

AEDC 2012

RESOURCE

Extraction

10-Year Project Projection

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Research provided by *Petroleum News* and *North of 60 Mining News*

Resource Extraction Project Projection

TABLE OF CONTENTS

Preface	4
Executive Summary	5
Background Information Overview	10
Oil & Gas Resource	11
Four oil sources, two drivers, could raise northern Alaska’s oil and natural gas output	11
Cook Inlet.....	13
Proposed Projects – Oil & Gas	15
Projects to be Watched – Oil & Gas	18
Existing Fields – Oil & Gas	20
Mining Resource	22
Mining Job Outlook Overview	22
Proposed Projects - Mining.....	26
Projects to be Watched - Mining.....	28
Existing Mines - Mining.....	29
Appendix A - Oil & Gas	31
Badami Producing Unit, Eastern North Slope	31
Beechey Point Unit, Central North Slope.....	32
Colville River Producing Unit, Western North Slope (Alpine) and the CD5 expansion into the NPRA.....	33
Dewline Unit, Central North Slope.....	34
Great Bear Petroleum Shale Source Rock Development, Central North Slope	35
Kitchen Lights Unit, Upper Cook Inlet exploration.....	35
Kuparuk River Producing Unit, Central North Slope.....	37
Liberty Development, Beaufort Sea OCS, off Central North Slope.....	38
Milne Point Producing Unit, Northstar Producing Unit, and Endicott Producing Unit, Northern North Slope	39
Mustang Pad Development in the Southern Miluveach Unit (Formerly North Tarn), Central North Slope Prospect.....	40
Nikaitchuq Producing Unit, Central North Slope.....	40

Nuna Project, Central North Slope.....	41
Oooguruk Producing Unit, Central North Slope	42
Chukchi Sea and Beaufort Sea, Outer Continental Shelf	43
Point Thomson Unit, Eastern North Slope.....	43
Prudhoe Bay Producing Unit, Central North Slope	45
Repsol/Armstrong/GMT Prospects, Central North Slope, on and offshore	46
Stinson Prospect, offshore Eastern North Slope	47
Tofkat Unit, Central North Slope (previously named Titania)	48
Umiat Prospect, Central North Slope.....	48
Viscous and Heavy Oil, Central North Slope.....	49
Yukon Gold, Eastern North Slope.....	51
Appendix B - Mining	52
Bokan Mountain Rare Earth Element Project.....	52
Chuitna Coal Project	52
Donlin Gold Project.....	53
Fort Knox Gold Mine	53
Greens Creek Mine.....	53
Kensington Gold Mine.....	54
Lik Zinc Project.....	54
Livengood Gold Project.....	54
Niblack Project.....	55
Nixon Fork Gold Mine	55
Pebble Copper-Gold-Molybdenum Project.....	56
Pogo Gold Mine	56
Red Dog Mine.....	57
Usibelli Coal Mine - Healy Operations	57
Wishbone Hill Coal Project	58
Appendix C - 2011 Resource Extraction Executive Summary	58

PREFACE

Welcome to the 2012 AEDC Resource Extraction Project Projection, generously sponsored by Northrim Bank, with research support from the *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 to give perspective on what the future might hold for resource extractions in the next decade. While that first forecast was very simplistic, it triggered a flood of requests for a more detailed projection that should be updated annually.

Over time, this projection changed in a number of ways, including improved project details and better modeling of project flow and annual workforce demands. In 2007, the projection was handed off to Anchorage Economic Development Corporation (AEDC). Then in 2009, a milestone was reached through an agreement between AEDC and *Petroleum News* (PN) and *North of 60 Mining News* (N60) publications. The two publications agreed to provide the factual research upon which AEDC then developed 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 it was first developed, the purpose of 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 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. 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 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 Alaska. Alaska's future was bright and the early years of the resource extraction project projection reflected those looming opportunities.

The 2009 projection was a significant departure from previous years. While there were a large number of projects profiled that were proposing to move forward in the next 10 years, AEDC sounded a clear note of caution, for the first time, that forces were aligning against the successful launching of any of the projects profiled. This growing sense of concern was driven in part by the global recession, but also by growing issues related to taxation, permitting 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 challenged investment environment in Alaska led AEDC to view the future as questionable for most of the projects addressed in the projection. Permitting, litigation, critical habitat, taxation, project economics and lack of key infrastructure are issues that are challenging projects in ways that, when combined, create high levels of uncertainty that negatively affect investment and diminish Alaska's competitiveness in the global market place. Since the 2011 report was issued, the situation has grown worse in many instances, though with a few glimmers of hope and progress.

The next 10 years for Alaska are vital if our state is to have any hope for a prosperous 21st century. Resource extraction projects developed in the next decade will be the foundation of a growing, more diversified economy based on new jobs and a lower cost of energy for all Alaskans. If we fail to develop many of the projects described in this report, there is a growing possibility that Alaska will face a period of economic stress which will result in a growing period of stagnation and decline for many areas of Alaska.

AEDC would like to thank Mr. Dan Dickenson and Ms. Mary Ann Pease for their research and writing efforts on behalf of *Petroleum News* in the development of the oil and gas sections of this report. Additional thanks go to Mr. Shane Lasley of the *North of 60 Mining News* for his research and writing support for the development of the mining sections of this report.

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.

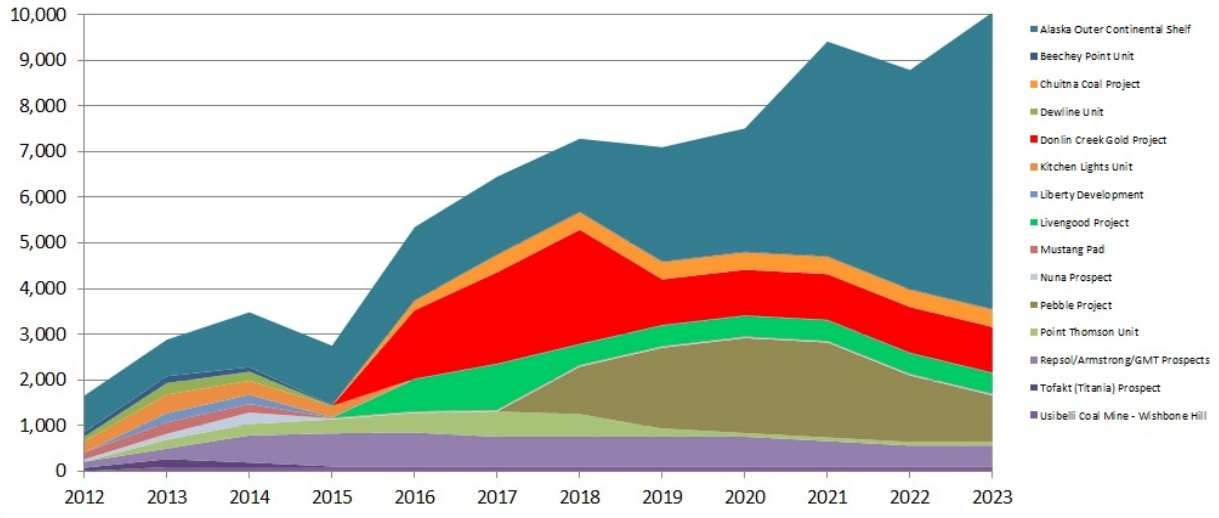
Since 2011, 4 projects were dropped from the Projection and 2 new projects were added this year. In oil and gas, the Great Bear Petroleum project is behind schedule and was moved to the "Projects to be Watched" section to allow the project to develop more fully. The Nikaitchuk Producing Unit successfully 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.

