide with known mineralization together with comparable responses that appear to highlight significant extensions of the known copper mineralization. Additional discrete chargeability anomalies in prospective geological settings have also been delineated. Results from 2015 drilling include holes CD15-01 and CD15-02, drilled to evaluate the shallow portion of the eastern end of Lens 6, which returned 10.1 meters at 7.1% copper from 39.0 meters in CD15-02 and 12.2 meters at 3.2% copper from 39.8 meters in CD15-01. Hole CD15-03 was drilled to evaluate the upper portions of Lens 4. This hole returned 51.1 meters at 5.3% copper from 4.4 meters, including several higher grade intervals. CD15-04 and CD15-05 were new exploration holes drilled to evaluate the central portion of the previously untested Lens 2, which surface mapping indicates is at least 200 meters long. Hole CD15-04 intersected 8.7 meters at 1.7% copper from 54.2 meters. CD15-05, drilled from the

same pad at a steeper angle, intersected 10.0 meters at 1.6% copper from 62.5 meters. Drilling in Lens 5 in hole CD15-06 returned 4.6 meters at 0.6% copper from 3.0 meters and 3.2 meters at 8.7% copper from 14.5 meters. An additional 4,000 meter drilling program was recently approved to allow continued exploration of the project.

Strongbow Exploration, Inc. announced that it has finalized the terms of its acquisition of each of the **Sleitat** and **Coal Creek** tin properties with **Osisko Gold Royalties Ltd.** and **Ron Netolitzky,** which combined own 100% of **Sleitat** and **Coal Creek** properties. The final agreement contemplates the acquisition of the properties in exchange for a total of **6.5 million** common shares of Strongbow and a 2% NSR royalty on the properties. The Sleitat property consists of 1,425 hectares of state mining claims located approximately 137 kilometers northeast of Dillingham. Past evaluation of the property was conducted by **Cominco America, Inc.** in the mid-1980s and **Solomon Resources** in the mid-2000s. Exploration work has consisted of mapping, sampling, geophysical surveys, 4,680 feet of drilling (14 holes), and initial metallurgical studies. In 1989, the US Bureau of Mines estimated the **Sleitat** prospect to contain an "inferred resource" of 25.9 million tonnes at an average grade of 0.224% to 0.37% tin. The **Coal Creek** property consists of 971 hectares of State claims in the Chulitna District north of Anchorage. Past evaluation of the property was conducted by **Houston Oil and Minerals** in the early 1980s and **Brett Resources** in the late 2000s. Exploration work consisted of mapping, sampling, geophysical surveys, 19,520 feet of drilling (46 holes), and initial metallurgical studies. In 1982, **Houston Oil and Minerals** estimated a "preliminary geologic resource" of 4.77 million tonnes grading 0.27% tin.

Miranda Gold Corporation and project operator **Gold Torrent** provided an update on their activities at the **Willow Creek project** near Anchorage. The partners plan to move the **Coleman deposit** to the production stage in twenty-four to thirty months. Initial production estimates are for 21,000 ounces of gold annually from the mining and milling of 150 tons per day. The company anticipates achieving +80% gold recovery through use of gravity tables and spiral concentrators. The companies are conducting mine planning, mill scoping, and permit planning exercises. The current resource estimate for the **Upper Coleman deposit** includes measured and indicated resources of 62,100 troy ounces at an average grade of 24.6 grams per tonne. An additional 4,100 troy ounces of inferred resources also are identified. No drilling was planned for 2015; however, the companies are modeling the old underground workings, drill holes, and underground samples to provide targets for 2016. By rehabilitating the Enserch tunnel, targets can be drilled from underground drill stations. The 2015 efforts are a follow-up to late 2014 work that included collection of 234 soil samples along with rock samples of quartz vein rubble, the results of which suggest that the vein system mined on **Bullion Mountain** extends beyond a fault that bounded historic production. The gold in soil anomaly is 800 meters long and open, but the highlights of the sample program are the discovery of three quartz vein subcrops that assayed 50.74 grams of gold per tonne, 17.05 grams of gold per tonne, and 18.15 grams of gold per tonne. The company thinks that the **Lucky Shot Ridge** and **Bullion Mountain** veins are fault offsets of the same zone of high-grade gold quartz veins. The soil anomalies show discrete breaks from background and are defined as having gold values of greater than 0.100 to 2.00 parts per million gold. The soil anomaly remains open to further expansion.

Northern Alaska

NovaCopper, Inc. and partner **NANA Development** announced the start of work on the **Arctic volcanogenic massive sulfide deposit** pre-feasibility study at its **Upper Kobuk Mineral project** in the Ambler District. The company has approved a **$5.5 million** budget for the 2015 field season to complete in-fill and geotechnical drill programs during July and August. This field season's work program included completion of approximately 2,500 meters of in-fill drilling at the Arctic deposit designed to improve the confidence level of the resource model with the goal of re-categorizing the in-pit inferred resources to measured and indicated. An updated resource estimate will be completed later in the year. In addition, other areas of study will include: 1) geotechnical and hydrology drilling to better understand the wall rock characteristics and hydrology within the open pit area; 2) waste rock characterization studies to assess acid generation potential; 3) wetlands delineations studies; and 4) continued environmental baseline studies. This work will form the basis for completing a pre-feasibility study on the Arctic deposit. The company also continued its efforts supporting the Alaska Industrial Development Export Authority in working towards drafting an EIS to permit the **Ambler Mining District Industrial Access Road.** The Consolidated Right of Way application document is substantially complete and the US Army Corps of Engineers has selected a third-party environmental engineer to manage an EIS on behalf of the Corps. State government budget shortfalls have sidelined this process since early in the year.

NovaCopper, Inc. and partner **NANA Development** also provided a 2014 year-end update on its **Bornite deposit,** also on its **Upper Kobuk Mineral project.** The company completed a re-logging program of approximately 13,000 meters in 37 historical drill holes from **Bornite** previously drilled by **Kennecott Copper Company.** Targeted historical holes were located within the near-surface **Ruby Creek zone** of the Bornite deposit. At a cutoff grade of 0.5% copper significant results include hole RC-22 which intersected 5.60 meters grading 0.5% copper, hole RC-49 which intersected 9.25 meters grading 1.18% copper, hole RC-71 which intersected 16.13 meters grading 0.72% copper, hole RC-79 which intersected 16.45 meters grading 0.52% copper, and hole RC-112 which intersected 5.19 meters grading 0.65% copper. Environmental baseline data collection continued in 2014 and annual maintenance of the stream gauges and the meteorological station on the property were performed. Water quality sampling continued marking seven years of continu-

ous environmental baseline data collection. During 2014 the company spent **$2.5 million** on the **Upper Kobuk Mineral project** for cumulative project expenditures of **$53.8 million.** The company also plans to advance assessment work at **Bornite** with the goal of evaluating potential synergies between **Bornite** and the nearby **Arctic deposit.**

Goldrich Mining Company announced a year-end 2014 and 2015 to date summary of development and preproduction activities at its **Chandalar gold project** in the Brooks Range. **Goldrich NyacAu Placer LLC,** which is a 50:50 joint-venture between the company and **NyacAU LLC,** invested more than **$17 million** in equipment and infrastructure through year-end 2014 to prepare for commercial-scale gold mining on the **Little Squaw placer gold deposit.** Major accomplishments during 2014 included plant relocation, construction of new water ponds, upgrade of the new expanded plant, and installation of a new grizzly feeder. Full capacity of the feeder is expected to be approximately 600 bank cubic yards per hour and will be realized as additional gravel screens and gold recovery tables are added in stages through 2016. For 2015 the company has completed approximately 15,000 feet of drilling on the upper half of the **Little Squaw Creek placer deposit** and outlined 10.5 million cubic yards of mineralized material, at an average head grade of 0.025 ounces of gold per cubic yard (250,000 ounces). The company also released projected gold production and cost information for 2015 through 2018. Estimated production costs for 2015 using a **$1,200 per ounce** gold price was **$713 per ounce** for estimated production of 16,500 ounces of gold. **Goldrich** also completed a hard-rock exploration program during 2014 that consisting of an airborne radiometric and magnetic survey. Results of the airborne study demonstrate a broad northwest-trending belt of elevated potassium values with a centrally located, kilometer-scale feature where thorium values are elevated relative to potassium. The potassium/thorium anomaly is closely associated with magnetic anomalies to form a circular kilometer-scale feature in the highlands above and adjacent to the **Little Squaw placer gold deposit** and is consistent with an intrusive body at depth.

Southeast Alaska

Hecla Mining announced year-end 2014 and first half 2015 operating results for its **Greens Creek mine** on Admiralty Island. The total cash cost per ounce of silver produced for 2014 was **$2.89 per ounce,** and the average grade of ore mined was 13.24 ounces of silver per ton. For 2014, the mine produced 7,826,341 ounces of silver, 58,753 ounces of gold, 20,151 tons of lead, and 59,810 tons of zinc. The operation milled an average of 2,236 tons per day in 2014, which is the highest daily average since the mine began operations in 1989. Improved economics were the result of lower milling costs and higher by-product credits and silver production. The company also announced year-end 2014 reserves and resources for the mine including proven and probable reserves of 7,796,000 tons grading 12.2 ounces of silver per ton, 0.10 ounces of gold per ton, 3.1% lead, and 8.3% zinc. In addition, the mine contains measured and indicated resources of 823,000 tons of indicated resources grading 11.0 ounces of silver per ton, 0.12 ounces of gold per ton, 3.5% lead, and 8.0% zinc. The mine also reported inferred resources of 3,452,000 tons grading 13.6 ounces of silver per ton, 0.09 ounces of gold per ton, 2.8% lead, and 6.6% zinc. For the first quarter of 2015 the mine realized an 11% increase in silver ore grades and higher recoveries with cash costs coming in at **$3.23 per ounce** of silver. The average grade of ore mined during the quarter was 13.78 ounces of silver per ton and the mine produced 2,035,966 ounces of silver,

15,239 ounces of gold, 4,930 tons of lead, and 13,920 tons of zinc. The mill operated at 2,172 tons per day during the first quarter and processed 195,469 tons of ore during the quarter. For the second quarter of 2015, operating costs were **$3.30 per ounce** of silver from ore averaging 12.33 ounces of silver per ton. During the second quarter the mine produced 1,856,125 ounces of silver, 13,753 ounces of gold, 5,393 tons of lead, and 15,462 tons of zinc. The mill processed 199,694 tons of ore during the quarter, or 2,194 tons per day. As a result of both higher grades and recoveries, the company now expects **Greens Creek** to produce 7.7 million to 8 million ounces of silver during 2015. Exploration efforts at the mine continue to outline new resources. Recent assay results from the **NWW Zone** include 107.3 ounces of silver per ton, 0.73 ounces of gold per ton, 4.0% zinc, and 2.1% lead over 6.0 feet and 50.5 ounces of silver per ton, 0.14 ounces of gold per ton, 13.1% zinc, and 7.3% lead over 6.2 feet. In the 9A zone significant results include 26.8 ounces of silver per ton, 0.01 ounces of gold per ton, 3.8% zinc, and 2.4% lead over 14.0 feet and 10.4 ounces of silver per ton, 0.06 ounces of gold per ton, 18.4% zinc, and 7.9% lead over 10.2 feet. Recent and previous exploration drilling of the **Gallagher Fault Block** defined mineralized zones with 95 to 425 vertical feet of continuity over 1,000 feet of strike length. Recent drill intersections in the **Deep 200 South zone** include 61.9 ounces of silver per ton, 0.04 ounces of gold per ton, 2.1% zinc, and 1.3% lead over 6.2 feet and 41.2 ounces of silver per ton, 0.04 ounces of gold per ton, 3.7% zinc, and 3.2% lead over 7.0 feet.

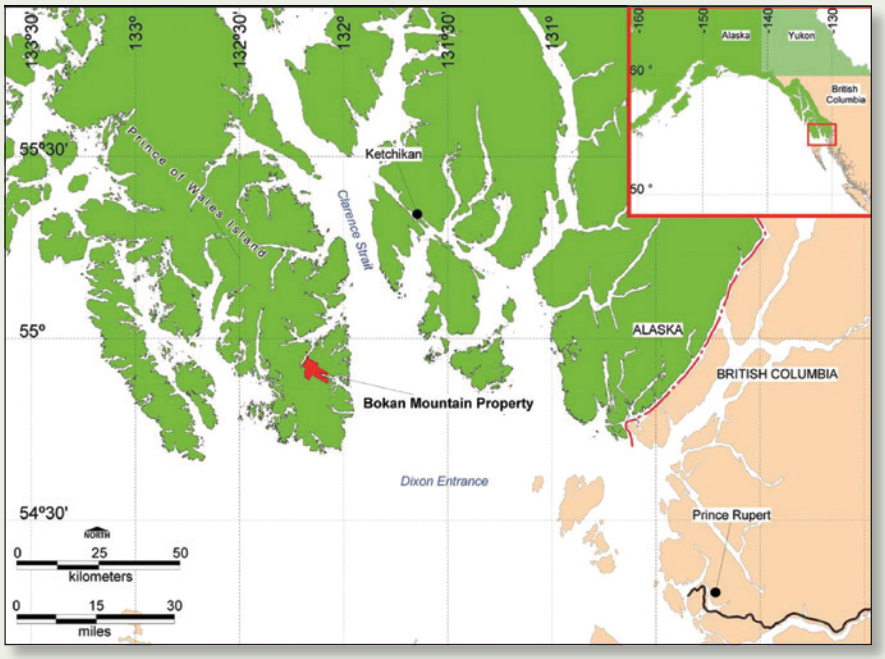
Coeur Mining, Inc. announced preliminary year end 2014 production results and first half 2015 production results from its **Kensington mine.** During 2014 the mine produced 117,823 ounces of gold. Year-end 2014 reserves and resources at the mine included proven reserves of 400,000 tons grading 0.180 ounces of gold per ton (72,000 ounces) at the Kensington deposit and an additional 17,000 tons grading 0.412 ounces of gold per ton (7,000 ounces) at its newly defined **Raven deposit.** Probable reserves at **Kensington** came in at 2,824,000 tons grading 0.181 ounces of gold per ton (512,000 ounces) while **Raven** came in at 162,000 tons grading 0.241 ounces of gold per ton (39,000 ounces). Total combined measured and indicated resources at **Kensington** and **Raven** were of 1,566,000 tons grading 0.244 ounces of gold per ton (382,000 ounces), while total combined inferred resources at **Kensington** and **Raven** were 1,622,000 tons grading 0.351 ounces of gold per ton (570,000 ounces). During

the first quarter of 2015 the mill processed 147,969 tons of ore, or nearly 1,650 tons per day, and the mine produced 33,909 ounces of gold grading 0.24 ounces of gold per ton with an average recovery of 94.8%. Second quarter 2015 production is estimated at 29,845 ounces of gold at cash operating costs of **$745 per ounce.** The mine processed 170,649 tons of ore grading 0.18 ounces of gold per ton during the quarter. Mill throughput was steady at 1,875 tons per day, and average recovery was 94.9%. The increased production was the result of a higher throughput offset by lower gold grades during the quarter. Estimated 2015 total production from **Kensington** was upgraded to 115,000-125,000 ounces of gold and 2015 estimated cash operating costs were decreased to **$850-$900 per ounce.** The company also released its plans for mining higher grade material from the nearby **Jualin zone,** located approximately 8,250 feet from current mining activities. Resources in the **Jualin zone** continue to expand based on ongoing drilling and contain an average gold grade over three times the average reserve grade of 0.185 ounces per ton. The current resource base at **Jualin** is 257,000 tonnes grading 0.46 ounces per ton (approx. 110,000 ounces). Initial production from **Jualin** is expected in mid-2017 at a mining rate of approximately 250 tons per day, increasing to 500 tons per day in early 2018. Recently completed drilling in **Jualin Vein 4** cut mineralization approximately 1,000 feet away from the existing inferred resource included in the mine plan, demonstrating the possibility to expand resources along **Vein 4.** Significant results from **Vein 4** include 4.3 feet grading 2.69 ounces of gold per ton and an additional 2.6 feet grading 1.831 ounces of gold per ton in hole JU14-X045 and 4.4 feet grading 0.559 ounces of gold per ton in hole JU15-X006.

After a very successful drilling program in 2014, **Constantine Metal Resources Ltd.** and partner **Dowa Metals & Mining Co., Ltd.** announced an updated independent mineral resource estimate for the **Palmer copper-zinc-silver-gold project** near Haines. Using a **$75 per tonne** cutoff value, the new inferred resource contains 8,125,000 tonnes grading 1.41% copper, 5.25% zinc, 0.32 grams of gold per tonne, and 31.7 grams of silver per tonne. This new resource is almost double the previously published resource and is based on 82 diamond drill holes from the South Wall and RW zones, 48 of which intersect the interpreted mineralized zones in 19,000 meters of core. As a result, the $5 million 2015 drilling program includes approximately 6,000 meters of diamond

REE

Ucore Rare Metals, Inc. announced results from ongoing testing of the use of Molecular Recognition Technology licensed from **IBC Advanced Technologies, Inc.** for the separation of rare earth elements from its **Bokan-Dotson Ridge project.** The heavy rare earth element concentrate from the project contained 24.54% samarium, 4% europium, 21.82% gadolinium, 25.65% dysprosium, 3.14% holmium, 5.96% erbium, 1.71% thulium, 6.09% ytterbium, and 1.08% lutetium. The high purity and recovery of the concentrate produced by molecular recognition technology is in contrast to conventional separation processes such as solvent extraction where as much as 30% of these metals remain unrecovered. The company also reports that the final separation test recovered 99.2% of the samarium and 99.2% of the gadolinium in the test ore. Pilot scale testing is planned next to confirm the successful laboratory results and is designed to recover each individual rare earth elements at greater than **99% purity.** The company also announced an updated resource estimate containing indicated resources at a 0.4% cutoff of 4,787,900 tonnes grading 0.363% total light rare earth elements and 0.239% total heavy rare earth elements for a total rare earth element content of 0.602%. At the same cutoff, the project also has inferred resources of 1,050,000 tonnes grading 0.365% total light rare earth elements and 0.237% total heavy rare earth elements for a total rare earth element con-



Map: Ucore Rare Metals, Inc.

The Bokan-Dotson Ridge rare earth elements project is located on Prince of Wales Island in Southeast Alaska.

tent of 0.603%. The resource is based on a database of 97 diamond drill holes totaling 20,000 meters and 56 surface channels totaling 200 meters. The company also announced that it has contracted with **Ausenco Engineering Canada, Inc.** to complete a feasibility study on the project. These studies include 1) results from bulk sampling and x-ray sorting tests, 2) the results of environmental studies designed to provide baseline data required for the permitting process, 3) engineering information for incorporation in the Plan of Operations for the proposed mine site, 4) revised resource drilling, totaling over 4000 meters, to be incorporated into a resource model, 5) continued testing of the metallurgical process flow sheet, and 6) finalization of the rare earth oxide separation process. ☼

Ucore announced results from core samples the company previously obtained at the Bokan-Dotson Ridge REE project.

Courtesy of Ucore Rare Metals, Inc.

drilling to be completed with two drill rigs. Drilling will be focused on resource growth, with holes targeting the lower elevations of the recently updated mineral resource blocks. The resource is open to expansion in most areas, with the thickest part of the deposit located at the current down dip limit of the **South Wall Zone.** The thickening trend of the deposit in that direction, combined with mineral zoning and borehole geophysical data, support the potential for a copper-rich core zone within the **Lower Offset target,** located below the Kudo fault. This target, and the open strike extensions of the thick **SW EM Zone** resource, represent the priority target areas for the 2015 drill program. Other work planned for the 2015 season includes borehole geophysical surveys and environmental and geotechnical studies. Results of the 2015 drill program are pending. ☼

Curtis J. Freeman, CPG #6901, is head of Avalon Development Corporation, PO Box 80268, Fairbanks, AK 99708. Phone: 907-457-5159. Fax: 907-455-8069. He can also be contacted by email at avalon@alaska.net or found online at avalonalaska.com.

