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AEDC
Anchorage Economic
Development Corporation

RESOURCE EXTRACTION

10-YEAR PROJECT PROJECTION

Research partners:
Petroleum News and *North of 60 Mining News*

PREFACE

Welcome to the 2013 AEDC Resource Extraction: 10-Year Project Projection Report, generously sponsored by Northrim Bank, with research support from *Petroleum News* and *North of 60 Mining News*. This projection began in 2004 as a modest project to address a request to the Kenai Peninsula Borough Mayor's Oil & Gas office from the University of Alaska sponsored Workforce Development Conference. The goal was to give a perspective on what the future might hold for resource extraction projects in Alaska and to identify the related workforce demands those projects could generate in the next decade.

While that first projection was very simplistic, it triggered a flood of requests for a more detailed projection that could be updated annually. Over time, this projection changed in a number of ways, including improved project details, better modeling of project flow and annualized workforce demands. In 2007, the projection migrated from the Kenai Oil & Gas office to the Anchorage Economic Development Corporation (AEDC).

Then in 2009, a milestone was reached through an agreement between AEDC, *Petroleum News* (PN) and *North of 60 Mining News* (N60) publications. The two publications agreed to provide the factual research foundation upon which AEDC could then develop its own perspectives and projections. At the same time, AEDC also engaged the McDowell Group to provide help with ratios needed in modeling annualized workforce needs and project spending for the projects profiled.

When first developed, the projection was focused on providing perspectives in support of workforce training initiatives. For example, what projects were under development, when would they likely begin activities and how many workers in different skills categories would they need? It also underlined the need to be better prepared to support the projects through infrastructure improvements, as well as the potential social and economic impacts to communities.

From 2004 through 2008 this projection was driven by optimism for the future, and there was good reason for that optimism. The natural gas pipeline from the North Slope to the Lower 48 looked like a sure thing, the national political stars were aligned for the Arctic National Wildlife Refuge (ANWR), mining was seeing a resurgence of investment and the Pebble Mine was emerging as a world-class copper prospect that could become a new economic driver in a struggling region of rural Alaska. Alaska's economic future was bright and the early years of the resource extraction project projection reflected those dawning opportunities.

The 2009 projection, however, was a significant departure from the previous year's forecasts. While there were a large number of projects profiled that had the potential to move forward in the next 10 years, for the first time AEDC sounded a clear note of caution that forces were aligning against the successful launching of those projects. This growing sense of concern was driven in part by the global recession, but also by growing issues related to taxation, permitting, infrastructure and litigation.

In 2011, AEDC departed completely from past practice and did not offer "odds of success" for any projects included in the projection. The increasingly challenged investment environment in Alaska led AEDC to view the future as questionable for most of the projects addressed.

Permitting, litigation, critical habitat, public support, taxation, project economics and lack of key infrastructure were issues that challenged resource extraction projects in ways that, when combined, created high levels of uncertainty that negatively affected investment and diminished Alaska's competitiveness in the global market place. Since the 2011 report was issued, the situation has grown even worse in many instances, though there are a few glimmers of hope and progress that were noted in the 2012 report.

In 2013, with several new enhancements added, our report will underscore a renewed yet cautious sense of optimism for some of the projects, particularly those in the Cook Inlet Basin. The report also notes some progress over the last year in addressing the many challenges that face the mining and oil and gas industries, mainly focused in the area of taxation and to a lesser degree permitting. But it will also demonstrate again that Alaska's attractiveness to investment in major energy and mineral projects remains challenged.

AEDC would like to thank Mr. Dan Dickenson for his research and writing efforts on behalf of AEDC in the development of the oil and gas sections of this report. Additional thanks go to Mr. Shane Lasley of *North of 60 Mining News* for his research and writing support for the development of the mining sections of this report. AEDC would also like to thank *Petroleum News* for their continuing support in providing research and review of the factual information contained in this year's report.

EXECUTIVE SUMMARY

In this year's report, unlike recent past editions, there is some optimism to our projection. That optimism is tempered by the many challenges that still face proposed mining and oil and gas projects in our state.

On the optimistic side, the Cook Inlet basin has seen what is being touted by many regional industry leaders as a renaissance in investment and activity. Estimates by many observers peg 2012 capital expenditures in the basin at nearly $500 million with estimates for 2013 topping $600 million in potential new spending. This renaissance is driven by both very favorable market conditions for crude oil and natural gas in the Railbelt region, combined with extremely favorable tax policies by the State of Alaska that have demonstrated a high level of attractiveness to smaller independent oil and gas explorers.

Oil and gas and related support industry employment in the Cook Inlet region have seen significant increases in the last 18 months, with a corresponding significant drop in the unemployment rates, particularly within the Kenai Peninsula Borough. This bodes well for the odds of future success for projects proposed for this region in the next decade; a number of challenges related to permitting, infrastructure, key industry support services and litigation – to name a few – could delay or derail many of these efforts.

Alaska's North Slope may see similar results in the coming decade, though this view is tempered to a significant degree as it is still too soon to judge the effect that recent passage of oil tax reduction legislation by the Alaska State Legislature. Opponents of the legislation are engaging in a repeal petition effort to place the tax reduction legislation on the ballot in August 2014, leaving the question of oil and gas taxation still not fully resolved. This continuing tax policy debate will maintain a level of uncertainty that could adversely affect industry investment if not resolved.

Even if this legislation ultimately withstands this potential vote to repeal, expectations must be controlled. Tax policy alone will not lead to another "Oil Boom" as was seen in the early days of the Prudhoe Bay discovery. Progress in stemming declines in North Slope oil production will likely be measured in inches in the next few years as proposed investments ramp up, projects are designed, permits are developed, litigation is overcome, drilling is completed, facilities are built or revamped, and actual new production is brought on line as a result.

It should be noted that in the last 12 months some permitting issues were addressed to varying degrees. Some progress was made in the effort to make permitting in Alaska more timely at the State level and Federal permitting has seen some administrative improvements in coordination between agencies. But the panoply of federal permitting regimes still remains a significant barrier to reasonable timeliness in obtaining vital federal permits, as does the seemingly endless litigation processes most projects face in federal courts.

If production declines are actually halted, longer term new production growth will require even larger investments, with all the same challenges but on a bigger scale. New technologies in exploration and drilling will be vital to bring about new production increases. Alaska resource development will likely be

dependent on new technologies like those that have created the boom in natural gas and oil production in the Lower 48 states. Again, expectations must be tempered by the fact that we must change more than tax policy in Alaska if we are to remain competitive in our quest for new investment that will bring about increases in oil production.

As demonstrated by the historical and current resource data upgrades in this year's report, with the exception of ANWR, the odds of another Prudhoe Bay super field being discovered in the North Slope area are slim given our history of smaller new oil discoveries over the last 40 years. There is, however a massive known resource in the form of heavy oil that is measured in the billions of barrels that could be developed within the existing Greater Prudhoe Bay Field. But again, this requires new drilling and recovery technologies to make this massive resource viable. Tight oil prospects, similar in some aspects to those found in North Dakota, will also require new investments in new technologies if they are ever to be successfully developed.

The odds for a new super field being discovered improve in the offshore regions of northern Alaska, particularly in the federal waters of the Outer Continental Shelf (OCS). But as was clearly demonstrated by the challenges and misfortunes suffered by Shell in their efforts to drill in the Chukchi Sea in 2012, drilling and developing oil and natural gas resources in the OCS is a long-term effort that could take a decade or more to deliver the first barrel of oil to market.

Given current conditions, there are no likely short-term project opportunities in Alaska. Alaska has reached a point where the average project timeline is measured in decades. Given the rapidly changing marketplace Alaska finds itself doing business in, time is not Alaska's friend.

In just five years global oil and gas markets, particularly in the Lower 48, have become ever more competitive thanks to new technological innovations. Hydraulic fracturing and horizontal drilling have changed the face of U.S. energy markets. According to the U.S. Energy Information Administration projections, within the next 20 years the United States could reach a point of balance in the amount of energy it consumes as a nation versus the amount of energy it produces domestically, meaning the United States will no longer reliant on imported crude oil.

This is a game changer for energy markets, regional economies and the global trade in oil and natural gas. These new technologies are driving down the costs and time required for exploration, development and production of oil and natural gas with resulting regional supply overbalances that are driving down prices as new reserves of oil and natural gas flood U.S. markets. Technology is making Alaska's already challenging cost and time environment even less competitive as it becomes cheaper to explore for and produce oil and natural gas in the Lower 48 and Canada.

In the mining sector, the momentum that Alaska seemed to have prior to 2009 in new projects being developed has slowed dramatically. Global economic demands for key mineral resources have changed significantly in the last year. The Gold market appears to be moving into a declining "Bear" cycle, resulting in dramatic declines in the commodity price for gold.

This trend has dried up much of the investment flows into new mine development. There has also been a sea change in corporate leadership over the last 18 months that has seen new CEO's installed at almost every major global mining company. Mining company shareholders have demanded that CEO

strategies should shift from new project investments and growth seen in the last decade to strategies focused on dividends and cash returns to investors.

Most companies are now waiting for improved global economic stability before contemplating investments in new mine projects. In effect, venture capital in the global mining industry is significantly constrained at this time, creating serious headwinds for proposed projects. The net result is that projects in development before this shift in the global mining markets are still moving forward, but much more slowly. Brand new project proposals will likely be few and far between in the next couple of years until global market conditions improve.

Alaska is lucky that it has several projects already proposed that were well into the long-term development process. Projects are now estimated to take seven to 10 years to permit with a long-term outlook of 10 to 15 years from beginning proposal to first production. But like the oil and gas industry, these timelines are significantly out of line with timelines required in other regions of the world, including our neighbors in Canada. Again, Alaska is losing its competitive edge.

Why should Alaskans care about these issues? In the 2011 edition of the projection, AEDC described the current economic foundations of Alaska, the existing resource extraction based projects in place, the proposed resource extraction projects and the growing list of challenges those projects faced that made their development highly unlikely within the next 10 years. In the following 2012 edition, very little changed that mitigated those challenges. That story still holds true today.

As was the case in 2012, AEDC's perspective on the outlook for the majority of these projects is not optimistic. Alaska's competitiveness in the global markets remains challenged in many ways. Several related issues continue to diminish Alaska's competitiveness. Issues based in social compacts, taxation, permitting, litigation, commodity pricing, high costs related to project development and access to needed infrastructure have reached a point of, what is effectively, gridlock for many proposed projects. Compounding these challenges is a continuing lack of agreement among Alaskans on a common vision for Alaska's economic future.

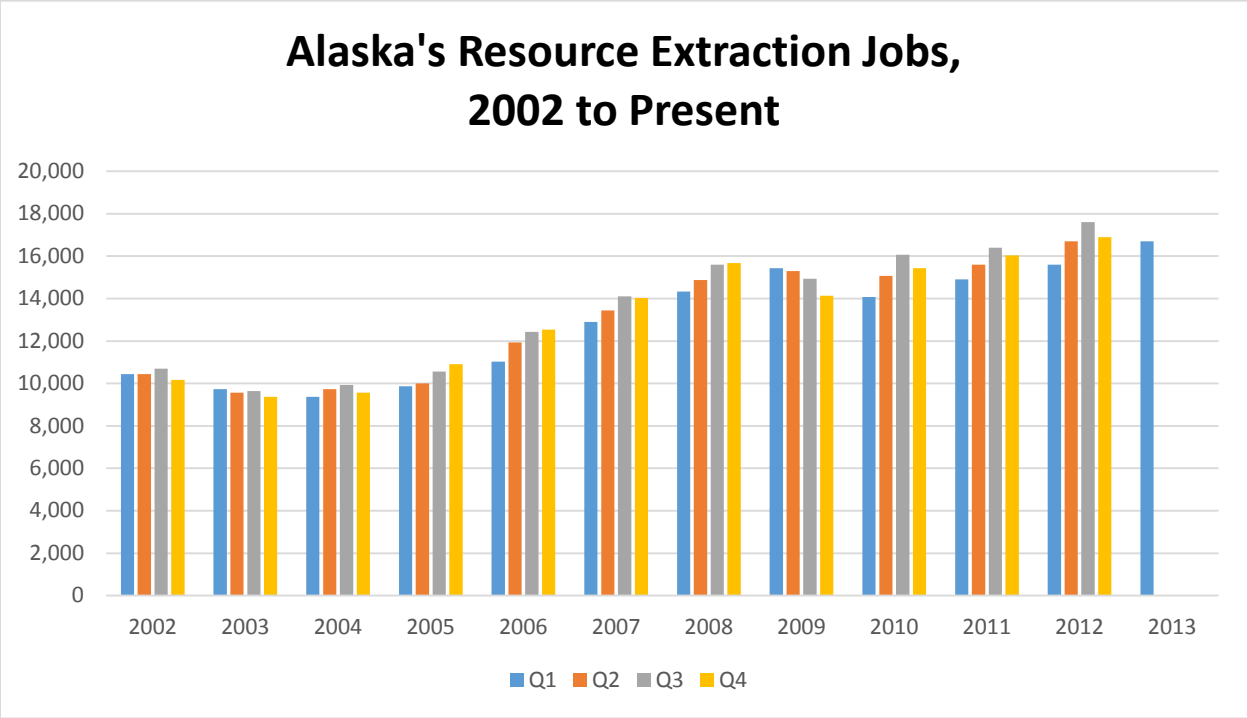
Resource extraction projects developed in the next seven to 10 years will be the foundation of a growing, more diversified economy based on new jobs and a lower cost of energy for all Alaskans. The wealth generated by these projects, combined with our existing industry base, will provide the needed capital to broaden our economy though investments in education, infrastructure, community and economic development. If we are unable to develop even a minority of the projects described in this report, there is a growing likelihood that Alaska will face a period of economic stress which will result in a growing trend of economic stagnation and decline for many areas of Alaska.

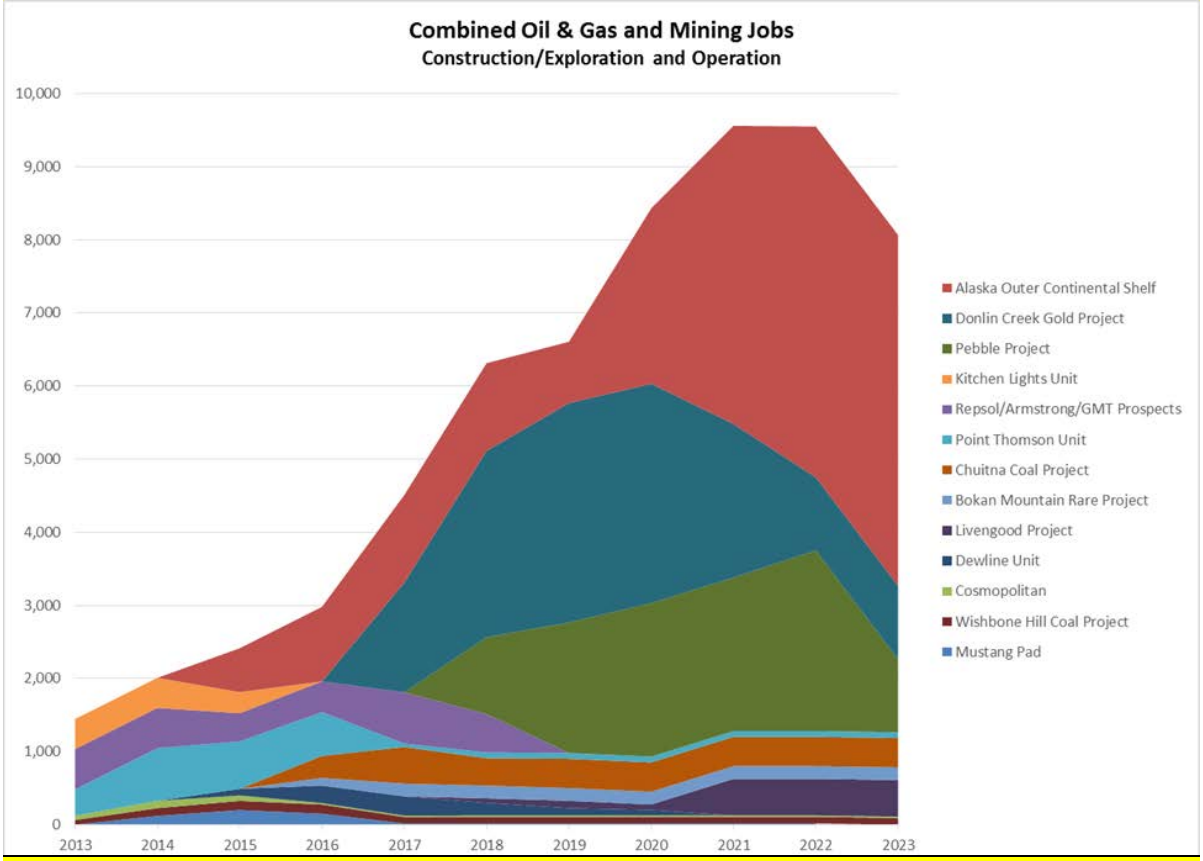
So what is the outlook for proposed projects in the next decade? For 2013, AEDC's updated projection shows Alaska has the potential to generate as many as 14,362 jobs at peak construction that would be created through $24.6 billion of private sector investments in 18 resource extraction projects that are proposed for development within our state in the next decade.

The following are the graphed views of the projects profiled in this projection, along with a historical representation of resource extraction job levels in Alaska over the last 11 years to provide context. The first three graphs present a combined view of oil and gas and mining projects from two perspectives.

The first shows the number of resource extraction jobs in Alaska by quarter since 2002. Next is the view of total jobs the proposed projects in this report could create and when. This is the earliest that these jobs/spending could occur and are based on favorable conditions. The third graph presents an overview of total spending on these projects and when that spending will take place.

Please note that all graphs are based on available information and in some cases, projects only offer jobs numbers or capital investment figures, not both, and will be excluded from either the jobs or investment graph. It is inappropriate to interpret these graphs as firm commitments by the proposing companies. As discussed at multiple points in this report, all of these projects face significant challenges that must be overcome to initiate actual construction and operations.




Combined Oil & Gas and Mining Jobs
Construction/Exploration and Operation
10,000
9,000
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7,000
6,000
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1,000
0
2013
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2018
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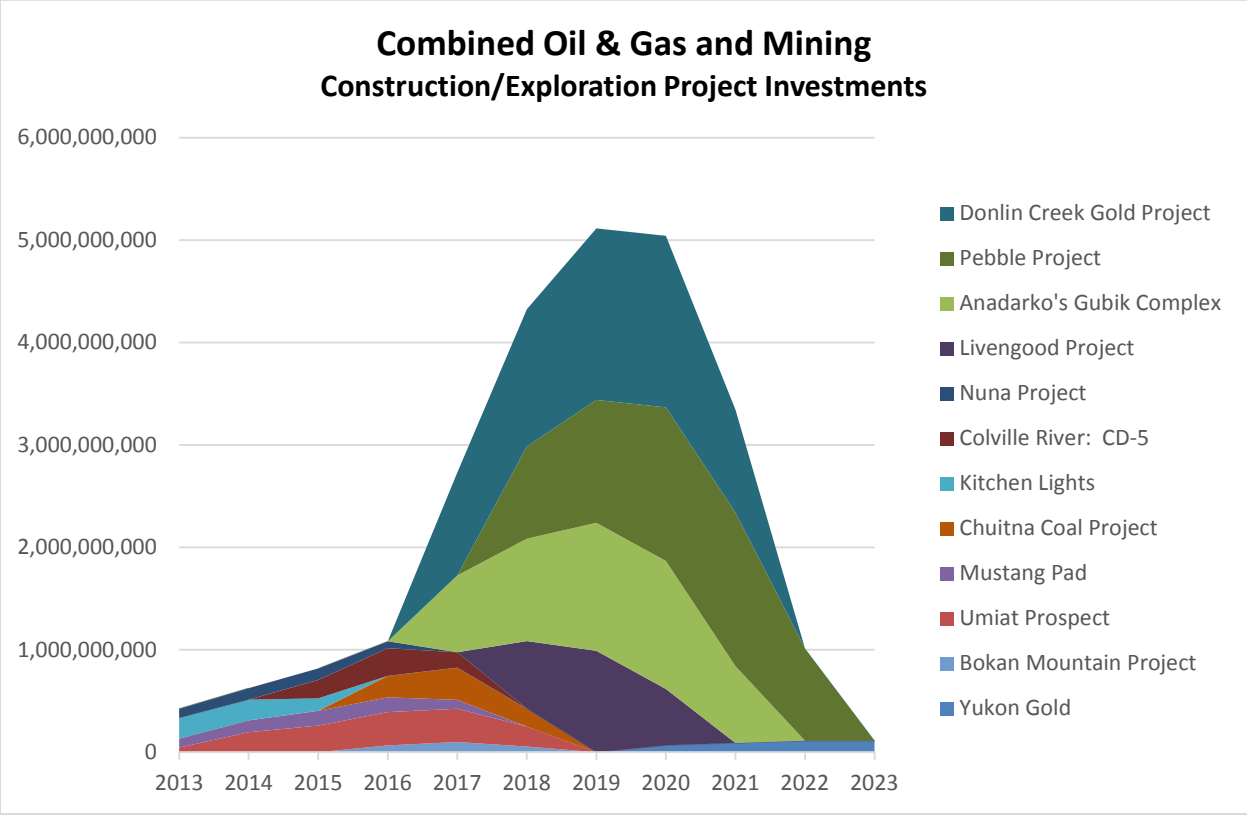
2020
2021
2022
2023
Alaska Outer Continental Shelf
Donlin Creek Gold Project
Pebble Project
Kitchen Lights Unit
Repsol/Armstrong/GMT Prospects
Point Thomson Unit
Chuitna Coal Project
Bokan Mountain Rare Project
Livengood Project
Dewline Unit
Cosmopolitan
Wishbone Hill Coal Project
Mustang Pad


Combined Oil & Gas and Mining
Construction/Exploration Project Investments
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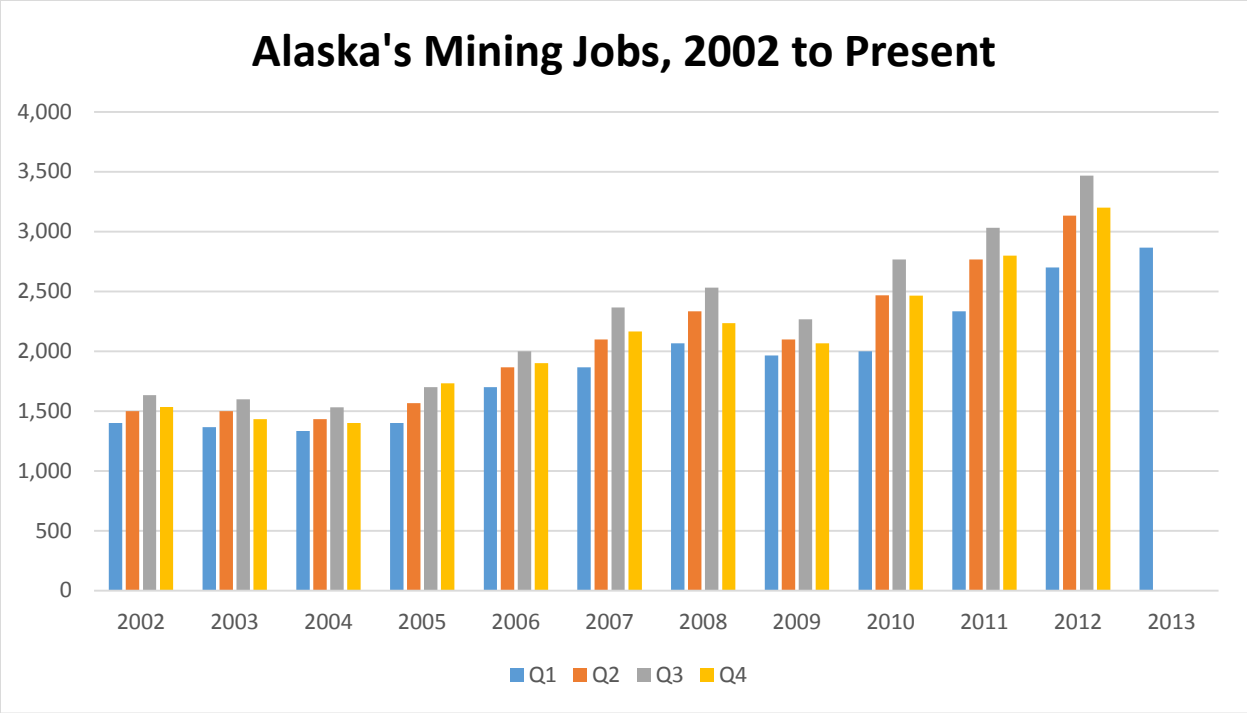
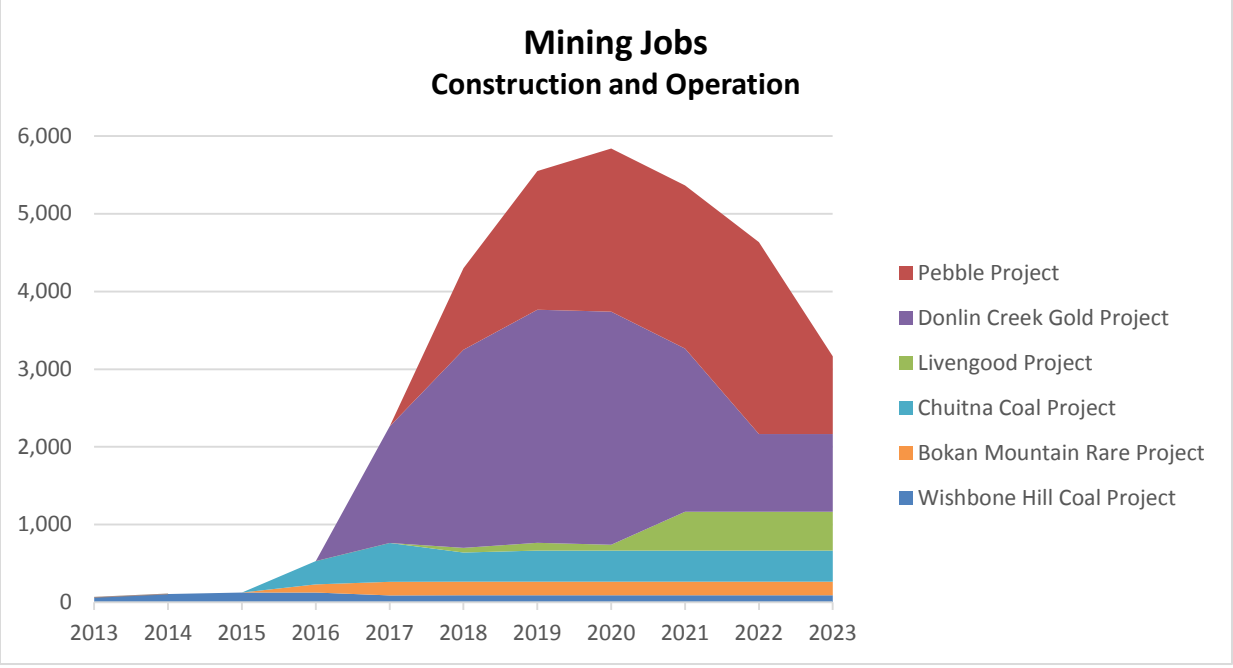
2022
2023
Donlin Creek Gold Project
Pebble Project
Anadarko's Gubik Complex
Livengood Project
Nuna Project
Colville River: CD-5
Kitchen Lights
Chuitna Coal Project
Mustang Pad
Umiat Prospect
Bokan Mountain Project
Yukon Gold