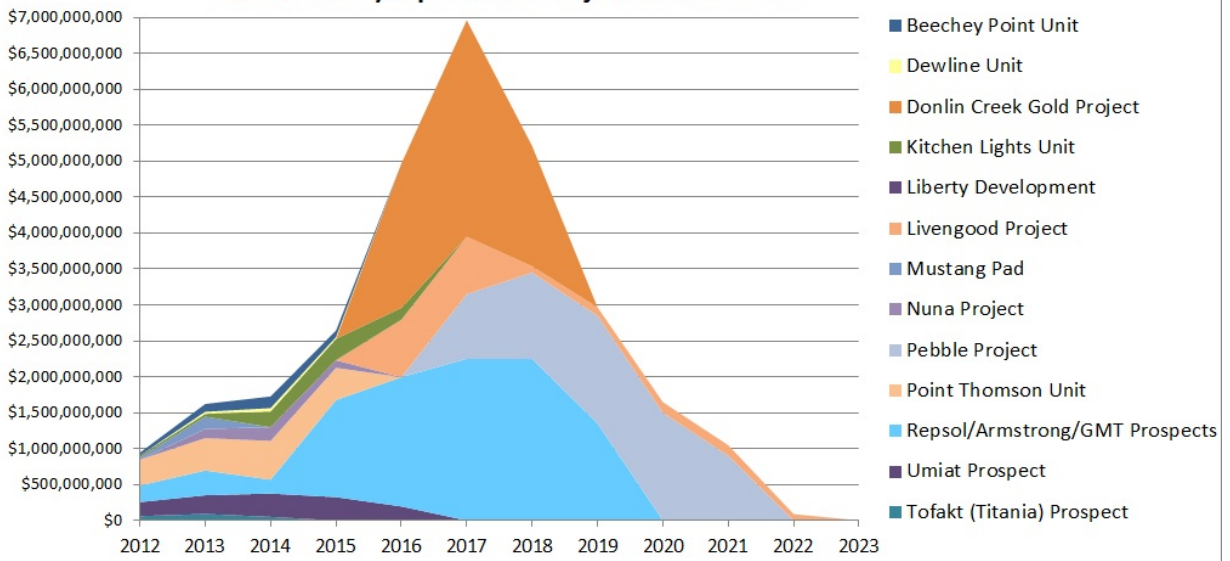
The following are the graphed views of the projects profiled in this projection. The first two graphs present a combined view of oil and gas and mining projects from two perspectives. The first is the view of total jobs these projects will create and when. This is the earliest that these jobs/spending 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.



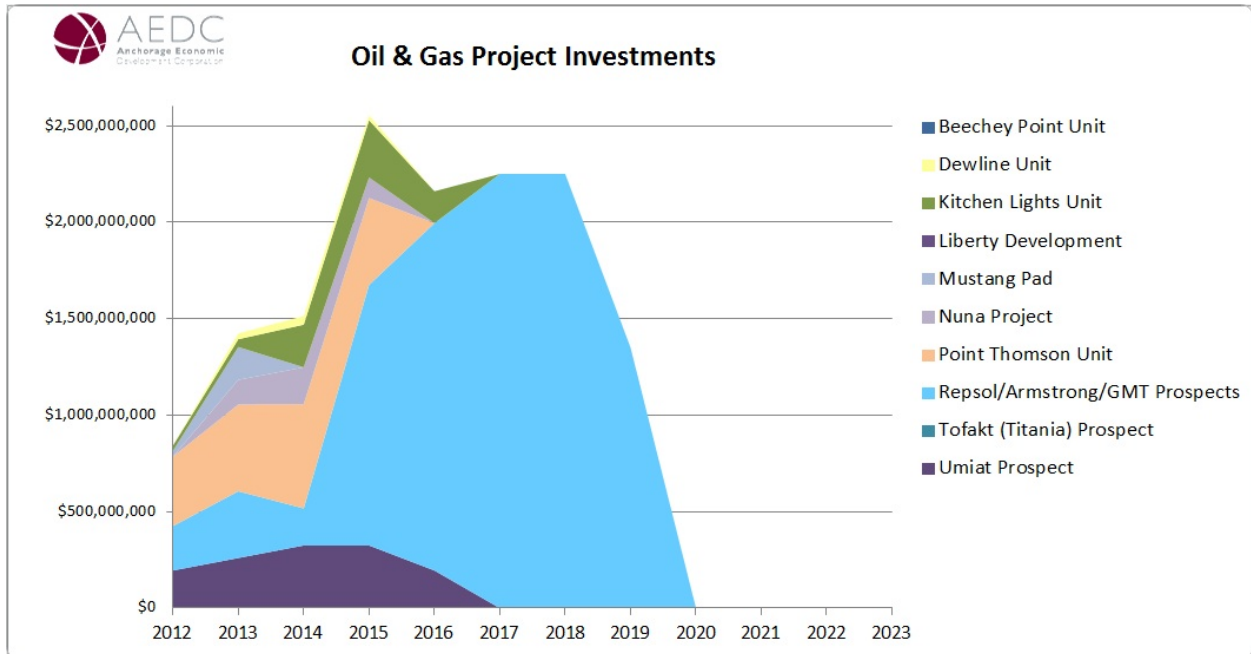
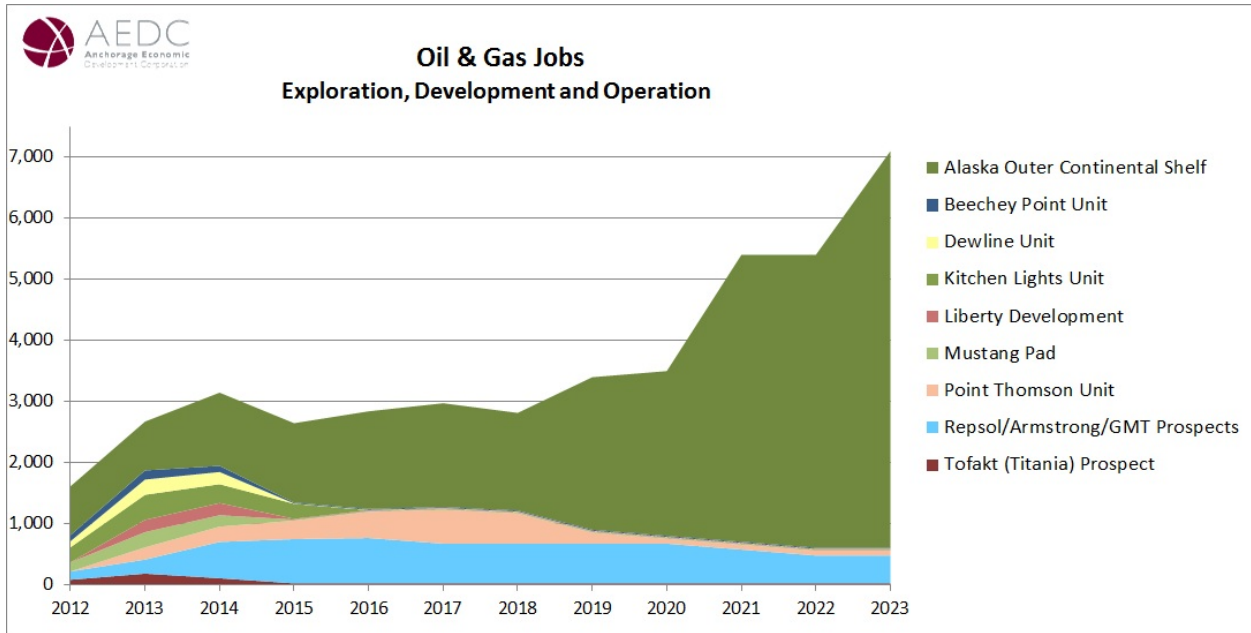
Combined Oil & Gas and Mining Construction/Exploration and Operation Jobs