ALASKA BUSINESS MONTHLY'S 2015 MINING DIRECTORY

The Bee Creek Prospect (Dry Creek) after drilling, near Chignik on the Alaska Peninsula. Courtesy of Millrock Resources

COMPANY	TOP EXECUTIVE	FOUNDED/ESTAB. AK	WORLDWIDE\AK EMPLOYEES	SERVICES
Alaska Aggregate Products LLC 2525 C St., Suite 425 Anchorage, AK 99503 **Phone:** 907-562-2792 **Fax:** 907-562-4179	Dave Cruz, CEO/Pres. deb.engles@aicllc.com ak-gravel.com	2006 2006	125 125	**Recent Projects:** Ft. Knox Gold Mine, POGO Mine, Kensington Mine, Rock Creek Mine. **Mining District:** Historically Statewide - Current projects in S Central District **Commodity:** Pit Run Gravel, Processed Aggregates, Redi-mix Concrete, mining and resources infrastructure support.
Avalon Development Corp. PO Box 80268 Fairbanks, AK 99708 **Phone:** 907-457-5159 **Fax:** 907-455-8069	Curt Freeman, Owner/Pres. avalon@avalonalaska.com avalonalaska.com	1985 1985	10 10	**Recent Projects:** Tetlin Gold project; Golden Summit gold project; Richardson Gold project; Shorty Creek copper project. **Mining District:** Multiple **Commodity:** Precious Metals, Base Metals, Platinum Group Metals, Rare Earth Metals
Bering Shai Rock & Gravel, LLC PO Box 196 Unalaska, AK 99685 **Phone:** 907-581-1409 **Fax:** 907-581-3409	Diane Shaishnikoff, Owner/Mgr. Dianeshai@hotmail.com beringshairock.com	2004 2004	5 5	**Recent Projects:** Barging armor, rip rap, and spec rock, and gravel to the Aleutians and Western Alaska. **Mining District:** Aleutian Chain **Commodity:** Spec Rock, Rip Rap, Armor Stone, Gravel
Browns Hill Quarry PO Box 58158 Fairbanks, AK 997711 **Phone:** 907-488-2527 **Fax:** 907-277-2003	Sam Brice, Pres. albab@briceinc.com briceinc.com/browns-hill-quarry/	1972 1972	DND DND	**Recent Projects:** Browns Hill Quarry produces 200,000 cubic yards of materials annually for state and federal agencies. Located outside Fairbanks, Brown's Hill is the only retailer in Interior Alaska selling basalt. **Mining District:** Fairbanks **Commodity:** Aggregate, Sand, Gravel, Basalt
Coeur Alaska, Inc. 3031 Clinton Dr., Suite 202 Juneau, AK 99801 **Phone:** 907-523-3300 **Fax:** 907-523-3330	Wayne Zigarlick, VP/GM jtrigg@coeur.com coeur.com	1987 1987	2,000 320	**Recent Projects:** Coeur Alaska recently released a new high-grade mine plan at Kensington Gold Mine which reflects the impact of new high-grade mineralization from ongoing exploration success. **Mining District:** Juneau **Commodity:** Gold
Diamond Gold Corp. HC 89 Box 5601 Willow, AK 99688 **Phone:** 907-232-7719	Ed Ellis, Pres. diamondgoldcorporation@yahoo.com diamondgoldcorporation.com	1978 1978	1 1	**Recent Projects:** Fire Brick Mine. **Mining District:** Yentna Mining District **Commodity:** Gemstones, Gold, Silver, Copper, and Palladium
Donlin Gold LLC 4720 Business Park Blvd., Suite G-25 Anchorage, AK 99503 **Phone:** 907-273-0200 **Fax:** 907-273-0201	Stan Foo, GM info@donlingold.com donlingold.com	2008 2008	20 20	**Recent Projects:** Proceeding with NEPA review and permitting process. **Mining District:** Aniak **Commodity:** Gold
Freegold Ventures Limited 700 W. Georgia St., Suite 888 Vancouver, BC V7Y 1G5 **Phone:** 604-662-7307 **Fax:** 604-662-3791	Kristina Walcott, Pres./CEO ask@freegoldventures.com freegoldventures.com	1985 DND	DND DND	**Recent Projects:** Golden Summit and the Shorty Creek Project. **Mining District:** Fairbanks,Tolovana **Commodity:** Gold, Copper
Goldrich Mining Co. 2607 Southeast Blvd., Suite B211 Spokane, WA 99223 **Phone:** 509-535-7367 **Fax:** 509-695-3289	William Schara, CEO ggallagher@goldrichmining.com goldrichmining.com	1959 1959	3 1	**Recent Projects:** Reclamation, reviewing drilling data from past drill programs and planning for a hard rock drilling program. **Mining District:** Chandalar **Commodity:** Gold, Placer Gold
Graphite One Resources, Inc. 510-700 West Pender St. Vancouver, BC V6C 1G8 **Phone:** 604-697-2862	Anthony Huston, Pres./CEO anthonyh@graphiteoneresources.com graphiteoneresources.com	2007 2010	4 0	**Recent Projects:** Graphite Creek Project. **Mining District:** Cape Nome **Commodity:** Graphite
Heatherdale Resources Ltd. 1040 West Georgia St. Vancouver, BC V6E 4H1 **Phone:** 604-684-6365 **Fax:** 604-684-8092	Patrick Smith, Pres./CEO info@hdimining.com heatherdaleresources.com	2010 DND	DND DND	**Recent Projects:** Heatherdale holds 100% interest in the advanced exploration stage Niblack Copper-Gold-Zinc-Silver Project. **Mining District:** Alaska **Commodity:** Gold, Copper, Zinc, Silver

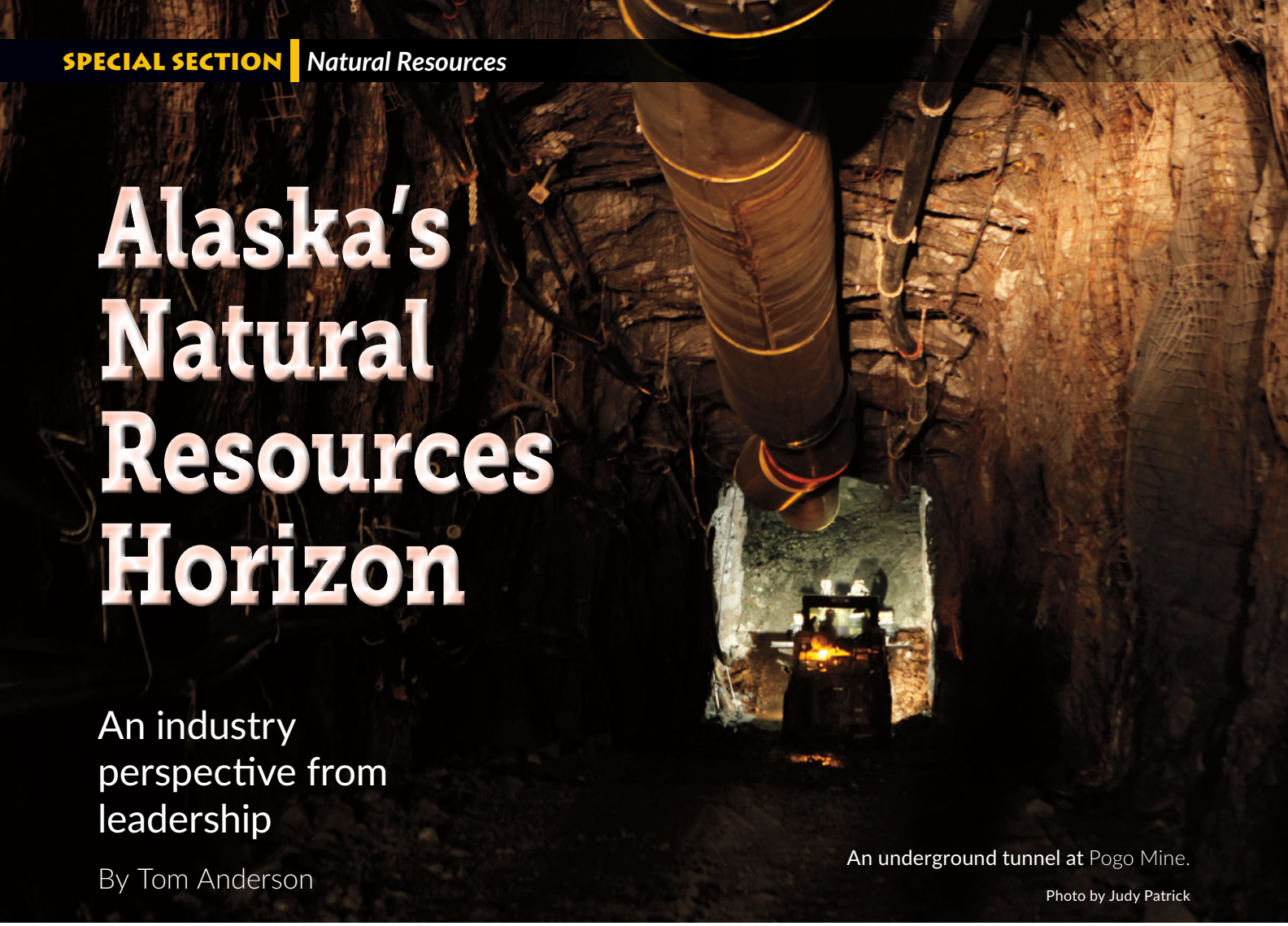
COMPANY	TOP EXECUTIVE	FOUNDED/ESTAB.	AK	WORLDWIDE\AK EMPLOYEES	SERVICES
Hecla Greens Creek Mining Co. PO Box 32199 Juneau, AK 99803 **Phone:** 907-789-8114 **Fax:** 907-789-8128	Scott Hartman, GM hecla-mining.com	1988 1988	415 415	**Recent Projects:** An aggressive underground drilling program is anticipated at Greens Creek in 2015 with plans for three drills to be active all year. Production in 2015 is expected to be 7.3 million ounces. **Mining District:** Admiralty Mining District **Commodity:** Silver, Zinc, Lead, Gold
Hope Mining Co. PO Box 101827 Anchorage, AK 99510 **Phone:** 907-274-1906 **Fax:** 907-644-0361	Al Johnson, Pres. hopemining.com	1923 1923	1 1	**Recent Projects:** Hope Mining Company is a commercial mining company that specializes in gold mining leases. We locate, buy, sell and lease gold claims and can provide placer mining consultation. **Mining District:** Seward **Commodity:** Placer Gold, Silver
Kinross Fort Knox PO Box 73726 Fairbanks, AK 99707 **Phone:** 907-490-2218 **Fax:** 907-490-2290	Eric Hill, GM anna.atchison@kinross.com kinross.com	1995 1995	8,000 650	**Recent Projects:** Continued investment in process streams to include construction of a process solution booster pump station. **Mining District:** Fairbanks **Commodity:** Gold
Millrock Resources, Inc. PO Box 200867 Anchorage, AK 99520 **Phone:** 907-677-7479 **Fax:** 907-677-3599	Greg Beischer, President/CEO info@millrockresources.com millrockresources.com	2008 2008	DND DND	**Recent Projects:** Millrock currently has 22 active exploration projects: eight gold, copper, and zinc properties in Alaska; a uranium project in New Mexico; and 12 gold, silver, and copper projects in Mexico. **Mining District:** Alaska, Southwest USA, and Mexico **Commodity:** Base Metals, Gold, Precious Metals, Uranium
NovaCopper, Inc. Suite 1950-777 Dunsmuir St. Vancouver , BC V7Y 1K4 **Phone:** 604-638-8088 **Fax:** 604-638-0644	Rick Van Nieuwenhuyse, Pres./CEO info@novacopper.com novacopper.com/index.asp	2012 2012	DND ~44	**Recent Projects:** Upper Kobuk Mineral Projects. **Mining District:** Ambler **Commodity:** Copper, Zinc, Lead, Silver, Gold
NOVAGOLD 789 W. Pender St., Suite 720 Vancouver, BC V6C 1H2 **Phone:** 604-669-6227 **Fax:** 604-669-6272	Gregory Lang, Pres./CEO info@novagold.com novagold.com	1998 1999	13 0	**Recent Projects:** NOVAGOLD's Donlin Gold project is progressing through the permitting process. The U.S. Army Corps of Engineers, lead permitting agency, anticipates issuance of the final Donlin Gold EIS in early 2017. **Mining District:** Kuskokwim Gold Belt **Commodity:** Gold, Placer Gold, Precious & Base Metals
Nyac Mining Co./Nyac Gold/NyacAu 1634 W. 13th Ave. Anchorage, AK 99501 **Phone:** 907-279-6094 **Fax:** 907-279-6867	Mike James, Pres. mjames@nyacak.com	1982 1982	~60 ~60	**Recent Projects:** 1-placer gold mine at NYAC , AK 2-hard rock gold exploration at NYAC , AK 3-placer gold mine at Little Squaw Creek, AK **Mining District:** Southwestern Alaska and Northern AK **Commodity:** Gold
Oxford Assaying & Refining Corp. 3406 Arctic Blvd. Anchorage, AK 99503 **Phone:** 907-561-5237 **Fax:** 907-563-8547	Toni Goodrich, VP facebook.com/oxfordmetals oxfordmetals.com	1980 1980	8 8	**Recent Projects:** Oxford has been the only gold refiner and bullion dealer in Alaska for more than 35 years. Oxford provides the service, value, honesty, and integrity that Alaskans have counted on for generations. **Mining District:** Alaska **Commodity:** Gold, Silver
PacRim Coal LP 1007 W. Third Ave., Suite 304 Anchorage, AK 99501 **Phone:** 907-276-6868 **Fax:** 907-276-2395	Dan Graham, Chuitna Proj. Mgr. chuitnacoalproject.com	1972 2005	2 2	**Recent Projects:** Exploration dates back to 1968, permitted in the 1980's, re-permitting initiated in 2005. **Mining District:** Beluga Coal Field **Commodity:** Coal
Pebble Limited Partnership 3201 C St., Suite 602 Anchorage, AK 99503 **Phone:** 907-339-2600 **Fax:** 907-339-2601	Tom Collier, CEO receptionist@pebblepartnership.com pebblepartnership.com	2007 2007	15 15	**Recent Projects:** Continuing to advance the Pebble Project. **Mining District:** Southwest Alaska - Iliamna **Commodity:** Copper, Molybdenum, Gold
Polar Mining, Inc. 5836 Poker Creek Cir. Fairbanks, AK 99712 **Phone:** 907-455-4198	Dan May, Pres. pmi@ak.net	1981 1981	7 7	**Recent Projects:** Fox Mine Site. **Mining District:** Fairbanks **Commodity:** Base Metals, Gold, Placer Gold, Gravel
Sumitomo Metal Mining Pogo LLC PO Box 145 Delta Junction, AK 99737 **Phone:** 907-895-2841 **Fax:** 907-895-2866	Chris Kennedy, GM pogominealaska.com	2005 2005	315 315	**Recent Projects:** Pogo continues to operate as the top producing underground gold mine in Alaska. The company invests heavily in exploration and is working to extend the life of the mine. **Mining District:** Goodpaster **Commodity:** Gold
Teck Alaska-Red Dog Mine 3105 Lakeshore Dr., Bldg. A, Suite 101 Anchorage, AK 99517 **Phone:** 907-754-5116 **Fax:** 888-900-1179	Henri Letient, GM reddog.info@teck.com reddogalaska.com	1989 1989	11,000 450	**Recent Projects:** Lime silo construction. **Mining District:** Noatak **Commodity:** Base Metals, Lead, Zinc
Tower Hill Mines 506 Gaffney Rd. Fairbanks, AK 99701 **Phone:** 907-328-2800	Thomas Irwin, CEO info@ithmines.com ithmines.com	2006 2006	11 10	**Recent Projects:** Tower Hill Mines is an advanced exploration stage company focused on the development of its 100% interest in the Livengood Gold Project located 70 miles northwest of Fairbanks, Alaska. **Mining District:** Livengood, Fairbanks **Commodity:** Gold
Ucore Rare Metals, Inc. 210 Waterfront Dr. Bedford, NS B4A 0H3 **Phone:** 902-832-5246 **Fax:** 902-491-4281	Jim McKenzie, CEO info@ucore.com ucore.com	2006 2006	DND 2	**Recent Projects:** Currently in the permitting process doing water and environmental testing. **Mining District:** Ketchikan **Commodity:** Rare Earths, Tantalum, Niobium
Usibelli Coal Mine, Inc. 100 Cushman St., Suite 210 Fairbanks, AK 99701 **Phone:** 907-452-2625 **Fax:** 907-451-6543	Joseph Usibelli Jr., Pres. info@usibelli.com usibelli.com	1943 1943	115 115	**Recent Projects:** Recently began operations in Jumbo Dome mining unit. **Mining District:** Healy **Commodity:** Coal
WestMountain Gold, Inc. 120 East Lake St., Suite 401 Sandpoint, ID 83864 **Phone:** 208-265-1717 **Fax:** 208-906-8621	Gregory Schifrin, CEO mlangway@westmountaingold.com westmountaingold.com	2007 2007	DND 13	**Recent Projects:** Terra Project. **Mining District:** McGrath **Commodity:** Gold
ZAZU Metals Corporation 885 Dunsmuir St., Suite 350 Vancouver, BC V6C 1N5 **Phone:** 604-878-9298 **Fax:** 604-568-9298	Matthew Ford, Pres. info@zazumetals.com zazumetals.com	2006 2007	3 1	**Recent Projects:** Lik Project. A zinc development property in NW Alaska. **Mining District:** Northwest Alaska **Commodity:** Zinc, Lead

DND= Did Not Disclose

Alaska's Natural Resources Horizon

An industry perspective from leadership

By Tom Anderson



An underground tunnel at Pogo Mine.

Photo by Judy Patrick

It was Alaska's Governor Bill Walker who pegged the State's FY2016 deficit at nearly $3.7 billion last summer. He, too, called the Alaska State Legislature into special session October 24 to consider monetizing natural gas reserves through a gas reserves tax and to assess expenditures for an enormous natural gas pipeline project flowing from the North Slope south to the Kenai Peninsula.

The very real fact the Alaska economy and annual budgets are dependent on natural resource extraction and revenue doesn't go unnoticed by the business leaders in this industry exclusively. The collective of resource development and commerce trade associations also remains vocal about the state's prospective fiscal instability. The opinions of the leaders of these organizations matter too, and may very well represent the largest swath of affected Alaskans: employers, employees, customers, and their families.

The Alliance is a nonprofit trade association with 680 members and 30,000 employees represented. The organization promotes responsible natural resource exploration and development, particularly in the oil, gas, and mineral sectors.

Rebecca Logan, the Alliance's executive director, says a permanent goal of her members is "to improve public awareness of the relationships among political decisions, industry activity, and Alaska's economic health." Logan recognizes Alaska's budget is in jeopardy, highlighting that "in a low-oil price environment with a large state budget deficit—the most important message we can communicate on behalf of our members is that actions have immediate consequences."

The Alliance has long focused on fairness afforded to the private sectors when it comes to resource extraction and markets. Logan says a seemingly harmless veto of $500 million in tax credits leads to the immediate reduction in work for the support industry and job losses. Further, "Attempting to restructure the [Alaska] LNG project leads to an immediate delay in the progress of the project and that leads to uncertainty for the support industry who is currently allocating financial and human resources to plan for the mega-project and their future work," she adds.

Logan and Alliance Board of Directors have been working on securing reasonable tax credit incentives for the association's members, recently working with a group put together by State Senator Cathy Giessel and also facilitating meetings with presidential candidates that involve briefings on Alaska's role in solving national energy problems. Waning employment, energy independence, and prospective projects to generate more revenue are the lion's share of the discussion.

"We are involved with a group of trade associations working on sustainable budget issues," says Logan. "We will be putting together recommendations for the Walker Administration and the state legislature on appropriate fiscal policy and opportunities for efficiencies and savings in the state budget."

Presidents and Policies—Council of Alaska Producers

On August 24, a week prior to President

Barack Obama's historic three-day visit to Alaska on a global warming awareness mission, some of the most prominent commerce, resource, and labor nonprofit advocacies in the state sent a letter to the President. The message was reminder of Alaska's vital dependence on natural resource development.

"Since becoming a state in 1959, 88 percent of state revenue from all natural resource development has come from oil and gas development. Including all direct, indirect, and induced employment and wages, oil and gas spending accounted for 110,000 jobs and $6 billion in public and private sector wages—estimates that do not include nonresident industry workers or their wages," states the letter.

One of the signers of the letter to the president, along with Logan at the Alliance and twelve other organization leaders, was Karen Matthias with the Council of Alaska Producers.

The Council of Alaska Producers (CAP) is a trade association formed in 1992. CAP advocates for large metal mines and major metal developmental projects in the state by representing and educating policymakers on regulatory issues. The nonprofit supports and advances Alaska's mining industry while serving as an information source for the public, media, and government on related issues involving economic opportunity and environmentally sound practices.

Matthias notes that her members' industry "provides 8,700 direct and indirect jobs in Alaska." CAP supports the state's efforts to right-size government while maintaining a rigorous and efficient permitting system. "I want to see more mines permitted and developed responsibly in Alaska so that mining can make an even greater contribution to the state," she adds.

CAP's members deem it a priority to allow the private sector to move forward with projects that create jobs, goods, services, and ultimately revenue. Matthias says providing royalties to Native corporations and directly benefitting communities through compliant environmental and safety standards for all mining activities will further ensure fiscal growth and stability.

"At CAP, we believe existing mines and new mining projects should be rigorously reviewed, and those reviews should be science-based, transparent, and efficient," says Matthias. "Stringent state and federal laws and regulations not only protect health, safety, and the environment, but also require financial assurances that provide for restoration of mine sites after closure. As a parent and as someone who enjoys Alaska's great outdoors, I want to see Alaska be economically and environmentally sustainable."