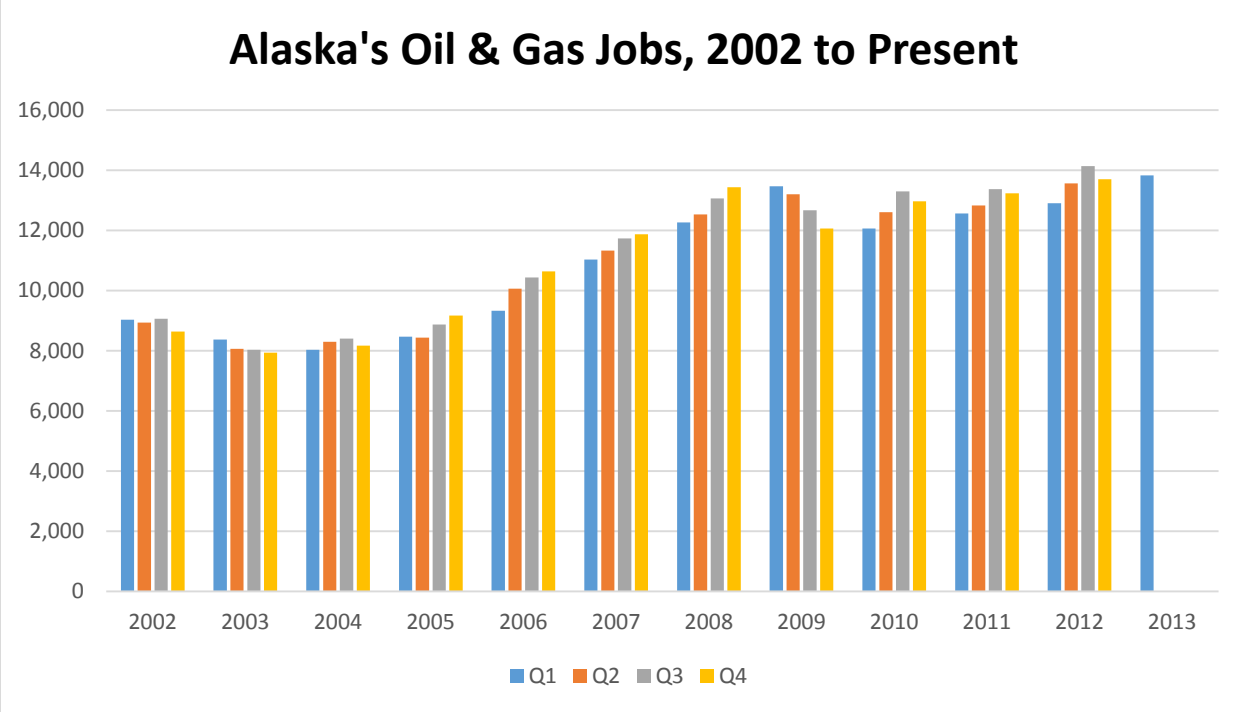
THIS GRAPH REPRESENTS THE NUMBER OF JOBS IN THE MINING INDUSTRY IN ALASKA OVER THE LAST ELEVEN YEARS.



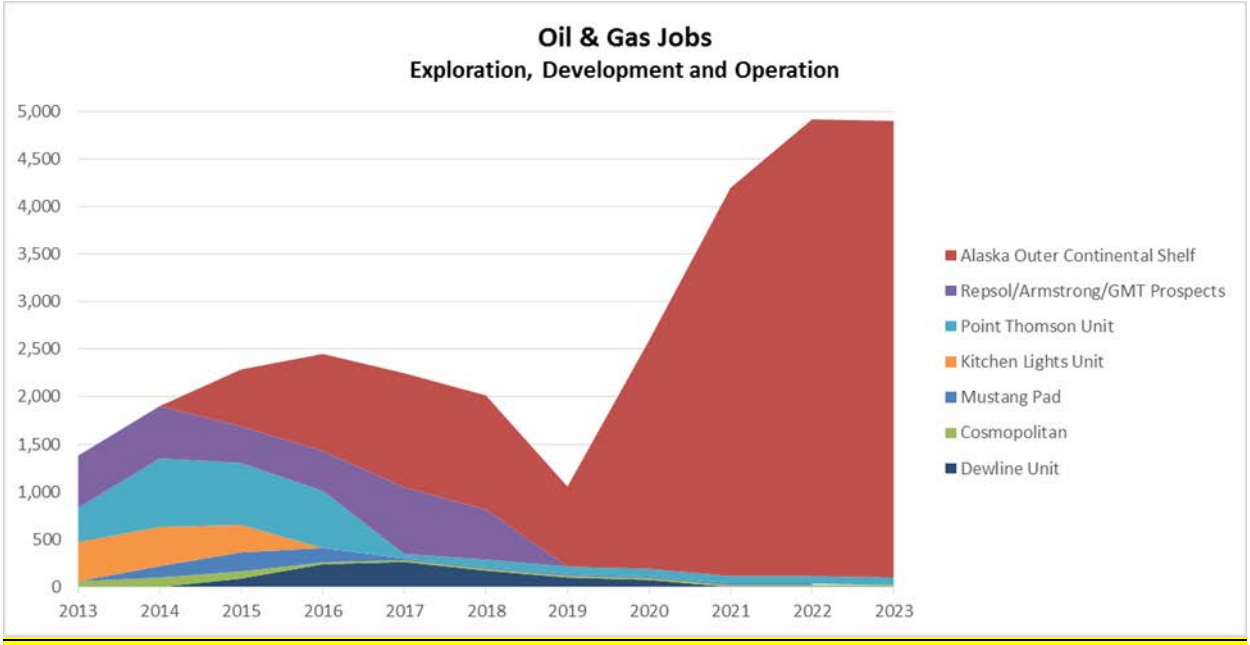
THE NEXT TWO GRAPHS OFFER THE NARROW VIEW OF PROPOSED MINING PROJECTS ONLY, AND AGAIN ADDRESS TOTAL JOBS AND SPENDING RELATED TO THOSE PROJECTS OVER THE NEXT DECADE.

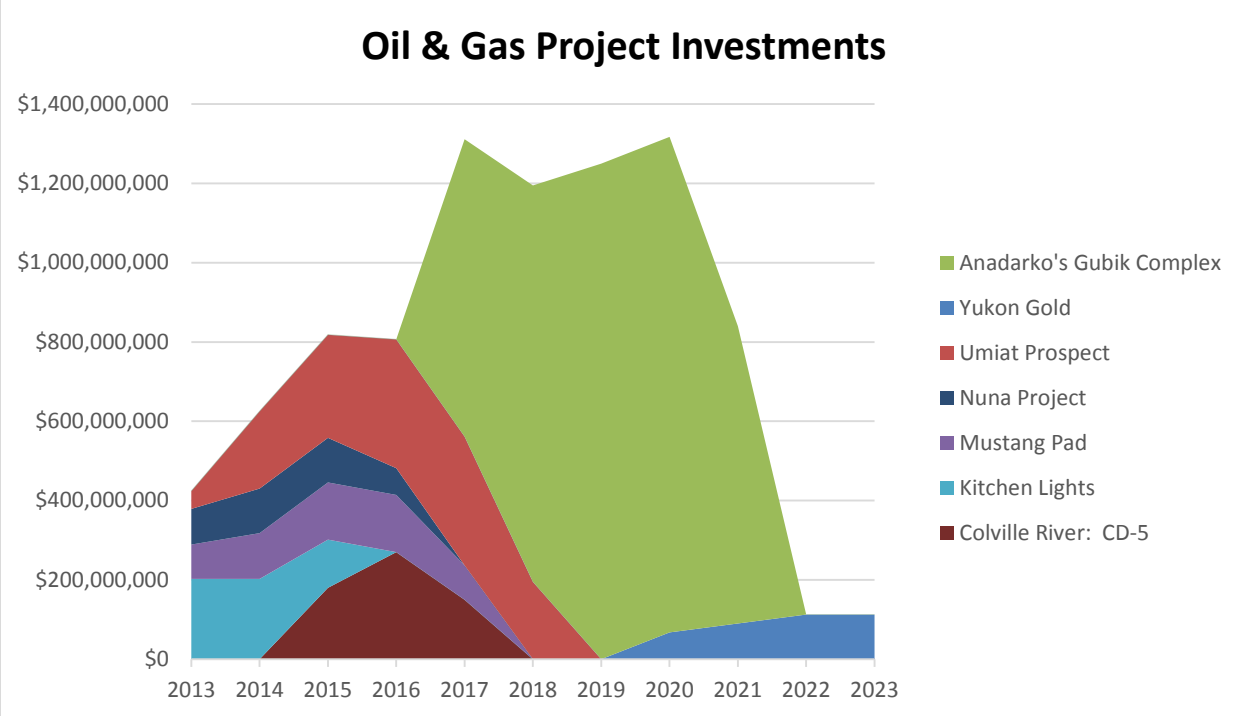


THIS GRAPH REPRESENTS THE NUMBER OF JOBS IN THE MINING INDUSTRY IN ALASKA OVER THE LAST ELEVEN YEARS.



THE FINAL TWO GRAPHS OFFER THE NARROW VIEW OF PROPOSED OIL & GAS PROJECTS ONLY – AND AGAIN ADDRESS TOTAL JOBS AND SPENDING RELATED TO THOSE PROJECTS OVER THE NEXT DECADE.





Why are these projects so important? Aren't we doing just fine as an economy? The 2009 global recession hardly hurt our economy, so that means we have nothing to worry about, right? From AEDC's perspective, we have a lot to worry about. While the current economic trends appear to be positive for Alaska's economy over the next few years, there are definite storm clouds on the horizon that we must begin now to steer a course around if we are avoid the worst of the looming economic tempest Alaska could be caught up within by the end of this decade, if not sooner.

As we noted in last year's report, to understand our concerns, one need only examine the basics of Alaska's economy. We are a young state with a small population of 730,000 spread out over a vast geographic region. Our entire state population could fit within the boundaries of any number of mid-size cities in the Lower 48 and still have room left over. This small population base does not lend itself to the vision we all share of a more fully diversified economy. It will likely be decades before our population, infrastructure, and general economic conditions mature enough to realize this more diversified vision. This leaves us more vulnerable to large swings in the economy created by changes in our key economic components.

Alaska's economy is fundamentally based on three relatively equal valued broad components. Oil revenues, government spending and everything else. In terms of jobs, a recent study by the UAA Institute for Social and Economic Research noted that, out of an average 357,000 total jobs in Alaska between 2004 and 2006, the petroleum sector generated 31 percent of all jobs in Alaska, while the federal government accounted for 35 percent of Alaska jobs. All other industry sectors, including tourism, fishing, mining, retail, health care, etc. combined generated the remaining 34 percent of jobs in Alaska.

If Alaska is to mitigate the looming cuts in federal spending, it must choose those strategies and efforts that focus on opportunities Alaska has the most control over. The development of oil, natural gas and mineral resources offer the only opportunities of a significant order of magnitude to not only offset federal spending cuts, but to actually grow the Alaska economy even in the face of declining federal spending. Given the continued decline in oil production from state lands, time is running out to embrace new development strategies.

As was noted in last year's projection, resource extraction projects in Alaska face an ever-growing list of individual challenges that, when combined to varying degrees are delaying or stifling many of the projects described in this year's projection. Those challenges and issues continue to include:

- Timely permitting reviews and awards
- Nonstop litigation
- Lack of key infrastructure such as roads, ports, communications and power
- Lack of social compacts with communities affected by proposed projects
- Taxation
- Commodity markets
- High costs associated with Alaska projects
- Lack of agreement among Alaskans on a vision for Alaska's economic future
- Time as a cost due to delays in development timelines caused by any combination of the challenges listed above

But when taken as a whole, most of the projects AEDC profiled in last year's projection made very little headway in the face of the numerous challenges they continue to face. In the view of AEDC, these are all lost or delayed opportunities to address Alaska's looming economic challenges. Some steps have already been taken by state government to reduce permitting delays and to more aggressively market Alaska's mineral and energy resources for development. There have been some victories on the federal side of government permitting and regulation. But more must be done. Alaska has resource development opportunities that most other states, regions and even countries can only dream of having. As a state, we have the ability to embrace these projects in order and move as many of them forward as reasonably possible. We need to seek ways to shorten the time it takes to develop these projects while protecting the interests of Alaskans to provide more certainty to energy and mining companies so that a decision can be made within a finite time period on whether or not they will be able to move their project forward. If even 25 percent of the projects described in this projection were to move forward and be developed as proposed, Alaska would see a period of investment and corresponding jobs growth not seen since the 1970s.

Ultimately, we as Alaskans must continue to seek common ground to the greatest degree possible on these proposed projects, as well as the existing oil and gas and mining projects in our state. Until we can reach common ground on how to develop any of these projects, Alaska's opportunities for future economic growth will continue to be one more year away.

BACKGROUND INFORMATION OVERVIEW

In prior years the Resource Extraction Projection Project has presented oil and gas projects in various ways. We have looked at what projects could be considered far enough along to actually be considered "plans" and which were ideas to watch. We compared projects with a greater than 50 percent likelihood to those with less than a 50/50 chance. We assembled massive appendices detailed the latest information on various projects. In this 2013 edition, we have moved away from classifying fields as proposed or to be watched, as this brought an element of "picking winners and losers" into the equation.

In an earlier publication, we wrote of the three steps required to bring about oil and gas production: exploration to find hydrocarbons; investments to develop a field (including required supporting infrastructure); and finally production. In this year's edition of the resource extraction project we look at the world through these three phases, and assign each oil and gas project to one of the three. Our goal is to provide summaries of recent activities to allow the reader to judge the projects based on its merits. Of course, as a ten year project projection report, some prognostication is required, and the AEDC's perspective on job numbers and project investment levels is shown in the preceding graphs. We hope these changes provide an improvement to this report and serve to expand the community's understanding of this vital industry.

This report is divided into two sections, Oil & Gas and Mining, each beginning with an overview of the general resource and market factors that are driving current interests in Alaska by a variety of companies. Next, the oil and gas project overviews are presented in three groupings: producing units; active drilling and exploration; and other explorations. The mining section is presented in two pieces, proposed projects and existing operations. At the end of each resource section, maps are provided to show the distribution of projects across Alaska.

OIL & GAS RESOURCES

TECHNOLOGY AND THE NEW MARKETPLACE

In the 2012 Resource Extraction Projection Project, we identified two drivers and four sources of oil that could maintain or increase the level of liquids in the Trans Alaska Pipeline (TAPS). We discussed at length the prospects for a natural gas pipeline that could connect the huge gas resources on the North Slope with international markets. The market constraints that we mentioned all still exist – and after the 2013 legislative session it now appears that if a gas line is built it will be built as a non-market project financed by the state.

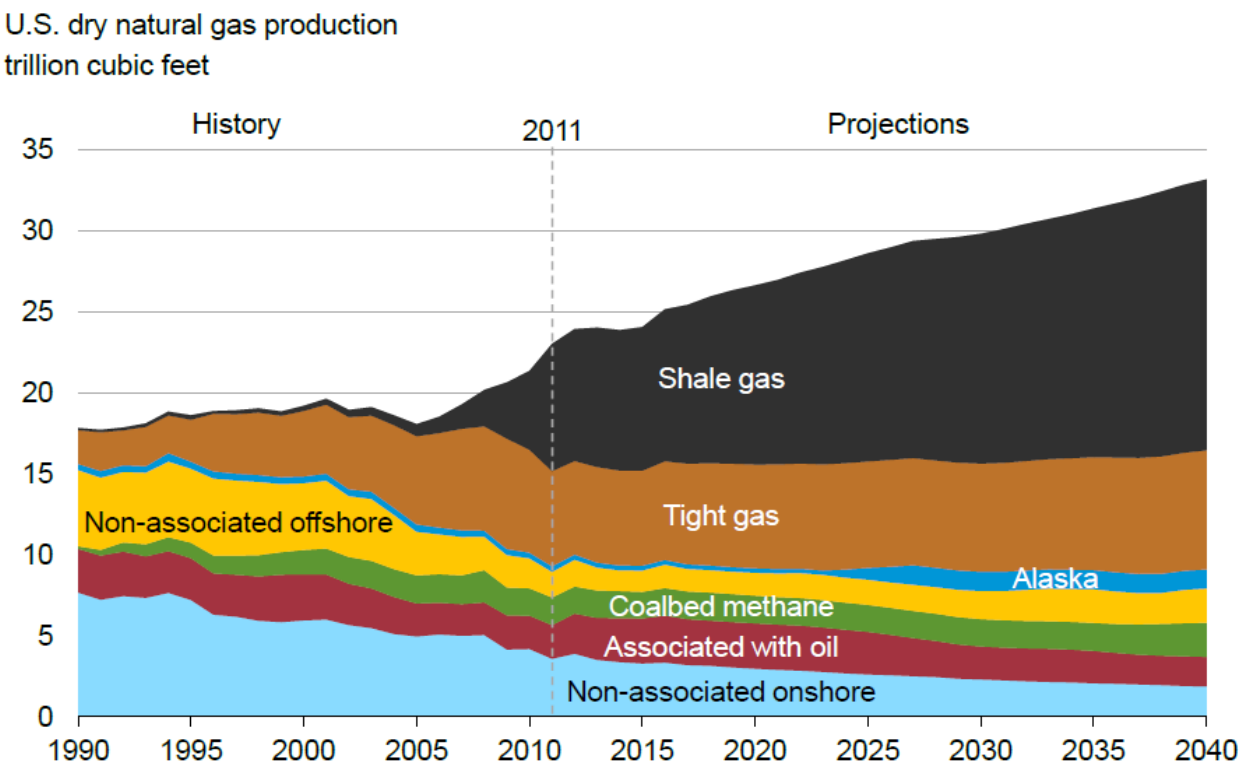
In that same report, we devoted a single sentence to the other driver: technology. Throughout the thirty-one potential oil and gas projects in this report, we see that many of these projects often revolve around hydrocarbon discoveries made ten, twenty, or in the case of some of the US Navy's drilling in the National Petroleum Reserve, 70 years ago.

Two technologies have transformed the oil and gas markets in the lower 48 in a very short time, horizontal drilling and hydraulic fracturing. The effect of both of these technologies is to allow huge amounts of oil and gas to be produced from shale and other "tight" formations.

According to the Energy Information Administration (EIA)[1] in 2000, roughly 2 percent of US supplies, or 0.3 tcf (trillion cubic feet a year) came from shale gas. A decade later in 2010, production from shale was 4.8 tcf a year, comprising 23 percent of US production. Shale gas continues to grow and displace other forms of gas and we are halfway through an expected a doubling of US shale gas production to 9.9 tcf a year by 2017 when the EIA[2] anticipates it will comprise 39 percent of all U.S. gas production, reaching 50 percent by 2036.

[1] Note the US federal government's Energy Information Administration (EIA) should not be confused with the Paris based OECD related International Energy Agency (IEA).

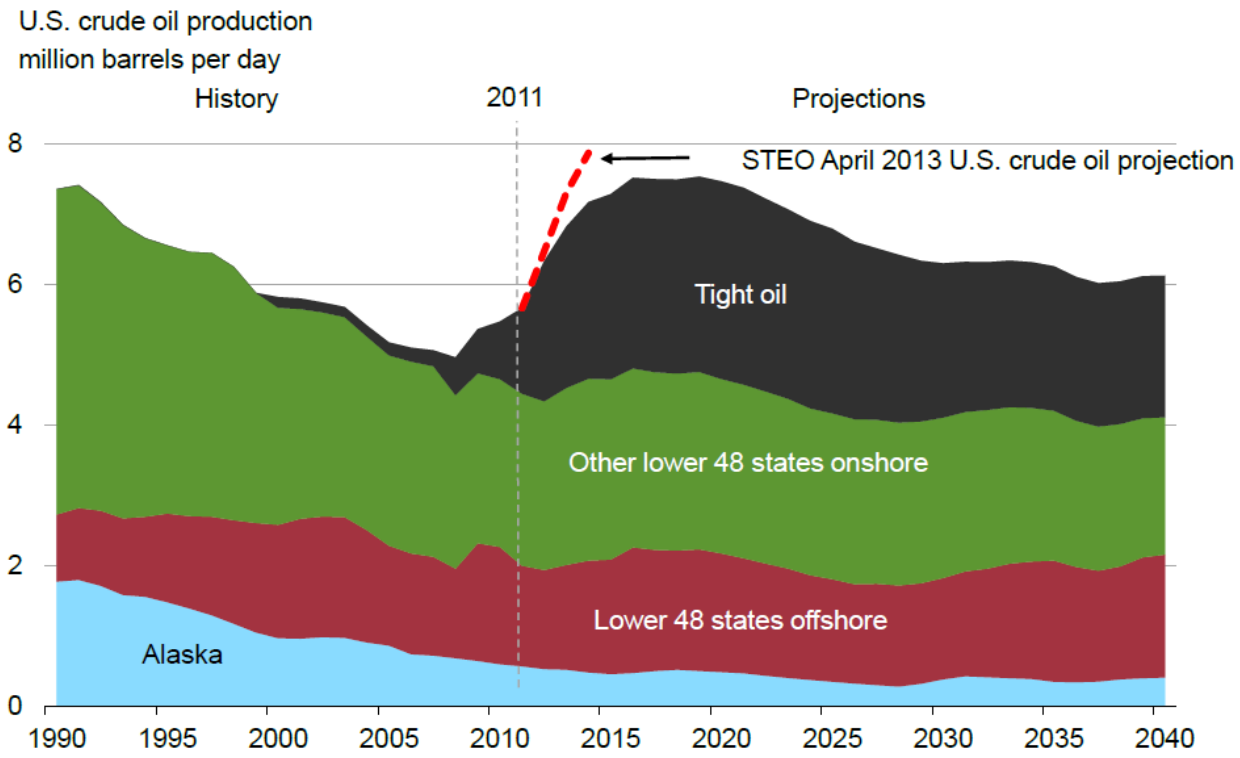
[2] In its International Energy Outlook for 2000, the EIA identified the technology for the future as CTG because "much of the world's endowment of identified, recoverable natural gas resources lies in remote locations or smaller accumulations…"



Source: EIA, Annual Energy Outlook 2013 Early Release

A transforming aspect of this transition to shale gas is that no exploration is needed. Geoscientists have identified at least another 100 years of gas supplies in the lower 48 states. There the conversation includes "gas factories." The raw materials are known and the process of producing gas is now the logistics of moving the needed material and supplies to the factory, using it, and disposing of any waste. This is a very different business than drilling wildcat wells.

Although the shape of the past and projected growth curves are a little different, the same technologies have sparked a huge growth in the production of oil from shale. As recently as 2009, total shale (and other tight) oil production in the US was about equal to total Alaskan oil production at just under 650,000 bbls a day. By 2017, the EIA predicts that the US will produce about ten times as much shale oil as it will Alaskan oil, which will then account for over one-third of total US production. No Alaskan needs to be reminded that led by production from North Dakota's Bakken, the surge in shale oil is leading the resurgent growth in US production. In fact, according to the IEA,[3] growth in American production will lead to the US surpassing Saudi Arabia in oil production by 2020.



Source: EIA, Annual Energy Outlook 2013 Early Release and Short-Term Energy Outlook, April 2013

Neither of these technologies are new here. Alaska has long used horizontal drilling and hydraulic fracturing. Both have proven useful and necessary to produce the North Slope. When former BP (Exploration) Alaska chief John Minge stated during the 2011 debate on production taxes that BP already knew from previous exploration activities where 5 billion barrels of oil were, and that their focus was on developing those barrels, he was essentially making this point. Looking for projects to put oil into TAPS, finding ways of producing challenged oil can be as important and critical as exploring for "new" oil.

Of the four drivers discussed last year, three are explicitly about new technology. One is the expertise needed in exploiting heavy and viscous oil, as described later in this report. The process of returning to drilling in the OCS appears to be as much about safety technologies and a determination as to just how confident we can be that another 2010 Gulf Coast blow out will not occur off the shores of Alaska. Great Bear's wells to test for production of oil from shale are labeled as "proof of concept". Each of these new technologies could lead to billions of barrels of additional oil. In fact, if the Ugnu heavy oil field could be produced, it would be the second largest North Slope field after Prudhoe Bay.

The fourth driver was finding new reserves among the remaining unproduced stratigraphic and structural plays. Even there, the exploration process is changing under the influence of technology. Three dimensional seismic surveying and new ways of interpreting the data collected means more of the exploration is being done in the lab, and less by poking vertical

holes down into the ground. One of the projects we discuss in this 2013 edition is Apache's new Cook Inlet well, drilled after an intensive and wide 3 dimensional seismic analysis, using new seismic technology.

In this report, we track thirty-two proposed projects, each in various stages of development. Many of these projects will fall by the wayside. Some will likely be developed. There is no question that changing technology will play a significant role in determining which projects proceed. When it comes to how the technology will develop, and which projects it will boost, the crystal ball is a great deal cloudier.

PRODUCING UNITS, OIL & GAS

NORTH SLOPE DEVELOPMENTS

Alaska's North Slope oil production is mainly derived from the super-giant Prudhoe Bay unit, with additional input from a handful of nearby fields, many of them giant fields.[4] Their available reserves and historic production output are shown on the following table, along with Cook Inlet for comparison.