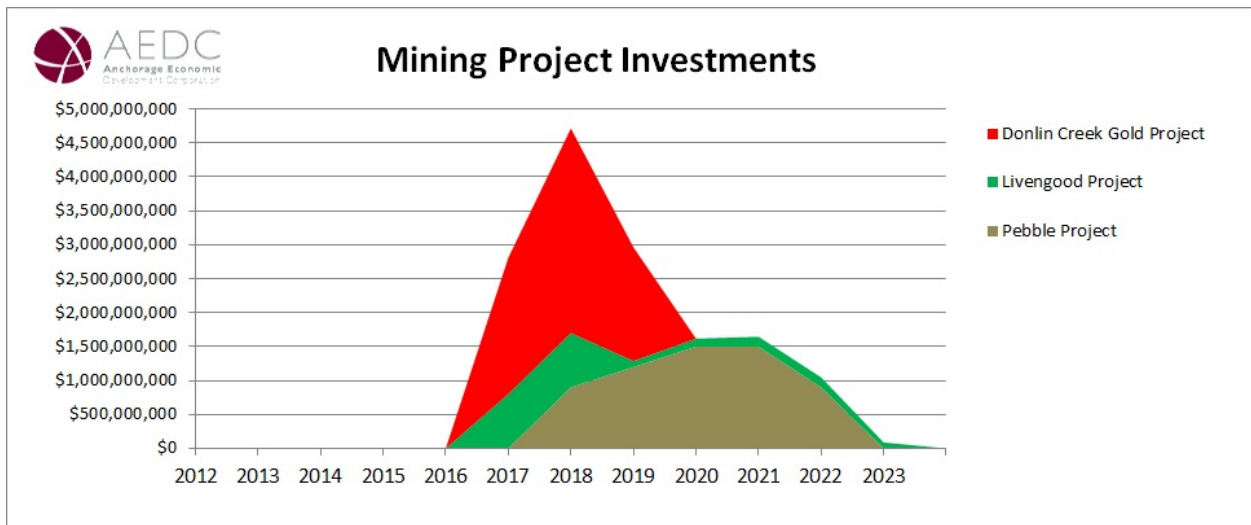
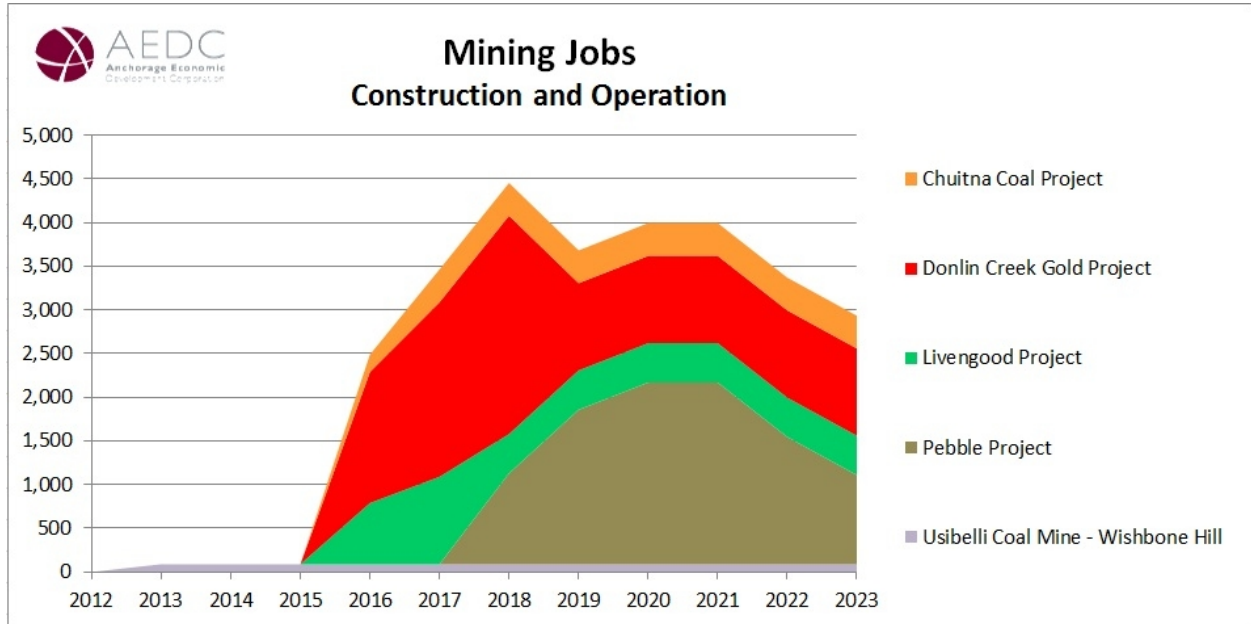
Combined Oil & Gas and Mining Construction/Exploration Project Investments



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 to 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.

Background Information Overview

The following sections contain the factual background information upon which this projection is based. Our thanks to the *Petroleum News* and *North of 60 Mining News* publications for providing the research that generated the very detailed information that is provided herein.

Divided into Oil and Gas and a separate Mining section, each begins with an overview of the general resource and market factors that are driving current interests in Alaska by a variety of companies followed by a brief overview of each proposed project, prospect or developed field/mine included in this document. These brief overviews are divided into one of three categories:

1. **Proposed Projects Profiled** (included in the projection graphs)
These projects have achieved sufficient progress in their development to have reasonable estimates of proposed development timelines, capital investment and workforce required.
2. **Projects to Be Watched** (have not achieved enough progress to be included in the projection graphs)
These projects have not sufficiently been developed yet for inclusion in the projection, but represent significant developable resources and should be monitored for future inclusion in the projection.
3. **Existing Fields/Mines** (included for reference, but not included in the projection graphs)
These are existing projects and will likely help to maintain current levels of employment and investment if the issues and challenges noted earlier are addressed. They are included as an important reference point.

Finally, we have also included a fully detailed review of each project which provides a significant level of detail about the resource, the project mechanics, and the project requirements for investment and workforce where available.

OIL & GAS RESOURCE

FOUR OIL SOURCES, TWO DRIVERS, COULD RAISE NORTHERN ALASKA'S OIL and Natural Gas OUTPUT

Northern Alaska has four sources of oil that could, in the next 10 years, maintain the level of liquids in the Trans-Alaska Pipeline System, or increase it.

A major driver of oil exploration and production is a pipeline that provides a market for the region's huge reserves of natural gas. Over time, northern Alaska's basin will follow the history of other maturing basins from oil to natural gas. Between then and now, the shared economics becomes a big driver. However, it now appears that market economics in the lower-48 states due to the flood of large new reserves of shale gas will prevent a large diameter line from being built to the mid-west. Hundreds of trillions of cubic feet of newly proven natural gas reserves from shale rock have been developed in just a few short years since the introduction of new so called "fracking" technologies in 2008. Technological innovation has led to the demise of the \$30+ billion dollar lower-48 pipeline project that once was touted as the future of Alaska's economic health.

This now leaves Alaska with only in-state pipeline options for monetizing ANS natural gas. These substantial, liquids rich natural gas reserves might be delivered to Pacific Rim markets via a large volume in-state LNG export pipeline, a smaller so called "bullet" line servicing in-state markets, or some combination of the two.