The Economics of it All—Anchorage Chamber of Commerce

The Anchorage Chamber has nearly one thousand members throughout the Municipality of Anchorage, with committees and policy task forces that monitor critical business issues and establish positions based on what is in the best interest of business.

In May, Bruce Bustamante was named president of the Chamber, replacing Andrew Halcro, who ran for Anchorage mayor. Bustamante previously served a regional sales director for Alaska Airlines, president and CEO of the Anchorage Convention & Visitors Bureau, and director of public affairs for Princess Cruises Alaska.

"At the Anchorage Chamber of Commerce we recognize the need to educate our membership on issues related to a natural resource based economy," says Bustamante. "Each week we host the 'Make it Monday Forums' for members and non-members to get information on developments that relate to their businesses for which natural resources and support services are always very popular and significant. And the education continues through other education tools such as Chamber Academy and the CEO Forums."

Bustamante says the Anchorage Chamber's forum content is often determined through membership surveys and board of director input.

Policymakers at the local, state, and federal level certainly take note of and respect the voice of chambers of commerce. Anchorage's chamber is the largest in the state for city representation, and when economic sectors are discussed, whether highlighting a poll or reviewing an academic analysis, the layers of staff, management, and elected officials within government are seen attending and participating in the dialogue.

There is longevity with the Anchorage Chamber, which also lends credence to its message. Bustamante proudly acknowledges that over the last one hundred years the Anchorage Chamber has been serving the interest of its business members in the Anchorage area with a mission embracing civic, economic, and cultural betterment of the community. From the Anchorage Chamber of Commerce's perspective, that includes a robust natural resources industry.

The ANWR Objective—Arctic Power

"Keeping optimistic after thirty-five years of battling Congress and various administrations is hard to do for Alaska's outreach natural resource groups," says Adrian Herrera, executive director of Arctic Power.

"With so much of our state ruled by quagmires of federal agencies and White House agendas in DC, an awfully long way away from the everyday lives of Alaskans, it is easy to see why we have malaise towards efforts to spend money to fight these issues. Yet with no other in-state industry or income to generate the needed funds to operate Alaska, it's an absolute necessity to argue and campaign for resource development on the federal level," adds Herrera.

Arctic Power is a grassroots organization founded in 1992 to expedite congressional and presidential approval of oil and gas exploration and production within the Coastal Plain of the Arctic National Wildlife Refuge (ANWR).

"Whether it be OCS [outer continental shelf] revenue sharing or development, ANWR 10-02 exploration, or NPR-A [National Petroleum Reserve-Alaska] development, these battles are fought in DC on the Hill and in the DC administrative offices. Unfortunately Alaskans almost never have the chance to read a press article that carefully explains the process or complexities of debate, and thus often remain only aware of these issues in a black or white headline simplistic way," says Herrera.

The organization's management and members visit congressional offices yearround to personally deliver the views of Alaskans and works on a day-by-day basis to help move bills. Yet when it comes to advocacy, funding for the organization is drying up and the state legislature is wavering on fiscal support.

Herrera points to the fact that updated and relevant ANWR and resource development information provided to federal policymakers and staff may be the only tangible way to achieve a consensus to open development. He adds that with TAPS [Trans Alaska Pipeline System] volume steadily declining and environmental groups boasting from a massive influx of financial support, Alaska pro-development advocacy will be far more successful in a concerted, organized voice like that of Arctic Power.

Herrera works nearly every day of the year to promote the potential and encourage congressional members to recognize the importance of development in Alaska's Arctic. He believes Alaska is nearing the finish line to victory for development in the region, but that also takes support.

"On ANWR, the House has passed the issue twelve times, prompting many to complain to us pushing bills, 'How many more times do we have to do this for you?' Overcoming a Senate filibuster [requiring sixty votes] is the main obstacle and to mount a campaign to do that would require $5 [million] or $6 million per year. Even then there is no guarantee of success. We have passed that hurdle three times yet only once made

it to the White House only to be vetoed by President Clinton. With Congress sitting only two hundred days a year and competing against hundreds of other larger bills, often there is literally no chance for a vote at all."

Alaska resources advocacy appears to succeed more often when the industry is behind organizations like Arctic Power and executive directors have the tools and arsenal of messaging capability to generate attention, visibility, and reputation. As Herrera contends, "For us it's also critically important that Alaskans support the grassroots of the message and the Alaska legislators sponsoring pro-development resolutions and statements that influences the president, his administration, and our Congress."

Let the Oil Flow—Alaska Oil & Gas Association

The Alaska Oil & Gas Association (AOGA) is a trade association primarily advocating for the long-term viability of the oil and gas industry in Alaska. Led by President and CEO Kara Moriarty, a former educator, advocate and both federal and state legislative staff member and policy analyst, AOGA is addressing the state's fiscal crisis with measure and diplomacy.

"In light of the current low oil prices impacting both the resource development industry and state's budget, efficiency, and cost containment are front and center for our industry," says Moriarty. "As Alaska looks to diversify its economy, a vibrant and successful oil and gas industry will remain crucial to the state's future."

Moriarty imparts that any potential state fiscal policy change needs to be examined by considering the long-term consequences of short-term strategies. "To do otherwise risks compromising an industry that remains the driving force for the Alaska economy as well as the key contributor to the state's fiscal welfare."

AOGA stands by the recognition that since statehood, oil and gas activities have been essential in providing jobs to Alaskans and revenues for state funding. Moriarty delineates that one-third of all jobs in Alaska can be attributed to the industry. As oil prices continue to stay at lower levels, cost containment, efficiencies, cooperation, and technology will all play a role in the state and industry weathering yet another price cycle, she notes.

Moriarty says AOGA's mission is to promote the vast resources in Alaska, with one-third of the nation's reserves here in the state, including over five billion barrels of conventional oil remaining in existing fields, another two billion in shale and upwards of 10 billion barrels of oil in federal lands onshore not currently open for development in ANWR, and 35 trillion cubic feet of natural gas. The Arctic OCS is estimated to contain 27 billion barrels of oil and 132 trillion cubic feet of natural gas. This does not include the 24 billion to 30 billion barrels of heavy and viscous oil that exists onshore but for which technology does not yet exist for bringing that resource to market. "Alaska should not contemplate sacrificing its future welfare by undermining one of its most important assets. Changes need to be evaluated on more than just the impact on state revenues, but also the impact the change would have on the private sector," cautions Moriarty.

Building Alaska's Economy—Associated General Contractors of Alaska

The Associated General Contractors of Alaska (AGC) is a construction trade association with over 640 general contractors, specialty contractors, suppliers, and manufacturers and represents the largest segment of the construction industry in Alaska. When resource development is underway, from exploration and extraction to production and delivery, many AGC members are the operators and technicians performing the services.

John MacKinnon, AGC's executive director, admits the most recent legislative and special sessions created a struggle to reach a budget compromise, regardless of the price of oil and projections of fiscal crisis. He and his members in the building trades are proactive at the local and borough levels, as well as with state and federal bureaucracies, to relay the urgency for responsible resource development and infrastructure.

"Thanks to hidden fees on your airplane ticket, the gas tax, and a federal highway and aviation program, there will continue to be a stable volume of horizontal construction work for the foreseeable future—provided Congress does their job," says MacKinnon. "What we will begin to experience beginning next year, outside of military construction, is a significant reduction in building construction, or vertical work," he adds.

MacKinnon acknowledges the price of oil will soon have a big impact on the construction industry. He says there is a direct impact because of reduced industry investment and flat capital budgets that fall short of even funding for deferred maintenance. Add to the mix indirect consequences from reduced private investment and there surfaces a palpable apprehension in investment and commerce absent state support.

AGC embraces the macro view of Alaska's economy when it comes to synergy in industry. MacKinnon is consistent in his bottom line that the construction industry feeds all other industries. Whether AGC members are the "umbilical cord" of commerce and growth, or a cog in the resource development wheel that keeps process and movement in motion, it's evident by the number of construction projects statewide that contractors are integral to exploration.

"There are a significant number of workers who start a career in construction and after a period of time, move on to doing similar or related work in other sectors—oil and gas and mining in particular," says MacKinnon. "The experience and skill sets they learn in their construction years, building projects like new mines and petroleum facilities, makes for an easy transition into those resource industry jobs."

AGC, like many of the trade associations, holds true to the perspective that construction, transportation, research, and ultimately exploration and resource removal are a chain of actions that are integral to each other.

Solidarity to Solve the Problem

Whether Alaska's budgetary struggles are perceived as spending-based, or pervasive because of burdensome tax and regulatory constraints on the petroleum and mining industries, it's rational to conclude that any opportunity to support a burgeoning development climate must come from advocates as much as benefactors.

The commerce, resource, trade, and building associations that endorse and support responsible resource development in Alaska are definitely being heard by both elected officials and voters. Input and education are the lifeblood of policy change.

The question remains: Wwhat direction into the natural resource horizon will Alaskans choose?

As the August letter to President Obama concluded, "Alaska's motto is 'North to the Future.' As you develop and implement federal regulatory policy, we encourage you to consider the potential future impacts to Alaskans and Americans in the Lower 48, and strike a reasonable balance that will continue to permit the development and use of our resources. Alaska may be small in population, but its opportunities are countless." ☼

Tom Anderson writes from across Alaska.

Regional Training Centers Prep Workforce

Photo by Steve DuBois

Collaboration helps provide life-changing tools

By Molly Dischner

Partners for Progress in Delta, Inc. Operator's Academy graduates and Governor Bill Walker with Labor Commissioner Heidi Drygras and Representative Jim Colver in Delta Junction on June 9, 2015; (from left) Jay Hodges, Bill Finke, Robert Deeter, Anthony Chavez, Josiah Helkenn, Representative Jim Colver, Erik Linnik, Governor Bill Walker, Anne Steel, Levi Tucker, Mariah Groppel, Commissioner Heidi Drygas, Kimba Crocketts-Manning, Gary Hall, Andre Urdininea, Ilya Morozov, Mark Vorobyov, Nikolay Donets, Al Odom.

Alaska's regional training centers prepare students of all ages for the workforce—from driver's licenses to maritime skills. There's also a growing pool of healthcare training in response to increasing demand throughout the state.

Located around the state, the centers serve much of rural Alaska. Many use different models to bring together a range of partners who want to serve students, says Karen Cedzo from the Delta Career Advancement Center, which is operated by Partners for Progress in Delta, Inc., a joint endeavor between secondary and post-secondary education providers and others.

But they all have one thing in common: collaboration and a belief that by working together, the centers can help give people the tools to change their lives.

"There's a lot we can do together," says Ben Eveland, director of Seward's AVTEC (Alaska Vocational Technical Center).

AVTEC

For Eveland, vocational education is a long-time passion. Eveland says it's an education that can make a difference in someone's life and give them tools to improve their life. "It's where the rubber meets the road," he says.

Eveland taught vocational education classes for the Kenai Peninsula Borough School District in the 1980s and worked at the career tech high school in the Mat-Su more recently. In between was more work as a teacher and administrator. In 2014 he returned to the Kenai Peninsula to become director at AVTEC, which serves about three hundred full-time students and another seven hundred to eight hundred students who take a shorter-term class.

The school offers a wide-range of programs, including culinary arts, welding, building trades, and maritime skills.

"I'm excited about them all," he says.

The school is also increasing its healthcare training programs.

The first graduates from the Licensed Practical Nurse program will complete their program in November, and the school also offers training for students to become certified nursing assistants and medical assistants. Come January, Eveland hopes a new set of healthcare training will be up and running.

The new program will be healthcare academies based in Anchorage that are offered in conjunction with the state Department of Labor and Workforce Development.

Eveland says it's a need that impacts nearly every community in Alaska, and the new academies will include an apprenticeship component to help introduce students to the field and prepare them for work in long-term care facilities, and other health fields that currently have high demand for employees. That's partially thanks to collaboration with healthcare providers like Southcentral Foundation and Providence Health & Services.

Although the academies will start out in Anchorage, Eveland says the goal is to make them portable, so they could be taken and taught in any community. The need exists all around the state, he says.

"We're all going to get older, and we need these people there," he says.

Southwest Alaska Vocational and Education Center

With input from a governing board that represents a variety of industries, the Southwest Alaska Vocational and Education Center provides training for the Bristol Bay region from the hub community of King Salmon.

The center is housed on the former US Air Force station and is a partnership between local government, private companies (including local Native corporations), the housing authority, the university system, those in the healthcare world, and tribes through the native association.

The Southwest Alaska Vocational and Education Center was formed in 2002 and is one of the newer centers in Alaska, offering a more local option for the region.

The wide-range of partners translates to a wide-range of classes. Training offered at the center is comprised of construction trades, healthcare training, office skills, welding, and other programs. But much of the focus is on preparing students for fisheries, maritime, and related occupations.

Like other hub-based training centers, it has lodging for some students and instructors, so students in the region can attend classes. The center is also working with school districts to expand its programs for high school students, and the Bristol Bay Borough is working on new buildings for that component of the center.

Alaska Works Partnership/ Fairbanks Pipeline Training Center

With roots in training Alaskans to work on the pipeline, the Alaska Works Partnership now has a focus on a wide-range of construction trades throughout Alaska.

Like other programs, the partnership draws on resources from several entities: the Denali Commission, Construction Education Foundation, Alaska Apprenticeship Training Coordinators Association, Alaska Department of Labor and Workforce Development, Alaska AFL-CIO, and others.

Unlike some of the regional training centers that are geared toward high school students, Alaska Works has a focus on the more traditional workforce and re-training for older Alaskans.

The partnership provides training for the jobs needed to build and operate infrastructure throughout the region—as well as the trainings needed for safe operations and to meet federal standards. Unions for various trades are also involved in the programs. The offerings have also expanded in response to demand: weatherization is now one of the skills offered, in addition to standards like welding, electrical work, and others.

Students preparing for healthcare careers at the Alaska Technical Center in Kotzebue.

A primary focus is on construction academies in Fairbanks, Anchorage, and the Mat-Su region, and the partnership also offers courses that are specific for certain populations, including programs that are geared towards bringing non-traditional workers, such as women or retired or transitioning military members, into construction industry jobs.

Alaska Technical Center

Kotzebue's Alaska Technical Center was started in the 1980s after many conversations in the region about the need for a

Students from Kotzebue's Alaska Technical Center at the Red Dog mine.

Courtesy of Alaska Technical Center

well-trained workforce. Director Cheryl Edenshaw has been there since it started and became director in 1987.

The center draws on partnerships with nearly two dozen organizations, which range from healthcare providers to mining companies and Native corporations.

It offers longer-term courses for a range of vocations including mining technology, healthcare, office work, and construction. The center also administers employer-designed short courses and basic education for adults.

The center has kept growing since it was first founded.

Edenshaw says the center just finished a renovation to the training and residential facilities. Next up is housing for students with families, aiding yet another population access the center's services.

Program offerings have also continued to grow, with the first group of Process Technology students graduating in May 2015 and a recent expansion to the culinary arts program.

Edenshaw said the center is also working on expansions to healthcare and construction courses to meet demand.

"Because we live, train, and work in Arctic Alaska, we are very focused on the opportunities and challenges that come as a part of the ongoing changes in our environment," Edenshaw writes.

Northwestern Alaska Career and Technical Education Center

There are two basic things a student needs for a job: a driver's license and a high school diploma. The Northwest Alaska Career and Technical Education Center (NACTEC) is helping students in the Nome region achieve both.

NACTEC began as a conversation between Nome Public Schools and the Bering Straits School District—and a possible solution to a problem with education. Graduation rates were low, there were unused shop facilities at Nome-Beltz High School, and the two school districts thought they might be able to work together to provide vocational education for the fifteen villages around Nome, says Doug Walrath, NACTEC director. Since then several entities have come together to aid the collaboration with funding.

And in the past decade, the collaboration has worked.

"The graduation rates started climbing steadily," Walrath says.

The region has gone from having about seven out of ten students drop out each year to seven out of ten students graduating.

"That's pretty darn powerful," Walrath says.

Today Walrath says, the regional graduation rate is about 73.2 percent, on par with the state's urban school districts.

The school uses a different model than other training centers, but one that's meant to respond to regional needs. Students attend two-week modules during the school year and four week modules in the summer.

The length is meant to help them adjust to the amount of time they might be away from home if they take a job on the North Slope or at a mining project; two weeks is also considered about the maximum length a student can be away from core classes and still catch back up, Walrath says.

Like other training centers, NACTEC provides a wide-range of courses, aligned with the Alaska Department of Labor and Workforce Development's priorities for workforce education.

The most basic is driver's ed. The center is the only driver's ed course in an eighty-thousand-square-mile region; it's also certified as a third party examiner for road tests.

"The opportunity to get in a vehicle and drive is limited," Walrath says, but the skill is often required.

Beyond driver's ed, the center has classes on transportation fields, preparation for work in fisheries and maritime work, and hospitality and tourism training. One course combines Alaska Native arts with business and marketing. But one of the center's strengths is healthcare—a response to the local demand for healthcare employees.

A dual-credit program enables high school students to start training to become certified nurse aides and get some college credit for the coursework.

Walrath says that's a priority for a local health consortium, which wants to see more local residents work at the Norton Sound Health Corporation in Nome.

That's because local employees have a better retention rate, and patients are often more responsive to a care provider they can relate to, Walrath says. At last count the long-term care facility associated with the hospital had eight tribally-enrolled certified nursing assistants, he says, which the HR department considered a great benefit for the corporation and for the community.

The center also has a village health aide training program.

Southeast Alaska Career Consortium

The Southeast Alaska Career Consortium is geared toward educating Alaskans who need entry-level skills or want to be more marketable in the workplace. The consortium developed out of the Sitka Education Consortium, which began in 1995, and is focused on helping various entities in the region pool their efforts and best use their resources. It's largely under the umbrella of

Courtesy of NACTEC

Students raising a pole at the Northwestern Alaska Career and Technical Education Center in Nome.

Sitka Schools, but local education outlets Sitka High School, the University of Alaska Southeast, and the Sheldon Jackson campus are all part of the consortium. Local industry also participates.

The consortium uses career pathways to help prepare high school students and others for the workforce.

Galena Interior Learning Academy

Like NACTEC, the Galena Interior Learning Academy is a boarding school, part of the Galena City School District, that provides an opportunity for students from many communities to come together and learn.

The school moved into the Galena Air Force Station in 2008, and work is still underway to finish turning the former military installation into a school. Although enrollment has varied, the school can house up to about 350 students. Last year about 200 students attended.

The school started in 1997 with project-based learning and is now a boarding school for students throughout the state to learn automotive technology, aviation (including both flight instruction and dispatcher programs), construction trades, cosmetology, computer science, and culinary arts. Health sciences and medical terminology courses are also offered.

In response to statewide needs the academy has also looked at adding additional natural resource related coursework, including a wildland firefighter training program and a natural resource management class. The learning academy also provides a regular academic curriculum, unlike many of the other regional training centers.

The Galena Interior Learning Academy is also the only center with other components of traditional secondary education, like school sports. Academy students can compete in cross country, volleyball, wrestling, and several other sports while also learning trades.

According to the school plan, the goal is to either prepare students for direct entry into the workforce in those fields or to prepare them for further study.

Iḷisaġvik College

The training center farthest north in Alaska—and in the United States—is in Barrow at the Iḷisaġvik tribal college, which houses the Northwest Area Health Education Center.

Programs at Iḷisaġvik reach nearly every age, from middle school to post-secondary workforce development, and are offered at the Barrow campus as well as villages throughout the region.

The college also offers many classes in response to what North Slope employers are looking for. Those can range from necessary personnel-type trainings to business planning, marketing, video production, or asbestos abatement.

Through the Junior Public Health Educator program, high school students learn to talk to younger students about health education topics throughout the region.

The college also offers an associate's degree in allied health, as well as summer camps for middle and high school students meant to introduce them to those fields. That program serves as both recruitment for the college's programs and an introduction to higher education.

Many of the high school programs also offer dual credit, helping the students get a start on college coursework.

Delta Career Advancement Center

Partners in Progress for Delta, Inc. operates the Delta Career Advancement Center, which is a collaboration between the Delta-Greely School District, the University of Alaska Fairbanks Career and Technical College, the Alaska Works Partnership, and UAF's Cooperative Extension Service.

Under the auspices of that program, high school students learn about aviation and welding, and community members can finish a university degree or learn business skills—an increasing popular set of offerings. About two hundred students make their way to the center each year.

Each partner delivers curriculum through the organization, Cedzo says.

"There's a lot of collaborative activity that's made possible because of the center," she says.

The list of partners doesn't end there.

Even the local fairgrounds help out with one summer class. Each June, the center coordinates a heavy equipment operators academy for three weeks. Alaska Operating Engineers Local 302 helps with the training, Delta Industrial Rentals provides equipment to allow students to practice their skills, the community helps provide housing, and students come from across Alaska to participate after applying for a seat in the class.