Table One

Oil Production & Reserves, North Slope & Cook Inlet

Unit	Year Development Began	MMBO[1] of Reserves[2]	MMBO of Production[3]	Total
Prudhoe Bay	1977	2,449.80	12,557.21	15,007.01
Kuparuk	1981	990	2,363.12	3,353.12
Milne	1985	209.9	283.91	493.81
Duck Island/Endicott	1994	102.1	487.31	589.41
Badami	1998	100	5.2	105.2
Colville River/Alpine	2000	419.8	351.62	771.42
Northstar	2001	63.87	141.81	205.68
Oooguruk	2008	73	3.38	76.38
Nikaitchuq	2011	186.7		186.7
Entire Cook Inlet	1958	34	1,326	1,360
Totals		**4,629.17**	**17,519.56**	**22,148.73**

1. MMBO: Million Barrels of Oil
2. As of 1/1/2010
3. Through 1/1/2010

Source: Alaska Department of Natural Resources (DNR), Division of Oil & Gas

Resource development in the North Slope of Alaska repeats a pattern found around the world. Large fields typically have several owners – and those owners hire someone, frequently one of the owners with a large ownership share to be the operator, and actually run the field according to the wishes of the owners. Who are the owners?

As we can see from Table two below, there are three owners that own about 91 percent of the production. At the other extreme, the ten companies with the smallest ownership shares

[4] Although no "official" definition exists, generally fields with over a half billion bbls are considered "giant" fields. Super-giants are an order of magnitude larger with over 5 billion barrels.

own about three tenths of one percent. There are five companies that have stakes in at least three of the producing fields. ConocoPhillips has the most production spread across four fields, about 40 percent of the total.

Table Two

Oil Production by Unit and Ownership
North Slope, 2012

		Owners								
Unit	Production by Unit	Conoco Phillips	British Petroleum (BP)	Exxon Mobil	Anadarko	Chevron	ENI	Pioneer	Savant	10 Others
Badami	477,560								322,353	155,207
Colville River	25,852,795	19,813,582			5,796,197					245,602
Endicott	3,156,400	96,270	1,662,792	781,525		605,082				11,047
Kuparuk River	41,264,784	22,344,881	15,841,551	1,035,746		2,042,607				
Milne Point	6,401,648		6,211,519				69,778			120,351
Nikaitchuq	3,041,408						3,041,408			
Northstar	3,030,452		3,025,603							4,849
Oooguruk	2,508,258				9,531		686,009	1,788,388		24,330
Prudhoe Bay	102,645,781	37,034,598	27,057,428	37,363,064		1,190,691				
Totals	188,379,086	79,289,331	53,798,892	39,180,335	5,805,728	3,838,380	3,797,195	1,788,388	322,353	561,386
Barrels per Day	516,107	217,231	147,394		107,343	10,516	10,403	4,900	883	1,538
Percentage of Total		42.1%	28.6%	20.8%	3.1%	2.0%	2.0%	0.9%	0.2%	0.3%

Totals include royalty barrels owned by the State of Alaska.
The Ten Other Owners are PetroHunt, XH, Rosewood, ASRC, NANA, Doyon, Murphy, Herbally, Allen and Kerr McGee. The largest of these producers averaged less than 500 barrels per day.
Sources: Alaska Oil and Gas Conservation Commission (AOGCC), DNR

Each unit has an operator in charge of the day to day operations and infrastructure needed for extraction. BP's operations produce the most oil, around 60 percent of the North Slope total, mostly coming from the Prudhoe Bay Unit. For the first thirty years of North Slope extraction operations, BP and ConocoPhillips (or it predecessor Arco) were the only operators of producing fields. Since 2008, however, Pioneer, ENI and Savant have also become production operators in the region.

Table Three

Oil Production by Field & Operator, North Slope 2012

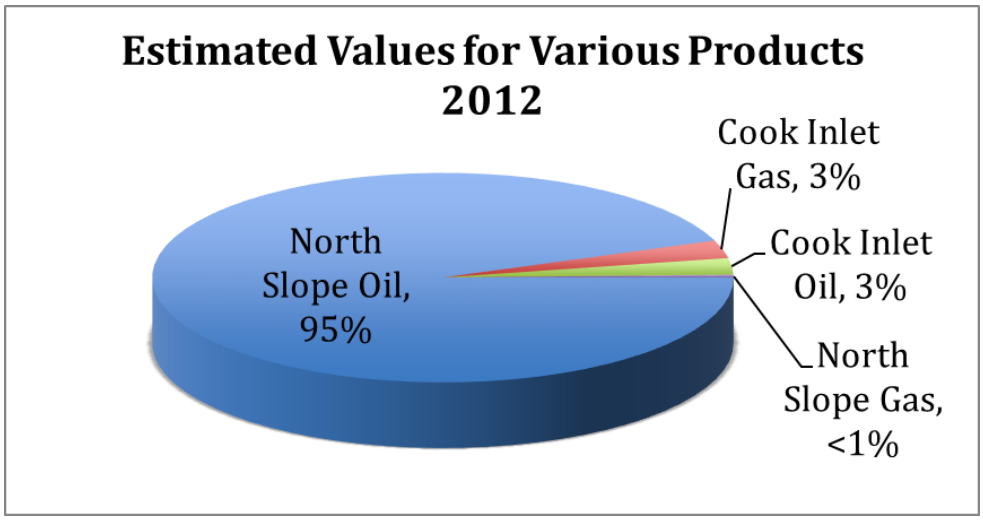
		Field Operator				
Field Name	**Production Totals**	**ConocoPhillips**	**BP**	**ENI**	**Pioneer**	**Savant**
Badami	477,560					477,560
Colville River	25,852,795	25,852,795				
Endicott	3,156,400		3,156,400			
Kuparuk River	41,264,784	41,264,784				
Milne Point	6,401,648		6,401,648			
Nikaitchuq	3,041,408			3,041,408		
Northstar	3,030,452		3,030,452			
Oooguruk	2,508,258				2,508,258	
Prudhoe Bay	102,645,781		102,645,781			
Totals	188,379,086	67,117,579	115,234,281	3,041,408	2,508,258	477,560
Barrels per Day	516,107	183,884	315,710	6,872	8,303	1,308
Percentage		35.6%	61.2%	1.3%	1.6%	0.3%

Sources: AOGCC and Operator Interviews

COOK INLET DEVELOPMENTS

As Table Four below indicates, production in the Cook Inlet region represents about 6 percent of the overall value of Alaskan oil and gas extraction.

Table Four



Source: Alaska Department of Revenue

Table Five presents the oil production from the Cook Inlet. Cook Inlet accounts for roughly 2 percent of the oil produced in Alaska. As recently as 2010, there were more than six companies producing oil in the Cook Inlet. However, most of them were acquired by Hilcorp between in 2011 and 2012, and now there are three.

Table Five

Oil Production by Unit and Owner
Cook Inlet, 2012

		Owners		
Unit	Production by Unit	Hilcorp	XTO	CIE
Swanson River	265,609	265,609		
Beaver Creek	41,767	41,767		
Redoubt Shoal	91,423			91,423
W. McArthur River	286,357			286,357
Trading Bay	212,145	212,145		
Granite Point	803,244	803,244		
Middle Ground Shoal	868,727	192,236	646,491	
McArthur River	1,517,437	1,517,437		
Totals	4,056,709	3,032,438	646,491	377,780
Barrels per Day	11,114	8,308	1,771	1,035
Pecentage of Total		74.8%	15.9%	9.3%

All figures are in barrels.
Sources: AOGCC and DNR

Cook Inlet is also a gas producer, producing gas that is exported as liquefied natural gas, but the majority of it is utilized by Alaskan consumers. (The North Slope also has sizable gas resources. However, most of it is used to power the operations that produce oil, or it is re-injected into the field to help produce the oil. There is some of that usage in the Cook Inlet as well.

Table Six

Natural Gas Production by Field & Operator, Cook Inlet 2012

Field	Total Gas Produced	Hilcorp and acquired properties	ConocoPhillips	MOA (ML&P)	Aurora	Buccaneer	Other
ALBERT KALOA	58,808	-	-	-	58,808		
BEAVER CREEK	2,637,369	2,637,369	-	-	-		
BELUGA RIVER	32,070,418	10,690,139	10,690,139	10,690,139	-		
DEEP CREEK	2,563,107	2,558,493	-	-	-		4,614
GRANITE PT	638,986	638,986	-	-	-		
IVAN RIVER	1,095,367	1,095,367	-	-	-		
KASILOF	609,318	609,318	-	-	-		
KENAI	11,697,700	11,697,700	-	-	-		
KENAI C.L.U.	4,114,336	4,090,473	-	-	-		23,863
KENAI LOOP	1,666,687	-	-	-	-	1,666,687	
LEWIS RIVER	507,580	507,580	-	-	-		
LONE CREEK	472,551	-	-	-	472,551		
MCARTHUR RIVER	20,825,105	20,825,105	-	-	-		
MIDDLE GROUND SHOAL	35,126	35,126	-	-	-		
MOQUAWKIE	129,593	-	-	-	129,593		
NICOLAI CREEK	1,243,513	-	-	-	1,243,513		
NIKOLAEVSK	79,387	79,387	-	-	-		
NINILCHIK	11,583,273	11,122,259	-	-	-		461,014
NORTH COOK INLET	13,373,128	-	13,373,128	-	-		
NORTH FORK	1,484,495	-	-	-	-		1,484,495
PRETTY CREEK	19,296	19,296	-	-	-		-
STERLING	515,324	514,499	-	-	-		825
STUMP LAKE	119,611	119,611	-	-	-		-
SWANSON RIVER	1,650,727	1,650,727	-	-	-		-
THREE MILE CREEK	87,288	-	-	-	87,288		-
TRADING BAY	64,576	63,284	-	-	-		-
Total	109,342,669	68,954,720	24,063,267	10,690,139	1,991,753	1,666,687	1,974,811
Mcf/day	299,569	188,917	65,927	29,288	5,457	4,566	5,410
Percentage		63.1%	22.0%	9.8%	1.8%	1.5%	1.8%
Cumulative Percent		63.1%	85.1%	94.8%	96.7%	98.2%	100.0%

MCF: Thousand Cubic Feet
Sources: AOGCC and DNR
Other Producers in the North Fork Unit include operator Armstrong, GMT Exploration, Dale Resources, Nerd Gas and Jonah Gas.

UNIT OVERVIEWS

BADAMI PRODUCING UNIT

Overview

The Badami unit is located on the eastern North Slope, onshore and offshore between Endicott and Point Thompson. BP had brought Badami on line in 1998, however it had proved a disappointment and had only been producing intermittently. When Savant became the unit operator in January 2012, the unit was producing slightly more than 1,200 barrels per day from five wells. Since then, Savant has drilled the Red Wolf No. 2 exploration well, which proved to be a dry hole. However, Savant is expanding the Badami unit and the final terms of that expansion commit Savant to drilling another well within the next drilling season.

Start Date: Currently in production

Duration of Project: TBD

Jobs: Savant currently has 55 contractors and employees working at Badami

Total Project Costs: Unknown

COLVILLE RIVER PRODUCING UNIT AND THE CD-5 EXPANSION IN THE NPRA

Overview

Located about 40 miles west of the Kuparuk River Unit, the Colville River Unit (Alpine) came on line in 2000. Peak production of 123,000 bpd occurred in 2006, before three satellites were added. The unit abuts the Colville River, which generally divides State-selected lands on the North Slope from the federally owned National Petroleum Reserve – Alaska (NPRA). Although it took over seven years for ConocoPhillips to receive approval for its CD-5 satellite development 5 miles to the west in the NPRA, the company has received the necessary permits, sanctioned the project, and in 2012 began the process of designing and building the first roads, bridges and pipelines across the Colville River. The project is expected to eventually produce 10,000 to 18,000 bbls a day.

Start Date: Alpine currently in production, as well as satellites Fiord, Nanuq and Qannik, CD-5 construction starts 2014, first oil late 2015

Duration of Project: Unknown

Jobs: Unknown

Total Project Costs: (CD-5) $1 billion (gross)

COOK INLET ACQUISITIONS BY HILCORP ENERGY

Overview

The first commercially produced oil in from Alaska was produced from the Swanson River field in the Cook Inlet. Although gas now dominates its hydrocarbon production, at its height in the early seventies, Cook Inlet oil production peaked at over 80,000 bbls a day. The gas production from this area once fed a large fertilizer plant and an active LNG export facility, but as of 2012, most of the gas produced is used in the railbelt of Alaska. In 2011 and 2012, Hilcorp acquired the assets of the two largest Cook Inlet producers, Marathon and Chevron, as well some other smaller assets. Hilcorp has announced investments of several hundred million dollars over the next several years, which would include bringing four new rigs into the inlet. While its acquisitions have been dramatic, its approach to development is to make marginal

improvements in existing assets. In 2013, President Greg Lalicker stated that its approach to Cook Inlet would be "what we specialize in as a company: lots of little things."
Start Date: Currently in production
Duration of Project: TBD
Jobs: "Growing and Hiring"
Total Project Costs: Unknown

The scope of Hilcorp's acquisitions can be seen in the following table which shows the legacy Chevron, Marathon, Pacific Energy and ExxonMobil properties that make up Hilcorp's Cook Inlet production.

Hilcorp Oil Production, 2012

	Total Oil Produced	All Hilcorp Properties	Legacy Site's Production			
			Chevron	Marathon	Pacific	ExxonMobil
Swanson River	265,609	265,609	265,609	-	-	-
Beaver Creek	41,767	41,767	-	41,767	-	-
Redoubt Shoal	91,423	-	-	-	-	-
W. McArthur River	286,357	-	-	-	-	-
Trading Bay	212,145	212,145	53,036	-	-	159,109
Granite Point	803,244	803,244	803,244	-	-	-
Middle Ground Shoal	838,727	192,236	192,236	-	-	-
McArthur River	1,517,437	1,517,437	710,161	-	807,276	-
Totals	**4,056,709**	**3,032,438**	**2,024,286**	**41,767**	**807,276**	**159,109**
bbls/day	11,114	5,546	5,546	114	2,212	436

KUPARUK RIVER PRODUCING UNIT

Overview

The Kuparuk River Unit was discovered in 1969, around 40 miles west of Prudhoe Bay. First oil was produced in 1981, with peak production of 340,000 bpd occurring in 1992. Total oil produced through the end of 2012 was 2.5 billion barrels with 586 producing wells (completions). Since production began, the Kuparuk owners have spent more than $5.6 billion to develop and implement programs to optimize oil recovery at the unit. Kuparuk is the second largest oil field on the North Slope.
Start Date: Currently in production
Duration of Project: Unknown
Jobs: Unknown
Total Project Costs: Unknown

MILNE POINT PRODUCING UNIT – CHOPS PROJECT

Overview

Milne Point, Endicott and Northstar are a trio of BP-operated North Slope fields that include both onshore and offshore production. Through the end of 2011, they had produced around 900 million barrels of oil. Milne Point is the site of the Cold Heavy Oil Production with Sand (CHOPS) pilot project, originally developed to discover ways to produce cold and heavy oil

from the Ugnu deposit. BP started up a $100 million heavy oil pilot program on the Milne Point S-Pad in April 2011 in an effort to find an economical way to extract Ugnu heavy oil. Although initial results were encouraging, in 2012 BP Alaska's former CFO Claire Fitzpatrick stated that even with a successful pilot project it could be ten years until volumes of 10,000 bbls a day could be reached.
Start Date: Currently in production
Duration of CHOPS Project: 3-5 more years
Jobs: Unknown
Total Project Costs: $100 million to date, Total unknown

NIKAITCHUQ PRODUCING UNIT

Overview

The Nikaitchuq producing unit, operated by Eni Petroleum, is located immediately north of the Kuparuk unit and northeast of the Oooguruk unit. Shown as a "planned project" in the 2010 Resource Extraction Projection, Eni produced first oil from the unit in January 2011. Peak production is estimated at 28,000 bpd, and recoverable reserves estimated at 220 million barrels of oil. As of 2012, Eni has drilled many of the 52 extended reach wells initially planned for full development. These include 26 producing wells, 21 water injection wells, 3 water source wells and 2 disposal wells. The company plans to spend around $2 billion on the project, with 650 jobs created during construction through 2011, 200 jobs created during development drilling from 2011-2014 and 60 jobs created during field operation from 2015 until the end of the estimated 30 plus years of production.
Start Date: Currently in production
Duration of Project: at least 30 years
Jobs: 650 jobs created during construction through 2011, 200 jobs created during development drilling from 2011-2014 and 60 jobs created during field operation from 2015 until the end of production
Total Project Costs: Around $2 billion

NORTH FORK UNIT ARMSTRONG/GMT/DALE

Overview

The North Fork was designated a project to watch until in 2011 when it began producing gas and graduated to a producing Cook Inlet unit. Armstrong believes the prospect, originally discovered back in the sixties, is far from fully delineated, but said early results suggest a field between 7.5 billion and 12.5 billion cubic feet of gas, with the possibility of as much as 20 billion to 60 billion. The North Fork #22-35 well was reported finished in 2012, and Armstrong has permitted and is drilling other wells.
Start Date: In production
Duration of Project: Unknown
Jobs: 150 jobs expected to be created by development and construction phase and 20 jobs expected to be created by production operations.
Total Project Costs: Unknown

OOOGURUK PRODUCING UNIT

Overview

The Oooguruk producing unit is located northwest of Oliktok in the Beaufort Sea's Harrison Bay, northwest of the Kuparuk unit. In 2008, Pioneer Natural Resources, Alaska become the first independent to operate a producing field on Alaska's North Slope. Crude is processed at Kuparuk River unit (KRU) under a facility sharing agreement with KRU. There are an estimated 120-150 million boe in recoverable reserves, resulting in an estimated 30-year commercial life from start-up for the unit, not including liquids from the Nuna project (see Nuna Project overview).

Start Date: Oooguruk is currently in production
Duration of Project: 30 years from start-up
Capital Investment to Date: approximately $1 billion

PRUDHOE BAY PRODUCING UNIT

Overview

The Prudhoe Bay unit is located in the Central North Slope. Oil was discovered in the Prudhoe Bay reservoir in 1968 and came online in 1977. Production averaged more than 1.5 million barrels of oil and natural gas liquids per day for more than a decade. By the end of 2012, more than 12.3 billion barrels had been produced from the Prudhoe reservoir, including associated satellite fields Orion, Polaris, Aurora, Midnight Sun, Borealis, Lisburne, Point McIntyre and Niakuk. Over time, production from Prudhoe has accounted for about 70 percent of all the oil produced in Alaska. There are 25 billion barrels of oil currently in place at Prudhoe Bay, excluding heavy oil. Initially, engineers thought they could recover 40 percent, but by 2009, new technologies and techniques increased that estimate to more than 60 percent. That would leave 2 billion to 3 billion barrels of conventional oil still recoverable, in addition to 26 trillion cubic feet of natural gas. Additional and expensive research investments are required to bump up the 60 percent recoverable estimate.

Start Date: Currently in production
Duration of Project: Some estimates as high as decades from now
Jobs: Over 2,000 full time jobs
Total Project Costs: Over $40 billion to date, which includes development and transportation infrastructure

ACTIVE DRILLING AND EXPLORATION, OIL & GAS

One way of measuring recent progress on oil and gas projects is to review recent drilling. It is not a perfect measure. As the NPRA section demonstrates, there are projects first drilled in the 1940s which found hydrocarbons but which have still not been produced. However, drilling wells is key to developing an oil and gas project, and is the measure we will use in this section.

The Alaska Oil and Gas Conservation Commission (AOGCC) is charged with regulating wells in the state and it publishes statistics on wells completed and permitted. For 2012, the AOGCC published data about 174 wells and 196 permits.[5]

Of these, 136 wells were both permitted and drilled in 2012. Thirty-eight wells were completed based on earlier permits. Sixty permits have been issued for wells that have not yet been drilled.

Table Seven

Oil & Gas Wells Drilled in 2012, by Operator and Area

	Development & Service Wells		Exploratory Wells		
Operator	North Slope	Cook Inlet	North Slope	Cook Inlet	Other*
BP EXPLORATION (ALASKA) INC	51				
CONOCOPHILLIPS ALASKA INC	66		1		
ENI US OPERATING CO INC	15				
PIONEER NATURAL RESOURCES ALASKA INC	6		2		
ARMSTRONG COOK INLET, LLC		1			
HILCORP ALASKA, LLC		5		1	
MARATHON OIL CO		1			
CONOCOPHILLIPS ALASKA INC		2			
BROOKS RANGE PETROLEUM			2		
REPSOL E&P USA, INC.			3		
GREAT BEAR PETROLEUM OPERATING LLC			2		
BUCCANEER ALASKA OPERATIONS, LLC				2	
COOK INLET ENERGY, LLC				1	
FURIE OPERATING ALASKA, LLC				2	
NORDAQ ENERGY INC				1	
LINC ENERGY OPERATIONS INC					2
COOK INLET NATURAL GAS STORAGE ALASKA, LLC					2
NORTH SLOPE BOROUGH					3
UNIVERSITY OF ALASKA					3
Grand Total: 174	**138**	**9**	**10**	**7**	**10**

Source: AOGCC

* The other wells are for part of (a) the CINGSA or Cook Inlet storage project, (b) the University of Alaska Pilgrim Springs geothermal research project in Selawik , (c) gas wells drilled by the City of Barrow for local consumption (like the Municipality of Anchorage's ownership in the Beluga River Field, producing gas for local consumption.) and (d) Linc's coal gasification research.

[5] Well completions are included in the AOGCC's reporting as that data is reported to the AOGCC. The figures analyzed here are those reported through the end of March 2013. The numbers are slightly different from those reported by the AOGCC in its annual data summaries as those only included wells reported through mid-February.

The vast majority of the wells (138) were service or development wells. For the most part, these wells were drilled by operators BP and ConocoPhillips as part of ongoing development of the larger North Slope units. Development wells will be used to actually produce oil while the service wells including injection wells are used to support production. ENI and Pioneer also drilled service and development wells as part of their respective North Slope unit operations. The exploration wells drilled by these four operators and shown in the first four lines of the table were drilled within the units.

Similarly in the Cook Inlet, nine development wells were drilled in the Cook Inlet by operators. Hilcorp drilled an exploration well within the Happy Field within its Deep Creek Unit. The development wells were drilled for both the production of gas and oil.

That leaves 13 oil and gas exploration wells in 7 new projects, 3 on the North Slope and 4 in the Cook Inlet. Of these, three are new additions to the Cook Inlet projects being tracked. The AOGCC does not track the drilling of wells in the federal waters off of Alaska. Thus is the eighth project included here covers the wells started by Shell on the outer continental shelf north of Alaska.

UNIT OVERVIEWS

OTTER PROSPECT- COOK INLET

Overview

Cook Inlet Energy drilled the Otter #1 Well on the west side of the Cook Inlet. It plans to reenter the well in 2013 and drill deeper seeking access) to the 45 bcf (billion cubic feet of gas) it believes is in that field.

Start Date: Started 2012

Duration of Project: Unknown

Total Project Costs: Unknown

KENAI LOOP PROJECT, COOK INLET

Overview

Buccaneer Alaska found gas with its Kenai Loop #1 well in 2011. In 2012 production facilities were completed and that well began production. Two exploratory wells, the Kenai Loop #3 and #4, are shown as being completed in the AOGCC data base. The former was a dry hole. However, the former will join the KL #1 as a gas producer.

Start Date: In progress

Duration of Project: Unknown

Total Project Costs: Unknown

SHADURA PROJECT

Overview

Nordaq completed its first well, the Shadura No. #1 well, on the east side of the Cook Inlet. Although the well was not shown as finished in the AOGCC data until 2012, in the fall of 2011 Nordaq announced a discovery that is hoped to lead to production of up to 50 million cubic feet of gas a day starting in early 2013. Currently advance work is proceeding, and as of early 2013, the draft environmental impact statement for a six well project was receiving public comments. The next Nordaq well began in 2012 was the Tiger Eye prospect on the west side of the Cook Inlet.

Start Date: Permitting and planning underway

Duration of Project: Unknown

Total Project Costs: Unknown

GREAT BEAR PETROLEUM

Overview

Great Bear Petroleum's source rock oil development is located south of the Kuparuk and Prudhoe units, bracketing the Dalton Highway and the trans-Alaska oil pipeline. Great Bear Petroleum is proposing to develop "source-reservoired oil" from its 500,000-acre lease position. If production began in 2013 as originally planned and grew by a projected 200 wells per year, Great Bear could be producing from its acreage 200,000 bpd by 2020, peaking at

600,000 bpd in 2056, with a projected project life of around 80 years. In 2011, when asked by Alaska lawmakers if it would be possible for Great Bear to increase the number of wells up to 1,000 a year in order to get 1 million barrels of oil into the Trans-Alaska Pipeline System (TAPS), Great Bear's top executive said it would, provided he had the support of all of the stakeholders in such an accelerated program. Total project costs, including the necessary infrastructure construction, could reach as high as $40 billion with thousands of jobs created. As part of a planned six well "proof of concept" drilling program, Great Bear drilled the Alcor #1 and Mercak #1 wells in 2012. Samples from those wells are currently undergoing laboratory analysis.
Start Date: Underway (first oil unknown)
Duration of Project: Roughly 80 years
Jobs: Unknown
Total Project Costs: Unknown – $2 billion a year during development

KITCHEN LIGHTS UNIT

Overview

The Kitchen Lights Unit (KLU) is located in the Upper Cook Inlet and is operated by Furie Operating Alaska. In 2011, Furie brought the first jack-up rig to the Cook Inlet in almost 20 years. Drilling only during the months that ice conditions allowed in 2011 and 2012, Kitchen Lights #1, #2 and #2A wells were drilled, and KLU#3 is planned for 2013. Although the well data remains confidential, Furie announced a major gas find as the 2011 drilling season ended and the rig was moved to a winter standby location. The only other prospect in the unit that has been previously drilled is Corsair, where Shell, Phillips and ARCO drilled a total of five exploration wells between 1962 and 1993. These wells all had gas shows and some also tested for small quantities of oil. In 2012, Furie began an application to the Army Corps of Engineers for permits to install a production platform, the first new Cook Inlet platform since 2000, and accompanying subsea pipelines.
Start Date: Underway (first gas as early as 2014)
Duration of Project: 30 Years
Jobs: 412 exploration/drilling
Total Project Costs: $810 million

NUNA PROJECT

Overview

The Nuna Project aims to access the Torok formation, a predominantly shale formation partially off-shore and inside the Oooguruk Unit, from two on-shore drill sites, one outside the unit boundary and one just inside. The Nuna #1 appraisal well drilled in 2012 encountered an estimated 50 million barrel pool. During a flow test in April of 2013, 27,654 barrels of oil were produced over the course of 19 days (1,455 bbl/day). A Nuna #2 appraisal well is currently being drilled. Part of the project will be constructing a pipeline to send the well fluids from these new onshore drill sites to the Kuparuk Production facilities where the oil will be produced.
Start Date: Nuna could begin production as early as 2014-2015
Duration of Project: 30 years from start-up
Total Project Costs: Estimated at $450 million

OUTER CONTINENTAL SHELF/CHUKCHI AND BEAUFORT SEAS

Overview

The Outer Continental Shelf (OCS) waters off Alaska's northern coastline encompass the Chukchi Sea and the Beaufort Sea. Resource estimates by the now defunct U.S. Minerals Management Service projects a mean estimate of up to 15.5 billion barrels of oil and 50 trillion cubic feet of natural gas economically recoverable in this region. In February 2008, Shell successfully bid $2.1 billion to acquire 275 lease blocks in the Chukchi Sea, in addition to their $44 million bid in 2005 for 84 leases in the Beaufort Sea. Since 2008, Shell had proposed several drilling plans that have all been challenged during the various permitting processes and in a number of cases in court. Finally, in late 2012, Shell was able to begin its long delayed OCS drilling program. Originally planned as a 5-well season, a series of mechanical and regulatory issues limited Shell to drilling two "top holes". Shell anticipated a return during the 2013 drilling season to complete those projects and drill other wells. In September of 2012, Norway's Statoil announced that it was pushing out its anticipated OCS drilling by a year from 2013 to 2014. In February 2013, after a high profile grounding of their drilling vessel, Shell announced "a pause" and deferred its return to the OCS from 2013 to 2014. In April of 2013, ConocoPhillips announced that it too was deferring OCS work originally planned for 2014. At the same time, the head of international exploration for Statoil was quoted as saying that the 2014 return date was tentative "if we drill it at all."