ANS natural gas might also be converted to other energy, such as gas-to-liquids (GTL) that can be shipped down the trans-Alaska oil pipeline or gas generated electricity shipped via transmission lines. However, market economics of the first of these two options remain tough challenges to overcome due to the costs of associated technologies for GTL. So called "gas by wire" may hold better opportunities but again do not offer the volumetric models necessary to economically support an in-state pipeline by itself.

In effect, Alaska's options for monetizing ANS natural gas have become significantly fewer. The remaining options (LNG exports, in-state power/heat, value-added chemical manufacturing, etc.) have a limited window of opportunity and must be addressed in the near term before those windows close again and ANS natural gas is once more stranded with no likely opportunities for monetization for several decades.

Another major driver is the advances in technology that have made production of hydrocarbons from the four sources possible.

The four major sources of remaining oil in northern Alaska are as follows:

I. Viscous and heavy oil. Viscous oil is oil that has a higher resistance to flow and a higher specific gravity than lighter crudes, typically making it more difficult to produce than lighter crudes. This causes viscous oil on the North Slope of Alaska to have the consistency of maple syrup. Heavy oils on the North Slope have a greater resistance to flow and higher specific gravity than viscous oil. In the producing units on the North Slope, heavy oil is found at shallower depths and is therefore also at colder temperatures than the deeper viscous oil which creates North Slope heavy oil that has the consistency of molasses.

Viscous oil production from Alaska's North Slope currently is approximately 40,000 barrels a day, depending on the definition of viscous used by the reporting company or agency. That production is drawn from an estimated 6 billion barrels of in-place viscous oil that is located within currently producing North Slope Units (four billion

barrels in the West Sak sands/Schrader Bluff formation in the Milne Point and Kuparuk River units and 2 billion barrels in the Schrader Bluff formation in the Prudhoe Bay unit (Orion and Polaris satellites), Nikaitchuq and Ooguruk units.) In addition to the 6 billion barrels within the existing producing units, another 4-6 billion barrels of undeveloped in-place resource is estimated to exist close to infrastructure. Heavy oil is not in production because it cannot be produced economically, but it represents a bigger prize; perhaps 20 billion barrels in place close to and within existing infrastructure. BP, ConocoPhillips, Exxon Mobil and other legacy field partners continue to work on technology that will allow part of this resource to be commercially extracted with 50 percent rates of recovery being the ultimate target.

2. Source rock. Alaska has three of the most prolific source rocks in the world, stacked one above the other, the deepest and oldest being the Triassic-age Shublik; in the middle the Jurassic-age Kingak shale; and the youngest and shallowest being the Cretaceous-age Hue shale, which is also referred to as the Pebble, HRZ or GRZ shale. At least 100 bpo, a maximum of 20 percent of the crude generated in them, has migrated north to traps along the Barrow Arch on Alaska's northern coast; filling the reservoirs of all those fields, which include Alpine, Kuparuk, Prudhoe Bay, and Point Thomson, and spilling over the arch into the reservoirs under the Beaufort and Chukchi seas. Left behind, trapped in the shale source rocks, is approximately 400 bpo. Five to six percent, or 20-24 billion barrels, of which is likely recoverable with today's rapidly advancing technology. In addition to oil, these same three source rocks also contain huge quantities of natural gas and natural gas liquids that would be extracted as a part of the production process.

3. Beaufort and Chukchi outer continental shelf, or OCS. In 2008 the United States Geological Survey (USGS) estimated that Arctic Alaska contained almost 30 billion barrels of mean technically recoverable conventional oil. Much of this potential is located in the Beaufort and Chukchi seas. While numerous large discoveries have been made in the OCS, currently the only production is coming from the northern part of BP's Northstar field, which is in decline and produces about 18,000 barrels a day. A recent study commissioned by Shell, and executed by Northern Economics and the Institute for Social and Economic Research (ISER) at the University of Alaska, estimates that in a 50 year period, starting with exploration drilling, OCS development off northern Alaska will produce an annual average of 2,800 full-time jobs from the Beaufort and 2,500 jobs from the Chukchi. The direct monetary investment in Alaska's economy from the oil and gas industry during these 50 years will likely total \$72.0 billion.

4. Remaining onshore and near shore stratigraphic and structural plays. Conventional oil and gas reservoirs produce from either structural or stratigraphically trapping mechanisms (or a combination of both). In structural plays oil is trapped within a folded or faulted reservoir and usually has a distinctive signature that can be seen on seismic data. In a stratigraphic play the oil is not trapped in a structure but by a change in reservoir rock properties causing the up-dip portion of the reservoir to act as a seal. Stratigraphic traps are much more subtle and difficult to interpret on seismic data.

Most of the more obvious and assessable structural plays in northern Alaska, particularly onshore and near-shore in state waters along the Barrow Arch, have been drilled, but many stratigraphic reservoirs have yet to be developed. Advances in technology, such as directional drilling, are not only making viscous and source rock plays viable, but horizontal drilling and the ability to produce from low permeability reservoirs are making more of these stratigraphic North Slope oil fields economic, inside and outside of producing units. There are also numerous untapped smaller structural plays close to existing oil and gas infrastructure. The USGS 2005 mean, or middle, estimate of remaining undiscovered, technically recoverable, conventional oil resources in the Central North Slope and adjacent offshore is 4 billion barrels, plus 478 million barrels of valuable natural gas liquids, which can be shipped with oil down the trans-Alaska oil pipeline. The USGS' mean estimate of remaining discovered reserves, largely inside of existing units, is 7 bpo.

National Petroleum Reserve-Alaska. There has been very little movement regarding access to leased acreage and future lease sales that allow access to NPR-A's most prospective areas for oil and gas from the federal government. This a major contributing factor in the low ranking (129 out of 143 oil provinces) Alaska as a whole gets from Wood Mackenzie for its Ability to Execute, Commercial Considerations in its analysis of global competitiveness. A revised NPR-A resource assessment from the USGS in October, 2010 has slashed its estimate of undiscovered, technically recoverable oil in the reserve 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 NPR-A likely contain very little oil west of the area that ConocoPhillips and Anadarko have been exploring around their Lookout and Alpine West prospects.

Cook Inlet

Cook Inlet basin is undergoing some of its most dramatic changes since production began more than 50 years ago. Although Cook Inlet oil production remains less than two percent of North Slope volumes, natural gas provided opportunities in both international and local markets in 2011. While those opportunities are expected to continue in the coming years, the Cook Inlet legacy companies won't be responsible for all of the activity. In 2011, Chevron sold its Cook Inlet holdings, (acquired from Union Oil Co. of California in 2005) to **Hilcorp Alaska**, a subsidiary of Houston-based Hilcorp Energy. This year, Marathon Oil announced that it too would sell its Alaska assets to Hilcorp. The two deals make Hilcorp the largest producer of both oil and natural gas in Cook Inlet. At year-end, Hilcorp Alaska had 235 full-time employees, a figure that will likely grow considering the company's long-term plans to develop its assets.

After closing on the Chevron deal in December 2011, Hilcorp became the operator of the Deep Creek, Ivan River, Lewis River, Nikolaevsk, Pretty Creek, South Granite Point, South Middle Ground Shoal, Stump Lake and Trading Bay units. The sale also gave Hilcorp interests in the Swanson River, Granite Point, Middle Ground Shoals, Trading Bay and MacArthur River fields; ten offshore platforms; onshore gas fields including the Ninilchik Unit and the Beluga River Unit; and two gas storage facilities. At year end, production from the properties was reported at 3,900 barrels of oil per day and 85 million cubic feet of gas per day. Although Chevron has also divested some of its North Slope assets to other parties, it does retain northern properties that it did not include in the Cook Inlet sale, including its interest in the 1002 area of the Arctic National Wildlife Refuge.