For its part the fairgrounds offer space for the course; in exchange the students usually help out with a project there. This summer they redid the horse arena.

Of the one hundred or so participants so far, Cedzo says, at least 25 percent have placed in the trades or construction fields after finishing the heavy equipment operators academy. Last year the training was also approved as a pathway into the Operating Engineers Union if a participant met certain qualifications.

The certified nursing aide program is another popular option that meets a growing demand for healthcare professionals in Interior Alaska. Delta itself has had a new clinic and assisted living facility open in the last several years.

Students are based in Delta, with videoconference and in-person instruction from a teacher who drives in from Fairbanks. Eventually, they all do a clinical component in Fairbanks.

"That has made it possible for folks in this area to get some of the emerging health-related jobs in this area," she says.

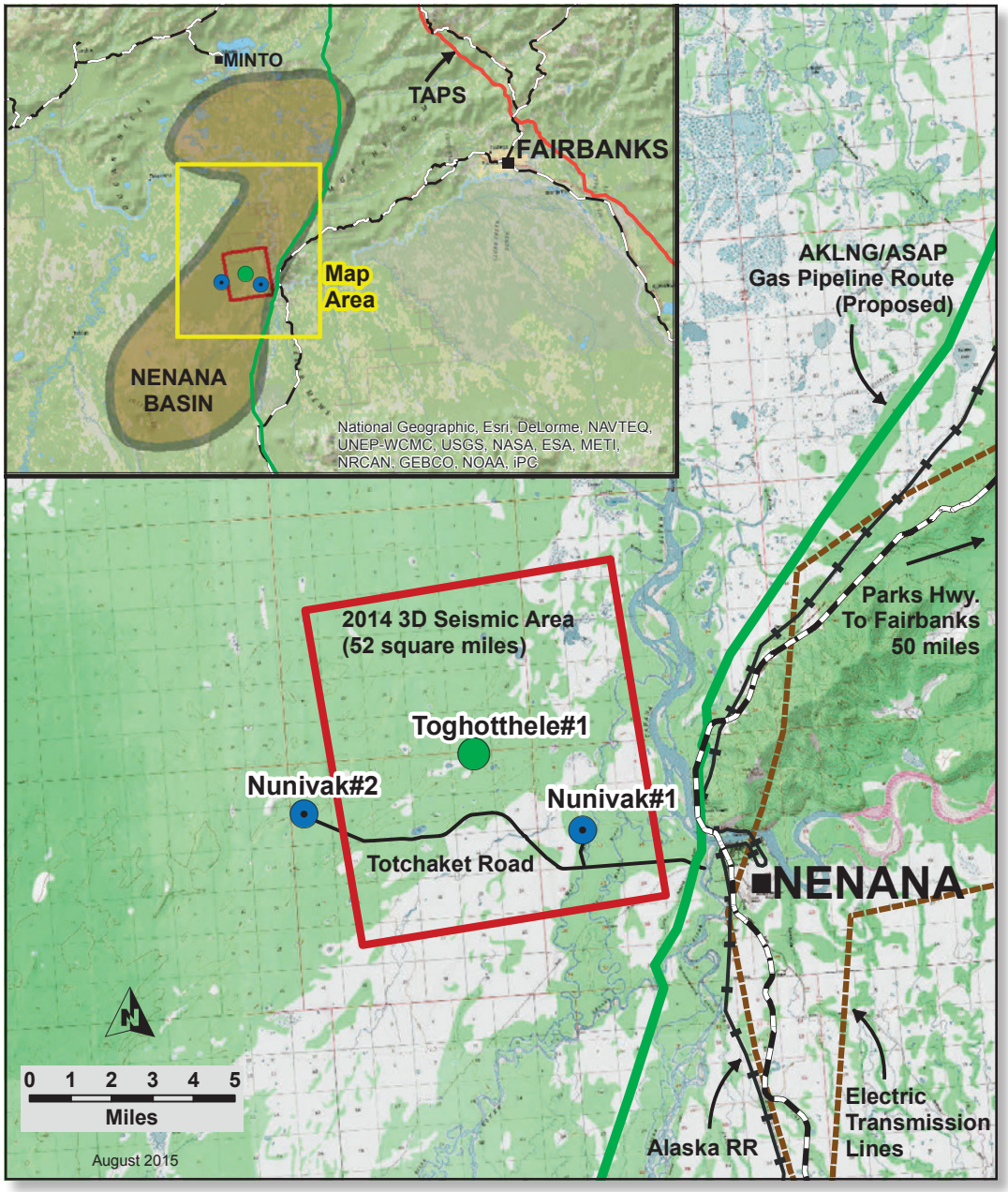
Cedzo says the offerings are based on the needs seen in the community—something repeated at each of the training centers in the state. "We kind of think what we're doing here is life-changing." ☼

Freelancer Molly Dischner writes from Dillingham.

New Well for Doyon in 2016

Company hopes to fuel Interior Alaska

By Julie Stricker



Doyon, Limited is hoping for some luck. The Fairbanks-based Alaska Native corporation announced in August that it plans to drill a third well in the Nenana-Minto basin. While the first two showed promising signs of hydrocarbons, Doyon officials hope the third time will deliver enough natural gas, and hopefully oil, to fuel Interior Alaska.

Doyon was created under the 1971 Alaska Native Claims Settlement Act. It is one of the top ten Alaska-owned companies, owning more than a dozen for-profit companies in fields such as oilfield services, government contracting, tourism, and resource development. It has 19,200 shareholders. In 2014, it had after-tax profits of $23 million on revenues of $363 million.

Doyon President and CEO Aaron Schutt announced the plans for the new well in a rare press conference. Standing at a dais in the lobby of Doyon's headquarters, Schutt plunged right in.

"Last winter, we ran an extensive 3D seismic program just west of the community of Nenana," he says. "We processed the data, got recommendations on next steps and we're very excited to announce the well."

Toghotthele No. 1

Doyon is hoping the well, called Toghotthele No. 1, will provide commercial quantities of natural gas and oil.

"We are very excited to begin the next phase of our exploration program," Schutt said in a news release announcing the well. "Building on promising results from each of our earlier programs, we have substantially reduced exploration risks to a point that we estimate the chance of success for a developable gas find is one in two, and one in five for oil. An oil or gas discovery would be great news for our companies, shareholders, residents of Interior Alaska, and the state."

The geology is promising, Schutt says. In the past decade, Doyon has done extensive 2D and 3D mapping of the area, about sixty miles southwest of Fairbanks. The most recent mapping, completed in 2014, identified several drilling opportunities in a fifty-square-mile area.

"We can see world-class rocks that provide good top seals," he says. Doyon found gas in both its Nunivak No. 1 and Nunivak

No. 2 wells, but believe broken top seals had let much of the gas in those locations escape. Toghotthele No. 1 is about equidistant between the first two wells, about seven miles west of Nenana.

"Certainly the basin has generated a lot of gas," he says. "The basin should also generate oil. Looking at the structure in this location, we're very, very optimistic." Schutt says experts estimate there's a one in two chance of a producible gas field in Toghotthele No. 1.

"With oil and gas exploration, you don't know what you have until you actually drill a well," he says. "What we've seen in the previous two holes has been very encouraging."

Interior Resource

Doyon is working closely with the village corporation for Nenana, Toghotthele Corporation. The corporation named the third well, which is not only the corporation's namesake, but that of a prominent local landmark. In Athabascan, it means "hill on the water."

Doyon Board of Directors Chairman Orie Williams believes the name will bring good luck to the enterprise.

"Chief Peter John used to say that 'Mama, there's something floating in the distance,'" Williams says. "Back in the old-time days when they traveled the rivers, they could see that Toghotthele Hill floating out in the distance, a good place to camp. It was a major landmark, so there will be some spirituality with this well and there will be some good luck to come with it.

"Cross your fingers and toes and whatever is available to see if this one comes in for us," he adds.

Doyon has been actively exploring the Nenana/Minto basin for about ten years on about 400,000 acres of state-owned land. Doyon also owns the subsurface rights, including oil and gas rights, to an additional 40,000 acres. It is also exploring a parcel of its land in the Yukon Flats near Stevens Village to the north. Doyon is one of the largest private landowners in the United States, with about 12.5 million acres, an area the size of France.

Doyon is leading the first exploration of potential large oil and gas deposits in Interior Alaska. Most other petroleum exploration has been focused on the Cook Inlet and North Slope regions. If it does strike commercial quantities of oil or gas, it could bring relief to Interior residents, who have some of the highest energy costs in the nation.

"We're excited about the opportunities of working within our community, hoping to create an Interior source that we can use right here in Fairbanks, as well as statewide," Schutt says. "Also, we are very thankful that the state has a tax credit program that very much helps Doyon achieve its objectives. Wildcat exploration is not for the faint of heart, and the state's program is certainly a big part of Doyon's effort in the Nenana-Minto basin."

Wet Hydrocarbons

Nunivak No. 2, drilled in 2013, yielded propane and butane and other "wet" hydrocarbons that could be distributed to villages along the river systems in Doyon's region. Nenana is the launching point for most of the barges that service those communities.

"In terms of gas for Fairbanks, it really depends on what we find," Schutt says. Doyon would like to be able to serve the local market and be part of the energy solution for the region, he says.

"If it's bigger than that, if we're that lucky, then of course the Alaska LNG pipeline projects could provide export opportunities," he says. The proposed route for the Alaska LNG pipeline is only a few miles from the drill site. Even building a forty-five-mile pipeline to service Fairbanks would be a relatively quick process.

The Nenana basin is fifty miles long and twenty miles wide, trending northeast, west of the Tanana River. The geology is sedimentary, containing abundant hydrogen-rich coals, "coaly" shales, and possible lake bed shales, according to a March presentation by James Mery, Doyon senior vice present of lands and natural resources, to the Alaska House and Senate Natural Resources Committees. The Nenana basin was explored in the 1960s and '80s by Shell, ARCO Alaska, and Union, and two shallow wells were drilled.

Doyon has created two "data rooms," one online and one in Anchorage, that hold results from its recent drilling and seismic efforts, as well as data from the older explorations it has licensed from the major oil companies.

Project Timelines

If Doyon strikes gas, Schutt estimates it would take three to five years to get it to market, slightly longer if they strike oil. However, with the gas market in flux and potential projects underway to ship Cook Inlet gas to Fairbanks by rail or truck, a gas-only discovery wouldn't be ideal. Striking oil would bring the most economic benefits to Doyon and would likely trigger further exploration of the larger Yukon Flats basin.

Because the drill sites are so close to existing infrastructure—the Parks Highway, Alaska Railroad, and a major power intertie are only a few miles away—Doyon says the basin doesn't need a North Slope-sized discovery for the well to be economic, although low oil prices don't help. Doyon estimates the field would need to hold between 25 million to 50 million barrels to be economic.

Doyon, Limited President and CEO Aaron Schutt announcing drilling plans at the company headquarters in Fairbanks in August.

The Toghotthele No. 1 well will be relatively shallow, about 9,000 or 10,000 feet deep. Schutt says petroleum prospects are located as shallow as 6,500 feet. The drilling shows intervals greater than 200 feet of immature oil prone source rocks that drop into the basin "kitchen," where oil and gas are expected to be more abundant. Additional 2D seismic testing is planned for 2016 to better define areas seen in the 2012 mapping.

Drilling won't start until summer 2016 because Doyon's Arctic Fox drill is busy on another project this winter.

"There's still a lot of work to be done between now and next summer," Schutt says. Doyon has filed for some permits, but needs to get others. It needs to add a couple of miles to the nine-mile Totchaket Road it built to access the earlier exploration sites. A bridge over the Nenana River will connect the Totchaket to the main road system.

And it needs to sign contracts with various vendors, some of which will likely be Doyon subsidiaries.

"There's an awful lot of activity happening in a short period of time," he says.

The project will create about one hundred jobs over several months. And while Doyon plans to use some of its own oil field services companies, it is also encouraging other vendors to hire local shareholders.

Doyon doesn't have a price tag for the venture yet, Schutt says. "It's going to be expensive; we've got a lot of contracts. As Orie said, we're hoping for a little luck." ☼

Julie Stricker is a journalist living near Fairbanks.

Photo by Judy Patrick / © Shell

Drilling Unit *Polar Pioneer* in Dutch Harbor, July 11.

Shell Pulls Out of the Chukchi Sea

Ceases exploratory activity offshore Alaska

By Julie Stricker

After investing more than $7 billion to explore Alaska's Arctic oil and gas prospects, Royal Dutch Shell announced disappointing results on September 28, the day its rigs were scheduled to leave the Burger J prospect in the Chukchi Sea. They won't be returning next year: The company is abandoning drilling operations.

"Shell has found indications of oil and gas in the Burger J well, but these are not sufficient to warrant further exploration in the Burger prospect," the company said in a news release announcing its decision to cease exploration activity offshore Alaska.

"Shell continues to see important exploration potential in the basin, and the area is likely to ultimately be of strategic importance to Alaska and the US," Marvin Odum, director, Shell Upstream Americas, noted in the release. "However, this is clearly a disappointing exploration outcome for this part of the basin."

Shell spent more than $1.4 billion this year alone, spokeswoman Megan Baldino says. Shell spent $2.1 billion for the 275 Outer Continental Shelf leases in the Chukchi in 2008.

Many Challenges

The exploration program was beset by many challenges.

Shell's drilling program suffered setbacks in 2012 when a drilling rig ran aground. That incident led to stricter federal regulations on offshore oil exploration in the Arctic.

This spring, protesters who oppose Arctic oil development tried to delay Shell's flotilla as it prepared to embark on the journey to the Arctic from Seattle. Then, one of its icebreakers was delayed when it had to be sent back to Portland, Oregon, for repairs after hitting an underwater object just outside Dutch Harbor. The *Fennica* carried a capping stack—a key piece of equipment required to be on site before Shell could drill into potentially oil-bearing zones.

However, Shell's two drilling rigs, accompanied by support vessels, arrived at the Burger J prospect in July, still short of its final permits. On July 22, federal regulators approved permits allowing Shell to drill the top sections of two wells but stopping well short of the oil-bearing zone.

Shell commenced drilling at Burger J prospect July 30, using its semi-submersible drilling unit, the *Polar Pioneer*. The well is about 150 miles from Barrow in about 150 feet of water.

After the *Fennica* arrived on-site in August, Shell was allowed to drill into the oil-bearing zone, but only at the Burger J site.

Under the permits, Shell had to abide by strict noise rules set to protect walrus, polar bears, and other animals in the region, which meant it could only operate one of its two drilling rigs at a time, curtailing its exploration plan. The regulations required a fifteen-mile buffer zone around each well, but the two sites Shell planned to drill were only separated by nine miles.

The company had planned to drill as many as six wells over a two-year period.

In addition, high winds shut down operations for five days in August.

Despite the setbacks, Shell drilled to a total depth of 6,800 feet "in a basin that demonstrates many of the key attributes of a major petroleum basin," the company says. "For an area equivalent to half the size of the Gulf of Mexico, this basin remains substantially under-explored."

'Most Scrutinized'

Earlier in September, Odum told The Associated Press, "It's probably fair to say this is the most scrutinized, analyzed project—oil and gas project—probably anywhere in the world. I'm actually sure of that."

In its press release, Shell cited scrutiny as one of its reasons for its withdrawal from the Chukchi Sea.

"Shell will now cease further exploration activity in offshore Alaska for the foreseeable future," Shell states. "This decision reflects both the Burger J well result, the high costs associated with the project, and the challenging and unpredictable regulatory environment in offshore Alaska."

Shell's departure leaves no active drilling plans for the Chukchi. The other major leaseholder, ConocoPhillips, withdrew its drilling plans in 2013, citing uncertainty about regulations. Repsol E&P USA, Inc., Statoil Hydro USA E&P, Inc., Eni Petroleum US LLC, and Iona Energy Co. (US) and North American Civil Recoveries Arbitrage also have lease holdings in the Chukchi, but none have active plans to drill.

The Burger J well will be sealed and abandoned in accordance with regulations.

It was a blow for Shell and for the state of Alaska. The state was looking toward the estimated 27 billion barrels of oil and 132 trillion cubic feet of recoverable gas estimated by the US Geological Survey to exist offshore Alaska to help fill the trans-Alaska oil pipeline and fuel future energy needs and exports.

Reaction to Shell's announcement was swift. While environmentalists rejoiced, Alaska leaders voiced concerns about its impact on the state economy and future of oil exploration in the region.

Alaska Governor Bill Walker says he plans to meet with the White House to discuss the impacts of Shell's withdrawal and express the need to open other areas of Alaska, such as the Arctic National Wildlife Refuge coastal plain, to oil exploration.

US Senator Lisa Murkowski released a statement reflecting her disappointment and frustration at the decision and the delays that led to it.

"What we have here is a case in which a company's commercial efforts could not overcome a burdensome and often contradictory regulatory environment," Murkowski said in the statement. The Interior Department "placed significant limits on this season's activities, which resulted in a drilling rig sitting idle, and is widely expected to issue additional regulations in the coming weeks that will make it even harder to drill. Add this all up, and it is clear that the federal regulatory environment—uncertain, ever-changing, and continuing to deteriorate—was a significant factor in Shell's decision."

'Deeply Disappointing'

Shell's announcement was a blow to Arctic Slope Regional Corporation, which, with six other village corporations in the region, had formed a strategic partnership with Shell called Arctic Inupiat Offshore LLC that allowed them to acquire interests in Shell's Chukchi operations.

"At a time when Alaska is confronting a fiscal crisis, the news from Shell is deeply disappointing," says Arctic Slope Regional Corporation President and CEO Rex Rock Sr. "This is a major blow for Alaska, and leaves into question the viability of our state's economy.

"Closer to home on the North Slope, we are looking for solutions on how we continue to sustain our local economies to support our communities. Absent any responsible resource development onshore and offshore, we are facing a fiscal crisis beyond measure. The federal regulatory environment has proven to be a burden for any development, whether onshore or offshore. With this type of uncertainty, we will continue to see good opportunities slip away because no one wants to do business in Alaska."

Kara Moriarty, president and CEO of the Alaska Oil and Gas Association, echoed those concerns.

The announcement "is a painful reminder that exploration is expensive, involves huge risk, and does not guarantee success," Moriarty said in a statement. "Shell's departure underscores the need for legal, fiscal, and permitting certainty and predictability."

She asked whether Shell would have gotten different results if it had been allowed to go through with its original plans to drill two full wells instead of the one exploratory well.

The companies already working in Alaska's oil and gas industry also need "legal, fiscal, and permitting predictability and consistency," Moriarty said, so they can continue to invest in projects that will keep the trans-Alaska oil pipeline operational. Shell's decision to leave will also affect thousands of Alaskans whose jobs and businesses are tied to Arctic development because of Shell's $7 billion investment.

'Arctic is Crucial'

Their role in the Arctic may be taken by other countries that may have less stringent environmental standards, Moriarty said.

"There are very few companies that could meet these federal requirements and expensive demands, but even large companies with financial resources like Shell will walk away from mega opportunities when they cannot continue to spend billions of dollars without any promise of a return," she said.

"The Arctic offshore has rightly been viewed as the next generation of oil and gas development in this state, so for those plans to disappear overnight is beyond painful," Moriarty continued. "It is also a clear reminder about how a state dependent on one industry for 90 percent of its spending needs to look constantly for new developments in oil and gas development."

Development in the Arctic will happen, Murkowski said, whether it's spearheaded by Russia, Canada, or non-Arctic countries. She prefers to see the United States at the forefront.

"The Arctic is crucial to our entire nation's future, and we can no longer solely rely on private companies to bring investments in science and infrastructure to the region."

Shell's Odum said that while developing alternate energy sources is a priority, right now the focus should be on making sure oil and gas are developed safely.

"Oil will be required for a long time," he told the AP. "Let's take a really close look at developing our own resources, control how it's done, and get all the benefits that go along with it." ☼

Julie Stricker is a journalist living near Fairbanks.

Photo by Colby Wright / Courtesy of GeoFORCE Alaska

Sarah Fowell, director of GeoFORCE Alaska (center), with students during a geologic fieldtrip that traveled Outside to learn geology.

GeoFORCE Alaska

Opportunities in geology for rural students

By Russ Slaten

This year eighteen high school students from North Slope communities graduated from GeoFORCE Alaska, a multiple year summer program geared toward engaging students to see the relevance of geology in their everyday lives, promoting high school graduation and pursuit of higher education, and perhaps encouraging students to pursue careers in the high tech industries that rely on Alaska's abundant natural resources.

"Being able to see the geology first-hand instead of a picture in a textbook is helpful for the students because it's hard to get across the three-dimensional aspects and the scale and reach of geology, which all comes together when you're standing in a place like the Grand Canyon," says Sarah Fowell, director of GeoFORCE Alaska and a University of Alaska Fairbanks (UAF) associate professor of geology.