Start Date: 2012 – Restart date - unknown
Duration of Project: 50 years
Jobs: 1,200 exploration/delineation; 4,800 production
Total Project Costs: Unknown

REPSOL/ARMSTRONG/GMT PROSPECTS

Overview

The Repsol/Armstrong/GMT prospects are located on 494,211 acres of Alaska's North Slope and nearshore Beaufort Sea, including large chunks near the Kuparuk River and Oooguruk units. For the 2011-2012 drilling season, the companies proposed between six and fifteen wells at a cost of $5 to $30 million per well, depending on depth and location. However, a blow-out at the Qugruk No. 2 well delayed much of that program, though both the Qugruk No. 4 and Kachemach No. 1 wells were completed. The companies have so far allocated a minimum investment of $768 million for a multiyear drilling program. Current estimates place the oil reserves around 1.5 billion barrels. For the 2012-2013 drilling seasons, the companies were drilling the Qugruk Nos. 1, 3 and 6. In April 2013, they announced "encouraging results during production tests" at #1 and 6, and hydrocarbons "at multiple levels" at Well #3.

Start Date: Multiyear exploration drilling program began in 2011-2012
Duration of Project: Unknown
Jobs: Direct jobs expected during the exploration phase are estimated at 550, with 400-700 jobs per year for two years each during peak development drilling and construction investment periods
Total Project Costs: Unknown

SOUTH MILUVEACH UNIT, MUSTANG PAD (FORMERLY NORTH TARN) DEVELOPMENT

Overview

The Mustang Pad is located on the North Slope adjacent to the west side of the Kuparuk River unit, just north of the Alpine pipeline and west of Kuparuk River Unit drill site 2M. Brooks Range Petroleum Corp. (BRPC) has formed the Southern Miluveach Unit covering 8,960 acres over leases held by its joint venture partners. BRPC drilled the first well in March 2011, resulting in a discovery. In the 2011-12 exploration season, the company drilled and tested a delineation sidetrack which confirmed the size of the reservoir. This winter, in an innovative financing structure with the Alaska Industrial Development and Export Authority (AIDEA), an access road and production pad are being constructed. Work on the production facilities is slated to start in 2014 with first oil expected in the same year. Peak production is expected to reach 15,000 barrels a day. The estimated cost of the development is $577 million, with an approximate cost per well of $20 million.

Start Date: 2013 (first oil in 2014)
Duration of Project: 20 years
Jobs: 100 construction, 100 drilling, 16 operation
Total Project Costs: $577 million

In addition, the AOGCC data base shows sixty additional permits were issued in 2012. The following table breaks those permits out by month. As can be seen, over half the permits were issued in the last four months of the year. Some of those wells were even begun in 2012. However, they have not been reported as being completed.

Table Eight

Well Permits Issued in 2012, by Month and Region

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Grand Total
Cook Inlet						1	2		6		3	1	13
Development & Service Wells						1	2		4		1	1	9
ARMSTRONG COOK INLET, LLC							1		2				3
AURORA GAS LLC									1				1
HILCORP ALASKA, LLC						1	1		1		1	1	5
Exploratory Wells									2		2		4
APACHE ALASKA CORPORATION											1		1
COOK INLET ENERGY, LLC											1		1
NORDAQ ENERGY INC									2				2
North Slope	3	3	6			6		4		4	9	9	44
Development & Service Wells	1		3			6		4		4	8	8	34
BP EXPLORATION (ALASKA) INC						3		4		4	4	4	19
CONOCOPHILLIPS ALASKA INC	1		2			3					2	3	11
ENI US OPERATING CO INC											1	1	2
PIONEER NATURAL RESOURCES ALASKA INC			1								1		2
Exploratory Wells	2	3	3								1	1	10
BP EXPLORATION (ALASKA) INC		1	1										2
CONOCOPHILLIPS ALASKA INC											1		1
PIONEER NATURAL RESOURCES ALASKA INC												1	1
REPSOL E&P USA, INC.	2	2	1										5
SAVANT ALASKA LLC			1										1
Other					1			1			1		3
LINC ENERGY OPERATIONS INC					1						1		2
UNIVERSITY OF ALASKA								1					1
Grand Total	**3**	**3**	**6**	**0**	**1**	**7**	**2**	**5**	**6**	**4**	**13**	**10**	**60**

Source: AOGCC

OTHER EXPLORATION PROJECTS

Before a hopeful explorer can even drill, it must take the first step of acquiring the right to explore (and/or produce) oil and gas from land. There are a handful of land-owners in the state who also own the mineral rights underneath their land. However, in Alaska and off its shores, the state and federal governments generally own the rights to develop the oil and gas. There are several programs such as the State's exploration license program which don't involve competitive bidding. However, the way state and federal governments typically get this land into hands of prospective explorers is by holding lease sales. There bidders vie for the right to acquire leases which give them a certain number of years to explore for oil and gas, and if they find it, to hold on to those leases while they develop and produce the oil and gas. Acquired acreage is another good measure of a project.

There are three sets of lease sales pertinent to Alaska. They are acronym rich: both the outer continental shelf (OCS) which starts three miles off shore, and any federal land within in Alaska are under the control of the US Department of Interior. Within that department, the Bureau of Land Management (BLM) administers the land while the Bureau of Ocean Energy (BOEM)[6] has jurisdiction over the offshore.

For the last decade, the BLM has held a sale offering leases in the NPRA almost every year including the last three years 2010, 2011 and 2012. In that last sale in 2012 there were two bidders that obtained NPRA acreage.

Table Nine

2012 National Petroleum Reserve-Alaska Lease Sales

Winning Bidder	Leases	Dollars	Acres
Nordaq	11	750,700	137,293
Woodstone	2	148,200	22,785
Total Federal NPRA Sales	13	898,900	160,078

The MMS/BOEM picture is more complex, as the table ten shows: there were no lease sales for OCS land in Alaska in 2012. In fact, the last such event was Lease Sale 193 held in 2008. The next scheduled sale is Lease Sale 224 in 2016.

[6] Many people may be more familiar with the Minerals Management Service (MMS) which existed from 1982 to 2010: the BOEM was created when MMS was split into several pieces.

Table Ten

Recent BOEM Outer Continental Shelf Area Lease Sales in Alaska

	Planning Area			
	Chukchi Sea	Beaufort Sea	Cook Inlet	North Aleutian Basin
Lease Sale 244			Scheduled for 2016	
Lease Sale 242		Scheduled for 2017		
Lease Sale 237	Scheduled for 2017			
Lease Sale 221	Scheduled for 2012 - Withdrawn			
Lease Sale 219			Scheduled for 2011 - Cancelled due to lack of industry interest	
Lease Sale 217		Scheduled for 2011 - Withdrawn		
Lease Sale 214				Scheduled for 2010, but withdrawn until 2017
Lease Sale 212	Scheduled for 2010 - Withdrawn			
Lease Sale 211			Scheduled for 2009 - Cancelled due to lack of industry interest	
Lease Sale 209		Scheduled for 2010 - Withdrawn		
Lease Sale 202		Held April 2007		
Lease Sale 195		Held Mar 2005		
Lease Sale 193	Held Feb 2008			
Lease Sale 191			Held 2004 - No bids received	

Source: Bureau of Ocean Management

On the state side, the Department of Natural Resources conducts annual lease sales with active bidders in each of the areas of interest across the state. Bidders have shown little interest in the Alaska Peninsula (in the same part of the state as the Federal North Aleutian Basin study area) since 2007. There were no bidders in the North Slope foothills area in 2010 and 2011. Other than those exceptions, however, the state has had annual vigorous sales for its land in

the Cook Inlet, on the North Slope and for the Beaufort Sea.[7] The results of the 2012 sales include both some projects and the principals in the projects covered here are and some new names.

Table Eleven

2012 Alaska DNR Lease Sales

Area	Winning Bidder	Leases	Dollars	Acres
Beaufort	Cade (Donkel et al.)	3	200,602	7,680
Beaufort	Donkel/Cade	5	295,936	12,800
Beaufort	Donkel/Lowe	1	6,400	640
Beaufort	Nordaq	15	1,185,312	69,760
Beaufort	Realeza Del Spear	1	54,170	5,120
Beaufort	Repsol	1	38,816	3,200
	Subtotal	26	1,781,235	99,200
Cook Inlet	Apache	7	1,028,160	40,320
Cook Inlet	Cook Inlet Energy	18	2,719,680	74,880
Cook Inlet	Hilcorp	18	3,117,120	82,560
Cook Inlet	William M Crawford	1	875	35
	Subtotal	44	6,865,835	197,795
Foothills	Anadarko	8	961,920	46,080
	Subtotal	8	961,920	46,080
North Slope	70 & 148 (Armstrong)	16	3,138,707	36,480
North Slope	AVGG (Brooks Range))	5	996,992	12,800
North Slope	Bachner/Forsgren	5	130,413	4,480
North Slope	Cade (Donkel et al.)	2	37,613	1,440
North Slope	ConocoPhillips	7	2,053,222	17,920
North Slope	CP/BP/EM/Chevon (Kuparuk)	3	2,200,134	7,579
North Slope	Donkel/Cade	1	66,867	2,560
North Slope	Great Bear	17	637,214	24,480
North Slope	Paul Basinkski	4	276,710	5,760
North Slope	Repsol	24	1,588,762	39,040
North Slope	Savant	1	103,424	2,560
North Slope	Woodstone	7	267,120	10,080
	Subtotal	92	11,497,179	165,179
	Total State Lease Sales	**170**	**21,106,169**	**508,254**

Source: DNR

[7] Note that for purposes of the State's leasing program the Beaufort Sea is the three mile strip of the Northern Coast of Alaska.

The remaining projects monitored here are all ones where the project sponsor has acquired land in 2012 or earlier lease sales. Many of these projects have been drilled in the past – not just in 2012.

UNIT OVERVIEWS

ANADARKO PETROLEUM'S GUBIK COMPLEX

Overview

The Gubik Complex is near Umiat, in the gas-prone Brooks Range Foothills. Originally explored by the US Navy in the forties and fifties, it consists of a series of natural gas prospects and known, but undeveloped natural gas fields, including Gubik, Chandler and Wolf Creek. The first exploration program for natural gas in northern Alaska, Gubik Complex exploration and delineation wells were drilled in the early winters of 2008 and 2009. Results of the first well were made public by Petro-Canada, which reported it tested at rates of up to 15 million cubic feet per day. However, projects to move North Slope gas to markets have not advanced as anticipated, postponing further development. In 2012, Anadarko returned to the well for additional testing.

Start Date: Unknown

Duration of Project: TBD

Jobs: Had the entire $4-$6 billion range project proceeded as originally hoped, total jobs for the exploration phase were estimated at 560. Total estimated development and construction phase jobs: 2,400. Total jobs estimated for production operations: 3,300

Total Project Costs: $4 to $6 billion

BEECHEY POINT UNIT

Overview

The Beechey Point unit is located in Gwydyr Bay at the Kuparuk River delta north of the Prudhoe Bay unit. The operator, Brooks Range Petroleum Corp., has drilled four wells in the area. The development program includes total construction and drilling costs estimated to be $200 million (excluding what has already been spent to date) with a total of 100 drilling and 100 construction jobs created. Exploration drilling on the property began with the Hamilton Brothers Point Storkersen No. 1 well in 1969.

Start Date: Unknown

Duration of Project: Unknown

Jobs: Unknown

Total Project Costs: Unknown

COSMOPOLITAN PROSPECT OFFSHORE SOUTHERN COOK INLET

Overview

What is now the Cosmopolitan prospect was first explored by Pennzoil in the sixties from an offshore jack up rig in the Cook Inlet. Subsequent exploration by predecessors of ConocoPhillips and Pioneer Natural Resources occurred onshore. In 2011, Pioneer terminated the Cosmopolitan unit and in 2012 sold its remaining leases to BlueCrest Energy and Australian based Buccaneer. Buccaneer brought the Endeavour jack up rig to Cook Inlet in 2012 and once

again the Cosmo prospect will be drilled from offshore. Buccaneer has released estimated proven and probable (2P) reserve figures of 90 bcf of gas and 44 million bbls of oil.
Start Date: Drilling to begin in 2013
Duration of Project: Unknown
Jobs: Total of 100 jobs estimated to be created during development and construction phase and 20 jobs to be created by production operations.
Total Project Costs: Unknown

DEWLINE UNIT

Overview

The Dewline Unit is wedged along the coastline, just west of Prudhoe Bay unit's Point McIntyre and north of the Midnight Sun PA. The first well in the area was the 1969 Hamilton Brothers Pt. Storkersen #1 Well. Since forming the unit, operator Ultrastar drilled one 9,900 foot vertical well targeting oil in the Ivishak formation. A North Dewline No. 1 well, also targeting the Ivishak, is in the planning stage. Estimated potential reserves in the unit are 5 to 20 million barrels of oil, though the economic analysis for development was done on the mean case for reserves, or 11 million barrels. Although part of the unit is offshore, all wells can be drilled from onshore locations.
Start Date: Possible start date of 2014 (first oil unknown)
Duration of Project: Unknown
Jobs: Estimate 150 jobs for the drilling of second well, 150 for third well drilling and 100 for road and pipeline construction when development proceeds.
Total Project Costs: Unknown

HEMI SPRINGS PROSPECT

Overview

The Hemi Springs prospect is composed of 16 leases located just south of the Prudhoe Bay Unit. The prospect overlaps or is contiguous to acreage that once was either part of Arco's Hemi Springs unit, ENI's RockFlour unit, Pioneer's NE Storms unit or Alaska Crude's Artic Fortitude Unit. The Donkel/Cade group assembled leases over a number of years and in early 2013, the 40,698 acre package was acquired by Polar Petroleum. Polar estimates that the project could yield up to a half billion barrels of oil. At least one Arco well drilled in the vicinity in the eighties was certified as having found paying quantities of hydrocarbons. Polar has committed to drilling the next exploration well in the next two years.
Start Date: Unknown
Duration of Project: Unknown
Jobs: Unknown
Total Project Costs: Unknown

KALDACHABUNA WELL & APACHE'S 3D COOK INLET SURVEY

Overview

In 2011, Apache began a multi-year 3 D seismic program in the Cook Inlet, using a cutting edge wireless nodal technology. They acquired roughly 800,000 acres through state exploration lease sales and arrangements with private landowners. Although the USGS's estimate of Cook Inlet reserves is around 600 million barrels, Apache geologists are seeing evidence of figure around

twice that size. After extensive surveys on the west side of Cook Inlet, in 2012 the seismic program was slowed by permitting issues. Apache shifted its focus to a west side well which was drilled in the spring of 2013.
Start Date: 2011 for the seismic phase
Duration of Project: 3 years for the seismic phase
Jobs: Unknown
Total Project Costs: Unknown

LIBERTY DEVELOPMENT

Overview

The Liberty Development is located in the Beaufort Sea outer continental shelf (OCS), 15 miles east of Prudhoe Bay. Shell drilled two wells in 1982 and one in 1987 within the Liberty prospect area. Although it found evidence of hydrocarbons in the 1987 well, Shell subsequently dropped the lease. In 1997, BP discovered the Liberty accumulation when drilling an exploration well from the Tern gravel island. It has proposed a number of ways of reaching the accumulation; the latest plan would have used a specially built rig to drill up to 8 miles from the existing Duck Island causeway. The rig was delivered in 2009, but needed additional work, and eventually the project was suspended pending an 18 month review. The results of that study were announced in the summer of 2012 and the project will not be put back on track "in its present form." The Interior Department's Bureau of Safety and Environmental Enforcement has given BP until the end of 2014 to submit a new development and production plan for Liberty or risk losing its leases.
Start Date: Unknown
Duration of Project: Unknown
Jobs: Unknown
Total Project Costs: Unknown

NATIONAL PETROLEUM RESERVE ALASKA (NPRA)

Overview

Although the NPRA was created on account of its projected oil reserves, as of 2012 there was still no commercial production from area. There are about 180 legacy wells drilled by the federal Interior Department left over from the early years of the reserve. Several public lease sales were held in the early eighties, though all those leases eventually expired. Finally in 1999, a more regular pattern of sales was established and there were seven lease sales held between then and 2012, including one each year from 2010 to 2012. There are concerns that these sales have not covered NPRA's most prospective areas for oil and gas. However, a revised assessment from the U.S. Geological Survey in 2010 slashed the estimate of undiscovered, technically recoverable oil in the reserve by roughly an order of magnitude from 10.5 billion barrels to just 896 million barrels. The data indicate an abrupt change from oil prone to more gas prone resources, just 15 to 20 miles west of the Alpine oil field in the Colville River Delta. USGS scientists think oil plays analogous to the Alpine field in NPRA likely contain very little oil west of the area that ConocoPhillips and Anadarko have been exploring around their Lookout and Alpine West. See the discussion of the Colville Units western expansion for more information on what is likely to be the first NPRA production.

Other NPRA explorers include Talisman subsidiary FEX, which drilled four wells in 2006/07 and conducted extensive seismic work. However, in 2008 it turned its focus elsewhere, and eventually gave up its NPRA leases.
Start Date: Unknown
Duration of Project: Unknown
Jobs: Unknown
Total Project Costs: Unknown

POINT THOMSON UNIT

Overview

The Point Thomson unit is located on state acreage along the remote Beaufort Sea shoreline, 60 miles east of Prudhoe Bay and 60 miles to the west of the village of Kaktovik. The total estimated recoverable reserves are 8 trillion cubic feet of gas, about 25 percent of the North Slope's gas reserves, and over 200 million barrels of condensate. In 2012, operator ExxonMobil and its partners announced an agreement with the state setting forth work commitments that would allow the owners to retain their leases and bring the unit into development. The settlement agreement requires the owners to construct an "Initial Production System" to include a pipeline to connect Point Thompson to the existing pipeline infrastructure and gas cycling facilities capable of cycling 200 million cubic feet of gas per day while extracting 10,000 barrels a day of condensate for delivery to TAPS. Subsequent development could include full-field cycling, enhanced hydrocarbon recovery and/or natural gas sales. Point Thomson could become, according to ExxonMobil, the highest-pressure gas cycling operation in the world.
In October of 2012, the US Army Corp of Engineers approved the Environmental Impact Statement for the development, a major regulatory hurdle. As the project moves forward, the winter construction season of 2012-2013 was focused on support infrastructure. ExxonMobil recently announced that Rosneft, a mostly state-owned Russian oil firm, had acquired an option to purchase up to a 25 percent interest in Point Thomson.
Start Date: Construction of the support infrastructure has begun with first production anticipated in 2015-2016
Duration of Project: 30 years
Jobs: 600 peak construction, 200 development drilling and 60-80 operation
Total Project Costs: Over $1 billion has been spent to date

STINSON PROSPECT, OFFSHORE WESTERN NORTH SLOPE

Overview

The Stinson prospect is composed of 10 leases located on 35,434 acres north of ANWR's 1002 area in Camden Bay directly west of Point Thompson. Early in 2011, the DNR chose not to unitize the prospect and owners Donkel/Cade lost some leases. Those investors were able to re-acquire much of the acreage in a December 2011 lease sale. The current lessees have not drilled on the property to date, but the Stinson #1 well ARCO drilled on the property in 1991 is certified as capable of producing in paying quantities. There are an estimated 150 million barrels in the tertiary horizon within a single 100-foot sand. Once the property has reached the development stage, the sponsor would need to construct a pipeline tie-in to Badami, or if developed by then, Point Thompson.
Start Date: Unknown
Duration of Project: Unknown

Jobs: Unknown
Total Project Costs: Unknown

TOFKAT (FORMERLY TITANIA) PROSPECT

Overview

The Tofkat prospect is located east and south of Nuiqsut, southwest of the Kuparuk River unit near the Colville River. To keep the leases in the Tofkat unit, Operator Brooks Range Petroleum Corp. will need to drill additional exploration wells in the future.
Start Date: Unknown
Duration of Project: Unknown
Jobs: Unkown
Total Project Costs: Unknown

UMIAT PROSPECT

Overview

The Umiat prospect, originally discovered by the US Navy in the 1940s is located in the foothills of the Brooks Range Mountains. Australia's Linc Energy acquired the prospect from Renaissance Alaska LLC in July 2011, signed a rig and announced plans for a five-well exploration program beginning during the 2012-13 season. Mobilization began in 2012 and the first wells are being drilled in 2013.The prospect has estimated oil reserves of 250 million barrels and an anticipated peak production rate of 50,000 barrels of oil per day. To commercialize any discovery, Linc would need to build oil processing facilities and a 110-mile buried pipeline.
Start Date: Drilling began 2013, (first oil possible as early as 2015)
Duration of Project: Unknown
Jobs: Unknown
Total Project Costs: $45 million for appraisal phase, $1.3 billion for development phase

VISCOUS & HEAVY OIL

Overview

Viscous oil production from Alaska's North Slope is currently around 40,000 barrels per day, depending on the definition of viscous used by the reporting company or agency. Production is drawn from an estimated 6 billion barrels of in-place viscous oil located within currently producing North Slope units, including the West Sak sands/Schrader Bluff formation in the Prudhoe Bay, Milne Point and Kuparuk River units, as well as the Nikaitchuq and Oooguruk units. Another 4-6 billion barrels of undeveloped in-place resource is estimated to be present close to existing infrastructure. With achievable technological advancements, BP Alaska's former President John Minge said in 2011 that he believes it is possible to develop 2 billion barrels of gross viscous oil on the North Slope. Hitting that target would require around 2,000 additional wells on 50 pads, in addition to a new gathering center and a hundred miles of new pipeline. This development would cost an estimated $30 billion and would provide roughly 3,500 jobs per year in the first 10 years.

While not currently in production, heavy oil represents a significantly larger prize. There are perhaps 20 billion barrels of heavy oil in place near existing infrastructure in the Ugnu

formation. The estimated cost of developing this oil is $30 billion, with a minimum of 3,500 jobs per year for the first 10 years of development.

ConocoPhillips is also focused on the Ugnu prospect. In its 2012 Fact Book, Ugnu is designated as project in appraisal, with an anticipated gross peak production between 20,000 and 30,000 barrels of oil per day. While ConocoPhillips has no timeline in place for this project, they have recently indicated that all proposed developments are being reevaluated in light of the new state tax regime.