Although the Marathon deal may not close until the end of the year, it will retroactively become effective as of January 2012. The sale includes 17 million barrels of oil equivalent of net proven reserves across ten fields in Cook Inlet, as well as gas storage and interests in gas pipeline transmission systems, according to the company. A major player in Cook Inlet since the 1950s, Marathon operates gas fields in the Beaver Creek, Cannery Loop, Kasilof, Kenai, Ninilchik, North Trading Bay and Sterling units. Through the deal, Hilcorp acquired more than 95 million cubic feet of gas per day in existing production, in addition to modest oil production of around 100 barrels per day.

Hilcorp is already one of the largest independent exploration and production companies in the United States. Hilcorp Alaska now passes **ConocoPhillips** and the Exxon affiliate **XTO** as the largest producer in Cook Inlet. While Hilcorp will produce from many units and leases across the basin and ConocoPhillips and XTO will each produce from one or two major properties in the region, a slew of smaller or not-so-small independent explorers and producers are also pursuing opportunities in the Inlet.

The interest in the basin is clear from recent lease sale activity. While the Alaska Department of Natural Resources received just five bids in its 2009 Cook Inlet areawide lease sale, it got 37 in 2010. In 2011, the large independent E&P company **Apache** Corp. submitted 91 bids. Other companies also acquired leases during the sale, one of the most successful in decades. The results pose a dramatic contrast to the disappointing December 2011 North Slope lease sale, which state officials characterized as a "modest" success.

Since acquiring its initial leases through a private sale in August 2010, Apache has become the largest leaseholder in Cook Inlet with approximately 800,000 acres of state and non-state land. In typical Apache fashion, the company began its exploration activities in spring 2011 by conducting a "technology test" to determine if wireless nodal technology could be used to effectively collect seismic data in the unique operating environment of Cook Inlet. Finding that it could, near the end of 2011, Apache kicked off a three-year 1,200-square mile 3-D seismic shoot across its entire leasehold in Cook Inlet using the new nodal technology and is currently collecting seismic data on the west side of Cook Inlet. Later this year the company plans to move to the east side of the basin, to a section of the Kenai Peninsula between Kasilof and Anchor Point. Apache expects to continue collecting seismic data from across the basin for the next three years and recently began permitting its first two wells. The Aspen well planned

for July would be around four miles west of Tyonek on the west side of the basin, and the Captain Boomer well planned for the late fall would be on the east side southwest of Moose Point.

In 2011, the Alaska Oil and Gas Conservation Commission permitted four oil and gas exploration wells in Cook Inlet, with three permits going to new explorers in the area: **NordAq**, **Furie** and **Buccaneer**. Meanwhile, another new entrant to the region, **Linc Energy**, completed a previously permitted exploration well in the Point MacKenzie area last year.

Those companies all have big plans for the region.

- NordAq recently completed the Shadura No. 1 well and is planning to drill up to six wells to produce gas from the Shadura discovery on Alaska's Kenai Peninsula.

- Furie Operating Alaska (formerly Escopeta Oil) brought the first jack-up rig into Cook Inlet in decades and used it last fall to drill the Kitchen Lights Unit No. 1 well to a depth of 8,805 feet, halfway to its target depth. Furie plans to re-enter KLU No. 1 in mid-May. Depending on the reservoir analysis, the company may also drill the KLU No. 2 well this year. Although Furie publicly announced a major gas discovery from its drilling to date, the actual well data remains confidential and the company subsequently revised its estimates downward, but this time provided an estimate for a much smaller area. The Department of Natural Resources gave Furie a four-year extension to the term of the Kitchen Lights Unit, giving the company until Jan. 31, 2016 to continue its work. See *Projects To Watch for further details*.

- Linc completed the LEA No. 1 well, but did not find commercial amounts of hydrocarbons and abandoned the well for conventional development. The company has focused other activities on underground coal gasification and said the LEA prospect might continue to hold promise for further development in that arena.

- Buccaneer Energy Ltd. drilled the Kenai Loop No. 1 and No. 3 wells. The company made a discovery at Kenai Loop No. 1 and brought the well into commercial production in early 2012, making the Australian independent the newest producer in the region. Kenai Loop No. 3 was a dry hole, but Buccaneer continues to delineate the prospect.

In 2012, Buccaneer and a partner acquired the Cosmopolitan field and Buccaneer became the operator of the offshore prospect. The undeveloped oil and gas field sits in 50 feet of water just off Anchor Point, off the southern Kenai Peninsula. Independent estimates put the proved and probable reserves of Cosmopolitan at 44 million barrels of oil and 90 billion cubic feet of gas. The previous owner, Pioneer Natural Resources, dissolved the original unit and relinquished most of the leases in January 2011. Through the sale, Buccaneer acquired a 25 percent working interest in the prospect and Ft. Worth-based independent Bluecrest Energy acquired the other 75 percent. Buccaneer intends to explore and develop the prospect using a jack-up rig it financed in partnership with the Alaska Industrial Development and Export Authority. The company plans to also use the rig to explore its two offshore units, Northwest Cook Inlet and Southern Cross.

Armstrong Cook Inlet, another new Cook Inlet entrant and an affiliate of the successful North Slope explorer **Armstrong Oil and Gas**, brought the North Fork unit online in 2011, finally producing gas from an onshore field originally discovered in the 1960s but left undeveloped for decades.

Finally, the reported demise of liquefied natural gas export operations in Alaska — and the consequent loss of jobs — turned out to be greatly exaggerated. The owners, ConocoPhillips and Marathon, announced plans in February 2011 to shut the plant down because declining gas production made it difficult to secure long-term contracts overseas. Throughout the year, though, cargo after cargo found buyers. In 2011, Marathon sold its interest in the Kenai plant to ConocoPhillips. Although ConocoPhillips placed the plant in “warm shut in” mode over the winter, the company has said that at least four tanker loads will be exported in 2012. ConocoPhillips also said that it does not have plans to make any staffing changes among the 50 jobs supported by the plant.

Cook Inlet Energy LLC is attempting to revive old assets in the basin. The local subsidiary of Tennessee-based Miller Petroleum brought the Osprey Platform back online in 2011. Although Osprey is the youngest platform in Cook Inlet, built by Forest Oil around 10 years ago, it was out of operation by 2009. Cook Inlet Energy brought

the facility out of lighthouse mode and is currently assembling a new rig on the platform. Cook Inlet Energy is also developing a work program for the Susitna basin north of Anchorage, where it holds an exploration license. Between its leases and licenses, the company holds nearly 700,000 acres of state lands southcentral Alaska. Once it completes its work commitments on the license area, Cook Inlet Energy can convert any or all of the acreage to leases with a five year term, 12.5 percent royalty, and \$3/acre annual rentals.

Cook Inlet Energy also transferred a 50 percent working interest and 43.25 percent royalty interest in one Cook Inlet lease to Unocal, who in turn transferred it to Hilcorp.

Aurora Gas continues to produce natural in Cook Inlet and is in the process of completing several new wells among its operated properties on the west side of Cook Inlet.