Modeled for Success

The UAF program within the College of Natural Science and Mathematics' Geosciences Department was developed in partnership with and modeled after the longstanding GeoFORCE Texas program from the Jackson School of Geosciences at the University of Texas at Austin. Rural students from the communities of Nuiqsut, Kaktovik, Barrow, Wainwright, and Point Hope began the program at the end of their eighth grade year in 2012 and have participated every summer until graduating this July, Fowell says.

The program has helped build an interest in science, technology, engineering, and math among rural high school students through an annual weeklong geologic field trip. UAF geosciences professors teach the program as students learn geology at the college level.

"Even though they are Alaskan students, many of them have not had the opportunity to visit the Alaska Range or walk on a glacier; a lot of these iconic features of Alaskan geology area really far from their

homes,"Fowell says. "Through GeoFORCE they've had the chance to see geology in the field and the opportunity to travel out of state to visit some of our national parks—places where the geology is spectacular—so they can learn what's going on and be able to interpret it."

During the weeklong trip students spend long days in the field with activity-filled experiences and engaged learning. They hear a lecture the night before to prepare for what they will see in the field and then spend most of the day learning the geologic concepts of the area they visit through concrete examples. They conduct a review session with an educational coach who is typically a high school teacher and finish the day with a short quiz on the topics covered that day.

"The first year we used this stuff we called flubber—made with glue and other components to make a rubbery material that flows—and we cut PVC pipe to make models of glacial valleys to see where the ice might flow most quickly and slowly. [The students] think about how the flubber simulates what a glacier does when it moves downhill," Fowell says. "So we have a lot of hands-on activities in the classroom to get them ready for what they're going to see in the field."

Students first meet at UAF, starting with classroom work and hands-on activities to prepare them for the field excursion, which culminates with a final exam at the end of the weeklong academy. Students are required to score at least 80 percent on the final in order to return the next year, which has never been a problem, Fowell says.

Jerry Brower, a high school senior graduating next May from Mount Edgecumbe High School in Sitka, is originally from Nuiqsut, a village of a little more than four hundred people located nearly sixty miles west of Prudhoe Bay on the North Slope.

Brower discovered GeoFORCE Alaska through a friend, and since he entered the program he saw a dynamic change in his priorities, learned to work with groups of people with differing personalities, and gained a better understanding of geology and how it relates to his life and his Iñupiaq heritage, he says.

"The first year we were learning about the different types of rivers and how they curve, and that kept me interested because I come from a village that's right off the coast of a major river [the Colville River]," Brower says. "It kept my attention because when I went home I continued to go out on the river and go hunting, and I noticed that everything that was in every lecture and discussion was right here and it was all true—it was right here in my own backyard."

Photo by Colby Wright / Courtesy of GeoFORCE Alaska

GeoFORCE Alaska students learning Rocky Mountain geology at the Grand Tetons in Wyoming during this summer's fieldtrip Outside.

Industry Support

GeoFORCE Alaska is a free program entirely funded through donations, many from sponsors involved in natural resource development in Alaska. Arctic Slope Regional Corporation, ExxonMobil, Great Bear Petroleum, Schlumberger, and Shell have supported the program through all four years. Also sponsoring in 2015 were the Autaaqtuq Fund, BP, ConocoPhillips, Mapmakers Alaska, Olgoonik Corporation, Repsol, and Statoil.

GeoFORCE has worked with the same students for the last four years in a row, and now with a graduating class, organizers are looking to recruit a new cohort of students and expand program capacity from twenty to forty students. All students were initially recruited from the North Slope Borough, but to double the number of students, the program will be accepting applications from students in the Northwest Arctic Borough and gain support from NANA Regional Corporation, Inc.

"There were twenty students in the first cohort, and we're hoping to double that when we recruit this year for next summer," Fowell says. "We're certainly looking for regional sponsors; we endeavor to go where we have interested sponsors and interested students, and NANA contacted us about supporting students from the Northwest Arctic Borough, so we're happy to go there."

Long-standing supporters, including Shell, send industry mentors who help coach students throughout the field academy. Industry mentors give a presentation on their education, their road to the job they currently hold, and share what they actually do at work, so students have a better idea of what geologists do for a living.

Industry mentor Josh Payne of Shell says the students in the program are tomorrow's leaders in their communities.

"By informing them what geology is, how it works, and how the earth works, it will help them in their everyday decisions that must be made in their communities," Payne says. "I think it's important that we're educating these students on geology, which is the foundation for mining and the foundation for oil and gas, so that when industry comes to their community and says they're looking to do something—they understand."

Payne says industry participation is meant to promote geology and promote an industry that greatly affects the student's local economy and expands to even the global economy.

"My role is to get these kids energized about geology and understand its importance in everyday life," Payne says. "Many of these students won't be geologists, they may be teachers or even engineers—which is perfect for the workforce. But the idea is to get them to see that even if they come from small towns or villages, they still have the opportunity to get an education and enter the industry that's important to their local economy." ☼

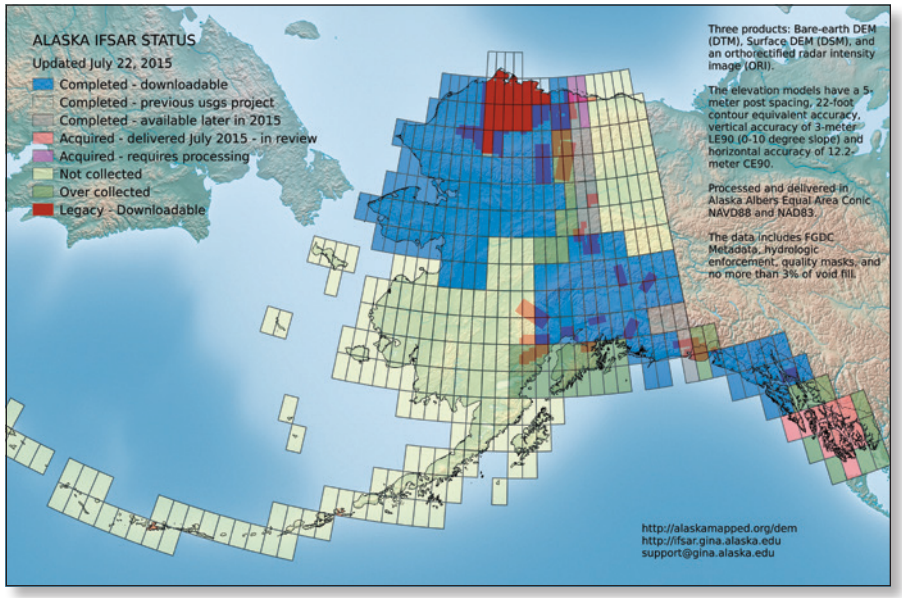
Russ Slaten is an Associate Editor at Alaska Business Monthly.

Mapping Alaska: Update on Digital Data

Alaska Geospatial Council says 60 percent complete

By Tasha Anderson

The Alaska Geospatial Council is charged with addressing "a long-standing deficiency in digital map data [which is] essential to economic development, public safety, and the responsible scientific understanding of the physical environment." On August 18, Alaska Geospatial, along with other government entities and invested individuals, announced that the goal to digitally map the state of Alaska in its entirety was 60 percent complete at Sky Breaking II, a public awareness and outreach luncheon.



Alaska Statewide IfSAR Status Map, updated July 2015.

Funding Collaboration

The project, which saw its first flight in 2010, has to date cost $36 million, according to Nicholas Mastrodicasa, large project manager, State of Alaska, Department of Natural Resources, Office of Project Management and Permitting. "We'd like to get [the mapping] done in the next two years," he says, and estimates that would cost about $12 million per year, bringing the cost of mapping Alaska digitally to approximately $60 million.

The largest obstacle in reaching that two-year goal is finding funding. "With the exception of USGS [US Geological Survey], there are no programmed funds," Mastrodicasa says. "My job over the past ten years has really been to get people on board with the project and then go around and pass the hat." He says that most of the funding so far has come from federal land owners and the state. However, contributions have also come from the Natural Resources Conservation Service, within the US Department of Agriculture, which was formerly called the Soil Conservation Service and which is not a land owner.

In fact, several of the speakers at Sky Breaking II lauded state and federal agencies for the level of collaboration that has taken place over the last five years in pursuit of mapping Alaska. This collaboration has been essential. As Mastrodicasa explains, Alaska is like a patchwork quilt in terms of land ownership, and "the calculus can get kind of challenging when you're planning acquisitions because agencies can only expend agency funds on agency lands. But the vendors want long, straight flight lines for efficiency, so there has to be a high level of cooperation and coordination among the agencies and the state." USGS has been instrumental in backfilling these acquisitions because they have no land management concerns restricting where their funding can be spent.

Map Layers

Mapping Alaska doesn't end with imagery and determining elevations, though Mastrodicasa says acquiring elevation data is the largest, and most expensive, part of the project. Alaska Geospatial, as it currently exists, was established as recently as 2014. Before that, mapping Alaska was monitored by the Statewide Digital Mapping Initiative, which focused exclusively on the imagery layer and elevation. "Hydrography is partially done. It's maybe 20 to 25 percent," Mastrodicasa estimates. Additionally, the Alaska Department of Transportation and Public Facilities has map information about transportation infrastructure, but in many cases it needs to be translated into a format where all of the layers are co-registered "so they are actually working together accurately, so that you've got a center line [on a road] where the center line is supposed to be on the map," he says.

This work, Mastrodicasa says, is above and beyond the current $60 million he estimates for the elevation portion of the project. The program uses aircraft flown by Intermap and Fugro to fly over the state to collect data. Intermap and Fugro are subcontracted through Dewberry Consulting, which is contracted by USGS, which receives the data and processes it, and then makes it available to Alaska Geospatial for mapping Alaska.

Mapping Technology

Alaska Geospatial is using IfSAR, or Interferometric Synthetic Aperture Radar, to map the state. The data gathered by this method has a "vertical accuracy sufficient to create contours with twenty-foot intervals and a post spacing of five meters." With this data, it's possible to construct three deliverables: ORI (orthorectified radar image), a precise radar type image; DTM (digital terrain model) which is a map of the bare earth—"potential landslides, tsunami inundation, storm surge analysis, all comes from the bare earth deliverable;" and DSM (digital surface model), "which is the surface of the canopy of the trees, building tops, and stuff like that," Mastrodicasa says. The DTM is the most important deliverable.

An alternative to IfSAR is LiDAR (light detection and ranging), which would have allowed for mapping down to a centimeter accuracy. Mastrodicasa estimates it also would've blown up the cost of the project from $60 million to $560 million. Additionally, the nature of LiDAR is such that cloud cover, water, and ice can interfere with the process. "Clouds are perpetual in many parts of Alaska—the Southeast, the Aleutians, Western Alaska—so it makes it difficult to even contemplate raising $600 million to do

LiDAR when you can't even execute it on a statewide basis," he says. "To my knowledge IfSAR remains the only technology capable of seeing through clouds and that is why it was selected," Mastrodicasa says.

Public Interest

"Having an accurate map is providing a service to the public that is really based on health and human safety," Mastrodicasa says. "Alaska Geospatial Digital Elevation Model 2015," a document prepared for the Sky Breaking II event, says "Public safety; disaster mitigation, response, and recovery; and rescue efforts require accurate elevation data." It references a November 2010 recovery operation near Denali. Initial plans were based on the "best-available" elevation data; upon receiving high quality elevation information, which was processed on a rush order, new slope analysis showed the original plan would have placed rescuers in avalanche prone areas.

The maps produced by the efforts of Alaska Geospatial will also be of great use to the Alaska business community. Mastrodicasa says that many Alaska Native corporations will be beneficiaries, having their lands mapped, in most cases, for the first time digitally.

Thus far, no private entities have contributed financially to this project, but Mastrodicasa says this project really is "the job of the government." All the information gathered, once processed, is freely available to the public through the Alaska Division of Geological and Geophysical Surveys at maps.dggs.alaska.gov/elevationdata. More than 347,500 square miles of elevation data is available for download at press time.

Looking Forward

Mastrodicasa says that data currently being gathered has a varied shelf life. "The elevation data has the longest lasting shelf life… I would say twenty to forty years." But, he says, rivers braid and change course while natural landslides and coastal erosion happen all the time, changing the landscape. "We'd like to see that, it's called change detection. But you can see those changes by doing the affected portion of the state, where you know there's been affected change and just do that area, not the whole state," Mastrodicasa says. "Will we eventually do the whole state of Alaska again? It won't be me," he laughs. "But likely we'll redo imagery every three to five years, but that's a very low hanging fruit in terms of cost: you're talking $2 million to $3 million to do the entire state." ☼

Tasha Anderson is an Associate Editor at Alaska Business Monthly.

Mobile and Network Data Security

Threats and strategies evolving with technology

By Tracy Barbour

As data security threats evolve with the expanded use of technology, Alaska businesses are incorporating new strategies and solutions to protect their information—whether it's on a computer network or mobile device.

Data security is a broad issue that involves the actions companies and individuals take to prevent corruption, loss, and unauthorized access of their information assets. These assets could include the personal information of customers, employees, and business partners, as well as strategic corporate initiatives or proprietary information like health records and financial information. "Protecting the confidentiality, integrity, availability, and authenticity of information assets is critical," says Anand Vadapalli, president and CEO of Alaska Communications.

However, data security isn't a single action or single undertaking, according to AT&T Sales Director-Security Solutions Terry Hect. Data security is the holistic effort that is utilized to provide an acceptable level of assurance that information or systems remain confidential and unchanged. To adequately protect data, businesses must ensure their information remains private and unaltered. "If bad actors have an objective to impact the operations of an organization, they can steal, expose, change, or destroy your data," Hect explains. "Lost data is a risk, but I wouldn't classify it as a 'security issue' unless the data is 'found' and used/stolen."

Latest Threats to Security

One of the biggest threats to any business or organization is a "distributed denial of service" attack, Hect says. This attack uses multiple endpoints to bombard the business with so much traffic that it overwhelms the capacity of service, system, or computer network, rendering the network useless. "These attacks can be politically, socially, or criminally motivated," he says. "The primary way to stop the attack is to move the mitigation to the network provider or other security solution that can redirect and scrub the traffic before it impacts the local asset."

Mobile security threats are exploding, partly due to the use of open source applications that allow malicious malware to be easily distributed. The impact of threats through mobile devices is just beginning, and it will increase as businesses continue to mobilize their workforce. However, there's no simple solution to the problem. "We have MDM [mobile device management] tools combined with security features/functions that help, but unfortunately there isn't a one-size-fits-and-fixes-all solution yet," he says.

As the threats to mobile and network security increase, the industry is devising new terms to represent changes in the security landscape. Now everyone is buzzing about advanced persistent threats, or APTs, a situation where a threat "actor" employs multiple techniques to gain access to privileged systems. Threat actors use a significant amount of effort to hide themselves on as many different systems as possible, which allows them to remain embedded in the network—even if discovered. "With new software and services come new attack techniques, but, for the most part, hackers try to reuse techniques that work for similar software," Hect says.

Threats Continue to Evolve

Today's data security threats look very different than they did five years ago, or even last year, Vadapalli says. Traditional security threats were broadly targeted and less sophisticated. Now, threats are directed more toward individuals and businesses. Attacks can include virus-infested emails designed to look like normal, legitimate emails that employees or organizations see regularly. Attackers may infiltrate businesses and not access any data for a long time or extract data a little at a time for an extended time period. They carry out a carefully crafted game plan to avoid detection, which is typical of APTs.

The reality of these threats makes it important to keep software patches current, utilize the principle of least privilege, harden systems, and proactively monitor the baseline for changes. This is important as new software vulnerabilities are identified for possible exploitation. "Vendors usually protect their products by releasing updates to cover these vulnerabilities," Vadapalli says. "Homegrown or internally-developed systems and integration programs can be hardened by applying principles of 'secure coding' to limit hackers ability to insert malicious codes."

> "Protecting the confidentiality, integrity, availability, and authenticity of information assets is critical."
>
> —Anand Vadapalli
> President and CEO
> Alaska Communications

Courtesy Alaska Communications

It's also critical for Alaska business owners to provide employees with the skills and training to identify information security risks. This can include training on spotting fraudulent emails, malicious websites, and suspicious activity, as well as knowing when to escalate these incidents to their IT experts.

Michael Wheeler, the owner of Alaska Computer Support LLC, is seeing a variety of data security threats targeting Alaska businesses. Malware is a common entry point, with the threats coming in two forms: targeted and exploit finding. With targeted malware, the crook knows what information the business has and launches an attack to get it. Exploit finding malware involves scanning systems with known vulnerabilities for nefarious reasons.

Although security attacks have evolved over the years, the perpetrators are using the same processes, Wheeler says. Only now they're updating their approach to take advantage of shortcomings in the new hardware and software that businesses are using. As cheaper equipment is being created to meet the small- and medium-size business market, more bugs and issues are being found. And vendors are publishing known exploits with hot fixes and updates, which doesn't necessarily help. "This makes the job of the hacker

easier," Wheeler says. "A major issue is that hot fixes and updates are never applied."

Addressing Security Issues

Hackers and cyber criminals can use stolen and unauthorized data in many ways. The type of attack and its purpose typically determine if the data is used for financial or political gain, fraud, or hacktivism (a form of online civil disobedience with the intent of wide-scale Internet disruption or economic collapse), Vadapalli says.

When it comes to data security, hackers and cyber criminals tend not to discriminate, so businesses of all sizes and industries are susceptible to threats. Security breaches don't take much time or bandwidth to be effective, and any compromised computer system can have value to criminal, Vadapalli says. "All businesses should be proactive in mitigating their information security risk," he says. "Smaller companies are usually suppliers to larger companies, and if smaller companies are not secure, they provide a conduit to compromise larger businesses—which, ultimately, is damaging to the business interests of both large and small businesses."

Wheeler agrees. Data security is something that every business needs to carefully consider. "Even if all you use is a smart phone, it is important to secure it with at least a four-digit pin," he says. "Identity theft is a huge problem, and it just takes a few pieces of information to cause some painful problems for any person."

In addition, many mobile devices contain saved passwords that could give a hacker direct access to a company's work environment.

Some of the current methods Wheeler has been using to help Alaska businesses address security issues are cloud base filtering and endpoint monitoring, forced password policies, and remote control of mobile device for remote data wipe. Additionally, his firm has been deploying smarter on-site network firewalls, as well as desktop protection monitoring tools that not only protect the networks but also lower overall monthly IT support costs.

Businesses have many points of concern when it comes to data security, but the same basic rules apply for mobile devices as for office networks, according to Wheeler. "There are layers of protection that ensure systems stay risk-free," he says. "But at the end of the day, it comes down to physical security management and strong policies that cover items like passwords or lost device reporting."

Service Providers Offer Solutions

A security breach can be very costly, but a proactive approach is key to long term success, Wheeler says. Therefore, Alaska Computer Support uses a comprehensive strategy to address policies, solutions, audits, and management with its customers. "We take all aspects into consideration to ensure a broad scope of protections while working with our clients' budget," he says. "Security doesn't have to be expensive, but it does require an on-going investment."

Security has always been about layering technology, Hect says. There's no magic solution that will protect systems/data absolutely, so businesses need to employ multiple tools and techniques to safeguard their data. Cloud, virtualization, sandboxing, threat analytics/intelligence, application security controls, penetration testing, policies, and procedures are all aspects of a modern security deployment. "It is no longer acceptable to deploy control/visibility [firewalls and intrusion detection/prevention] tools to your gateway and declare yourself 'protected,'" he says. "You must have plans for how the data you deliver to cloud assets will be protected."

Hect feels the most important security tool any business can employ is a well-managed network. That's why AT&T—which has been in the security business for more than fifteen years, offers Secure Network Gateways. These tools allow customers to move their point of presence into the AT&T infrastructure to ensure their data is secure before it is allowed in their infrastructure. AT&T also maintains partnerships with cloud providers to allow customers to extend their private network to cloud providers, enabling them to avoid traversing the Internet to reach Amazon, Microsoft, and other parties to utilize cloud assets. In addition, AT&T uses its network sensors to help clients detect and halt distributed denial of service attacks as they are happening, often mitigating the attack before the customer even knows it occurred.

Alaska Communications offers managed security to small, medium, and enterprise level businesses. Solutions include unified threat management, intrusion and data loss prevention, application control, and anti-spam measures. The company partners with industry leaders such as Watchguard and Checkpoint to provide global cyber security expertise at a local level.

"We listen to customers to understand their needs, and then help design, build, and manage custom security solutions," Vadapalli says. "We deploy equipment at the customer's location and remotely manage adherence to client security policies and maintain the equipment and software." ☼

Freelancer Tracy Barbour is a former Alaskan.

Cybersecurity: Leadership Challenges in the Cyber Threat Era

By Christopher Brill

Computers represent one of those rare creations in history whose unforeseen effects cascade throughout society, leaving lasting change. Emergent technology, such as the printing press or gunpowder, can challenge the status quo by creating new paradigms for how nations conduct war and diplomacy. Meanwhile, individuals charged with securing critical components of functional society—electrical grids, power plants, transportation networks—face unprecedented threats as well.