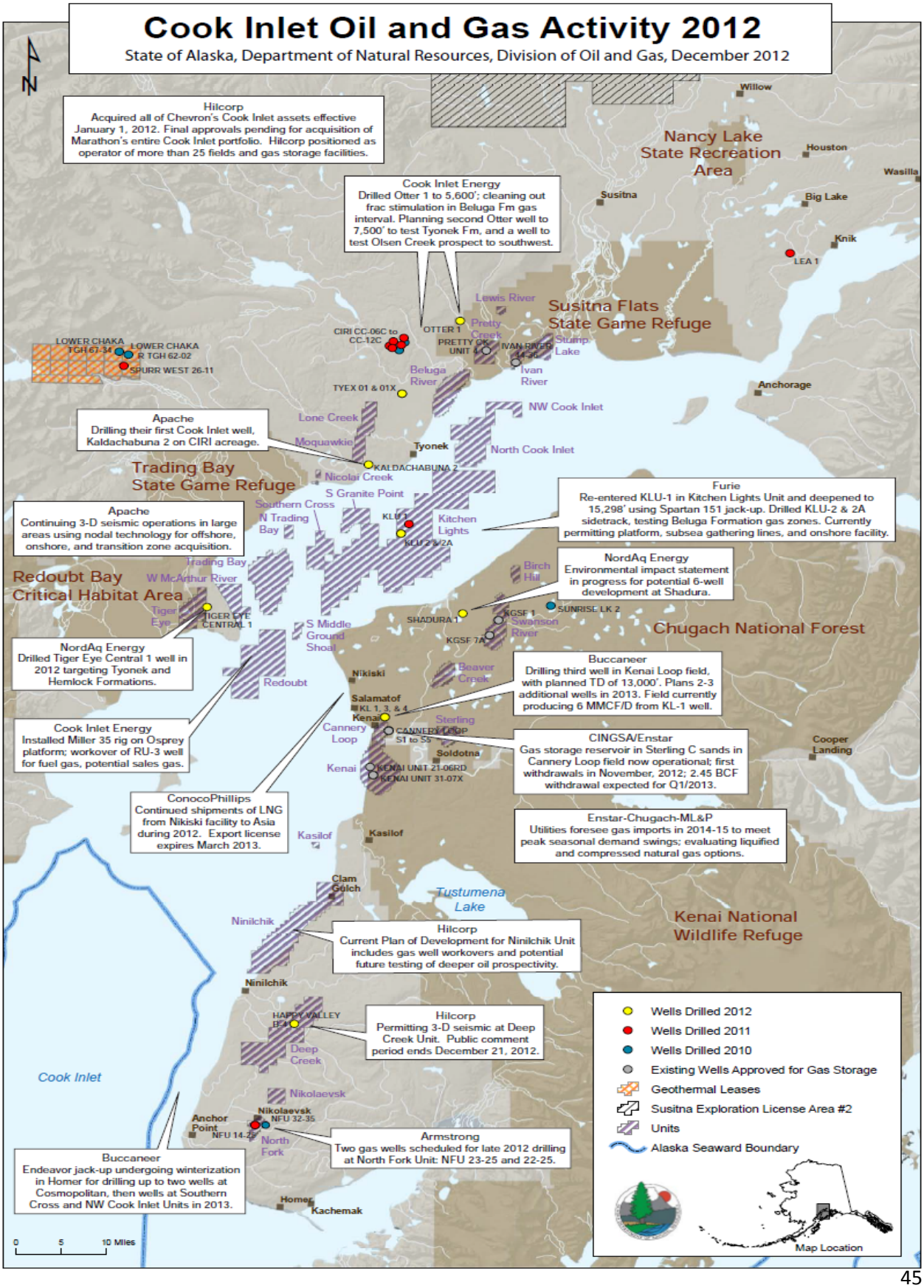
Start Date: Unknown. BPs heavy oil pilot program began in April 2011.
Duration of Project: Unknown
Jobs: 3,500 per year for first 10 years for viscous oil production plus an additional 3,500 per year for first 10 years of heavy oil production
Total Project Costs: $30 billion for viscous oil production, $30 billion for heavy oil production

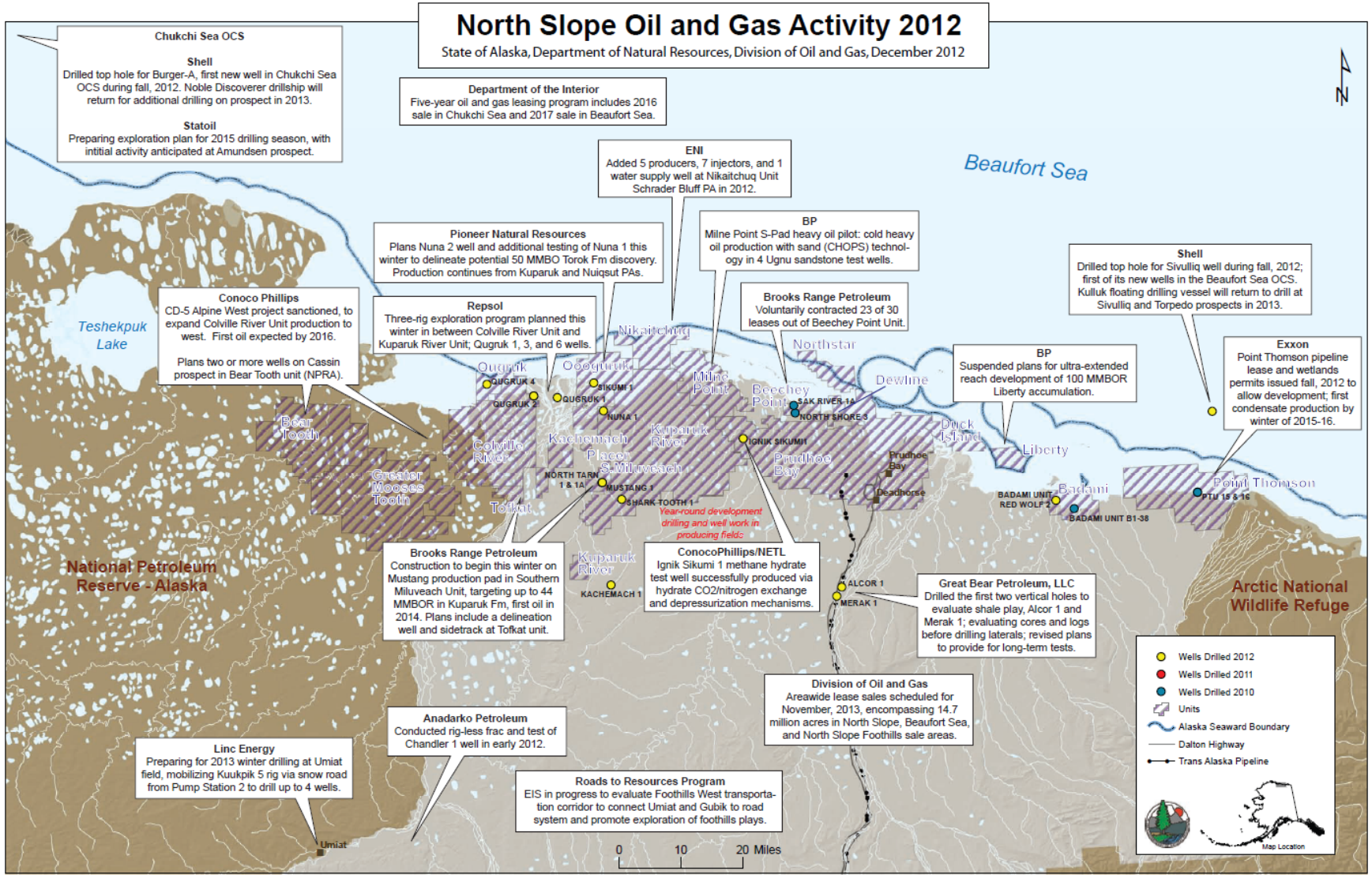
YUKON GOLD

Overview

The Yukon Gold prospect, operated by Savant Alaska, is located around 50 miles east of Prudhoe Bay. The Yukon Gold #1 well drilled by BP in the nineties confirmed the presence of hydrocarbons in the area: there are an estimated 120 million barrels of recoverable reserves with an expected peak production of 50,000 barrels of oil per day. Development of this prospect is expected to cost $450 million, a figure that does not include construction of a necessary pipeline to nearby Point Thompson. An estimated 300 to 400 jobs would be expected during the development drilling and pipeline construction phase of this project.

Start Date: Unknown. Dependent on construction of pipeline to Point Thompson
Duration of Project: Unknown
Jobs: 400 expected during development drilling and pipeline construction phase
Total Project Costs: $450 million (does not include cost of pipeline to Point Thompson necessary for project development)


Cook Inlet Oil and Gas Activity 2012
State of Alaska, Department of Natural Resources, Division of Oil and Gas, December 2012
Hilcorp
Acquired all of Chevron's Cook Inlet assets effective January 1, 2012. Final approvals pending for acquisition of Marathon's entire Cook Inlet portfolio. Hilcorp positioned as operator of more than 25 fields and gas storage facilities.
Cook Inlet Energy
Drilled Otter 1 to 5,600'; cleaning out frac stimulation in Beluga Fm gas interval. Planning second Otter well to 7,500' to test Tyonek Fm, and a well to test Olsen Creek prospect to southwest.
Apache
Drilling their first Cook Inlet well, Kaldachabuna 2 on CIRI acreage.
Apache
Continuing 3-D seismic operations in large areas using nodal technology for offshore, onshore, and transition zone acquisition.
Furie
Re-entered KLU-1 in Kitchen Lights Unit and deepened to 15,298' using Spartan 151 jack-up. Drilled KLU-2 & 2A sidetrack, testing Beluga Formation gas zones. Currently permitting platform, subsea gathering lines, and onshore facility.
NordAq Energy
Environmental impact statement in progress for potential 6-well development at Shadura.
NordAq Energy
Drilled Tiger Eye Central 1 well in 2012 targeting Tyonek and Hemlock Formations.
Buccaneer
Drilling third well in Kenai Loop field, with planned TD of 13,000'. Plans 2-3 additional wells in 2013. Field currently producing 6 MMCF/D from KL-1 well.
Cook Inlet Energy
Installed Miller 35 rig on Osprey platform; workover of RU-3 well for fuel gas, potential sales gas.
CINGSA/Enstar
Gas storage reservoir in Sterling C sands in Cannery Loop field now operational; first withdrawals in November, 2012; 2.45 BCF withdrawal expected for Q1/2013.
ConocoPhillips
Continued shipments of LNG from Nikiski facility to Asia during 2012. Export license expires March 2013.
Enstar-Chugach-ML&P
Utilities foresee gas imports in 2014-15 to meet peak seasonal demand swings; evaluating liquified and compressed natural gas options.
Hilcorp
Current Plan of Development for Ninilchik Unit includes gas well workovers and potential future testing of deeper oil prospectivity.
Hilcorp
Permitting 3-D seismic at Deep Creek Unit. Public comment period ends December 21, 2012.
Armstrong
Two gas wells scheduled for late 2012 drilling at North Fork Unit: NFU 23-25 and 22-25.
Buccaneer
Endeavor jack-up undergoing winterization in Homer for drilling up to two wells at Cosmopolitan, then wells at Southern Cross and NW Cook Inlet Units in 2013.
Nancy Lake State Recreation Area
Susitna Flats State Game Refuge
Trading Bay State Game Refuge
Redoubt Bay Critical Habitat Area
Chugach National Forest
Kenai National Wildlife Refuge
Cook Inlet
Tustumena Lake
Willow
Houston
Wasilla
Susitna
Big Lake
Knik
LEA 1
Lewis River
Pretty Creek
Stump Lake
OTTER 1
PRETTY CK UNIT 4
IVAN RIVER 44-36
Ivan River
Beluga River
CIRI CC-06C to CC-12C
LOWER CHAKA TGH 67-34
LOWER CHAKA R TGH 62-02
SPURR WEST 26-11
TYEX 01 & 01X
Anchorage
NW Cook Inlet
North Cook Inlet
Lone Creek
Moquawkie
Tyonek
KALDACHABUNA 2
Nicolai Creek
S Granite Point
Southern Cross
N Trading Bay
KLU 1
Kitchen Lights
KLU 2 & 2A
Trading Bay
W McArthur River
Tiger Eye
TIGER EYE CENTRAL 1
Birch Hill
SHADURA 1
KGSF 1
SUNRISE LK 2
Swanson River
KGSF 7A
S Middle Ground Shoal
Redoubt
Nikiski
Beaver Creek
Salamatof
KL 1, 3, & 4
Kenai
Sterling
CANNERY LOOP S1 to S5
Cannery Loop
Soldotna
Kenai
KENAI UNIT 21-06RD
KENAI UNIT 31-07X
Cooper Landing
Kasilof
Clam Gulch
Ninilchik
HAPPY VALLEY B-1
Deep Creek
Nikolaevsk
Nikolaevsk NFU 32-35
Anchor Point
NFU 14-25
North Fork
Homer
Kachemak
0 5 10 Miles
Wells Drilled 2012
Wells Drilled 2011
Wells Drilled 2010
Existing Wells Approved for Gas Storage
Geothermal Leases
Susitna Exploration License Area #2
Units
Alaska Seaward Boundary
Map Location


North Slope Oil and Gas Activity 2012
State of Alaska, Department of Natural Resources, Division of Oil and Gas, December 2012
Chukchi Sea OCS
Shell
Drilled top hole for Burger-A, first new well in Chukchi Sea OCS during fall, 2012. Noble Discoverer drillship will return for additional drilling on prospect in 2013.
Statoil
Preparing exploration plan for 2015 drilling season, with intitial activity anticipated at Amundsen prospect.
Department of the Interior
Five-year oil and gas leasing program includes 2016 sale in Chukchi Sea and 2017 sale in Beaufort Sea.
ENI
Added 5 producers, 7 injectors, and 1 water supply well at Nikaitchuq Unit Schrader Bluff PA in 2012.
Beaufort Sea
BP
Milne Point S-Pad heavy oil pilot: cold heavy oil production with sand (CHOPS) technol-ogy in 4 Ugnu sandstone test wells.
Shell
Drilled top hole for Sivulliq well during fall, 2012; first of its new wells in the Beaufort Sea OCS. Kulluk floating drilling vessel will return to drill at Sivulliq and Torpedo prospects in 2013.
Pioneer Natural Resources
Plans Nuna 2 well and additional testing of Nuna 1 this winter to delineate potential 50 MMBO Torok Fm discovery. Production continues from Kuparuk and Nuiqsut PAs.
Brooks Range Petroleum
Voluntarily contracted 23 of 30 leases out of Beechey Point Unit.
Exxon
Point Thomson pipeline lease and wetlands permits issued fall, 2012 to allow development; first condensate production by winter of 2015-16.
Conoco Phillips
CD-5 Alpine West project sanctioned, to expand Colville River Unit production to west. First oil expected by 2016.
Plans two or more wells on Cassin prospect in Bear Tooth unit (NPRA).
Repsol
Three-rig exploration program planned this winter in between Colville River Unit and Kuparuk River Unit; Qugruk 1, 3, and 6 wells.
BP
Suspended plans for ultra-extended reach development of 100 MMBOR Liberty accumulation.
Teshekpuk Lake
Nikaitchuq
Oooguruk
Northstar
Milne Point
Beechey Point
Dewline
Duck Island
Liberty
Prudhoe Bay
Deadhorse
Point Thomson
Badami
Bear Tooth
Colville River
Kachemach
Kuparuk River
Place
S.Miluveach
Greater Mooses Tooth
Tofkat
QUGRUK 4
QUGRUK 2
QUGRUK 1
SIKUMI 1
NUNA 1
SAK RIVER 1A
NORTH SHORE 1
IGNIK SIKUMI1
NORTH TARN 1 & 1A
MUSTANG 1
SHARK TOOTH 1
PTU 15 & 16
BADAMI UNIT RED WOLF 2
BADAMI UNIT B1-38
Year-round development drilling and well work in producing fields
Brooks Range Petroleum
Construction to begin this winter on Mustang production pad in Southern Miluveach Unit, targeting up to 44 MMBOR in Kuparuk Fm, first oil in 2014. Plans include a delineation well and sidetrack at Tofkat unit.
ConocoPhillips/NETL
Ignik Sikumi 1 methane hydrate test well successfully produced via hydrate CO2/nitrogen exchange and depressurization mechanisms.
KACHEMACH 1
ALCOR 1
MERAK 1
Great Bear Petroleum, LLC
Drilled the first two vertical holes to evaluate shale play, Alcor 1 and Merak 1; evaluating cores and logs before drilling laterals; revised plans to provide for long-term tests.
National Petroleum Reserve - Alaska
Arctic National Wildlife Refuge
Division of Oil and Gas
Areawide lease sales scheduled for November, 2013, encompassing 14.7 million acres in North Slope, Beaufort Sea, and North Slope Foothills sale areas.
Anadarko Petroleum
Conducted rig-less frac and test of Chandler 1 well in early 2012.
Linc Energy
Preparing for 2013 winter drilling at Umiat field, mobilizing Kuukpik 5 rig via snow road from Pump Station 2 to drill up to 4 wells.
Umiat
Roads to Resources Program
EIS in progress to evaluate Foothills West transporta-tion corridor to connect Umiat and Gubik to road system and promote exploration of foothills plays.
0 10 20 Miles
N
Wells Drilled 2012
Wells Drilled 2011
Wells Drilled 2010
Units
Alaska Seaward Boundary
Dalton Highway
Trans Alaska Pipeline
Map Location

MINING RESOURCES

TECHNOLOGY AND THE NEW MARKETPLACE

Compared to the oil and gas industry, where horizontal drilling and hydraulic fracturing have created a tectonic shift in the markets, the mining sector has not experienced game-changing technological advances.

Anglo American CEO Mark Cuitfani addressed the geological pace of developing new mining methods during an April speech at the company's 2013 general meeting.

"To deliver on our potential we will have to put in place new processes that reach outside the mining industry for their inspiration and application," Cuitfani told shareholders. "To be brutally frank, our industry lags the petroleum, manufacturing and aviation sectors and other more progressive and innovative heavy industry players in terms of operating practices – there is no reason why our industry should not use the best from all of these 'restless innovators'."

Hydraulic fracturing, a technology that is allowing billion of barrels of rock-bound oil and trillions of cubic feet of previously unrecoverable gas to flow into the market place each year, is one innovation the mining industry may adopt from its counterparts in the coming years.

While it may seem a stretch that ore could be fractured underground and rock-bound metals pumped to the surface, Curis Resources Ltd. is proposing to do just that at its Florence Copper project in Arizona. Known as in-situ copper recovery, the process involves using hydraulic fracturing or explosives to break up the copper-bearing rocks lying underground. A mild acid solution with a pH equivalent to household vinegar is pumped into the deposit, dissolving copper as percolates down through the ore. A ring of recovery wells draw the metal-laden solution to the surface where the copper is recovered.

Eliminating the need to handle the millions of tons of rock, in-situ copper recovery provides both economic and aesthetic benefits to recovering copper from deeply buried ore. The process also would eliminate the need for tailings facilities, a contentious issue at Pebble and other mega-mining projects.

Skeptics worry that this underground leaching of metal could contaminate surrounding groundwater. Engineers familiar with the process explain that extraction wells at an in-situ recovery operation would work like the drain of a bathtub, using gravity to draw water and solution down to the collection locations. Treated water and solution would be pumped back into the contained hydraulic circuit. Observation wells would allow for the monitoring of this hydraulic system.

Once the copper minerals have been recovered, injection and recovery wells will be used to rinse the bedrock with fresh groundwater. Once water quality has returned to its original condition, wells will be cemented and sealed off below ground-level and the minimal surface disturbances reclaimed.

Curis is planning to begin construction of a production test facility at Florence Copper later this year, with a full-scale operation expected to be permitted following the phase-one test. Given the right geological, metallurgical and hydraulic conditions, it is conceivable that in-situ recovery technology could be applied to other metals as well.

In the meantime, the Pebble Partnership is putting the finishing touches on a plan for mining the enormous Pebble copper-gold-molybdenum project in Southwest Alaska. Considering the world-class nature of the deposit and salmon fishery in Bristol Bay, the Pebble mine plan is expected to represent the most advanced technologies the mining industry has to offer. By the end of 2013, the Pebble Partnership, a 50-50 alliance between Vancouver B.C.-based Northern Dynasty and London-based Anglo American, will have invested roughly $750 million in the massive project.

"By the time the Pebble Partnership triggers permitting under NEPA (National Environmental Policy Act), more than $700 million will have been invested to ensure a robust project design from a technical, financial, environmental and social perspective," said Northern Dynasty President and CEO Ronald Thiessen.

While advancements in mining technologies have historically been slow to develop, inspiration from oil and gas and other heavy industry players could lead to new techniques that decrease environmental impacts and increase the profitability of proposed projects. Only time will tell how successful the mining sector is at adopting these transformative innovations and developing state-of-the-art technologies of its own, but improving the likelihood of developing new mining projects by reducing the risk and growing the reward is a quest worth undertaking.

ECONOMISTS FORECAST MORE ALASKA MINERS

MINING JOBS ESTIMATED TO INCREASE 19 PERCENT OVER THE COMING DECADE; EXPANSION OF EXISTING OPERATIONS, NEW MINES TO DRIVE GROWTH

An employment forecast published by the Alaska Department of Labor and Workforce Development in October, 2012 pegged the state's mining sector job growth from 2010 to 2020 at 19 percent. That is second only to health care, at 31 percent, and outpacing the 12 percent average growth across all Alaska industries.

Expansion of current operations coupled with prospects of building mines at the world-class Livengood and Donlin gold deposits were cited as drivers behind adding new miners to the Alaska workforce.

According to "The Economic Benefits of Alaska's Mining Industry," an annual report prepared by the McDowell Group for the Alaska Miners Association, the Alaska mining industry accounted for 4,800 direct and 9,800 indirect jobs in 2012.

At US$100,000 per year, the average pay in the mining industry is double the statewide average across all sectors. And, these hefty paychecks are taken home by miners living in 120

communities across the state, half of which are found in rural regions where employment opportunities are sparse and the cost of living is high.

Iliamna Development Corp. CEO Lisa Reimers – an Alaska Native who has been outspoken in her support of the enormous Pebble copper-gold-molybdenum project near her hometown of Iliamna – speaks to the need for jobs off the beaten path in Alaska.

"When the long winter comes, the seasonal industries leave, and the economy of southwestern Alaska shuts down," Reimers recently wrote. "The region's per capita income is US$15,000 a year. Worse, our remote location results in sky-high living expenses – gasoline is US$8-9 a gallon and milk costs even more – so the poverty rate exceeds 20 percent."

PEBBLE JOBS UNCLEAR

The Bristol Bay region of Southwest Alaska, where Reimers' hometown is located, is blessed with two epic resources – the world's largest run of sockeye salmon and Pebble, which is considered to be the largest undeveloped copper deposit on the planet.

The juxtaposition of these two world-class assets has fueled a heated debate, with one side worried that mining the copper-gold-molybdenum deposit may put the salmon at risk. Pebble supporters, on the other hand, say the deposit can be developed in a way that protects the fish and would create high-paying jobs for decades to come.

"This project has significant socioeconomic benefits for the people of southwest Alaska living in a region recognized with one of the highest costs of living in the nation, considerable village outmigration, school closures and high rates of unemployment," said Pebble CEO John Shively, upon rolling out a $180 million budget for 2013.

The Pebble Limited Partnership – a 50-50 alliance between Vancouver B.C.-based Northern Dynasty Minerals and London-based Anglo American – hopes the more than $700 million of geological, environmental and engineering work carried out at Pebble will result in a mine-plan that will stand up to the rigors of permitting.

The U.S. Environmental Protection Agency, meanwhile, is advancing its Bristol Bay Watershed Assessment, a study that could seal the fate of Pebble.

Under Section 404 of the Clean Water Act, the Army Corps of Engineers is charged with issuing permits for dredge and fill discharge into navigable waters, including wetlands. The EPA was granted veto authority to prohibit, restrict, or deny a discharge that poses an unacceptable adverse impact to fisheries or other water uses.

The EPA initiated the Bristol Bay Watershed Assessment in response to concerns from Alaska Native groups, fishing organizations and others who petitioned the agency to exercise its veto authority to pre-emptively deny the Pebble Partnership discharge permits needed to build a mine at the world-class copper-gold-molybdenum deposit.

Though EPA vigorously denies it has predetermined whether to exercise its veto authority, the draft assessment published by the agency surmises that development of Pebble may pose a threat to a world-class salmon fishery found there.

Sens. Lisa Murkowski, R-Alaska, and Mark Begich, D-Alaska told the mining community gathered at the Alaska Miners Association Convention in early November that they would stand up against any effort by the EPA to deny the Pebble Partnership its right to have its copper-gold-molybdenum project vetted by the permitting process.

"A pre-emptive veto makes no more sense than a pre-emptive approval," is a message Murkowski reiterated during her speech at the AMA convention.

This sentiment was echoed by her Democratic counterpart in the Senate.

"We made it very clear to the (then) administrator of the EPA, Lisa Jackson, that there is no room, no option,no opportunity for any pre-emptive strike," Sen. Begich told the mining community.

With the pushback from opposition, it is unclear whether the estimated 2,000 jobs that Pebble would offer during construction and roughly 1,000 mining jobs that would follow will be realized by 2020.

GENERATIONS OF MINERS

Usibelli Coal Mine, situated near the town of Healy some 100 miles (160 kilometers) south of Fairbanks, is Alaska's longest running employer of Alaska miners.

Of the 130 or so employees currently working for Usibelli Coal Mine Inc., about 27 percent are second, third and fourth generation employees – a testament to the strong ties built between the family-owned coal mining business and the people that contribute to its success.

Usibelli, which got its start in 1943 by supplying coal to Ladd Army Air Field (now Fort Wainwright) near Fairbanks, now produces approximately 2 million tons of coal per year. Roughly 1 million tons is delivered to six power plants in interior Alaska, the balance is shipped overseas.

Located some seven miles (11 kilometers) northeast of its current operation at Two Bull Ridge, the 83-million-ton Jumbo Dome deposit is anticipated to provide Usibelli's domestic and international customers with coal for the next 30 years and potentially provide jobs for fifth- and sixth-generation miners at the Interior Alaska operation.

Wishbone Hill, a coal deposit located 10 miles (16 kilometers) northeast of the Southcentral Alaska town of Palmer, is a second operation Usibelli hopes to get into production.
Based on 6 million tons of the bituminous coal currently in reserves, Wishbone Hill is forecast to put between 75 and 125 people to work for an initial mine-life of 12 years.

A dispute has erupted between the state of Alaska and federal regulators over the validity of the permits needed to advance Wishbone Hill. The permits in question have been attached to the operation and renewed several times since 1991. The federal Office of Surface Mining claims the permits lapsed in 1996, making any renewal invalid. Alaska officials contend that there is empirical evidence the permits are valid.

If Usibelli gets the regulatory green light to proceed with the development of Wishbone Hill, some 500,000 tons of bituminous coal is expected to be shipped overseas to Japan via the loading facility at Port MacKenzie on the west side of upper Cook inlet across from Anchorage.

INTERIOR GOLD MINERS

While Usibelli boasts the longest running mine in Interior Alaska, the region's two hardrock gold mines lay claim to being the biggest employers of miners in the Golden Heart of the state. Kinross Gold Corp.'s Fort Knox Mine, located some 26 miles (42 kilometers) northeast of Fairbanks, employs more than 600 miners, mostly Fairbanks residents. More than 5 million ounces of gold has been extracted from the open-pit operation since 1997. In 2009, Kinross completed construction of a heap leach facility and expansion at Fort Knox. According to the company's most recent projections, there is enough ore to feed the mill until 2018 and to continue the heap leach operation through 2021. It is expected that new deposits at and around the current mine area will continue to extend the life of this open-pit operation but Kinross has not published such projections.

The Pogo Mine, located about 60 miles (100 kilometers) southeast of Fairbanks, is a high-grade gold operation that employs about 330 miners.Sumitomo Metal Mining Pogo LLC – a joint venture between Japanese firms Sumitomo Metal Mining Company (85 percent) and Sumitomo Corp. (15 percent) to operate Pogo – celebrated the first 2 million ounces produced at this underground operation in July.

The 2,500-metric-ton-per-day mill at Pogo churns out around 1,000 ounces of gold per day. At this rate, the 2.9 million ounces of gold reserves at Pogo will carry the underground operation through 2019. With an additional 2.1 million ounces of gold in resources and two new gold-rich zones found within 300 meters of the ore being mined, Pogo employees need not worry about the mine closing at the end of the decade.