In a project that will help the entire basin, **Cook Inlet Natural Gas Storage Alaska** began operations at its new natural gas storage facility on the Kenai Peninsula in April. The operation will allow customers to inject gas into the underground reservoir in a depleted gas field during the summer when regional demand is low. Producers can maintain even production from their wells throughout the year. The regional distribution company Enstar Natural Gas Co. and the Railbelt power utilities have said that without the new storage facility they would be unlikely to deliver enough gas to meet peak, cold-weather gas demand in 2013. The current customer base includes Enstar, Anchorage Municipal Light & Power and Chugach Electric Association currently and Homer Electric Association plans to start using the facility in 2013. In a March 2012 status report to state regulators, CINGSA reported that two of the five wells at the facility had been tested and were ready for gas injection once connected to the facility's gas gathering head. The other three would be tested shortly.

Proposed Projects – Oil & Gas

The conventional life cycle of oil and gas production is typically exploration, development and then production. Of the following proposed projects, all, with the arguable exception of BP's Liberty project and Exxon's Point Thomson Unit, are either exploration projects for conventional resources, or "proof of concept" projects for unconventional resources. In 2011 the Nikaitchuq Unit was listed as a Proposed Project, and that year it graduated to a Producing Unit.

BEECHEY POINT UNIT - QUICKFACTS

Overview

The Beechey Point unit is located in Gwydyr Bay at Kuparuk River delta north of the Prudhoe Bay unit. The operator, Brooks Range Petroleum Corp., plans on drilling one well in the 2012-13 season at a cost of \$20 million. To date, the group has drilled four wells in the area. Should the exploration well prove successful, the company is planning a development program with 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: Winter 2012-2013

Duration of Project: 15 years

Jobs: 100 construction, 100 drilling, 16 operation

Total Project Costs: Over \$400 million

DEWLINE UNIT - QUICKFACTS

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. Since forming the unit, operator Ultrastar drilled one 9,900-foot vertical well targeting oil in the Ivishak formation. Subject to rig availability, Ultrastar plans to drill the North Dewline No. 1 well in the winter of 2013, also targeting the Ivishak. Estimated potential reserves in the unit are 5 to 20 million barrels of oil. 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 2015

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

KITCHEN LIGHTS UNIT – QUICKFACTS

Overview

The Kitchen Lights unit located in the Upper Cook Inlet is operated by Furie Operating Alaska. In 2011, it brought a jack-up rig into the Cook Inlet for the first time in almost 20 years. The company began Kitchen Lights No. 1 in the fall of 2011. Although the well data remains confidential, Furie announced a major gas find as the drilling season ended and the rig was moved to a winter standby location. The Kitchen Lights Unit has been extended through 2016 and in 2012, the jack-up rig will continue drilling to depths in the range of 16,000-20,000 feet into the Jurassic. 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. The wells all had gas shows and some also tested for small quantities of oil.

Start Date: As early as 2014

Duration of Project: 30 Years

Jobs: 412 exploration/drilling

Total Project Costs: \$810 million

LIBERTY DEVELOPMENT - QUICKFACTS

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. Future plans involve drilling up to four production wells and two water injection wells drilled from the completed extension of Endicott satellite drilling island. The program calls for drilling ultra-extended reach wells using one of the most powerful rigs in the world, a \$200 million Parker rig designed to drill eight-mile long directional wells. BP halted rig construction to divert resources to review design and engineering of the Parker rig, which pushed the initial start-up date of the project out to 2013. Parker subsequently defaulted on the rig, adding further uncertainty to the program.

Start Date: Uncertain, but no earlier than 2013

Duration of Project: Unknown

Jobs: Not yet determined

Total Project Costs: Estimated at \$1.5 billion

MUSTANG PAD (FORMERLY NORTH TARN) DEVELOPMENT - QUICKFACTS

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, and the stepout well Mustang No. 1 confirmed the size of the reservoir. Conceptual engineering work is underway and if the companies sanction the development project, drilling and construction is slated to begin in 2013 with the first oil expected in 2014. Peak production is expected to reach 15,000 barrels a day. The estimated cost of the development is \$400 million, with an approximate cost per well of \$20 million.

Start Date: 2013

Duration of Project: 20 years

Jobs: 100 construction, 100 drilling, 16 operation

Total Project Costs: \$400 million

NUNA PROJECT- QUICKFACTS

Overview

The potential drillsites for the Nuna Project are south and southwest of the Oooguruk unit boundary on the eastern bank of the Colville River. The Nuna Project aims to access the Torok formation -- partially off shore and inside the Oooguruk Unit -- from on shore drill sites, one outside the unit boundary, one just inside. The first appraisal well was drilled as an extended lateral from outside the unit during the 2011-2012 winter drilling season. 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: Total Oooguruk production — 30 years from start-up

Total Nuna Project Costs: Estimated at \$450 million

OUTER CONTINENTAL SHELF/ CHUKCHI AND BEAUFORT SEAS - QUICKFACTS

SHELL EXPLORATION AND PRODUCTION

OVERVIEW

The Outer Continental Shelf waters off Alaska's northern coastline encompass the Chukchi Sea and the Beaufort Sea. Resource estimates by the U.S. Minerals Management Service projects 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 the \$44 million bid in 2005 for 84 leases in the Beaufort Sea. Since 2008, Shell has proposed several drilling plans that have all been challenged by various interest groups during the various permitting processes and in a number of cases in court. Beginning in the fall of 2011, Shell was successful in overcoming a number of these challenges and now appears on track to perform its first exploration drilling in July, 2012. Shell's stated plan calls for two exploration wells drilled in the Beaufort Sea and up to three exploration wells drilled in the Chukchi Sea.

Start Date: 2012

Duration of Project: 50 years

Jobs: 1,200 exploration/delineation; 4,800 production

Total Project Costs: Unknown

POINT THOMSON UNIT - QUICKFACTS

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 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 resources – and 200 million barrels of condensate (excluding non-Thompson sands reservoirs). ExxonMobil, as operator, is advancing a project at Point Thomson to begin developing these resources.

On March 30, 2012, Gov. Sean Parnell announced an agreement between the state of Alaska and Point Thomson's working interest owners – including Exxon Mobil Oil Corporation, ConocoPhillips Alaska, Inc., and BP Exploration (Alaska) Inc. – that set forth the work commitments that would allow the owners to retain the leases and bring the unit into development. The Settlement Agreement registered with the Alaska Superior Court on March 29, 2012, requires the owners to install gas cycling facilities designed to process 200 million standard cubic feet per day of natural gas to produce gas condensate liquids, construct a pipeline connecting to the Trans-Alaska Pipeline System, bring the two existing wells drilled in 2009-2010 into production by the 2015-2016 winter season (pending requisite permits), and construct a second drilling pad and complete a third production well by the 2016-2017 winter season. The owners must also continue the permitting process as described in the ExxonMobil permit application – three drilling pads and five wells – for additional wells as may be needed to keep the IPS fully loaded with gas. Subsequent development could include full-field cycling, enhanced hydrocarbon recovery and/or natural gas sales.

Start Date: 2015

Duration of Project: 30 years

Jobs: 450 construction, 200 development drilling and 80 operation

Total Project Costs: Over \$1.8 billion

REPSOL/ARMSTRONG/GMT PROSPECTS - QUICKFACTS

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 15 wells at a cost of \$5 million to \$30 million per well depending on depth and location, but a blow-out at the Qugruk No. 2 well delayed much of that program this winter. The companies have allocated a minimum investment of \$768 million for a multiyear drilling program. Current estimates place the oil reserves around 1.5 billion barrels. The project is expected to create 550 direct jobs during exploration, with 400-700 jobs per year for two years during peak development drilling and construction investment. Repsol continues to drill the Kachemach No. 1 on the joint acreage.