Non-state actors (like Anonymous) and cyber protagonists (men like Edward Snowden) can infiltrate networks and threaten protected data with just a smart phone, and businesses are unprepared to defend against this new and dangerous threat. Deloitte's cyber advisor, Ed Powers, noted recently in the Wall Street Journal that among companies with more than $1 billion annual revenue, "Nearly 25 percent… are insufficiently prepared for such [cyber] crises, and just 10 percent say they are well-prepared."

Given that any employee with a smartphone or laptop can make a company vulnerable, and coupled with increased rates of cyber attacks, businesses should continuously reassess their cybersecurity programs to defend their high-value assets. Cybersecurity exposes leadership challenges in the cyber threat era.

Catching Up

The US government is hastily catching up. Although it has a National Security Strategy, the United States acknowledges the direct challenge of defending cyberspace. Military services, like their civilian counterparts, run operations and lines of communication on a backbone of crisscrossed wires and networks. In turn they are susceptible and vulnerable across the spectrum of threats, from wannabe malicious intruders to foreign state sanctioned cyber militias.

Although no one can predict the future with 100 percent certainty, we can take advantage of historical lessons learned by examining how emergent technology altered war and warfare. Cyber may be a new domain, but war itself is older than human recorded history—thus we are provided with centuries of information that assist in evaluating how emergent technology and rising threats have altered the face of defense and security.

One hundred years ago, European leaders sought every benefit of new technology along the battlefields of World War I. Planners used the full extent of railroads, airplanes, and radio technology for strategic, operational, and tactical advantage. Consequently, Europe was nearly bled to death because leadership failed to think differently about "how to fight." They continued the same failed tactics over and over again and contributed to wholesale slaughter—37 million people were killed, wounded, or missing. Both sides stood frozen in a stalemate where wins and losses were quantified in yards and inches.

Valued Commodity

Information has always been a commodity: a tangible object sought by the curious, the ambitious, and the devious. Information in the twenty-first century continues to be a valued commodity, existing in the cloud and delivered through networked machines that give us access to markets on an unprecedented scale. Barriers to information are being reduced and scores of individuals are empowering themselves in this self-help era. Cheap technology has enabled millions of people around the world to be their own information broker at a sliver of the cost. But more information does not equal to better information.

The constant creation of new malware means that today's firewall advantage could be tomorrow's disadvantage. Cyber technology has facilitated the growth of lone-wolf hackers who represent the myriad of malicious, criminal behavior coinciding with evolving technology. For example, equipment blueprints, energy infrastructure, and financial records are all accessed through a networked computer, which can become tempting low-hanging fruit for would-be intruders. Thus, it is reasonable to consider that a cyber attack on any national critical infrastructure is really the opening volley of conventional, armed conflict. Otherwise, a cyber attack on any critical component or function of society, which is not followed by conventional arms, could spoil a capability. If the juice isn't worth the squeeze then a precious source code is wasted.

Leader Preparation

However, the steady speed of new and better technology may just outpace an organization's ability to adapt to new technology, which begs the question: how can we prepare leaders to manage pervasive risk when the nature of the threat changes on a near daily basis? The answer is: We can't! The current environment requires strategies that plan for attack and sets objectives that contain cyber activity and then follow through with planned responses. By performing risk analysis and identifying likely targets and access points, companies can evaluate which assets need extra insulation from attack and which assets can sustain loss.

Military deterrence, as a concept, parallels loosely with civilian IT redundancy as a means of guaranteeing business continuity. The Department of Defense Information Network connects the military establishment in a single backbone network. If jeopardized, military units and operators could be fragmented and vulnerable to more conventional forms of warfare. Fortunately, the military would still exist as a tangible force with plausible counter-strike capabilities, such as rifles, trucks, and other small arms. Therefore, to deter an invading force, credible counterstrike capabilities must first be known by enemy forces. Deterrence only works if everyone knows your capabilities and believes that you will use them if necessary.

Military leaders are instructed, coached, and persuaded to take appropriate action in the absence of orders, which also assumes prudent risk and disciplined initiative: concepts outlined in military doctrine and field manuals. However, the military has been operating in a networked world since Operation Desert Storm in 1991 and our military culture, like civilian culture, has grown accustomed to a digital lifestyle—becoming almost dependent. This prompts the question of whether our military could adapt to a sudden, radical shift in warfighting methodology. How would we react if

our networked bubble suddenly burst? Severed from our virtual chains-of-command, our mettle would be tested to be sure, but does that equate to a defeated force?

Zero-Day Attack

What would be the full measure of our military capabilities in a zero-day (+1) attack? It is impossible to predict. But, defense functionality would slightly resemble the joint forces that spearheaded the invasion of Panama in 1989. Known as Operation Just Cause, the effort to remove Manuel Noriega from power provides a glimpse of US military capabilities prior to the emergence of networked computers. Nevertheless, the joint force that invaded Panama was effectively trained, motivated, and led.

It's impossible to replicate past environments. Events in the past were shaped and formed from the experiences unique to the circumstances of the time and by the individuals making decisions in the heat of battle. The use of wireless radio made headway in World War I, but trench warfare brought soldiers together in close proximity and enabled each side to eavesdrop, thus making wireless a risky method of communication. So soldiers lay miles and miles of wire to connect various headquarters.

Realizing that constant artillery was severing wire and cutting off communications, signal officers again relied on previous methodologies and that timeless means of communication: the runner. It is likely that we will fight the next fight with the latest and greatest technology, but we should also consider war's reality—that humans can foil technology. Despite our best efforts, we must accept that certain conditions could exist that compel us to fall back to timeless means of warfare. One of our founding fathers, Benjamin Franklin, understood this concept and suggested American soldiers use bow and arrow when faced with depleted ammunition stockpiles.

Although history helps put emergent technology into context, we really don't know where cyber technology will go or whether or not there's a cyber "finish line." Despite our best planning efforts, cybersecurity comes down to a quasi-guessing game. That's why the US Army conducts deliberate planning. We draft war plans and disaster responses during peacetime to reduce friction during conflict. We level the playing field by anticipating chaos and the fog of war and then train in it. We will continue to operate in a hybrid cyberspace ecosystem where collaborative technologies converge among fixed, mobile, and cloud platforms, where the only guarantee is that humans and technology will co-exist in a dynamic relationship. ☼

Christopher Brill is a Lieutenant in the Alaska Army National Guard where he serves as a staff Signal Officer for the 1-207th Black Hawk Aviation Battalion. His previous assignments include Platoon Leader in a Long Range Surveillance Company and Executive Officer for a Network Signal Company. Brill is completing his MA from American Military University and conducting research in the fields of strategy, leadership, warfare theory and practice, military history, and cyber warfare. Brill's work has been accepted at top international conferences, such as the International Conference on Cyber Warfare and Security and the European Conference on Cyber Warfare. His paper, Fight the Last War to Win the Next, was recently awarded Best Masters Colloquium in the UK. Brill's new concept paper, The Diffusion of Information Technology: How Cyber will Reinforce the Global Balance of Power, has been accepted for presentation at Boston University in March 2016.

Conducting Successful Hotel Business Meetings

Courtesy of Hotel Captain Cook

Master the details through the fine art of juggling

By Lisa Maloney

It's happened again and again—a presenter is standing at the front of a packed ballroom and every head in the audience is craned forward anticipating a carefully prepared presentation. The presenter smiles, lifts the remote for the digital projector, cues the first slide, and...

...nothing happens.

That's the hard way of learning to always—always—test any audio/visual equipment before the meeting starts and to have a backup plan in case something suddenly doesn't work. Extra batteries for the microphone? Better have them. Duct tape and gaffer tape to patch breaks or hold cords down? Both are musts.

The good news is that hotels that specialize in conducting business meetings usually have a box of "just in case" items to help any meeting run smoothly. "You're going to have some bumps along the road, so you want to have a plan B and even sometimes a plan C if something doesn't work," explains Tammy Griffin, general manager of the Crowne Plaza Anchorage-Midtown hotel and thirty-five-year veteran of the hotel meeting industry in Anchorage.

However, no matter how professional a hotel's meeting staff may be, the event is only as good as the pre-planning and the communication between all involved parties. The following tips from hotel managers, event planners, and visitors bureaus cover not just how to prevent the biggest mishaps that can derail a meeting, but how to get the best out of the event space and catering staff, even when Alaska-size obstacles try to interfere.

Conquering Technology and Food

"Technical and food disappointments are the most challenging," says Griffin. "It's incredibly embarrassing for a meeting planner to have something go wrong." The technology pitfall is easily defused by doing a dry run beforehand: convene any presenters at least a day before the meeting. Take the time to make sure the venue's equipment works with everyone's personal technology and that everyone has the right cables to connect with the audio/visual equipment and knows how to operate both their personal devices and the venue's.

One of the biggest hurdles to watch for in terms of tech, Griffin warns, is that many mobile devices don't have the necessary jacks to connect to a digital projector—and very few projector systems are wireless. If a presenter keeps presentations on a tablet, make sure a backup laptop is provided at the event, and have the presenter bring a backup of the presentation on a thumb drive that can run off that laptop. Test the backup beforehand, too—just in case.

When it comes to food, Griffin says, "Always ask for a tasting, because one chef's idea of a sandwich may be a very different idea from what you're anticipating." And what shows up on the hotel's restaurant menu may not be the same thing that's available during a meeting. Ask to speak to the chef personally if possible, and then ask what their favorite foods or specialties are and which dishes tend to be the biggest hits at banquets.

Instead of going simply by price, Griffin recommends thinking in terms of the biggest bang for the buck. "Just because you can get something for free [or cheap] doesn't mean it's a bargain," Griffin warns. A fabulously done piece of lasagna or chicken will beat out a poorly cooked cut of expensive beef, and planners will rarely go wrong with the chef's specialty or favorites that frequent customers go for.

There's a bonus to doing all this face-to-face groundwork: When the chef and other venue staff get to know a customer personally, they're going to be that much more invested in making sure things go well. "It's not that they don't all care about providing the top quality... but when they actually have a conversation with someone it has more meaning," Griffin says.

"When they know you, they have a personal interest in making sure that your function goes well. When you own something, it's different than just a banquet order," she says. That's a bonus that keeps on giving for businesses that develop a continuing relationship with a given business hotel, because the business relationship deepens over time, and staff will take notes and tweak their system to help things run more smoothly every time.

Countdown to a Meeting

Clayton Damm and Chip Trantina, directors of catering at the Hotel Captain Cook, provided this list of suggestions to help keep any meeting on track.

As Soon as Possible

Provide an agenda to the catering department for room scheduling and so the wait staff can follow along throughout the course of the day.

Consult with staff to get up-to-date on any venue limitations, along with the facility's evacuation plan and any other relevant safety and security information.

Two Weeks Out

Know and communicate your audio/video setup needs to the event planner.

Ship any meeting materials so they arrive at least a couple days beforehand.

Confirm sleeping rooms and rates one to two weeks prior to the event.

One Week Out

Confirm event dates, time, and attendance with your (hotel) event planner.

Communicate your final head count to the catering manager at least three days prior.

Every Day

Give the venue as much advance notice as possible—then keep them up to date—on any special deliveries, VIPs, arrival times, or other information that can help facilitate their service. The more they know, the more they can do to support the meeting and smooth out any hiccups. ☼

Don't Like the Weather? Wait Five Minutes—It'll Change

Extend the same "taste-test" philosophy to both the venue and venue access. Noise can be a big consideration, especially in Alaska; Griffin warns that hotels are always renovating but don't necessarily advertise that fact, so be sure to ask about construction at or near the venue.

Next, she recommends, visit the venue during the same time of day the meeting will be held to get a first-hand idea of traffic, parking, and those all-important noise levels. Leading up to the meeting, check

Keep Attendees Comfortable

Anna Johnson, events manager at CIRI Alaska Tourism's Seward Windsong Lodge, provided these suggestions for keeping event attendees comfortable and on track.

Distribute an outlined agenda to everybody before the meeting.

When possible, arrange the seating for business meetings in a large U-shape or a square, so the attendees can all see and interact with each other.

Having a larger room that gives people room to get up and move around is nice.

Another nicety: A refreshment area with a few round tables, where people can sit for a snack during meeting breaks. This keeps attendees from having to juggle food at the meeting table(s) and also creates an informal icebreaker/socialization area before the meeting gets started.

Also, don't forget the importance of offering regular breaks throughout the day. Even the highest-powered executive is, after all, only human, so periodic breaks will help them stay focused on the reason they're there. ☼

with the Department of Transportation regarding any possible disruptions in the traffic pattern—especially if getting to the venue requires travel on a two-lane highway like the Seward Highway, where traffic hold-ups are the most likely.

During the Alaska summer, traffic delays can seem as inexorable as a bad weather system, but at least the former are predictable. Because there's no way to guarantee the weather beforehand, the best thing event planners can do is monitor the situation closely, then communicate clearly and proactively with meeting attendees about any weather concerns that arise.

"Oftentimes participants will not attend a meeting because there's inclement weather," Griffin explains. Keep numbers up by sending out reminder emails in the days leading up to the event. Make special note of any inclement weather, assure attendees that the meeting will still take place, and identify any steps taken to make things easier. Those might include providing coat racks or a coat check, a special place for storing wet footwear or umbrellas, or extra shuttle service for any attendees that are

"The Convention and Visitors Bureau knows the town inside and out. Many planners don't know that bureaus such as ours can help provide lead services to bid out and secure rooms and catering, for example, and to make referrals for other services."

—Liz Perry
President and CEO, Juneau Convention and Visitors Bureau

not staying at the hotel where the meeting is being held. Giving clear instructions ahead of time minimizes frustration for attendees and helps ensure that they'll still show up, no matter what the weather is doing.

Recruit the Best Allies

"Our first tip for planners booking meetings in Fairbanks [or really anywhere] is to contact the local destination marketing organization," says Helen Renfrew, director of meetings and conventions for Explore Fairbanks.

"The Convention and Visitors Bureau knows the town inside and out," agrees Liz Perry, president and CEO of the Juneau Convention and Visitors Bureau. "Many planners don't know that bureaus such as ours can help provide lead services to bid out and secure rooms and catering, for example, and to make referrals for other services." Staff at the destination marketing organization will also know about their community's quirks, from logistics and weather to seasonal considerations.

Although Renfrew says she couldn't really think of any disaster stories to share, it's clear that in her more than twenty years of working with meetings and meeting planners in the Fairbanks area, she's seen just about everything. "Please check with hotel staff for authorization before bringing any unusual items such as live animals or birds, fire, cannons, or motorized vehicles into the banquet rooms or lobby," she writes in an email. Staff need to know about more mundane concerns too, such as food allergies, the meeting agenda, and which business representatives are or aren't allowed to give instructions and make authorizations.

"Usually the guy walking through the lobby with an entire serving bowl of shrimp on ice from your reception is not authorized to take it to his room, contrary to what he's trying to tell the banquet staff," Renfrew writes. Designating one or two points of contact, then communicating clearly and frequently with hotel staff to keep them current on the meeting plan and logistics, is the key to keeping banquet items in place and other potential mishaps under control.

Finally, Renfrew offers another word to the wise: "The services and amenities available at meeting facilities around Alaska differ greatly. Don't ever assume that items or services are available or included—always double check." And keep in mind that cold temperatures outside might actually be a bonus, because they'll keep attendees inside and focused on the meeting.

A Beautiful State

Most catering and visitor service staff in Alaska are used to helping visitors negotiate the state's unusual hazards. For example, Fairbanks rental companies usually offer ice scrapers and electrical cords for plugging in rented vehicles in at night; hotel staff may have extra extension cords on hand, and Fairbanks hotels in particular are great about offering aurora wake-up

calls—although Renfrew says that visitors are sometimes surprised to find that the "wake-up" part of the call is literal, with aurora alerts sometimes coming in the middle of the night.

However, there is one statewide hazard that nobody can evade entirely: tourist season. Although the peak May through September season will boost prices on everything from hotel rooms to rental cars in any Alaska community, the effect is especially pronounced in Southeast, where boatloads of cruise ship passengers compete with other travelers and businesses for limited hotel and meeting space.

"Given enough notice, we can get blocks of hotel rooms for any given space [in Juneau]," Perry says. But only one Juneau hotel, the Westmark Baranof, offers large-scale meeting space that can accommodate more than a few dozen people, so it becomes a very hot commodity during the busy seasons.

Coming in the shoulder season, before or after tourist season, opens up better pricing and availability. But beware the additional hurdle of the legislative session that usually runs from mid-January to at least mid-April—assuming no special sessions are added. Ideally, for those wanting a room block for meetings of any size during those busy periods, Perry recommends booking at least six months in advance, although if anybody can help squeeze in a last-minute meeting, it's the local visitors' bureau.

There's another hidden advantage to holding meetings in a smaller community like Juneau: Aside from the beautiful scenery, logistical support, and the presence of enough infrastructure to make any meeting go smoothly, everything—from extra hotel rooms to after-hours outdoor recreation—is right there in front of the attendees, ten to twenty minutes away at most.

After the Meeting

Do take time for congratulations once the meeting has ended, and maybe one extra moment to savor the success, but don't put away the planner's notebook just yet. "Always have a wrap-up meeting with your catering manager at the end of your function," Griffin recommends. Now is the perfect opportunity to debrief with hotel staff, noting things that could be improved next time and, just as important, noting what worked well so the accolades can be passed on to staff.

Next, take a piece of advice from Katie Reeves, sales manager for CIRI Alaska Tourism's Talkeetna Alaskan Lodge and Seward Windsong Lodge, and create a clear plan for what comes next—before any assistant planners, committee members, or important attendees make their escape. Are any follow-up tasks needed? Decide when they'll be due, who will do them, and whether future meetings are necessary to follow up on the results. Remember, face time is invaluable, and that moment before everybody scatters is the best time to find out when they'll be available for any follow-up meetings or to begin planning for the next meeting.

Above all, stay in constant communication with the hotel's event planners and catering managers. They've done this before, usually many times, and have not only seen the common blunders that meeting planners usually make, but also know exactly how to avoid them. Any meeting that is started with clear expectations and is run by a planner taking full advantage of the resources offered by Alaska hotels and destination marketing organizations while keeping clear communication with staff, can only end well.

But do bring that extra roll of duct tape along or ask where the hotel keeps theirs. Just in case. ☼

Lisa Maloney is an Anchorage-based freelance writer.

AEDC

A new free resource is available for aspiring entrepreneurs in the 49th state. "Where to Startup," a ten-part, online video series produced by the Anchorage Economic Development Corporation, presents local experts discussing what an entrepreneur needs to know about starting a business in Alaska.

The videos cover a wide range of topics including crowdfunding, market research, cash flow, planning, marketing, and web development and feature local entrepreneurs and business.

The videos were created by AEDC in partnership with Connected Nation in order to develop the entrepreneurial environment in Alaska via the use of broadband. The "Where to Startup" video series can be viewed at online at aedcweb.com/where-to-startup.

Fairweather LLC

Fairweather LLC opened a new fully enclosed, heated jetway at the Deadhorse Aviation Center (DAC), serving passengers traveling to and from Alaska's North Slope via the DAC.

The first of its kind in the US Arctic, the new jetway or PBB (passenger boarding bridge) telescopes from sixty-three to ninety-five feet and swings 90 degrees in either direction for exact positioning between aircraft and terminal. Unique to its design are a number of built-in safety features. Completed in just 180 days, the new DAC jetway represents a significant investment in the future of Arctic operations, made possible through financing provided by First National Bank Alaska.

A member of the Edison Chouest Offshore group of companies, Fairweather's operations include DAC—a multi-faceted aviation facility located on the North Slope, supporting the US Arctic's expanding oil and gas industry onshore and offshore.

AIDEA

The Alaska Industrial Development and Export Authority selected five finalists to advance to Phase Two of the Interior Energy Project partner selection process. The finalists are: Harvest Alaska LLC (Hilcorp Alaska LLC); Phoenix Clean Fuels LLC; Salix, Inc. (Avista Corporation); Spectrum LNG LLC; and WesPac Midstream LLC. AIDEA expects to recommend a project partner to its Board in December.

Personnel Plus Employment Agency, Inc.

Personnel Plus Employment Agency, Inc. has moved its Anchorage office to 1500 W. 33rd Avenue, Suite 220. The company specializes in temporary staffing, permanent placement, executive recruiting, and employee leasing and has offices in Anchorage and Fairbanks.

Basketball Travelers, Inc.

The University of Alaska Anchorage will enter into a multi-year partnership with Basketball Travelers, Inc. to schedule, elevate, and develop the GCI Great Alaska Shootout beginning with the 2016 field. Basketball Travelers, Inc. will be responsibility for scheduling teams, developing national television partnerships, elevating the profile of the event, and assisting in the development of a business plan to ensure long-term success for the Shootout, one of the nation's oldest in-season college basketball tournaments.