If Pogo or Fort Knox were to shut down at the end of the decade, International Tower Hill Mines Ltd. would be glad to pick up some experienced miners to work at Livengood, a 20-million-ounce gold project located a few miles north of Fairbanks that the company hopes to have in operation by 2018.

"About the time Fort Knox drops off in production, we are going to be able to pick up some highly-qualified employees they are no longer going to be able to have – we look forward to that," said International Tower Hill Mines President and CEO Don Ewigleben.

According to a preliminary economic assessment completed in 2011, a 91,000-metric-ton-per-day mill at Livengood would churn out 12.9 million ounces of gold over 23 years. A feasibility

study expected to be completed by mid-2013 is investigating the appropriate size operation for Livengood. Ewigleben said the 560,000-ounce-per-year operation anticipated in the PEA is at the low end of various scenarios being contemplated.

With permitting slated to begin in 2013, Tower Hill is targeting 2017 to begin building a mine at Livengood and hopes to begin commercial gold production by 2018. Once in operation, this upcoming Interior Alaska mine is expected to put at least 500 miners to work, dependent on the scope of the operation that the company settles on.

NANA WORKS IN NORTHWEST

The Red Dog zinc-lead mine in Northwest Alaska – situated about as far off the beaten path as one can get – has become a case study for the employment opportunities mines can provide to rural regions. Nearly 53 percent of the 550 full-time jobs at Red Dog are filled by the shareholders of NANA – the Alaska Native corporation that represent the Inupiat who have called Northwest Alaska home for eons; many of whom have worked their way up to high-level positions at the mine.

Red Dog, which has been in operation for more than two decades, has enough high-grade zinc ore in its Aqqaluk deposit to carry the operation through 2031. NANA's Red Dog partner, Teck Resources, continues to explore other zinc-rich deposits in the region that could carry this mine well into the 21st Century. As the local workforce matures, it is expected that more and higher level Red Dog jobs will go to this primarily Alaska Native population.

Building on its success at Red Dog, NANA is on the hunt for mineral deposits that will sustain the economic well-being of its 12,500 shareholders beyond the life of the Red Dog Mine. "We know that one day we will be done mining at Red Dog, and it is our hope that we will keep finding deposits around the area," NANA Regional Corp. President and CEO Marie Greene told Mining News. "We have always known there are minerals in the upper Kobuk area. The question has always been: How much is there?"

To answer this question, NANA has forged a new partnership with NovaCopper Inc. This alliance – known as the Upper Kobuk Mineral Project – has pulled together a 331,000-acre (134,000 hectares) swath of highly prospective copper hunting ground.

The NANA-NovaCopper partnership already boasts two deposits with some 6.1 billion pounds of high-grade copper plus appreciable quantities of gold, silver, lead and zinc. About 2.6 billion pounds of this copper is found at the Arctic VMS deposit. The remaining 3.5 billion pounds is contained in the South Reef and Ruby zones at Bornite, carbonate replacement style deposits situated about 17 miles (27 kilometers) southwest of Arctic.

NovaCopper envisions these deposits supporting two long-lived mines in the Upper Kobuk region and a host of other prospects have the potential to provide mining jobs through the end of the 21st Century. The state of Alaska has invested some US$9.25 million toward studying the potential of building a road that links this copper-rich region to the highway system some 200 miles (320 kilometers) to the east.

"Getting a road into a district like Ambler will unlock a lot of value and create a lot of jobs for multi-generations," said NovaCopper President and CEO Rick Van Nieuwenhuyse.

LOCAL MINERS AT DONLIN

Companies under Van Nieuwenhuyse' leadership have established a track-record of putting local people to work. NovaGold Resources' 40-million-ounce Donlin Gold deposit is a glowing example. Roughly 87 percent of the people working on site at the gold project are shareholders of Calista Corp., the Alaska Native regional corporation for the Yukon-Kuskokwim Region of Southwest Alaska.

On Aug. 7, Donlin Gold LLC – owned equally by NovaGold and Barrick Gold Corp. – submitted permit applications for development of the Donlin deposit. It is expected to take about four years to gain the permits needed to develop the project and, if the partners decide to move ahead with development, construction will take about as long.

It is anticipated that upwards of 3,000 workers will be needed to build the Donlin gold mine and associated infrastructure. Once in operation, a milestone NovaGold would like to see achieved by 2020, Donlin Gold would employ some 1,000 miners for an initial 27 years, a mine-life that is expected to be extended by decades as additional ore is added to the deposit.

SE ALASKA MINES

Southeast Alaska currently hosts two operating mines and two advanced mineral exploration projects that hope to reach that status by the end of the decade. Located roughly 45 miles northwest of Juneau, Coeur d'Alene Mines Corp.'s Kensington gold mine employs some 250 miners. During 2011, the first full year of production at Kensington, the underground operation produced 88,420 ounces of gold at cash operating costs of US$1,088 per ounce. Late in 2011, Coeur cut processing rates in half to provide an opportunity to undertake several key initiatives aimed at improving the mine's production profile and the overall safety of the operation. The Southeast Alaska mine returned to full-scale production of about 1,500 tons per day in the second quarter. Based on current reserves, Kensington is expected to provide mining jobs for the next decade, an open-ended timeline that is expected to grow as Coeur finds more gold-rich ore.

Hecla Mining Co.'s Greens Creek silver mine near Juneau has been employing Southeast Alaska miners for more than 20 years. Today, the operation boasts some 300 employees. Hecla spent roughly US$90 million on upgrades at Greens Creek in 2012, the largest investment in the history of the Southeast Alaska mine. Going into 2012, Greens Creek had about 98 million ounces of silver in reserves – enough to keep the Southeast Alaska mine in production for about another 10 years – and Hecla sees plenty of potential to continue replenishing these stores of silver in the foreseeable future.

PRINCE OF WALES NEIGHBORS

Niblack and Bokan Mountain, two advanced exploration projects located on Prince of Wales Island southwest of Ketchikan, are vying to become the next operating mine in Southeast Alaska. Targeting the completion of a pre-feasibility study for Niblack by mid-2013, Heatherdale Resources Ltd. has engineers designing a mine and mill to process the gold-copper-zinc-silver ore at the volcanogenic massive sulfide project. Heatherdale anticipates building a mine at Niblack of similar scale to Greens Creek.

With the slopes of Lookout Mountain plunging steeply into the Niblack Anchorage, there is little room for a mill at Niblack. Instead of attempting to master this challenging topography, Heatherdale is considering barging ore to an offsite location. Gravina Island, an industrial site near the community of Ketchikan and about 40 miles (65 kilometers) northeast of Niblack, has been identified as an ideal location for a mill and tailings storage facility. Ketchikan, a logging town of some 8,000 people, has been seeking a new source of employment since the demise of the timber industry in the region. Located across a narrow passage from Ketchikan, regular ferry service could transport mill workers from the Southeast Alaska town to the proposed Gravina Island mill site.

Since becoming involved with Niblack, Heatherdale has built strong bonds with the residents of Prince of Wales Island and surrounding communities. A partnership with the Prince of Wales Tribal Enterprise Consortium – owned by the Craig Tribal Association and the Organized Village of Kasaan – is supplying Niblack with much of its current manpower needs. "From the outset, Heatherdale has made it clear that it wants its mineral development activities on Prince of Wales Island to benefit local people and communities through local hire and contracting," said Powtec CEO Bill Cole.

Dependent on a positive feasibility study, Heatherdale anticipates filing for permits to develop Niblack. Once applications are submitted, it will take roughly three years for permitting and two years for construction. Ucore Rare Metals Inc. is projecting a similar timeline for developing its Bokan Mountain rare earth element project roughly 15 miles (25 kilometers) south of Niblack. To gain a foothold on Bokan Mountain, the U.S. Department of Defense has signed contract with Ucore to advance the Prince of Wales Island project.

Several of the REEs found at Bokan Mountain are critical ingredients to the U.S. military's advanced weapon systems and other high-tech gadgets. The agreement penned with the Pentagon will help fund Ucore's pioneering work to free the critical REEs from the ore. Hoping to get the strategic elements stored at Bokan Mountain to market as soon as possible, Ucore hopes to begin construction at the Southeast Alaska deposit by 2015 and begin providing the United States with a domestic supply of heavy rare earths by 2016.

PROPOSED PROJECTS, MINING

BOKAN MOUNTAIN RARE EARTH ELEMENTS PROJECT

Overview

Bokan Mountain is a rare earth element project located within the Tongass National Forest on Prince of Wales Island some 35 miles southwest of Ketchikan. In March 2011, Ucore published an inferred mineral resource of 5.3 million metric tons grading 0.65 total rare earth oxides (TREOs), with 40% of the TREOs being the higher value heavy rare earth oxides (HREOs). Rare earths are key ingredients of a number of military, high-tech and green technology applications. China, which currently supplies between 90 and 95 percent of the world's rare earth oxides, has dialed back their exports over recent years. The strategic and economic importance of rare earths coupled with restrained and unreliable supply of these elements has resulted in support for the development of the Bokan Mountain project on both the state and federal government levels. A preliminary economic assessment released by Ucore in November projects that it will cost $221 million to put develop a mine at Bokan, including a separation plant capable of producing 2,250 metric tons of market-ready rare earth oxides per year during the first five years of full production; including an annual output of 95 metric tons of dysprosium oxide, 14 metric tons of terbium oxide, and 515 metric tons of yttrium oxide. With permitting and feasibility level studies beginning in 2013, Ucore plans to have detailed engineering studies completed in 2014 and a construction start by 2015. If this schedule holds, Ucore has a target of 2016 to begin providing the United States with heavy rare earths from the Southeast Alaska deposit.

Commodities: Yttrium, dysprosium, terbium, and other rare earth elements
Start Date: Construction expected to begin in 2015; production targeted for 2016
Duration of Project: 11 years (based on 2011 resource estimate)
Jobs: Approximately 175 during operation
Total Project Costs: $221 million

CHUITNA COAL PROJECT

Overview

The Chuitna Coal project is a surface coal mining and export development proposal for an ultra-low-sulfur, sub-bituminous coal resource located in the Beluga coal field of Southcentral Alaska, roughly 45 miles west of Anchorage. The proposed project includes a surface coal mine and associated support facilities, a mine access road, a coal transport conveyor, personnel housing, air strip facility, a logistic center, and a coal export terminal which would include a 10,000 foot elevated conveyor constructed into Cook Inlet for the loading of ocean going coal transport ships. The proposed mine is slated to produce roughly 240 million metric tons of coal over an initial 25-year mine-life. Landownership in the project area consists of a combination of public and private entities including the State of Alaska, Mental Health Trust, Kenai Peninsula Borough and Tyonek Native Corp. A previous project design was evaluated in an Environmental Impact Statement and permitted by most of the applicable state and federal regulatory agencies in the 1990s, but the project never proceeded to development. There have been substantial changes to the project's design since then which resulted in the United States Environmental Protection Agency requiring the project prepare a comprehensive, stand-alone Supplemental EIS (SEIS) which PacRim originally submitted in 2006. In 2010, the US Army Corp

of Engineers took over as the lead federal agency and a revised project description was submitted to incorporate current design changes. The SEIS and permitting process is expected to be completed by 2014 at which point the Pac Rim Coal LP will decide whether or not to proceed with development based on permit and market conditions.
Commodity: Coal
Start Date: Currently estimated to begin construction by 2015 and commence production following a two-year construction schedule.
Duration of Project: Current predictions a minimum of 25-year mine life
Jobs: About 500 during construction and 350–400 employees during operations
Total Project Costs: More than $700 million

DONLIN GOLD PROJECT

Overview

The Donlin Gold project, located 280 miles northwest of Anchorage, is situated on Native lands owned by the Kuskokwim Corporation (surface) and Calista Corporation (subsurface). The refractory gold deposit at Donlin has estimated reserves of 33.85 million ounces of proven and probable reserves averaging 2.09 grams of gold per metric ton. Additionally, the project contains 5.16 million ounces of gold in the measured and indicated resource category and 5.99 million ounces of gold in the inferred resource category. A feasibility study completed in 2011 estimates the capital costs of developing a mine at Donlin, including a natural gas pipeline stretching from Cook Inlet some 310 miles northwest to the Kuskokwim region project will be roughly $6.7 billion. Donlin Gold LLC – a partnership owned equally by NovaGold Resources Ltd. and Barrick Gold Corp. – initiated the permitting process for its Donlin Gold project in August, 2012. It is expected to take about three to four years to gain the 100 or so permits needed to develop Donlin and, if the partners decide to move ahead with development, construction will take about as long.
Commodity: Gold
Start Date: Construction is anticipated to begin in 2016 with operations scheduled to start by 2020
Duration of Project: 27-year mine life based on current reserves
Jobs: 3,000 construction jobs for 3.5-year construction period, about 1,000 workers during operations
Total Project Costs: $6.7 billion

LIVENGOOD GOLD PROJECT

Overview

The Livengood project, located adjacent to the Elliot Highway about 70 miles north of Fairbanks, is being advanced toward development by International Tower Hill Mines Ltd. The Money Knob deposit at Livengood has an estimated 20.6 million ounces of gold resources. According to preliminary economic assessment completed in 2011, building a 91,000-metric-ton-per-day at Livengood would cost roughly $1.6 billion, with an additional $585 million in life-of-mine sustaining capital costs. Based on current reserves, the mine outlined in the PEA would produce an average of 562,000 ounces of gold per year over a 23-year mine life, or about 12.9 million ounces of gold. International Tower Hill President and CEO Donald Ewigleben said the 560,000-ounce-per-year operation anticipated in the PEA is at the low end of various scenarios being contemplated. A feasibility study expected to be completed in 2013 is investigating the

appropriate size operation for Livengood. With permitting slated to begin in 2014, Tower Hill is targeting 2017 to begin construction, and hopes to begin commercial gold production at Livengood by 2019. Once in operation the project is expected to employ an estimated 500 workers.
Commodity: Gold
Start Date: Construction expected to begin in 2017 and production in 2019
Duration of Project: 23 years
Jobs: Approximately 1000 workers during construction and roughly 500 workers during operation (depending on final mine design)
Total Project Costs: Estimated at $2.2 billion

PEBBLE COPPER-GOLD-MOLYBDENUM PROJECT

Overview

The Pebble Project is a copper-gold-molybdenum porphyry deposit located in the Bristol Bay region of Southwest Alaska 17 miles northwest of the community of Iliamna. The reserves for the Pebble project are estimated to be 80.6 billion pounds of copper, 107.4 million ounces of gold, and 5.6 billion pounds of molybdenum as well as silver, rhenium and palladium. Assuming the total resource was mined at a rate of 220,000 metric tons per day, a mine at Pebble would be in operation for more than 100 years. The Pebble Limited Partnership – owned equally by Vancouver B.C.-based Northern Dynasty Minerals and London-based Anglo American – published an environmental baseline document for the project in January. This 27,000-page document compiles $120 million worth of environmental studies conducted in the Pebble region from 2004 through 2008. There have been several political and public relations campaigns for and against the Pebble Project, which has become a hot button issue for both environmentalists and resource development proponents. Due to the sensitive nature of the project, Pebble has been reluctant to issue a timeline for completion of the mine plan and feasibility study currently underway. Indications, though, are that the project could begin permitting in 2013. The project description is expected to include details of the Pebble mine plan, transportation corridor linking the deposit and Cook Inlet some 85 miles to the east, deep-water port-site at Cook Inlet; and a facility to generate the some 400 megawatts of electricity expected to be needed to power the mill and other facilities at the enormous copper project. Conceivably, Pebble could begin production as early as 2021 but given the contentious nature of this project, it will likely take longer to realize the potential of this massive deposit. Early estimates project it will cost $4.7 billion to develop the Pebble mine site and $1.3 billion will be needed for infrastructure costs. 2,100 people are expected to be employed over the four year construction period and 1,000 people will be necessary for the operations workforce.
Commodity: Copper, gold, molybdenum, silver, rhenium and palladium
Start Date: Construction in 2017, production in 2021
Duration of Project: The project will likely be permitted for a 20-30 year mine life
Jobs: 2,100 during the four-year construction phase, 1,000 during operations
Total Project Costs: Estimated at $6 billion

WISHBONE HILL COAL PROJECT

Overview

The Wishbone Hill coal prospect is owned by the Usibelli Coal Mine Inc. and is located ten miles northeast of Palmer. Estimated reserves are 14 million tons of bituminous coal. About 6 million tons are currently being considered for mining, which would provide for a potential commercial life of 12 years from start of production. If Usibelli decides to proceed with the development of Wishbone Hill, some 500,000 tons of bituminous coal will be shipped overseas to Japan via a newly constructed loading facility at Port MacKenzie on the west side of upper Cook inlet across from Anchorage. An Institute of Social and Economic Research (ISER) study estimated the number of jobs potentially created by the mine at 90 people.

Start Date: As early as 2013

Duration of Project: Twelve years based on current reserves estimates

Jobs: 75 – 125 based on an ISER socioeconomic study

Total Project Costs: Unknown

EXISTING OPERATIONS, MINING

FORT KNOX GOLD MINE

Overview

The Fort Knox mine is an open-pit gold mine located on State of Alaska and Mental Health Trust lands approximately 26 miles northeast of Fairbanks. The mine was originally permitted in 1994 and currently produces nearly 400,000 ounces of gold annually. To date more than 5 million ounces of gold have been extracted from Fort Knox since production began there in 1997. In 2009, Kinross Gold Corp., owner and operator of Fort Knox, completed construction of a heap leach facility and expansion of the existing mine. The heap leach facility, which can economically process low-grade material, is extending the life of Fort Knox and contributing to increased gold production at the mine. The operation produced 360,000 ounces of gold in 2012 and is on track to produce 425,000 ounces in 2013. If Kinross meets its 2013 production targets at Fort Knox, it would top the previous record of 411,220 ounces of gold mined at the mine in 2001. To accommodate the increased production, the workforce at Fort Knox is expanding from 550 to 625 employees. Kinross projects there are enough ore reserves in place to continue mill operations until 2018 and to continue heap leaching operation through 2021. At the end of 2012 the Fort Knox area had 3.6 million ounces of gold in reserves. An additional 1.6 million ounces of gold in the lower-confidence resource category and other nearby deposits are expected to add to the life of the mine.

Commodity: Gold
Start Date: 1997
Duration of Project: Current projections; mill operating until 2018 and heap leach into 2021
Jobs: 625
Total Project Costs: Unknown

GREENS CREEK MINE

Overview

The Greens Creek Mine is located adjacent to Admiralty Island National Monument, an environmentally sensitive area of Southeast Alaska. The Greens Creek property is located on 17 patented lode claim, one patented mill site claim, and property leased from the US Forest Service. In addition, Greens Creek also hold the mineral rights to 7,500 acres of federal land adjacent to the properties. The project is accessed by boat and served by 13 miles of road and consists of the mine, an ore concentrating unit, a tailings impound area, a ship-loading facility, camp facilities and a ferry dock. The Greens Creek Mine opened in 1989 with enough reserves to support a seven-year mine life. Subsequent exploration has expanded on those estimates and the current reserves are estimated to be 7.9 million tons, enough ore to keep the mine in operation for an additional nine years. Exploration expenditures for 2013 are budgeted at $6.6 million.

Commodities: Silver, gold, zinc and lead
Start Date: 1989
Duration of Project: Current reserves to last till 2022
Jobs: About 390
Total Project Costs: Unknown

KENSINGTON GOLD MINE

Overview

The Kensington Gold mine is located in southeast Alaska roughly 45 miles northwest of Juneau. Major permitting for the mine was completed in 2005 and the construction of the mine and mill facilities was completed in 2007. In 2009, the U.S. Supreme Court affirmed the Kensington 404 Permit for tailings placement allowing production at the mine to go forward. It was Alaska's sixth major mine when it began production on June 24, 2010. The mine produced a total of 43,143 ounces of gold during its first three months of operation and 88,420 ounces of gold in 2011. In November 2011, Coeur announced the curtailment of production levels at Kensington to complete several key projects designed to improve operational efficiency and consistency. As a result of the lower production rates through the first half of the year, Kensington produced 82,125 ounces of gold in 2012. Coeur anticipates the operation will recover roughly 110,000 ounces of gold during 2013. The company is continuing to add to its reserve estimates through exploration drilling in the area.

Commodity: Gold
Start Date: 2010
Duration of Project: 2022 based on current reserves
Jobs: About 300
Total Project Costs: $338 million

NIXON FORK GOLD MINE

Overview

The Nixon Fork mine is an underground lode mine located 32 miles northeast of McGrath that has been sporadically active since 1917. Fire River Gold Corp. resumed production at the historical operation in July, 2011. The mine is a 200 metric ton per day flotation plant with a gravity gold separation circuit, a sulfide flotation circuit and a new carbon-in-leach circuit. There is also a fleet of mining vehicles, a power plant, maintenance facilities, an 85-person camp, office facilities and a 5,000 foot long airstrip. The current mineral resource at Nixon Fork is sufficient to sustain 2 years of production. It is anticipated that exploration will continue to replenish this resource ahead of mining for several years.

Commodity: Gold
Start Date: 2011
Duration of Project: Two years of resource currently delineated
Jobs: 90
Total Project Costs: Unknown

POGO GOLD MINE

Overview

The Pogo gold mine is located 110 miles southeast of Fairbanks and is the first overseas mine operated by Tokyo-based Sumitomo Metal Mining. The operation at Pogo includes an underground mine that feeds gold ore to a mill at a rate of approximately 2,500 tons per day for an annual production of around 380,000 to 400,000 ounces of gold. Sumitomo spent $347 million on startup costs for the mine including the cost of infrastructure, electrical transmission and transportation construction costs. The facilities include an underground cut and fill mine

with conveyor access to the surface, a surface ore mill, tailings preparations facilities, a 249 person upper camp and 126 person lower camp, a transmission line and onsite electrical distribution system, a 49 mile all season road and a water management system. Two new zones of gold mineralization, North and East Deep, have recently been discovered adjacent to the Liese zone currently being mined at Pogo. Through the end of 2011, Sumitomo had outlined 2 million ounces of indicated and inferred gold resource at East Deep. This initial resource, according to Pogo General Manager Chris Kennedy, could be the tip of the iceberg when it comes to East Deep. The total extent of this zone is unknown and the deposit remains open to the west, north and northeast.
Commodity: Gold
Start Date: 2007
Duration of Project: 2019 (This is expected to be extended by at least 10 years based on recent discoveries.)
Jobs: 420
Total Project Costs: $347 million startup

RED DOG MINE

Overview

The Red Dog zinc-lead mine, located roughly 82 miles north of Kotzebue, is one of the worlds' largest producers of zinc concentrate. This Northwest Alaska mine is an open-pit truck-and-loader operation that uses conventional drill and blast mining methods. The mineral processing facilities use grinding and sulfide flotation methods to produce zinc and lead concentrates. Developed under an agreement between NANA Regional Corp. and Teck Resources, Red Dog began operations in 1989 with an initial mine life of roughly 20 years. Today, there are an estimated 55.7 million metric tons of reserves averaging 16.1 percent zinc and 4.1 percent lead – enough ore to sustain the operation until 2031. Anarraaq-Aktigiruq, a deep zinc-rich prospect that lies about eight miles northwest of the current operation, is shaping up to be another massive zinc deposit with grades comparable to those currently being mined at Red Dog. Teck discovered Anarraaq in 1999, subsequently establishing an inferred resource of about 17.2 million metric tons grading 15.8 percent zinc, 4.8 percent lead, and 71 g/t silver. In addition to continuing to expand Anarraaq, Teck is drilling a new region to the west of Red Dog called Noatak. These and other nearby deposits have the potential to extend the mine-life of Red Dog well into 21st Century.
Commodities: Zinc, lead and silver
Start Date: 1989
Duration of Project: 2031
Jobs: 604
Total Project Costs: Unknown

USIBELLI COAL MINE (HEALY OPERATIONS)

Overview

Usibelli Coal Mines' Healy operation, located about 100 miles south of Fairbanks, is Alaska's longest lived large-scale mine. The mine produces roughly 2 million tons of coal per year, with around 1 million tons delivered to six power plants in Interior Alaska and the balance is shipped overseas. The mine provides about 130 jobs and has a projected commercial life of 350 years based on current production rates and reserve estimates of around 700 million tons of coal in

the Healy area. The area being mined is located near to the currently idle Healy Clean Coal plant which has the potential to provide 50 megawatts of power to the Alaska Railbelt electrical grid. Golden Valley Electric is currently in the process of renewing the permit needed to bring the Healy Clean Coal operation online.

Start Date: 1943

Duration of Project: 350 years at current production rates and reserve estimates

Jobs: About 125

Total Project Costs: Unknown

Source: Alaska Miners Association, Economic Impacts of Alaska's Mining Industry, 2012

APPENDIX A- 2012 RESOURCE EXTRACTION EXECUTIVE SUMMARY

In the 2011 edition of the projection, AEDC described the current economic foundations of Alaska, the existing resource extraction based projects in place, the proposed resource extraction projects and the growing list of challenges those projects faced that made their development highly unlikely within the next 10 years. In 2012, very little has changed other than another year has gone by with only slight progress in moving the described projects forward. In effect, the opportunities and benefits those projects represent for Alaska's economy moved another year or more away from reality.