Start Date: Multiyear exploration drilling program beginning 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

Total Project Costs: Unknown

TOFKAT (FORMERLY TITANIA) PROSPECT - QUICKFACTS

Overview

The Tofkat prospect is located east and south of Nuiqsut, southwest of the Kuparuk River unit near the Colville River. Operator Brooks Range Petroleum Corp. plans to drill two exploration wells in the 2012-2013 drilling season, with production starting as early as 2014-2015, depending on exploration success. The 2012-2013 exploration is anticipated to provide 125 jobs.

Start Date: Unknown

Duration of Project: Unknown

Jobs: 125 during 2012-2013 exploration phase

Total Project Costs: est. \$40 million

UMIAT PROSPECT - QUICKFACTS

Overview

The Umiat prospect is located on 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 during the 2012-13 season. Although Linc had originally hoped to drill during the current season, permitting and other issues forced the company to push the drilling program back one year. The prospect has estimated oil reserves of 250 million barrels and an anticipated peak production rate of 50,000 barrels of oil per day. Once sanctioned, Linc would need to build oil processing facilities and a 110-mile buried pipeline.

Start Date: Development drilling and construction as early as 2013, production as early as 2015

Duration of Project: Unknown

Jobs: Unknown

Total Project Costs: \$45 million for appraisal phase, \$1.3 billion for development phase

Projects to be Watched – Oil & Gas

GREAT BEAR PETROLEUM – QUICKFACTS

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" at its new nearly 500,000-acre lease position. If production begins in 2013, as planned, and grows by a projected 200 wells per year, Great Bear could be producing from its acreage at 200,000 bpd by 2020, peaking at 600,000 bpd in 2056 with a projected project life of around 80 years. 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 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. The first wells for this project are "proof of concept" tests.

Start Date: 2013 for pilot project

Duration of Project: Roughly 80 years

Jobs: Unknown

Total Project Costs: Unknown

STINSON PROSPECT - QUICKFACTS

Overview

The Stinson prospect was composed of 10 leases located on 35,434 acres north of ANWR's 1002 area, in Camden Bay directly west of Point Thompson. In 2011, the DNR chose not to unitize the prospect and owners Donkel/Case lost some leases. The 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 a 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 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

VISCOUS & HEAVY OIL - QUICKFACTS

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 Ooguruk 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 President John Minge said 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. 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. 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. In its 2011 E&P Fact Book, Ugnu is among the 26 major long-range projects leading to start up dates after 2016. The report anticipates gross peak production between 20,000 and 30,000 barrels of oil per day from Ugnu.

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 - QUICKFACTS

Overview

The Yukon Gold prospect, operated by Savant Alaska, is located around 50 miles east of Prudhoe Bay. 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)

Existing Fields – Oil & Gas

BADAMI PRODUCING UNIT - QUICKFACTS

Overview

The Badami unit is located on the eastern North Slope, onshore and offshore between Endicott and Point Thompson. Savant became the operator in January 2012 and that month the unit produced slightly more than 1,000 barrels per day from five wells. Although originally a BP property, Badami had only been producing intermittently after proving a disappointment since BP brought it online in 1998. In 2012, Savant had a rig under contract to workover two existing Badami wells and drill the Red Wolf No. 2 exploration well from a remote ice pad. When Point Thomson eventually comes online to the east Badami, it will include a 22-mile, 70,000 bpd liquids pipeline to Badami. That pipeline may need to be expanded or duplicated in the future.

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 - QUICKFACTS

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, or NPRA. Although it has taken seven years for ConocoPhillips to receive approval for its CD-5 satellite development, the company got the necessary permits in 2011 and is now in the process of designing and building the first roads, bridges and pipelines across the Colville River.

Start Date: Currently in production

Duration of Project: Unknown

Jobs: Unknown

Total Project Costs: Unknown

KUPARUK RIVER PRODUCING UNIT - QUICKFACTS

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 322,000 bpd occurring in 1992. The total oil produced through the end of 2011 was 2.4 billion barrels. Since production began, the Kuparuk owners have spent more than \$5 billion to develop and implement programs to optimize oil recovery at the unit. By the end of 2011, Kuparuk had more than 500 producing wells, 200 water injectors and 160 water alternating gas injector wells.

Start Date: Currently in production

Duration of Project: Unknown

Jobs: Unknown

Total Project Costs: Unknown

NIKAITCHUQ PRODUCING UNIT - QUICKFACTS

Overview

The Nikaitchuq producing unit, operated by Eni Petroleum, is located immediately north of the Kuparuk unit and northeast of the Oooguruk unit. The unit has been unitized with pool rules for Schrader Bluff oil pool from Alaska's Oil and Gas Conservation Commission (AOGCC). 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 March 2011, Eni has drilled 12 of the 52 extended reach wells — 26 producing wells, 21 water injection wells, 3 water source wells and 2 disposal wells — planned for full development. 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

MILNE POINT PRODUCING UNIT – CHOPS PROJECT QUICKFACTS

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 to discover ways to produce cold and heavy oil from the Ugnu deposit.

Start Date: Currently in production

Duration of CHOPS Project: 3-5 more years

Jobs: Unknown

Total Project Costs: \$100 million to date, Total Unknown

OOGURUK PRODUCING UNIT - QUICKFACTS

Overview

The Oooguruk producing unit is located northwest of Oliktok in the Beaufort Sea's Harrison Bay, northwest of the Kuraruk unit. The Oooguruk unit has rules in place defining three oil pools: the Oooguruk-Nuiqsut and the Oooguruk-Kuraruk and the Oooguruk-Torok. The Nuna Project is targeting the Torok formation, which lies within Pioneer's existing Oooguruk unit. Production from the main Oooguruk unit began in June 2008 and the first oil from Nuna-Project targeting the southern edge of the Torok formation could be produced as early as 2014-2015. There are an estimated 120-150 million boe in recoverable reserves resulting in an estimated 30-year commercial life from start-up for the Oooguruk unit, not including liquids from the Nuna project. See Nuna Project quickfacts.

Start Date: Oooguruk is currently in production; Nuna could begin production as early as 2014-2015

Duration of Project: 30 years from start-up

Capital Investment to Date: Approximately \$1 billion

PRUDHOE BAY PRODUCING UNIT - QUICKFACTS

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 2010, more than 12 billion barrels had been produced from the Prudhoe reservoir with another one billion barrels from the Greater Prudhoe Bay area, including satellites Orion, Polaris, Aurora, Midnight Sun and Borealis, as well as Lisburne, Point McIntyre and Niakuk. There are 25 billion barrels of oil in place at Prudhoe, 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. Raising that number by just 10 percent would make another 2.5 billion barrels recoverable, but BP has said it needs a more moderate production tax system adopted by the State of Alaska in order to make those investments competitive with its opportunities elsewhere in the world.

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

MINING RESOURCE

Mining Job Outlook Overview

Mining industry posts record 2011; Administration tackles local concerns as miners eye global markets

Strong metals prices, solid operating performances from six operating mines in Alaska and the additional gold and copper produced at Fire River Gold Corp.'s Nixon Fork Mine all helped push mineral production in the state to \$3.62 billion in 2011, breaking the \$3.37 billion record set in 2007. Adding in some \$300 million spent on mineral exploration and around \$175 million on development, the value of the Alaska's mineral industry topped \$4.1 billion for the year.

This record year for Alaska's mining industry has translated into a growth of high paying jobs in the state. 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 4,500 direct jobs and 9,000 indirect jobs in 2011. The average mining job paid an annual salary of US\$100,000, which is double the statewide average for all sectors.

These high paying jobs were filled by residents of more than 120 communities across Alaska and half these workers live in rural areas of the state.