Aleut Corporation

The Aleut Corporation's subsidiary company Aleut O&M Services LLC of Colorado Springs, Colorado, was awarded the $395 million indefinite-delivery/indefinite-quantity contract as the prime contractor to provide Cape Canaveral launch operations and infrastructure support. Aleut O&M Services and its key subcontractor PAE Applied Technologies LLC will provide operations, maintenance, and engineering support for facilities and systems at Cape Canaveral Air Force Station, Florida. The six-and-a-half-year contract commences in December.

Yulista Holding LLC

Y-Tech Services, Inc., a Calista Corporation subsidiary under Yulista Holding LLC, has been awarded the MH-60T Rotary Wing Aircraft Depot Level Maintenance Support Services contract for the US Coast Guard in Elizabeth City, North Carolina. Y-Tech Services will support the Coast Guard Aviation Logistics Center's Medium Range Recovery product line and other support divisions. The MH-60T mission includes search and rescue, combat support, law enforcement, international ice patrol, marine environmental protection, and marine resource conservation. Y-Tech Services will perform maintenance services for about fourteen aircraft annually.

United Way of Anchorage

United Way of Anchorage received the Navigator grant for the third year in a row from the Centers for Medicare & Medicaid Services. Navigators serve as in-person resources for consumers who need additional assistance when shopping for and enrolling in health insurances plans through the federal Health Insurance Marketplace. A unique aspect of United Way's outreach efforts includes the placement of a Navigator within Alaska 2-1-1, the state-

wide health and human services information and referral system.

Hub International Limited

Chicago-based Hub International Limited, a global insurance brokerage, has acquired the assets of Kenai-based Brown Agency, Inc.—an agency that provides commercial and personal insurance services and employee benefit products. Doug Brown, principal at Brown, will join Hub Northwest.

Epoch Health

Epoch Health, a clinic dedicated entirely to men's health, opened in the Glenn Square in Anchorage. Epoch Health utilizes a masculine, state-of-the-art clinical approach designed to accurately and efficiently analyze symptoms common to men. Their goal is to pair those symptoms with appropriate medical treatments, regular proactive health screenings, and lifestyle modifications that return men to a healthier, happier state and significantly enhance their quality of life.

Seward Harbor 360 Hotel

Tom Tougas purchased the Seward Holiday Inn Express, returning Seward's largest waterfront hotel to local ownership. The ninety-room hotel is now called the Seward Harbor 360 Hotel because of its expansive views of Resurrection Bay and Mount Marathon. Renovations during the off-season will convert some of the first floor meeting room space to guest rooms with new, comfortable furnishings, and more family-friendly layouts. Harbor 360 Hotel will operate year round.

China Airlines

Taiwan-based China Airlines will launch three charter flights directly from Taipei to Fairbanks on December 4, 8, and 12, helping to market Fairbanks as an aurora destination to the growing Greater China market. China Airlines will be operating A340 aircraft for the service, with a capacity of close to 280 passengers. Charter group members will stay in Fairbanks for four nights and five days, participating in aurora-centered tour programs that are being sold by tour operators in Taiwan in partnership with local visitor industry businesses.

Quality Used Tire Service

Quality Used Tire Service at 1211 East 68th Avenue has signed on with the U-Haul Company of Alaska as a U-Haul neighborhood dealer to serve Anchorage. U-Haul trucks, trailers, towing equipment, support rental items, and in-store pickup for boxes will be offered.

Geosyntec Consultants

Geosyntec Consultants expanded its presence in Alaska with the opening of an office in Anchorage located at 4101 Arctic Boulevard, Suite 206. The new office primarily focuses on contaminated sites assessment, remediation services, and data management, visualization, and analysis.

Alaska Communications

Alaska Communications closed the refinancing of its existing senior term loan on September 14 and entered into $100 million of senior secured financing, including a $10 million revolving loan. Alaska Communications used proceeds to pay off its outstanding $80 million term loan, fund fees, and expenses associated with the refinancing and for corporate purposes. CoBank and ING Capital LLC served as the lead arrangers on the financing.

On the consumer side, Alaska Communications is simplifying home Internet with new Unlimited Internet for $79.99 per month without data caps, overage fees, or throttling. Customers with new Unlimited Internet plan will get speeds at their home of up to 50 Mbps.

AT&T and Best Buy

AT&T opened a new shop at the Best Buy store in Anchorage with a full range of products. The AT&T shop, located at the Dimond Center Best Buy, will give customers a more personalized connected life experience. From home security and automation to wearables and connected cars, the new shopping area is designed to show shoppers how it all works together.

Furie Operating Alaska LLC

Furie finished construction and installation of a new offshore platform, sixteen miles of subsea pipeline, and a natural gas processing facility in Nikiski this summer. They are currently connecting the Kitchen Lights Unit discovery well within the platform caisson to the production equipment. Furie has indicated that they plan to have production online by November.

Homer Electric Association

Homer Electric Association has signed a Gas Sale and Purchase Agreement with Furie Operating Alaska LLC, an independent oil and gas company operating in

Cook Inlet. Under the terms of the agreement, Homer Electric's subsidiary, Alaska Electric and Energy Cooperative, will receive natural gas from Furie to fuel HEA-owned power plants in Nikiski and Soldotna beginning on April 1, 2016. The contract terminates December 31, 2018, with two one-year options to extend the term of the agreement.

Storage Solutions

Chugiak-based Storage Solutions at 21108 Raven Street has signed on with the U-Haul Company of Alaska as a U-Haul neighborhood dealer to serve Chugiak and the surrounding area. U-Haul trucks, trailers, towing equipment, U-Box Warehouse, and support rental items are offered. U-Box containers—with 257 cubic feet of space and one-ton capacity—are delivered to and picked up at the customer's doorstep and are stored in a secure warehouse until the customer is ready to retrieve the belongings.

TOTE Maritime

TOTE announced a shift within its operating companies. Sea Star Line, which has served Puerto Rico and the Caribbean for more than thirty years, and Totem Ocean Trailer Express, serving the Alaska market for forty years, will now be known collectively as TOTE Maritime. In addition to their successful track records, both companies are switching their vessels to run on LNG, part of TOTE's long term strategy to be the most environmentally friendly shipping company in the world. Totem Ocean began the conversion of its first ship to LNG in the fall.

Westdahl LLC

The Alaska Industrial Development and Export Authority (AIDEA) Board approved a loan participation for a new retail project in Anchorage to Westdahl LLC, for $6,297,750, 90 percent of a $6,997,500 loan brought to AIDEA by Northrim Bank, which originated the loan and is participating with $699,750. The purpose of this loan is for long-term financing of a new, 21,132-square-foot retail building to be located near the corner of Debarr Road and Muldoon Road in East Anchorage. The building will be occupied by Krispy Kreme, BurgerFi, and Body Renew. This project will create twenty new construction jobs and ninety new permanent positions.

Royale Energy, Inc.

Royale Energy, Inc. reached an agreement to repurchase Rampart's 30 percent interest in its Alaska North Slope Western Block, brining Royale Energy's ownership position back to 100 percent working interest in all 96,000 acres on the North Slope and secures Royale's exclusive rights to the proprietary 3D seismic data.

Royale Energy has identified two targets in the Western Block for both conventional and unconventional oil and natural gas. Global independent expert Netherland Sewell and Associates reviewed geological and geophysical data including the 3D seismic survey and concluded that the targets may contain up to 325 Million barrels of oil in place.

GCI

General Communication Inc. (GCI) launched the state's only 1-gigabit-per-second Internet service, called 1 GIG red. GCI will be launching 1 GIG red across its entire Anchorage cable modem system by the end of this year.

GCI 1 GIG red speeds are up to 100 times faster than the current national average, enabling downloading a twenty-five-song playlist in less than a second, a console game in 33 seconds, and an HD movie in less than 30 seconds.

As 1 GIG red launches in Anchorage, GCI is also upgrading all other red Internet markets in Alaska—the Mat-Su, Juneau, Fairbanks, Kenai/Soldotna, Sitka, and Ketchikan—to speeds up to 500 Mbps from the current red speeds of up to 250 Mbps, previously the fastest Internet service available in Alaska. GCI plans to bring 1 GIG red to more Alaska communities in 2016 and beyond.

Alaska Earthquake Center

Alaskans can plan better for earthquakes following the installation of almost ninety new high-grade seismic instruments capable of measuring minute vibrations in the Earth. The instruments were installed in Southern and Interior Alaska as part of the EarthScope Transportable Array deployment, a $40 million, five-year, temporary National Science Foundation-funded project. Scientists plan to eventually install about 260 sites.

The 2016 deployment will focus on the North Slope region of Alaska, while the 2017 deployment will look at western Alaska. These large regions have had limited, if any, seismic study. The temporary deployment will help to shed light on earthquakes in areas of the Arctic that are of tremendous recent interest for resource exploration and infrastructure development. Scientists also hope for insight into puzzling earthquake sequences, such as the 2014 Noatak swarm. The statewide endeavor is assisted by the cooperative efforts of state and federal landowners, as well as the Alaska Native regional, village, and tribal corporations working in partnership with the EarthScope project and Alaska Earthquake Center. ☼

Ukpeaġvik Iñupiat Corporation (UIC)


Baiborodova

Kristina Baiborodova joins UIC as the director of Arctic business relations in the Anchorage office. For the past ten years she was an Arctic projects manager and Russian Federation liaison at the Institute of the North. Baiborodova earned a bachelor's in management and aviation technology, along with an MBA from the University of Alaska Anchorage.


Chythlook

Gloria Chythlook joins UIC as senior proposal and grant writer in the Anchorage office. She has more than fifteen years of experience in grant writing, program delivery, and nonprofit administration. Chythlook studied natural sciences and the Minority Medical Education Program at the University of Washington.


Cross

Emily Cross returns to UIC as the executive secretary to the president and UIC board of directors. Combining a mix of administrative expertise and project management, Cross worked at Alyeska Pipeline, CH2M HILL, and NANA.


Hurbi

Mathew Hurbi joins UIC as the assistant controller in the Anchorage office. He earned a bachelor's in accounting, magna cum laude from the University of Alaska Fairbanks. Hurbi earned his CPA while working for KPMG in Anchorage.

Anchorage Police Department

Chris Tolley was designated as Anchorage's Chief of Police. Tolley has more than thirty-five years of law enforcement experience, including six years as a Baltimore police officer and twenty-eight years as a special agent with the Drug Enforcement Administration.

Alyeska Pipeline Service Company


Nuttall

Alyeska Pipeline Service Company promotes Curtis Nuttall to be the new Vice President of the Risk and Technical Division. Nuttall joined Alyeska in 1989 as a senior engineering project leader, working over the years in various roles, serving as a senior project manager, senior project engineer, and as Strategic Sourcing and Contracts Department manager.

Alaska Heart & Vascular Institute


Ebenhoeh

Dr. Scott Ebenhoeh joins the Alaska Heart & Vascular Institute's main Anchorage clinic as a cardiovascular physician with nearly six years of experience. He provided full-patient care in the telemetry and intensive care units at Garden City Hospital and at Detroit Medical Center. Ebenhoeh earned a PhD in Osteopathic Medicine from Michigan State University and completed his fellowship training at Michigan State University's Garden City Hospital.

Thompson & Co. Public Relations


Cooper

Thompson & Co. Public Relations added experience to its Anchorage office with the addition of Abby Cooper as account executive and Sydney Brusewitz as account coordinator, as well as the promotions of Nikkie Viotto and Emily McLaughlin to junior account executives.


Brusewitz

Cooper spent more than six years with NBC-affiliate KTUU Channel 2 News in Anchorage, serving as weekend anchor, producer, and multi-media journalist.


Viotto

Brusewitz graduated from Western Washington University with a bachelor's in journalism and public relations and Hawaii Pacific University with a master's in communications.


McLaughlin

Viotto started at the agency as an account coordinator, and, as junior account executive, she will continue to manage social media, write, and pitch media for clients.

McLaughlin came to the agency as an intern and quickly worked her way to account coordinator before her promotion to junior account executive.

Municipality of Anchorage

Robert Harris joins the Municipality of Anchorage as the CFO. Harris's experience includes economic development, financial analysis, project and engineering management, and operations management. He was an engineering manager at CH2M HILL. He has an MBA and an MS from the University of Washington.

Alden Thern joins the municipality as the Deputy CFO. Thern brings fifteen years of experience at the Anchorage School District, most recently as the Executive Director of Contract Administration and the Director of Student Nutrition. He is a graduate of Purdue University with a degree in Business.

Hal Hart is the new Development Services Director at the Municipality of Anchorage. Hart was Juneau's Community Development Director and was a city planner in Woodinville, Washington. Hart earned a BA from Central Washington University and a master's in Urban and Regional Planning from Eastern Washington University.

Alaska Mental Health Trust Authority


Burke

Nancy Burke began a new Homeless Coordinator position at the Municipality of Anchorage funded by the Alaska Mental Health Trust Authority for eighteen months. Burke is a senior program officer specializing in housing at the trust. She has a master's in social work from Syracuse University and more than twenty years of experience in disability and mental health services.

McCool Carlson Green


Mazurek

McCool Carlson Green appointed Cara Mazurek as Director of Interior Design to manage and grow the firm's interior design practice with more than eleven years of experience. Mazurek earned a BS in Interior Design at the Art Institute of Portland. Her portfolio of interior

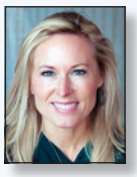
work includes the Alaska Neurology Center, Nikiski Fire Station 2, and Kodiak Electric Association.

WHPacific, Inc.


Nichols

Dan Nichols joins WHPacific, a subsidiary of NANA Development Corporation, as Facilities Director in the Anchorage office. Nichols has more than ten years licensed experience in civil and Arctic engineering and project management. He was a civil engineer and project manager at DOWL.

Arctic Information Technology, Inc.


Gasperlin

Mary Gasperlin joins Arctic Information Technology, Inc., a Doyon Government Group Company, as an Account Executive. Gasperlin has more than two decades of business development and sales experience in Alaska, including a long career in the aviation industry.

Juneau Convention & Visitors Bureau


Perry

Liz Perry was appointed as the President/CEO of the Juneau Convention & Visitors Bureau. Perry was the bureau's convention sales manager for more than two years and her background includes higher education, library management, and fund development.

Alaska Native Science & Engineering Program


Yatchmeneff

Michele Yatchmeneff and Matt Calhoun, both Alaska Native Science & Engineering Program alumni, are the first tenure-track Alaska Native engineering faculty members at the University of Alaska Anchorage. They both recently earned their PhD in engineering.

Yatchmeneff was deputy director at ANSEP and has worked in the construction and engineering industries, specializing in water and sewer projects in remote villages across the state. Yatchmeneff earned her PhD in engineering from Purdue University and a BS and MS in engineering from UAA.


Calhoun

Calhoun was a project engineer for three years before returning to ANSEP as a regional director in 2006. He earned his PhD in civil engineering from UAF, an MS in civil engineering from the University of Colorado at Boulder, and a BS in civil engineering from UAA.

ARECA Insurance Exchange


Hutchison

Mel Hutchison joins ARECA Insurance Exchange as the new Director of Loss Control. Hutchison was previously the systems operations supervisor at Homer Electric Association and is a thirty-five-year veteran of the electric utility industry with numerous industry-related certifications. He has worked at Chugach Electric Association in various managerial positions.

UAA College of Business and Public Policy


Deck

Cary Deck, a professor of economics at the University of Arkansas and the director of its Behavioral Business Research Laboratory, will serve as the University of Alaska Anchorage's Rasmuson Chair of Economics for the 2015-16 academic year. Deck's research uses controlled laboratory experiments to investigate a wide array of topics from risk taking to choice overload.

University of Alaska Southeast Sitka


Martin

Dr. Paula Martin joins the University of Alaska Southeast, Sitka Campus as Campus Director. She was the Assistant Director for Academic Affairs and an Associate Professor at UAA's Kenai Peninsula College since 2008. Martin has taught at Emory University and was the Assistant Provost at Juniata College in Pennsylvania. She earned her PhD at the University of Massachusetts Amherst in entomology.

Municipal Light and Power


Johnston

Mark Johnston was appointed as General Manager of Municipal Light and Power. Johnston previously served as acting General Manager and CFO and has held executive and management level finance positions at the Alaska Public Utilities Commission, Alaska Commission on Postsecondary Education, Alaska Railroad Corporation, and the Federal Energy Regulatory Commission.

Alaska Sea Grant

Marysia Szymkowiak and Matt Robinson are the 2015 Alaska Sea Grant state fellows, providing a yearlong professional experience in marine policy.


Szymkowiak

Szymkowiak earned a PhD in marine policy and fisheries management at the University of Delaware. Szymkowiak will work with the National Oceanic and Atmospheric Administration Sustainable Fisheries Division in Juneau.


Robinson

Robinson earned a master's in northern studies with a dual concentration in northern history and global environmental policy at the University of Alaska Fairbanks. His host agency is the North Pacific Fishery Management Council in Anchorage.

Anchorage Chamber of Commerce


Perri-Jimenez

Victor Perri-Jimenez joins the Anchorage Chamber of Commerce as the engagement membership coordinator. He was an International Student Assistant and an Education Opportunity Specialist at UAA and was a Student Coordinator at the University of London. Perri-Jimenez holds a BA in journalism. ☼

ALASKA THIS MONTH

By Tasha Anderson

ENTERTAINMENT

Juneau Public Market

Photo courtesy of Brenda Schwartz-Yeager

Marine artist Brenda Schwartz-Yeager of Wrangell.

Photos by Peter Metcalfe

Left: Hand painted Christmas ornaments by Cindy Wortman-Ziel of Craig. **Right:** Teas and herbs by Hope Merritt of Sitka.

The annual Juneau Public Market has gotten so big over the years that it fills two venues, Centennial Hall and the Juneau Arts & Culture Center. Peter Metcalfe, owner/manager of the event, says he modeled it after the public market in Seattle. "The only trouble with a good idea is it doesn't go away," he laughs. This year's market, taking place November 27-29, marks the 33rd year the event has taken place. Originally just in the Centennial Hall ballroom, it expanded to take over the entire Hall in 1991 and in 2005 spilled out into the Juneau Arts & Culture Center; the venues share a parking lot.

The two venues are slightly different. In order to be eligible to set up in Centennial Hall, vendors must certify that they are selling products unique to Juneau. There is a $7 admission fee to get into this Hall, while admission to the Juneau Arts & Culture Center is free, where vendors of any kind can set up shop. Metcalfe says that the market does have approximately a 25 percent turnover in vendors, so every year there are thirty to forty new vendors that haven't been there before, keeping the event fresh and exciting.

Shoppers will find a huge selection of homemade, handcrafted, and unique items ranging from jewelry and clothing to knives, smoked salmon, toys, or recently published books. Santa is on site on Sunday, and Metcalfe says that through the generous donations of the vendors, every child that visits with Santa walks away with a free gift.