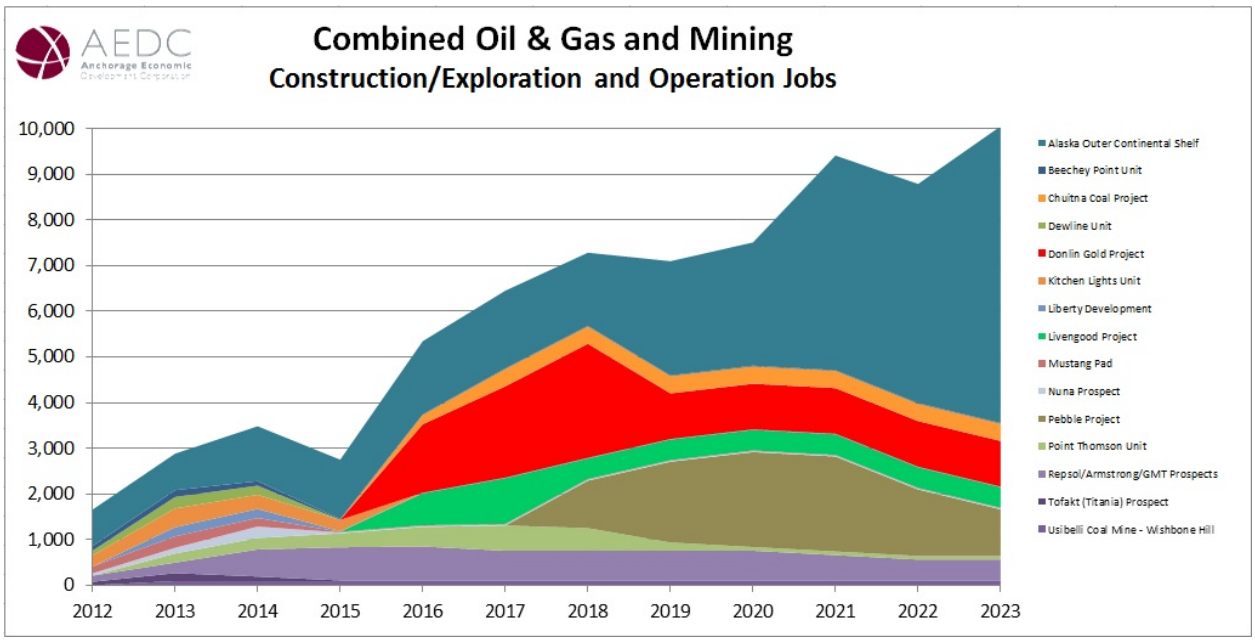
In the 2011 projection AEDC estimated a potential 10,460 jobs generated from $33.7 billion in private sector investments into 18 proposed new projects in the coming decade. As a point of reference, AEDC has chosen to include last year's Executive Summary as an appendix in this year's projection. We encourage the reader to fully review last year's summary.

For 2012, AEDC's updated projection shows Alaska has the potential to generate as many as 19,341 jobs that would be created through $30.4 billion of private sector investments in 16 resource extraction projects that are proposed for development within our state in the next decade.

Since 2011, 4 projects were dropped from the Projection and 2 new projects were added this year. In oil and gas, the Great Bear Petroleum project is behind schedule and was moved to the "Projects to be Watched" section to allow the project to develop more fully. The Nikaitchuk Producing Unit successfully moved into production in 2011. Two additions to this year's oil and gas projection are the Nuna Project in the region south and southwest of the Oooguruk unit boundary on the eastern bank of the Colville River, and Shell's Chukchi Sea/Beaufort Sea project in Alaska's Outer Continental Shelf region. In mining, the Nixon Fork Mine moved into production again, while the Rock Creek Mine has been dropped completely.

As was the case in 2011, AEDC's perspective on the outlook for these projects is not optimistic. Alaska's competitiveness in the global markets within which we compete, is not favorable in many ways. Several related issues have created these circumstances for Alaska's competitiveness. Issues based in social compact, taxation, permitting, litigation, commodity pricing, high costs related to project development and access to needed infrastructure have reached a point of, what is effectively, gridlock for many proposed projects. Compounding these challenges is a clear lack of agreement among Alaskans on a common vision for Alaska's economic future.

The following are the graphed views of the projects profiled in this projection. The first two graphs present a combined view of oil and gas and mining projects from two perspectives. The first is the view of total jobs these projects will create and when. This is the earliest that these jobs/spending could occur and are based on favorable conditions. The second graph presents an overview of total spending on these projects and when that spending will take place. Please note that all graphs are based on available information and in some cases, projects only offer jobs numbers or capital investment figures, not both, and will be excluded from either the jobs or investment graph.


AEDC
Anchorage Economic Development Corporation
Combined Oil & Gas and Mining
Construction/Exploration and Operation Jobs
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2012
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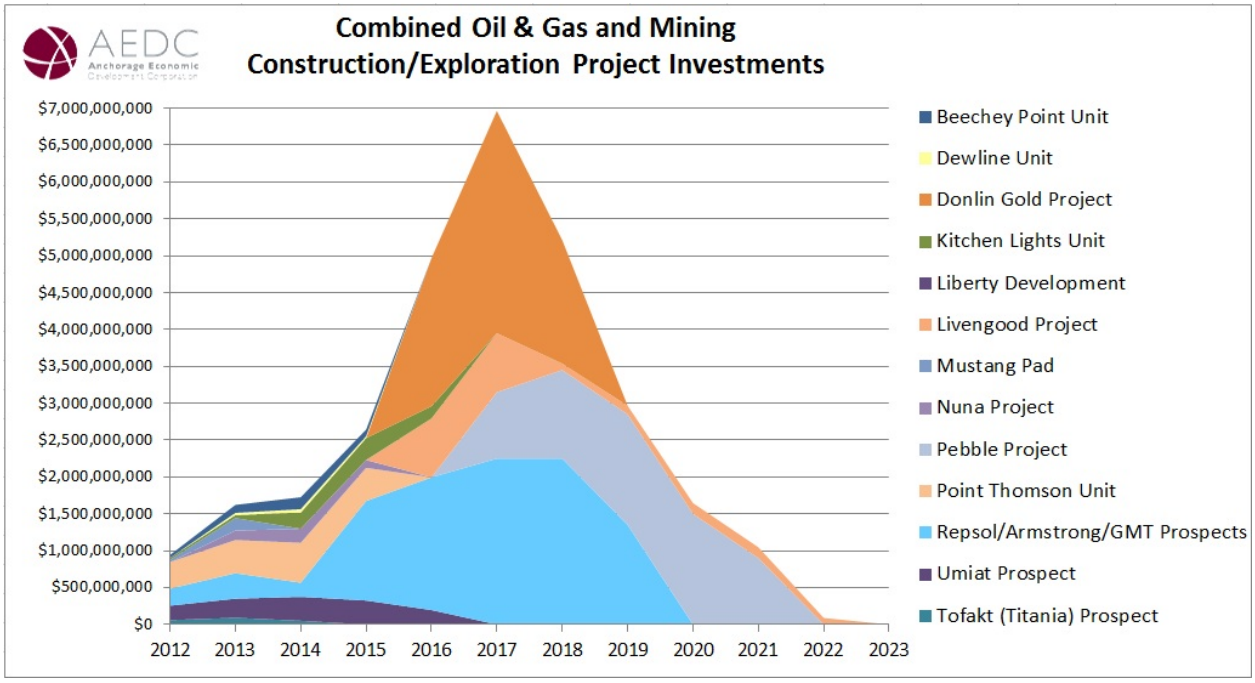
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Alaska Outer Continental Shelf
Beechey Point Unit
Chuitna Coal Project
Dewline Unit
Donlin Gold Project
Kitchen Lights Unit
Liberty Development
Livengood Project
Mustang Pad
Nuna Prospect
Pebble Project
Point Thomson Unit
Repsol/Armstrong/GMT Prospects
Tofakt (Titania) Prospect
Usibelli Coal Mine - Wishbone Hill


AEDC
Anchorage Economic Development Corporation
Combined Oil & Gas and Mining
Construction/Exploration Project Investments
$7,000,000,000
$6,500,000,000
$6,000,000,000
$5,500,000,000
$5,000,000,000
$4,500,000,000
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2012
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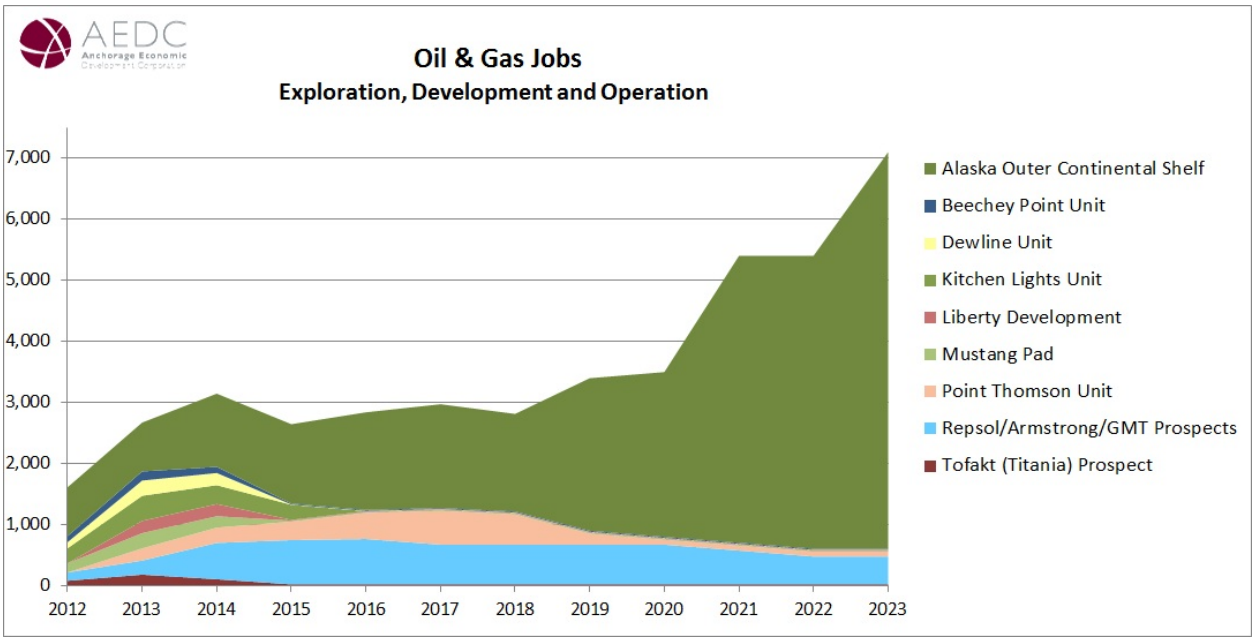
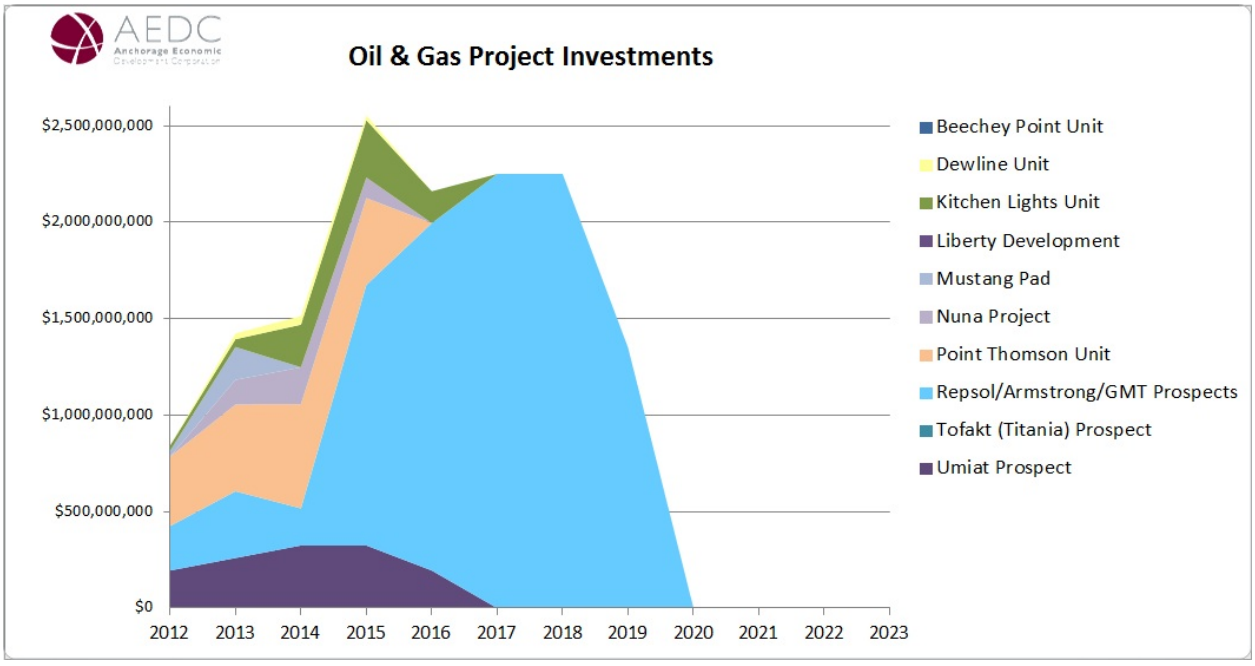
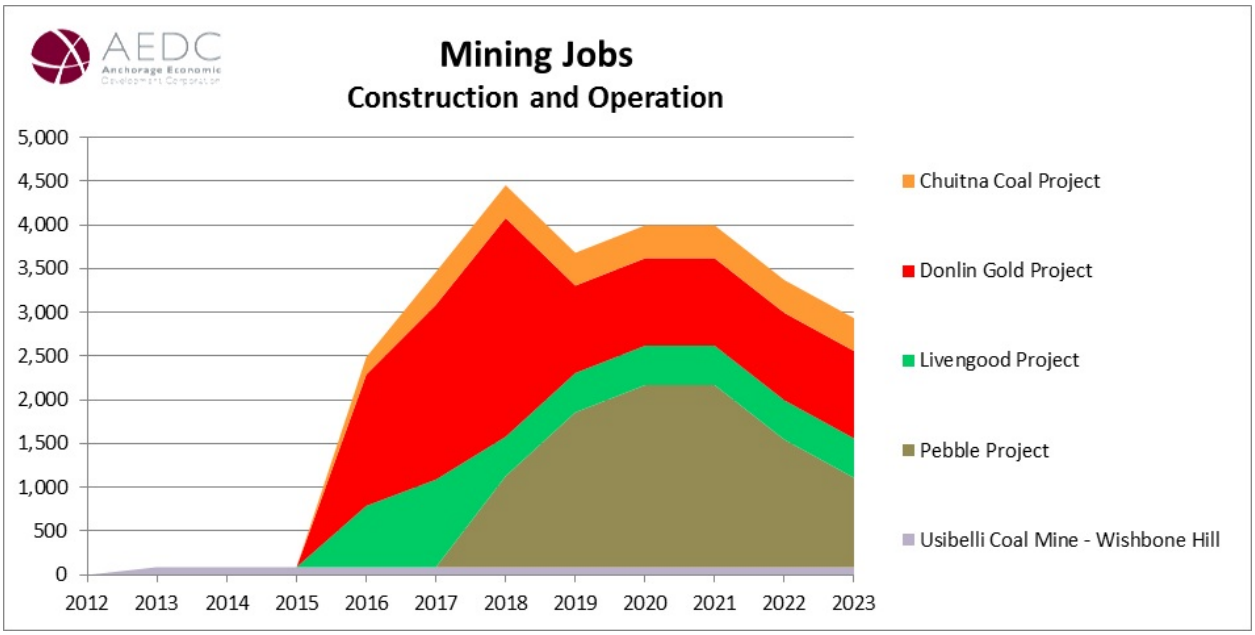
2022
2023
Beechey Point Unit
Dewline Unit
Donlin Gold Project
Kitchen Lights Unit
Liberty Development
Livengood Project
Mustang Pad
Nuna Project
Pebble Project
Point Thomson Unit
Repsol/Armstrong/GMT Prospects
Umiat Prospect
Tofakt (Titania) Prospect

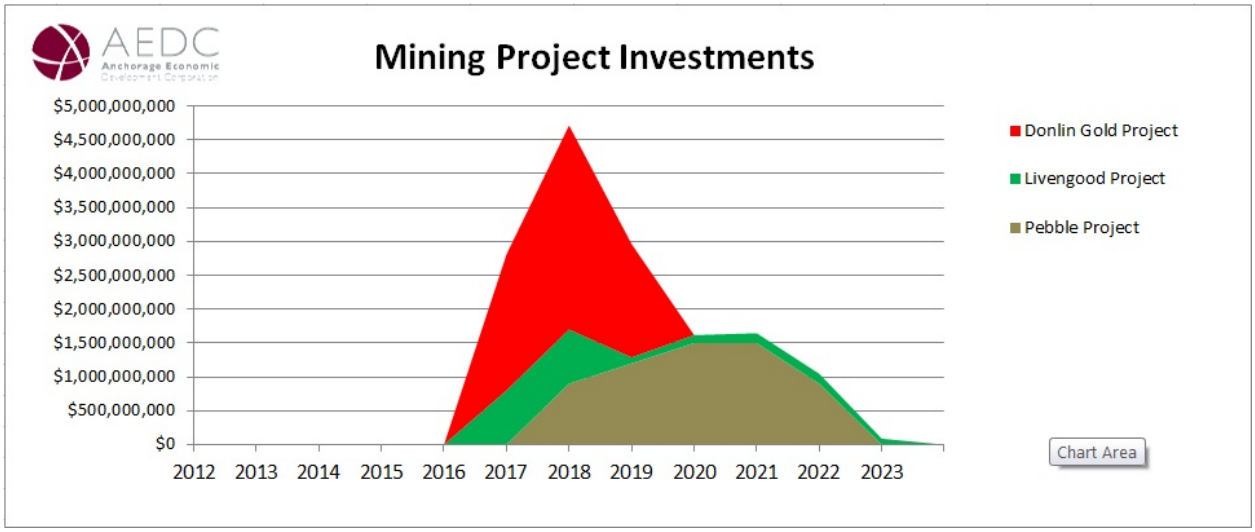
THE NEXT TWO GRAPHS OFFER THE NARROW VIEW OF OIL AND GAS PROJECTS ONLY, AND AGAIN ADDRESS TOTAL JOBS AND SPENDING RELATED TO THOSE PROJECTS OVER THE NEXT DECADE.





THE FINAL TWO GRAPHS OFFER THE NARROW VIEW OF MINING PROJECTS ONLY, AND AGAIN ADDRESS TOTAL JOBS AND SPENDING RELATED TO THOSE PROJECTS OVER THE NEXT DECADE.





There have been a few bright spots for some projects, in particular for projects in the Cook Inlet Basin. But in the aggregate, very little progress has been made to address the significant challenges that new oil and gas and mining projects face in Alaska. Another year has been lost and the bright economic future that Alaska should be getting closer to realizing has moved that much further out of reach.

Why are these projects so important? Aren't we doing just fine as an economy? The 2009 global recession hardly hurt our economy, so that means we have nothing to worry about, right?

From AEDC's perspective, we have a lot to worry about. While the current economic trends appear to be positive for Alaska's economy over the next few years, there are definite storm clouds on the horizon that we must begin now to steer a course around if we are avoid the worst of the looming economic tempest Alaska could be caught up within by the end of this decade, if not sooner.

To understand our concerns, one need only examine the basics of Alaska's economy. We are a young state with a small population of 722,000 spread out over a vast geographic region. Our entire state population could fit within the boundaries of any number of mid-size cities in the Lower-48 and still have room left over. This small population base does not lend itself to the vision we all share of a more fully diversified economy. It will likely be decades before our population, infrastructure, and general economic conditions mature enough to realize this more diversified vision. This leaves us more vulnerable to large swings in the economy created by changes in our key economic components.

Alaska's economy is fundamentally based on three relatively equal valued broad components. Oil revenues, government spending and everything else. In terms of jobs, a recent study by the UAA Institute for Social and Economic Research noted that, out of an average 357,000 total jobs in Alaska between 2004 and 2006, the petroleum sector generated 31% of all jobs in Alaska, while the federal government accounted for 35% of Alaska jobs. All other industry sectors, including tourism, fishing, mining, retail, health care, etc. combined generated the remaining 34% of jobs in Alaska.

If Alaska is to mitigate the looming cuts in federal spending, it must choose those strategies and efforts that focus on opportunities Alaska has the most control over. The development of oil, natural gas and mineral resources offer the only opportunities of a significant order of magnitude to not only offset federal spending cuts, but to actually grow the Alaska economy even in the face of declining federal spending. And given the continued decline in oil production from state lands, time is running out to embrace new development strategies.

As was noted in last year's projection, resource extraction projects in Alaska face an ever growing list of individual challenges that, when combined to varying degrees are delaying or stifling many of the projects described in this year's projection. Those challenges and issues continue to include:

- Timely permitting reviews and awards
- Nonstop litigation
- Lack of key infrastructure such as roads, ports, communications and power
- Lack of social compacts with communities affected by proposed projects
- Taxation
- Commodity markets
- High costs associated with Alaskan projects
- Lack of agreement among Alaskans on a vision for Alaska's economic future
- Time as a cost due to delays in development timelines caused by any combination of the challenges listed above

There have been a few small successes in moving projects forward in the last year. These include:

- ConocoPhillips finally gaining permission for the vital CD-5 bridge project in NPR-A
- Shell Exploration's recent successes in both court and in the agency review processes to gain needed permits to perform exploration drilling in Outer Continental Shelf region in the Arctic
- The likely start of the permitting process for the Donlin Creek Mine in 2012
- The discovery of two new ore bodies at the Pogo Mine that could extend the life of the project by an additional 10 years
- The accelerated interest and development efforts at the Bokan Mountain rare earths deposit that could see this strategic economic resource developed more quickly than the usual 10 to 15 years most mine projects now require to be developed in Alaska
- The Nikaitchuq Producing Unit, operated by ENI, has graduated from an exploration unit to producing unit in 2011 with a peak production estimate of 28,000 barrels per day

But when taken as a whole, most of the projects AEDC profiled in last year's projection made very little headway in the face of the numerous challenges they continue to face. In the view of AEDC, these are all lost or delayed opportunities to address Alaska's looming economic challenges. Some steps have already been undertaken by state government to reduce permitting delays and to more aggressively market Alaska's mineral and energy resources for development. And there have been some victories on the federal side of government permitting and regulation. But more must be done.

Alaska has resource development opportunities that most other states, regions and even countries can only dream of having. As a state, we have the ability to embrace these projects in order move as many of them forward as reasonably possible. We need to seek ways to shorten the time it takes to develop these projects while protecting the interests of Alaskans to provide more certainty to energy and mining companies so that a decision can be made within a finite time period on whether or not they will be able to move their project forward. If even 25% of the projects described in this projection were to move forward and be developed as proposed, Alaska would see a period of investment and corresponding jobs growth not seen since the 1970's.

Ultimately, we as Alaskans seek common ground to the greatest degree possible on these proposed projects, as well as the existing oil and gas and mining projects in our state. Until we can reach common ground on how to develop any of these projects, Alaska's opportunities for future economic growth will continue to be one more year away.

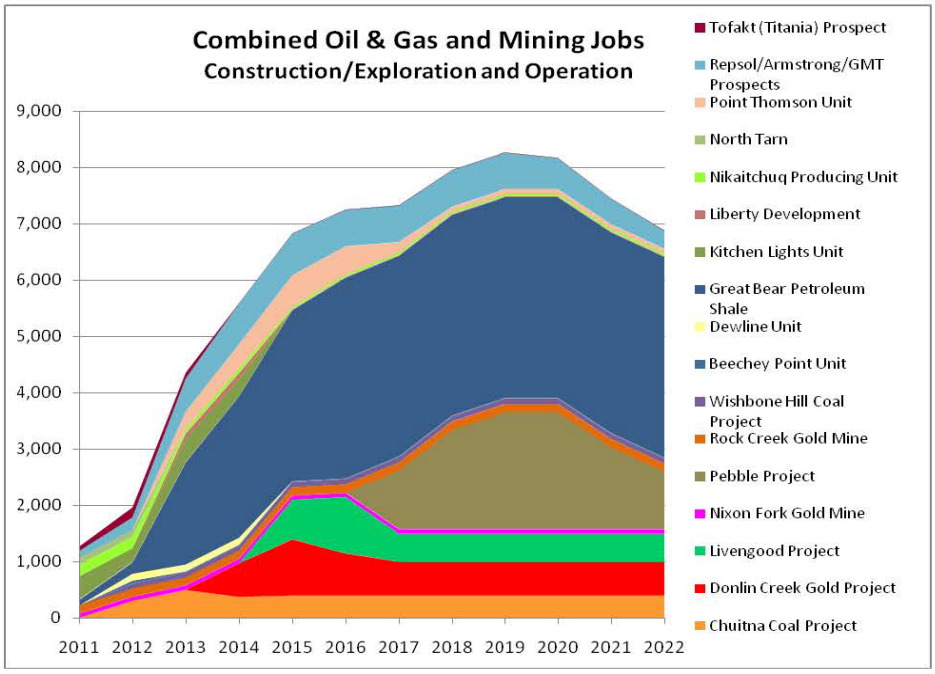
APPENDIX B – 2011 RESOURCE EXTRACTION EXECUTIVE SUMMARY

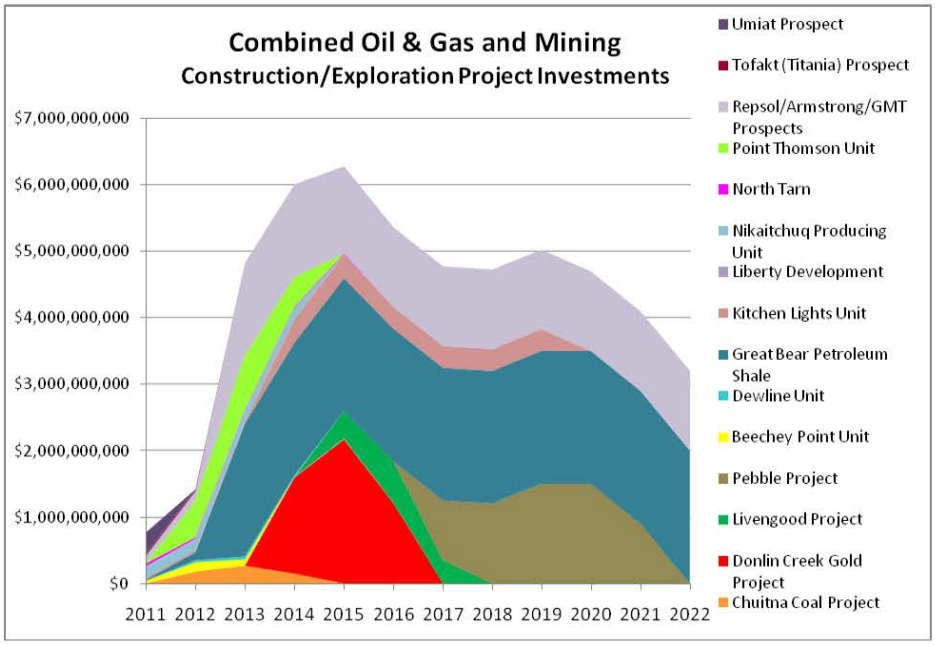
EXECUTIVE SUMMARY

In the next decade, Alaska has the potential to generate as many as 10,460 jobs that would be created through $33.7 billion of investments in 21 resource extraction projects that are proposed for development within our state. These oil and gas and mining projects are located in regions across Alaska and could create a renaissance in our state's economy that would assure our general prosperity for decades to come.

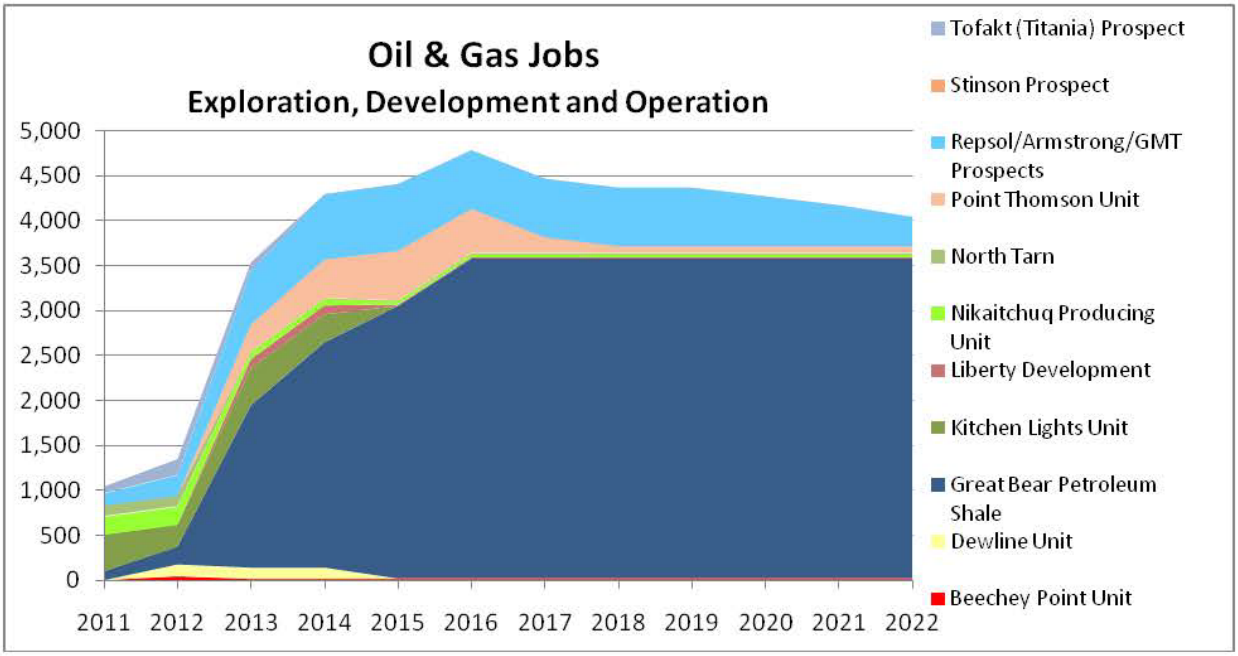
But, from AEDC's perspective the outlook for these projects is not optimistic. Alaska's competitiveness in the global markets we compete within is not favorable in many ways. Several related issues have created these circumstances for Alaska's competitiveness. Issues based in taxation, permitting, litigation, social compact, commodity pricing, high costs related to project development and access to needed infrastructure have reached a point of, what is effectively, gridlock for many proposed projects.

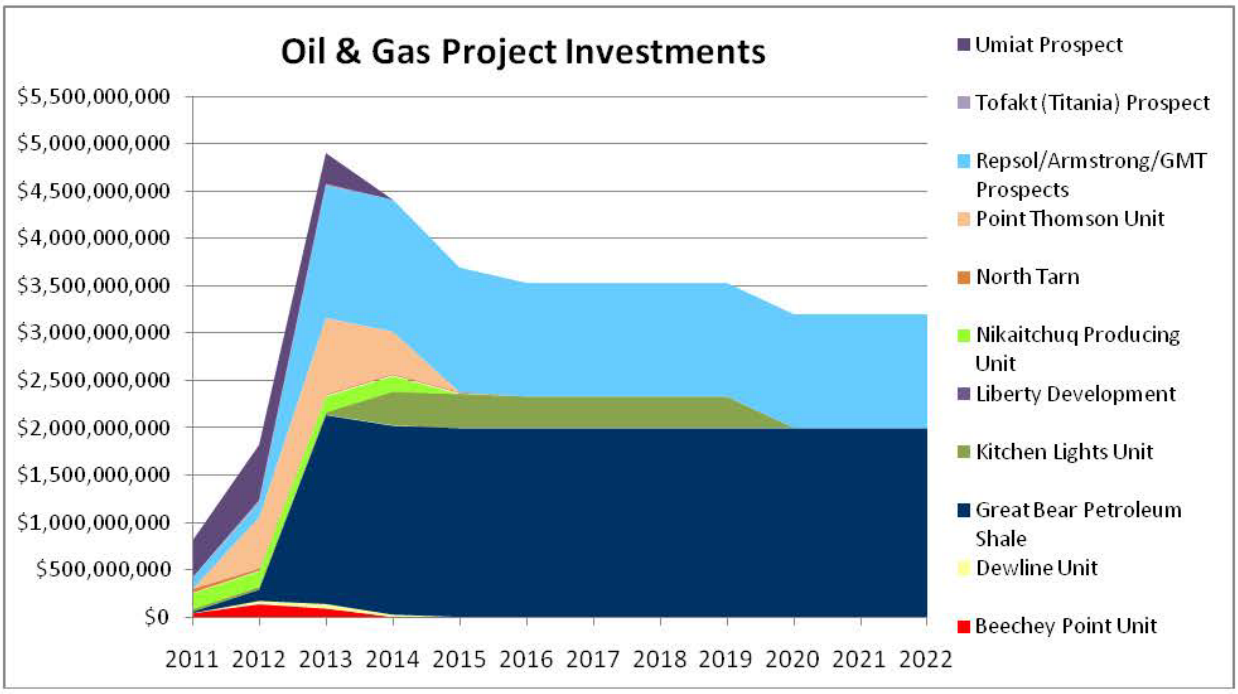
The following are the graphed views of the projects profiled in this projection. The first two graphs present a combined view of oil and gas and mining projects from two perspectives. The first is the view of total jobs these projects will create and when. The second graph presents an overview of total spending on these projects and when that spending will take place. Please note that all graphs are based on available information and in some cases, projects only offer jobs numbers or capital investment figures, not both, and will be excluded from either the jobs or investment graph.



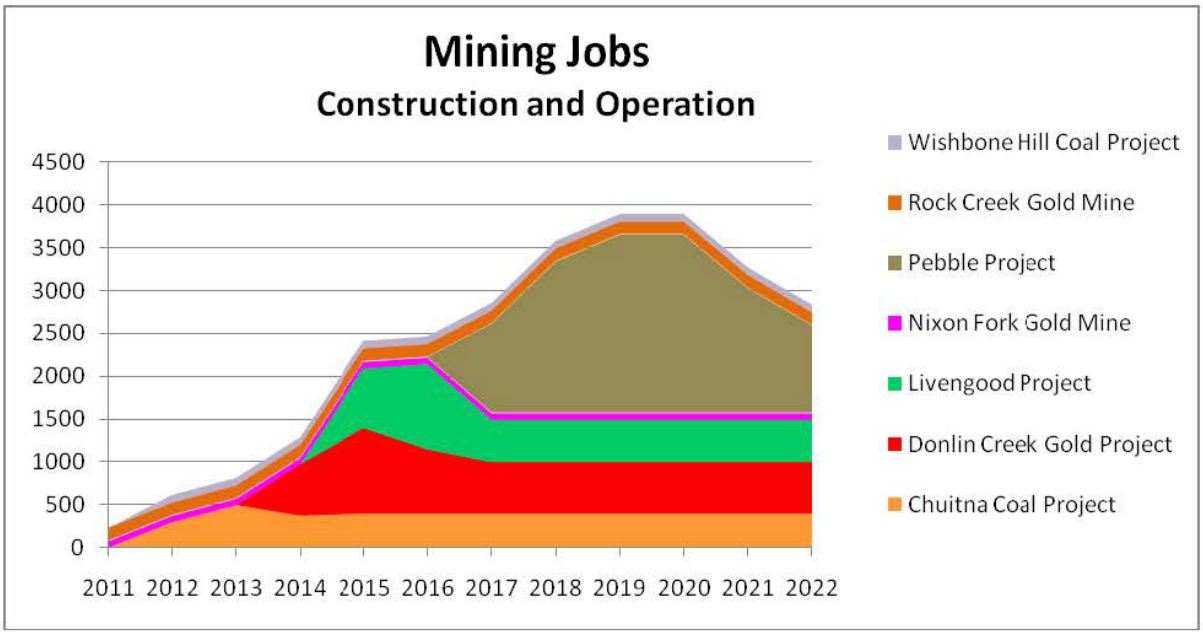


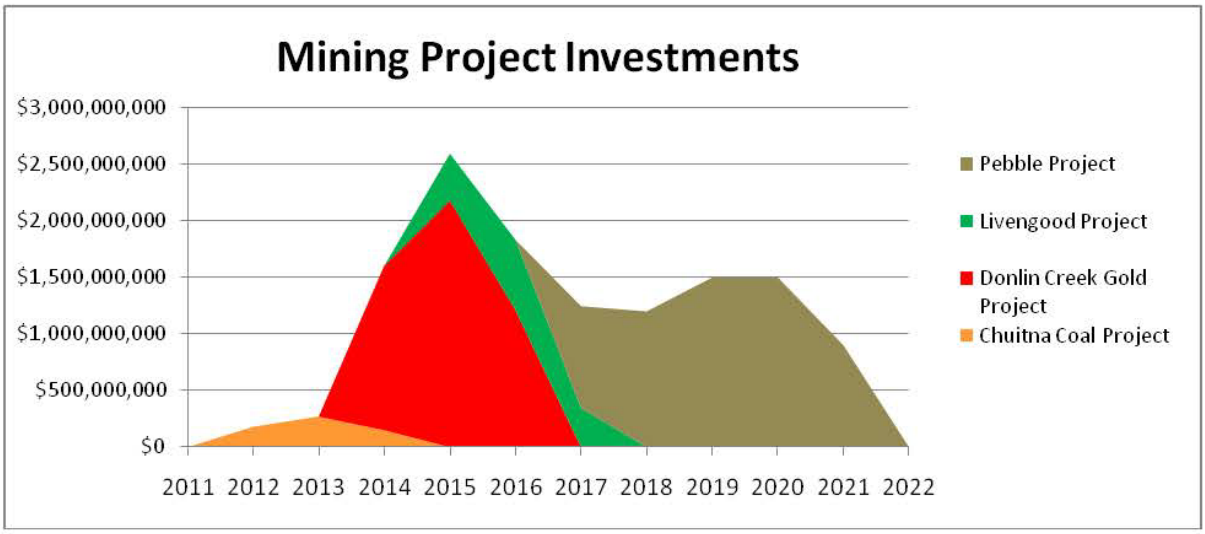
The next two graphs offer the narrow view of oil and gas projects only and again address total jobs and spending related to those projects over the next decade.





The final two graphs offer the narrow view of mining projects only and again address total jobs and spending related to those projects over the next decade.





The future of Alaska's economy will be based first and foremost on resource extraction and the ability to extract our hydrocarbon and mineral resources in a timely, cost effective and competitive manner. Resource extraction is the foundation upon which all future economic growth and diversification in Alaska will be built upon. We have built the beginnings of a strong, vibrant and sustainable economy over the last 50 years, but the foundation those efforts rest on is eroding.

Alaska stands at a crossroads. While this is often an overused analogy, it has never been truer for the economic future of Alaska. Alaska's economy is at a critical point in time in which the circumstances we are faced with today and how we respond to them in the coming year will either set our state on a path towards greater prosperity or, if we choose poorly, on a rapid path of economic decline, the likes of which have not been seen in Alaska since the mid-1980's.

Unfortunately, current economic circumstances detract from this view. General economic conditions in many of our larger communities are improving. Unemployment is declining and job numbers are up. These and other short-term indicators seem to signify we are back on the path to long-term prosperity as a state. We are not.

Ever higher average oil prices over the last 10-years have masked an underlying decay in our state's economic foundation. That decay lies squarely with the declining volumes of oil produced in our state and the difficulty companies encountering in developing new oil/gas and mining projects. A short list of examples includes:

- The Trans Alaska Pipeline System is now operating at less than 622,000 bpd, or less than 30 percent of capacity. The current outlook is for an average 6 percent decline in throughput volumes for the next several years, putting at risk a significant portion of the 90 percent of state government revenues derived from oil production, as well as the risks posed to the broader economy of Alaska in the form of decreased economic activity. This risk would be exacerbated if annual average crude oil prices decline to any significant degree in the near future.
- Shell Oil has invested billions of dollars in leases, environmental research and permitting processes for OCS development and still can't get permission from the federal government to drill after years of effort. This is due in part to muddled federal policies, continuous litigation and seemingly never ending federal permitting processes. This in a region that holds by some estimates as much as 30 billion barrels of oil (bpo) and 228 trillion cubic feet (Tcf) of natural gas.
- Shale gas has flooded lower 48 natural gas markets with 238 Tcf of newly proven reserves and 1,800 Tcf of potential reserves. This flood of new reserves collapsed the future commodity price outlook to the point that there is now an escalating debate within the Alaska Legislature, the business community and the public on whether or not the state should pull out of any further efforts to build the $30 billion North Slope Natural Gas Pipeline project.
- The world-class Pebble Mine copper prospect, a project that has yet to submit a single application for permits to build the mine, has generated a heated debate that has reached an unheard of level of, sometimes wildly extreme, opposing points of view with millions of dollars being spent annually in media campaigns of both sides. Meanwhile, given the specter of never-ending litigation against any permits that are ultimately issued, the thousands of jobs that the project could create in this economically depressed region seem to move further and further away.
- ConocoPhillips can't get a permit for a bridge to access its CD5 prospect in the National Petroleum Reserve Alaska (NPRA). In other words, it is being prevented from accessing the "National Petroleum Reserve" to drill for oil because it can't permit a bridge.
- With the imminent closure of the ConocoPhillips/Marathon Oil Company LNG plant in Nikiski, Alaska's 40+ year old natural gas value-added industry that used to employ hundreds is now a memory.

Economics of Pacific Rim natural gas markets combined with the high cost and uncertainty surrounding exploration in Cook Inlet in the last 15 years combined to bring an end to this industry.

- Cook Inlet has reached a critical point for the future energy security of Southcentral Alaska. Deliverability of natural gas for utilities is nearing a crisis situation. This situation has been over a decade in the making due to many factors. These include challenging economics and growing permitting issues, exacerbated by the past actions and inactions of the Regulatory Commission of Alaska related to supply contracts and market stability that industry relies on to make investment decisions. Today, because of the resulting lack of new natural gas reserves development over the last decade, it is likely that local utilities will be forced to import foreign LNG to meet Southcentral Alaska's peak demands for natural gas.
- The Donlin Creek mine project is almost ready except for one critical need. Power for the project. This issue has held up the project from going forward on final permits for several years. The developers now appear to be evaluating the concept of building a gas pipeline from Cook Inlet to the mine site, at considerable cost, to run a power plant, even in the face of dwindling natural gas supplies in Cook Inlet. They appear to be pegging their hopes on new natural gas supplies becoming available either from Cook Inlet or from the North Slope, though neither of these will likely become available for 7 to 10 years, given the current environment for development. The likely backup for this strategy is that foreign LNG would probably be imported to Cook Inlet in the next 3 years to solve regional power and heat demand and could provide the needed additional natural gas for the Donlin project.

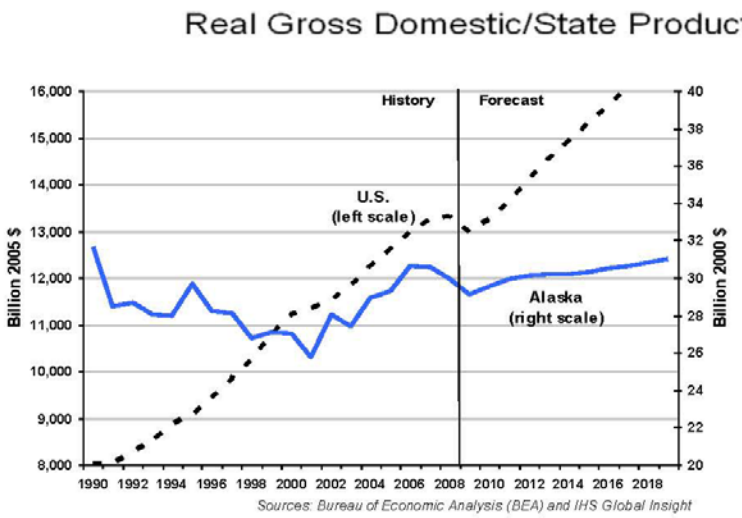
Another insidious impact of these issues is that they create an environment of ever growing timeframes required to develop a project. The specific issues include increased uncertainty of when final permits, particularly federal permits, will be issued, and seemingly unending litigation further delaying project starts or extensions. Overall, the ever growing affect these time delays have is that they erode the net present value and internal rates of return for the companies making investments in these projects which as we know makes Alaska less globally competitive over time.

In the past, oil and gas explorers could base Alaska investment decisions on a 3 to 5 year time frame to see a return on their investment (ROI) if they were successful in finding new reserves. Today that time frame now averages 7 to 10 years, putting Alaska at a significant competitive disadvantage compared to many other oil and gas regions. For mining, similar issues have developed. Today, new mine projects developers in many cases could see timelines of 10+ years or more before seeing any kind of return on their investments, again putting Alaska at a serious competitive disadvantage compared to other regions around the world where ROI can be expected in less than 5 years.

A stable, globally competitive tax structure is also a key issue. Whether for existing fields or for new exploration, it is vital that Alaska offer a consistent tax and royalty structure that positions Alaska as an attractive investment opportunity. This is particularly true given the difficult environmental conditions companies must operate within as well as the technological challenges that must be addressed to successfully develop both traditional and marginal oil resources such as heavy and viscous oil, as well as newly emerging oil resources such as shale oil. The ultimate goal is that we need to produce more oil and our taxes, our royalties and our incentives should support that goal. Our long-term economic future depends on the development of new oil reserves, which is underscored by recent economic trends in Alaska.

Gross State Product (GSP) saw a relatively steep decline from 1990 through 2000, corresponding directly to the annual decline of crude oil prices and oil production, our largest contributor to GSP. Then, beginning in late 2001, GSP saw a resurgence that again corresponded directly to the unprecedented surge in crude oil prices through 2008, even though production continued to decline during that same time period. The

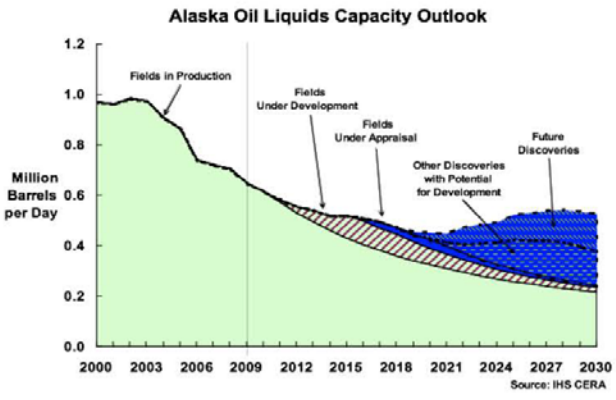
following chart clearly demonstrates the decline and recovery in Alaska's GSP from 1990 through 2008 and the disturbing outlook for future Alaska's economy compared to the rest of the United States.



Alaska's economy has been stagnating when looked at in comparison to the U.S. national economy.

The price of a barrel of Alaska North Slope (ANS) crude oil collapsed from an annual average high of just over $100/barrel to just over $70/barrel in response to onset of the global recession. Again, the corresponding decline, rise, and recent decline of GSP can be clearly connected to the rise and fall of the price of a barrel of oil. In recent months, prices have again surged to as much as $117/barrel., but because of the declines in production, even withthese higher prices, the outlook for Alaska GSP through 2020 is basically flat and still below where it stood in 1990.

The recent spike of ANS crude oil prices might give hope to some that our troubles are over and we are back on the path to ever increasing riches for our state. While we are seeing short term gains in state revenues, with as much as a $2.0 billion surplus recently forecasted for FY2011, this trend cannot continue for much longer unless more production can be brought online to stem the projected 6% annual decline in production as demonstrated in the following chart.



Alaska's oil and gas sector is massive (15% of the national supply), but in decline.

Without any new developments, we expect current fields to be producing only about one-third of their current levels by 2030.

In November, 2010 the state of Alaska forecasted ANS production at 622,000 barrels per day (bpd) with an average price of $77.28 per barrel in FY2012, generating $17.545 billion in gross revenue and resulting in $5.061 billion in unrestricted oil revenue to the state of Alaska. Using industry and government projections of 6% average decline in annual production per year over the next decade, the outlook is grim if the slide in annual crude oil production is not reversed. Given the added effects of inflation combined with a relatively flat outlook for GSP growth in the next 10 years, state and local governments could begin to see significant cuts in revenues, perhaps within the next 5 years, unless we can increase the level of oil production enough to stem the current decline of throughput in the TAPS system.

Simplistically, assuming no new crude oil is brought into production, to generate FY2012 levels of projected revenue to the state in FY2017 under the same tax regime, the average price of a barrel would have to rise to $105/barrel. If no new crude oil production is brought on line by FY2022, prices would have to rise to an average $127/barrel to equal projected FY2012 revenues. Neither of these price projections takes into account the higher cost to produce a barrel that will increase in the future as fields deplete. Nor do they take into account the likely higher future cost to transport oil from the North Slope to market through the Trans Alaska Pipeline System (TAPS) if throughput is not increased. Taking into consideration the likely higher cost to produce and transport ANS crude to market, and the negative impact those increased costs will have on net revenues to the state likely make these future price estimates less than what would be required.

The solutions are as complex as the issues. If Alaska is to prosper in the coming decade and beyond, we must be more proactive in developing integrated solutions that are strategic in thought and deed. We must develop a long-term vision for resource development in our state to re-establish the strong economic foundation the oil and gas and the mining industries represent. This vision should include these two guiding principles and corresponding general metrics:

- ***Economic development is defined as programs, policies and activities that improve the economic well-being and quality of life for our state by creating and/or retaining jobs that facilitate growth and provide a stable tax base. How does Alaska's strategic planning and policies for resource and infrastructure development support and embrace this definition?***

- ***Alaska is a resource extraction based economy and will be for decades to come. How is Alaska seeking to strengthen this vital foundation for all future economic growth and is it succeeding in that effort?***

AEDC believes there are several goals that should be acted on immediately, with these principles and metrics in mind, to effect significant changes in the future directions of the Alaska economy. Those goals include:

- **Alaska must promote increasing ANS crude oil production from state lease tracts immediately.** This is a crucial requirement to assure the future of the Alaska economy. To do so is vital to the strategic interest of the state of Alaska. All oil and gas related strategic planning and actions by the state of Alaska should be oriented around this single imperative until it is accomplished.

- **Improve the oil and gas taxation system to make Alaska more globally competitive.** These improvements could include changes such as-
    - Revisions in the current tax progressivity rates
    - Implementation of tax incentives that reward investments that generate increased production in existing oilfields fields

- Tax incentives that reward investments in high-risk exploration efforts to find new oil reserves
- Tax incentives that reward investments in new exploration and development technologies that increase production and/or lower the cost of production.

- **Improve the permitting regimes in Alaska to provide clear, consistent and timely permit decisions-** It is clear that permitting, especially federal permit processes, have become an often significant roadblock to resource extraction projects in Alaska. Alaska boasts what is arguably the most rigorous permitting regime in America if not the world. Between federal and state permitting processes, projects undergo rigorous government and public review before being permitted. This is appropriate given how much Alaskans value the environment we all live in. However, in recent years this robust permitting system has been degraded by inconsistent federal policies and permitting processes, increasingly slow permit processes and increased uncertainty that final permits issued are actually "final." Improvements should include:
  - Review of all state permitting processes related to resource extraction to assure that they are clear, consistent and timely. I.e. date certain processing of permit applications and date certain appeals processes that address both the time for appeals to be made and when those appeal processes will be completed.
  - To the greatest extent possible, engage the federal government to affect meaningful changes that provide significantly improved clarity, consistency and timeliness in all federal permitting processes related to oil and gas and mining projects within Alaska and its offshore regions. This engagement effort should include all decision making levels of the U.S. government including congress, the administration and the federal courts.
  - Assure that all projects, no matter how controversial, have the opportunity to go through the full project and permitting review process. It is a very slippery slope to move to a model where those who have the biggest public relations campaign budgets are allowed to make the decision whether or not a project is developed, rather than on the merits of a fully reviewed project proposal.

- **Affect significant changes in litigation processes for appeals of resource extraction projects.** As has been noted time is a key element in any oil and gas or mining project. While the public interest should and must be protected throughout the development of any resource extraction project, endless litigation does not serve that public interest. Although often discussed, the concept of making public litigants financially liable for legal costs of those they sue if they lose the lawsuit would be challenging to achieve. The most likely significant change that could be affected is:
  - Providing for date certainty in the process for legal appeals related to all final permits in which final decisions at all levels of the judicial process must be rendered within a finite period of time.

- **Adopting a more strategic approach to resource and infrastructure development.** While this approach has been engaged in to a degree by the state of Alaska, such as the road proposals to Umiat and Nome or the Watana Hydro project, our view is that this is an effort that should be expanded. We offer the concept that the state of Alaska, as the owner of the resource, should consider treating its efforts to develop natural resources much like a private owner might. How can I achieve the best rates of return from the most marketable resources I own? In the case of the state, how can Alaska achieve the highest levels of economic development (see definition above) through the prudent development of its resources and investments in key infrastructure that maximize resource development opportunities?

- **Engaging Alaskans in a clear dialog about the future of resource development.** In recent years, Alaska has become caught up in the "now" and lost perspective about both the past and the future. We seem to have lost our ability as a state to think beyond next year or remember past the year before. We also have become so polarized in our viewpoints that we cannot come to any kind of compromise on many of the projects profiled in this projection. There is no middle ground. Either it's absolutely "YES!" or absolutely "NO!" on projects such as the Pebble Mine, offshore Cook Inlet oil and gas, or the Red Dog Mine. We must engage in efforts to change the dialog from either yes or no to "should we?" based on the merits of fully reviewed projects. Alaska has a history of making big dreams a reality. We need only remember our amazing past and then look to the future.

These are many opportunities on the horizon for Alaska during the next decade. If Alaska can address the many challenges outlined here, as well as other important issues not addressed in this document, and make Alaska more competitive in the global competition for scarce investment dollars, the future of our economy can be much brighter.