"It's fun to be involved in a venture that has thousands of people coming through over a weekend, and everybody is happy and cheerful," Metcalfe says. "It's very social, there are people who come every year, and it's just fun that way."

juneaupublicmarket.com ☼

ANCHORAGE

7-8 Holiday Food and Gift Festival

This is a fun and family oriented event featuring a wide variety of unique gifts, handmade arts and crafts, clothing, jewelry, bath products, home decor, gourmet food, and more. Dena'ina Center, Saturday 10 a.m. to 6 p.m. and Sunday 11 a.m. to 5 p.m. *anchoragemarkets.com*

14 Anchorage Symphony Orchestra—People's Choice

The Symphony Orchestra is proud to welcome home Eliesha Nelson of North Pole. Nelson, currently a violist with the Cleveland Orchestra, will be performing Bartók's Viola Concerto. The rest of this concert is up to the people. Over the summer, community members have the opportunity to play "music director" through surveys sent to mailboxes, inboxes, and social media. Alaska Center for the Performing Arts, 8 p.m. *anchoragesymphony.org*

14 Alaskan Christmas Bazaar

With more than one hundred vendors from all over the state of Alaska selling their handmade, unique items, this bazaar is the perfect place to begin your holiday season. Be sure to stop by the silent auction tables filled with hundreds of hard-to-find deals. City Church, 10 a.m. to 5 p.m. *alaskanchristmas.com*

21-22 Christmas Arts and Crafts Emporium

This is a showcase for Alaska artists and crafters to display and sell their products during the holiday season, a free winter holiday show featuring a large variety of Alaska made arts and crafts, sold by their creators. Dena'ina Center, Saturday 10 a.m. to 6 p.m. and Sunday 11 a.m. to 5 p.m. *anchoragemarkets.com*

24-28 GCI Great Alaska Shootout

The Alaska Community gets its hoops fix—Host University of Alaska Anchorage takes on top foes in one of the longest-running tournaments in college basketball. Alaska Airlines Center. *goseawolves.com*

26 Skinny Raven Turkey Trot

The annual Turkey Trot brought to you by Skinny Raven is back and warmer than ever. We also have a new, one-loop 5K for the big turkeys and a one-loop 3K for those mini turkeys out there. We will be collecting food items and matching cash donations up to $1,000 again this year to help make sure everyone has a great Thanksgiving! Dena'ina Center, races start 11 a.m. *skinnyraven.com*

27 Holiday Tree Lighting

Meet Santa and his reindeer and watch the ceremonial lighting of the tree in Town Square. Enjoy a concert with free hot cocoa and cookies. Town Square, concert begins 5:20 p.m. *anchoragedowntown.org*

11/27-12/20 King Island Christmas

As a Christmas story, King Island Christmas has all of the elements for success: lifting music; a story of overcoming hardship to bring Christmas to the people; warmth; a refreshing lack of sentimentality; humor; a religious element that interweaves with one of the neighborliness; and the Alaska Native respect for the environment. Cyrano's, Saturdays 7 p.m. and Sunday 3 p.m. *cyranos.org*

FAIRBANKS

7 Holiday Bazaar at Pioneer Peak

Shop for holiday gifts and souvenirs among locally-made arts, crafts, and food products. Pioneer Peak Civic Center. *co.fairbanks.ak.us/pioneerpark*

28 Christmas in Ice

Christmas in Ice, the six-week winter ice park located next to Santa Claus House in North Pole, features Christmas-themed ice art competition pieces, ice slides and a maze, twirlers, indoor kids' crafts, and educational ice sculpture demonstrations, adding color and light to the Interior Alaska winter. *christmasinice.org*

28 Thanksgiving for the Birds

This is an opportunity to make feeders and learn about winter birds and how to feed them. Farmhouse Visitors' Center at Creamer's Field, Noon to 4 p.m. *creamersfield.org*

HAINES

9-15 Alaska Bald Eagle Festival

Many of the festival activities are located at the American Bald Eagle Foundation museum, such as wildlife workshops, tours, and presentations. There are also visits to the Alaska Bald Eagle Preserve to witness the "Gathering of the Eagles." Usually more than three thousand eagles can be found there during this time of year. American Bald Eagle Foundation Museum. *baldeagles.org/festival*

KETCHIKAN

27-29 Ketchikan Arts and Humanities Winter Arts Fair

Guests can check off their entire gift list with new creations from more than eighty local artisans and kids can explore and learn at the Imagination Station while their parents shop. There's sure to be everything from wreaths to pottery, from jewelry to photography, from tie-dye to metalwork. Cape Fox Lodge and Ted Ferry Civic Center. *ketchikanarts.org*

KODIAK

12 Letters Aloud

Through the personal letters of some of history's most famous and infamous characters (including Andy Warhol), Letters Aloud explores the high price of fame and how it has both evolved and devolved over the years: a funny, poignant, and moving experience with live musical accompaniment and a dynamic slide show. Gerald C. Wilson Auditorium, 7 p.m. *kodiakartscouncil.org*

PETERSBURG

27 Festival of Lights and Community Tree Lighting

The lighting of the seventy-foot Community Christmas Tree is celebrated with hundreds of people walking down Nordic Drive, with Santa, carrying light sticks or candles. Complimentary hot cider is available. *petersburg.org*

WASILLA

6 Telluride Mountainfilm Festival

Alaska Center for the Environment presents the Telluride Mountainfilm Festival. Started in 1979, Telluride Mountainfilm is one of America's longest-running film festivals. Through the years, in and out of trends and fads, the festival has always been best described by one unchanging word: inspiring. Glenn Massay Theater, 6:30 p.m. *mountainfilm.org/tour/films*

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2016 POWER LIST

The Ultimate Alaska Business Reference Guide


2015 POWER PROFILE

Builders Choice, Inc. has become Alaska's leader in modular construction and manufacturing of engineered building components

Established in 1996, Builder's Choice began manufacturing engineered roof trusses and wall panels for the construction industry and has expanded over the years into large building modular fabrication. Component framing is a "green solution," states Mark Larson, president of Builders Choice, Inc. "By using fewer natural resources and less man hours, we reduce waste significantly over typical field framing operations," he says. The truss plant, now located in Wasilla, caters to the professional contractors throughout the state of Alaska.

Since opening the South Anchorage modular manufacturing facility in the fall of 2005, Builders Choice offers turnkey modular solutions and has completed numerous successful projects throughout Alaska and North America. Their method of modular manufacturing has proven its ability to turn out quality buildings. Modular building is a highly engineered method of construction, where large components of the structure are built in a controlled indoor environment and then shipped to the job site for final assembly. Modules are delivered up to 95% complete and built in one-half the time of traditional site-built construction.

This privately held, family owned and operated company cut the ribbon on a second modular plant in late 2011—in South Dakota—to help meet the housing needs brought on by the Bakken oil rush. Much of the administration of their South Dakota branch is still centralized in their Anchorage office. Thus, the people and systems that have served them so well in Alaska are being put to use in their new branch.

In January 2013, the company expanded its Alaska operations into the vendor and retail markets, opening building material stores in Anchorage, Wasilla, and Soldotna. This has allowed Builders Choice to buy more products directly from manufacturers and, more importantly, sell lumber goods at retail and wholesale, thus giving end-users complete building packages. Builders Choice is an up-and-coming distributor throughout Alaska, becoming a one-stop shop for local general contractors.

In 2014 Builders Choice was announced as the recipient of the Businesss Excellence Gold Pan Award from the Anchorage Chamber of Commerce. For the second year, they were named one of the Top 49ers of Alaska by Alaska Business Monthly.

Involvement with organizations such as Alaska General General Contractors, ABC Alaska, Alaska Miners Association, Alaska Alliance, Alaska Chamber of Commerce, Resource Development Council (RDC), Anchorage Home Builders Association, and Mat-Su Home Builders Association, to name a few, has helped them build relationships with Alaskans, their #1 consumer.

They strive to build quality products that will stand the test of time. Builders Choice is committed to the pursuit of excellence in its work and to develop strategies that are able to meet changing market conditions and changing customer needs.

BUILDERS CHOICE

Please contact them at 907-522-3214 or www.builderschoice.us.com

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Deadline is 11/17/2015

By Amy Miller

Alaska's Mining Industry

A major source for future job growth

Despite minor setbacks in recent years, Alaska's mining industry is expected to be a major source of Alaska's job growth in the coming decade and sets Alaska apart from other states based on the total value of its annual mineral production.

Alaska is among the top mineral-producing states in the nation thanks to large deposits of several valuable minerals. Alaska's total value of mineral production in 2014 was $3.51 billion, and it was ranked seventh (in terms of value) in the nation for nonfuel mineral production, trailing Arizona ($8.06 billion), Nevada ($7.49 billion), Minnesota ($4.71 billion), Texas ($4.24 billion), Utah ($4.28 billion), and California ($3.51 billion), according to "Mineral Commodity Summaries 2015" produced by the US Department of the Interior, US Geological Survey.

Alaska's mining output accounted for 4.52 percent of the US total in 2014, according to the same report. Although this figure is impressive, it represents a decline from levels achieved in 2013 and 2012, which were $3.95 billion and $4.11 billion, respectively, according to "Alaska's Mineral Industry 2013 Special Report 69" produced by the Alaska Department of Natural Resources Division of Geological & Geophysical Surveys in cooperation with the Department of Commerce, Community, and Economic Development Division of Economic Development.

The state's Department of Labor and Workforce Development projected that non-oil mining employment would be one of the top two drivers in a projected 10.8 percent increase in jobs between 2012 and 2022 because of "higher than average mineral commodity prices and the expansion of existing mines," according to an article in the department's October 2014 Alaska Economic Trends. The department projected a 24.8 percent job growth (683 jobs) in non-oil mining between 2012 and 2022, trailing only slightly behind the 25 percent rate for the healthcare and social assistance sector (11,247 jobs) in terms of anticipated job growth. Mining jobs pay an average annual wage of approximately $100,000 per year, which is more than twice the statewide average of all industries combined.

Some might be surprised to learn that one of Alaska's most valuable mined products is sand and gravel for use in construction. It trailed gold, zinc, and silver as Alaska's top mining resources in 2014, according to the US Geological Survey's Mineral Commodities Summary for the year. There are 120 active rock quarries and sand and gravel operations in the state, according to the Alaska Miners Association's 2014 report on the economic impact of the industry. Hauling sand and gravel is a major revenue source for the Alaska Railroad.

Alaska is the top producer of silver in the United States. Meanwhile, Alaska's Red Dog Mine, located near Kotzebue in the Northwest Arctic, is the largest zinc mine in the United States and is responsible for 79 percent of US zinc production. It is one of the three largest zinc mines in the world. However, Alaska's most valuable commodity is gold. ☼

Alaska Trends, an outline of significant statewide statistics, is provided by the University of Alaska Center for Economic Development.

By Amy Miller

Indicator	Units	Period	Latest Report Period	Previous Report Period (revised)	Year Ago Period	Year Over Year Change
GENERAL						
Personal Income—Alaska	US $	1stQ15	39,836	39,218	37,534	6.13%
Personal Income—United States	US $	1stQ15	15,100,011	14,941,804	14,360,913	5.15%
Consumer Prices—Anchorage	1982-1984 = 100	1stH15	217.11	216.83	213.91	1.50%
Consumer Prices—United States	1982-1984 = 100	1stH15	236.27	237.09	233.55	1.16%
Bankruptcies						
Alaska Total	Number Filed	July	39	36	41	-5.13%
Anchorage Total	Number Filed	July	30	32	30	0.00%
Fairbanks Total	Number Filed	July	7	3	9	-28.57%
EMPLOYMENT						
Alaska	Thousands	July	352.42	346.09	348.63	1.09%
Anchorage & Mat-Su	Thousands	July	193.15	192.92	188.91	2.24%
Fairbanks	Thousands	July	44.17	43.73	42.98	2.77%
Southeast	Thousands	July	39.37	36.94	39.26	0.28%
Gulf Coast	Thousands	July	40.07	38.44	40.65	-1.43%
Sectorial Distribution—Alaska						
Total Nonfarm	Thousands	July	363.3	357.7	359.0	1.20%
Goods Producing	Thousands	July	64.5	55.3	65.6	-1.68%
Services Providing	Thousands	July	298.8	302.4	293.4	1.84%
Mining and Logging	Thousands	July	18.3	18.1	19.4	-5.67%
Mining	Thousands	July	17.9	17.7	18.7	-4.28%
Oil & Gas	Thousands	July	15.2	15.1	15.0	1.33%
Construction	Thousands	July	21.5	20.3	18.8	14.36%
Manufacturing	Thousands	July	24.7	16.9	27.4	-9.85%
Seafood Processing	Thousands	July	20.1	12.7	22.4	-10.27%
Trade/Transportation/Utilities	Thousands	July	72.3	71.4	71.0	1.83%
Wholesale Trade	Thousands	July	6.6	6.7	6.8	-2.94%
Retail Trade	Thousands	July	40.4	39.8	39.6	2.02%
Food & Beverage Stores	Thousands	July	6.7	6.5	7.3	-8.22%
General Merchandise Stores	Thousands	July	10.2	10.1	10.8	-5.56%
Trans/Warehouse/Utilities	Thousands	July	25.3	24.9	24.6	2.85%
Air Transportation	Thousands	July	6.8	6.8	6.9	-1.45%
Information	Thousands	July	6.3	6.3	6.2	1.61%
Telecommunications	Thousands	July	4.4	4.3	4.1	7.32%
Financial Activities	Thousands	July	12.3	12.1	12.5	-1.60%
Professional & Business Svcs	Thousands	July	30.1	30.2	31.0	-2.90%
Educational & Health Services	Thousands	July	47.4	47.6	46.0	3.04%
Health Care	Thousands	July	34.8	34.9	33.7	3.26%
Leisure & Hospitality	Thousands	July	41.2	40.3	38.6	6.74%
Accommodation	Thousands	July	12.2	11.7	9.6	27.08%
Food Svcs & Drinking Places	Thousands	July	22.7	22.6	23.1	-1.73%
Other Services	Thousands	July	12.3	12.3	11.7	5.13%
Government	Thousands	July	76.9	82.2	76.4	0.65%
Federal Government	Thousands	July	15.7	15.7	15.5	1.29%
State Government	Thousands	July	24.2	24.8	24.7	-2.02%
State Education	Thousands	July	5.7	6.0	6.0	-5.00%
Local Government	Thousands	July	37.0	41.7	36.2	2.21%
Local Education	Thousands	July	17.1	22.5	17.1	0.00%
Tribal Government	Thousands	July	4.1	3.9	4.4	-6.82%
Labor Force						
Alaska	Thousands	July	374.71	371.59	377.06	-0.62%
Anchorage & Mat-Su	Thousands		204.02	205.38	199.49	2.27%
Fairbanks	Thousands		46.45	46.50	45.67	1.71%
Southeast	Thousands		41.55	39.42	43.97	-5.50%
Gulf Coast	Thousands		42.67	41.43	44.28	-3.64%
Unemployment Rate						
Alaska	Percent		5.9	6.9	6.1	-3.28%
Anchorage & Mat-Su	Percent		5.3	6.1	5.5	-3.64%
Fairbanks	Percent		4.9	6.0	5.6	-12.50%

By Amy Miller

Indicator	Units	Period	Latest Report Period	Previous Report Period (revised)	Year Ago Period	Year Over Year Change
Southeast	Percent		5.2	6.3	5.3	-1.89%
Gulf Coast	Percent		6.1	7.2	6.1	0.00%
United States	Percent		5.3	5.3	6.2	-14.52%
PETROLEUM/MINING						
Crude Oil Production–Alaska	Millions of Barrels	July	13.9	11.0	13.09	6.49%
Natural Gas Field Production–Alaska	Billions of Cubic Ft.	July	8.3	7.9	9.00	-7.78%
ANS West Coast Average Spot Price	$ per Barrel	July	56.20	64.40	107.63	-47.78%
Hughes Rig Count						
Alaska	Active Rigs	July	10	10	9	11.11%
United States	Active Rigs	July	866	861	1876	-53.84%
Gold Prices	$ Per Troy Oz.	July	1130.81	1181.88	1311.98	-13.81%
Silver Prices	$ Per Troy Oz.	July	15.07	16.10	20.92	-27.96%
Zinc Prices	Per Pound	July	2.00	2.09	2.31	-13.42%
REAL ESTATE						
Anchorage Building Permit Valuations						
Total	Millions of $		31.78	82.32	67.0	-52.57%
Residential	Millions of $		15.33	26.01	27.9	-45.05%
Commercial	Millions of $		14.01	52.02	30.4	-53.91%
Deeds of Trust Recorded						
Anchorage–Recording District	Total Deeds	July	944	998	846*GeoNorth	17.97%
Fairbanks–Recording District	Total Deeds	July	*	*	251	*
VISITOR INDUSTRY						
Total Air Passenger Traffic–Anchorage	Thousands	July	710.17	619.25	664.73	6.84%
Total Air Passenger Traffic–Fairbanks	Thousands	July	127.40	118.69	128.26	-0.67%
ALASKA PERMANENT FUND						
Equity	Millions of $	July	52887.40	52800.50	51729.70	2.24%
Assets	Millions of $	July	54016.30	55003.50	51012.70	5.89%
Net Income	Millions of $	July	146.00	76.10	245.40	-40.51%
Net Income–Year to Date	Millions of $	July	43.40	-540.60	-264.80	-116.39%
Marketable Debt Securities	Millions of $	July	29.50	-146.40	11.85	148.95%
Real Estate Investments	Millions of $	July	13.10	62.60	6.08	115.46%
Preferred and Common Stock	Millions of $	July	-4.70	-450.90	-334.70	98.60%
BANKING *(excludes interstate branches)*						
Total Bank Assets–Alaska	Millions of $	2ndQ14	5,913.90	3,994.74	5,589.78	5.80%
Cash & Balances Due	Millions of $		222.57	207.48	309.79	-28.15%
Securities	Millions of $		151.28	154.35	145.27	4.14%
Net Loans and Leases	Millions of $		2,866.23	2,313.63	2,703.46	6.02%
Other Real Estate Owned	Millions of $		19.95	10.57	18.73	6.51%
Total Liabilities	Millions of $		5,109.57	3,506.48	4,814.61	6.13%
Total Bank Deposits–Alaska	Millions of $		4,334.37	3,340.30	4,188.54	3.48%
Noninterest-bearing deposits	Millions of $		1,779.18	1,000.84	1,702.65	4.49%
Interest- bearing deposits	Millions of $		2,555.19	2,327.83	2,485.89	2.79%
FOREIGN TRADE						
Value of the Dollar						
In Japanese Yen	Yen	July	123.27	123.82	99.76	23.57%
In Canadian Dollars	Canadian $		1.28	1.24	1.04	23.08%
In British Pounds	Pounds		0.64	0.64	0.66	-3.03%
In European Monetary Unit	Euro		0.91	0.89	0.77	18.18%
In Chinese Yuan	Yuan		6.11	6.11	6.18	-1.13%

Notes:

1. Source of Anchorage deeds of trust (GeoNorth) is cited in the data field.

2. Banking data has been updated to include Alaska State Banks and Alaska's sole federally chartered, Alaska-based bank, First National Bank Alaska

3. Deeds of trust data for Fairbanks in May and June were unavailable as of press time.

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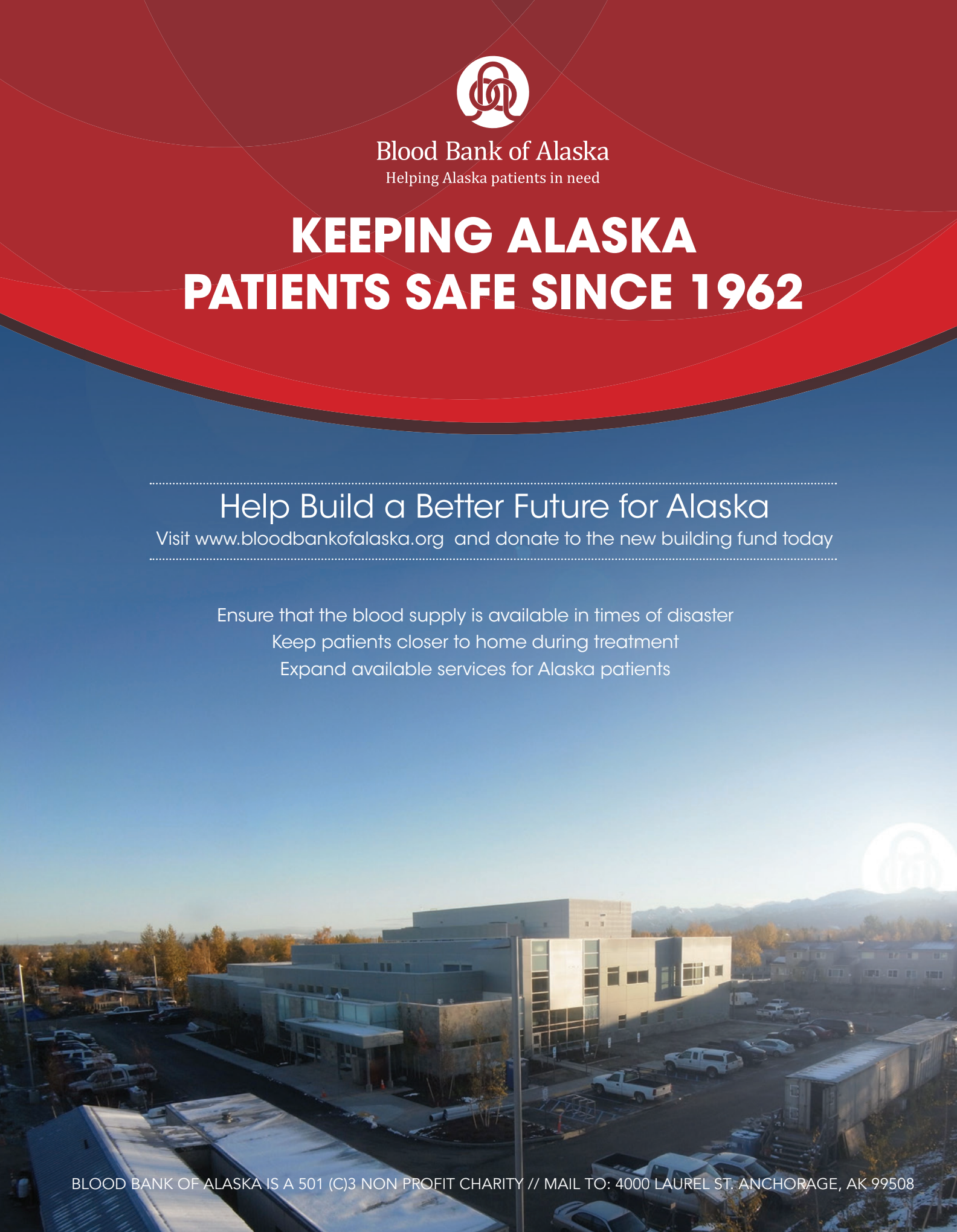

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