Additionally, Alaska's mining industry made payments of \$172 million to Alaska Native corporations; \$148 million in rents, royalties, taxes and other fees to the State of Alaska (up 170 percent over 2010); \$41.1 million to the Alaska Industrial development and Export Authority; \$28 million to the Alaska Railroad; \$17 million in taxes to local governments; and \$1 million to the Alaska Mental Health Trust for rents, royalties and construction materials sales.

At 665,000 tons, zinc accounted for about 40 percent of Alaska's mineral production value in 2011, followed by gold at 860,000 ounces. At least 12.8 million ounces of silver, 148,000 tons of lead and 2.2 million tons of coal were also mined in the state last year.

"We are really a zinc-producing jurisdiction ... largely from Red Dog," said former state geologist Dave Szumigala.

Gold and copper could bump zinc out of the dominant position if projects like Donlin Gold, Pebble and Livengood go into production.

In terms of exploration, porphyry copper-gold systems accounted for 40 percent of the 2011 exploration spending in Alaska, making them the top deposits being sought after. Intrusion-related gold systems came in second at 30 percent. Gold-quartz vein deposits, polymetallic volcanogenic massive sulfide, platinum group metal-enriched ultramafic-hosted, rare earth element, diamond, coal and placer gold deposits rounded out the list of minerals being sought in the state.

"The largest exploration project in the state is Pebble, as it has been for the past four or five years," according to Szumigala. "They haven't updated their resource, but it is arguably the world's largest porphyry resource – over 80 billion pounds of copper, over 100 million ounces of gold."

The Pebble Partnership's 2011 budget of US\$91 million included some 14,000 meters of drilling but was primarily focused on preparing the enormous project for permitting.

Development spending in Alaska dropped to about US\$175 million in 2011, compared to an average of US\$375 million over the previous five years.

This number is expected to increase in the coming years as Alaska's world-class exploration projects transition to development.

Barrick Gold Corp. and NovaGold Resources Inc. have said they plan to begin permitting the 40-million-ounce Donlin Gold project later in 2012 and the Pebble Partnership has indicated they will file permit applications the following year. International Tower Hill Mines Ltd. also plans to begin permitting of its 20-million-ounce Livengood gold project sometime in 2013.

“In the past decade, things have really been booming in the State of Alaska,” touted Szumigala. “We do have a golden future.”

Administration addresses mining concerns

A vast amount of mineral wealth is locked up in a more than 350,000-square-mile area west of Alaska’s contiguous infrastructure. This Texas-sized, expanse is without surface transportation or affordable energy.

Alaska Gov. Sean Parnell has included some \$50 million in his fiscal 2013 state budget proposal to support measures aimed at gaining access to much of the state’s abundant oil, gas and minerals resources including three roads that would trek westward.

“Better transportation corridors will open up petroleum and mining opportunities,” Parnell told the Alaska Chamber of Commerce Dec. 15. “Our Roads to Resources Initiative will be funded at US\$28.5 million to access oil and gas-rich lands around Umiat – in the Foothills West; to open access to the Ambler Mining District; to open up mining lands in a route to Tanana; and to fund work on the Klondike Industrial Use Highway outside of Skagway, to name a few.”

For the mineral industry, the most important project may be a proposed road to the Ambler Mining District – a region of Northwest Alaska renown for a 110-kilometer- (70 miles) long belt of world-class volcanogenic massive sulfide deposits rich in copper, zinc, lead, gold and silver that sweep across its breadth.

The 2013 budget put forward by the governor includes US\$4 million towards defining an optimal corridor to the Ambler Mining District; establishing a right-of-way; and beginning the environmental and permitting work to build the 320-kilometer (200 miles) transportation route to the remote copper-rich region.

Parnell said the state will explore the potential for a public-private partnership to proceed with financing and construction of the Ambler Mining District Road.

NovaGold Resources Inc. and NANA Regional Corp. are the likely private partners and primary beneficiaries of a road to the Ambler region.

In October, the mineral exploration company forged a partnership with the Inupiat-owned Alaska Native regional corporation to explore and develop 180,000 hectares (445,000 acres) of copper-rich lands at the western terminus of the proposed Ambler Road. The pact consolidates NovaGold’s Ambler property, including the world-class Arctic deposit, with the copper-rich Bornite deposit and other mineral prospects on NANA lands in the upper Kobuk River area.

In addition to a \$28.5 million allotment to the state’s Roads to Resources program, the governor’s budget includes funding for streamlining the permitting process in Alaska, continued assessment of the state’s rare earth element potential, a statewide digital mapping program and a geological assessment of shale oil on the North Slope.

“Funding Roads to Resources; more timely permits; a rare earths assessment; and statewide digital mapping — it’s all about jobs and creating new opportunities for independent, hard-working Alaskans to move forward,” Parnell said while rolling out his budget plans.

Concerns over environmental regulations and uncertainty over wilderness protected areas also weighs on mining investment in Alaska.

Amongst the top concerns is a study being conducted by U.S. Environmental Protection Agency to better understand how future large-scale development projects may affect water quality and the salmon fishery in the Bristol Bay watershed.

Under section 404 of the federal Clean Water Act the EPA can deny the discharge of dredged or fill material into an area if it believes the disposal “would have an unacceptable adverse impact on one or more of various resources, including fisheries, wildlife, municipal water supplies, or recreational areas.”

Opponents of the Pebble copper-gold-molybdenum project have petitioned the EPA to exercise its authority under the CWA to preemptively veto the Pebble Partnership’s permit applications before the NEPA process begins.

As a result of the request, the EPA launched the Bristol Bay study. The federal agency anticipates the release of a draft report in May.

Alaska Attorney General Michael Geraghty sent a letter to the EPA in March, requesting that the agency cease its work on the Bristol Bay Watershed Assessment.

“We believe that EPA’s actions in using the watershed assessment to address the pending petition are unlawfully preemptive, premature, arbitrary, capricious, and vague,” Geraghty wrote. “The State asks that EPA cease its work on the Bristol Bay Watershed Assessment. We also ask that EPA refrain from exercising its Section 404(c) authority until a Section 404 permit application has been submitted and other applicable regulatory reviews are conducted.”

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.

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 will begin permitting in 2013.

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.

China drives metal markets

Chinese consumption is the driving force behind the demand for industrial minerals being mined and developed in Alaska such as copper, zinc and thermal coal. This appetite has miners and analysts keeping tabs on the Far East country’s economy, especially during the recent cooling of gross domestic product growth.

“Our belief for this year is if China’s not importing it, you probably should not be investing in it, because with a negative GDP growth for Europe perhaps offsetting a slightly positive one in the U.S. we need the BRICs (Brazil, Russia, India and China) to drive commodity demand in 2012 much more so than 2010 and 2011,” Tony Robson, co-head of BMO Capital Markets’ Metals & Mining Equity Research, said upon releasing the research team’s first quarter 2012 report.

Over the past five years, China’s economic base has more than doubled, from a GDP of about US\$3.5 trillion in 2007 to US\$7.3 trillion in 2011.

“As with most materials markets outlooks these days, when you look at copper you also have to focus on China, since China accounts for more than 40 percent of global copper consumption,” Teck Resources Ltd. President and CEO Don Lindsay told industry leaders gathered at BMO Capital’s Global Metals & Mining Conference.

“As they continue to urbanize 20 million people per year, the electrical generation, transmission and distribution has to roll ahead of the movement of people,” he added.

China also accounts for more than 40 percent of the global consumption of zinc, Alaska’s top produced metal.

In 2011, zinc prices averaged around US\$1.00 per pound. Due to continued surplus of the industrial mineral on global markets zinc prices are forecast to be slightly lower in 2012, averaging around 94 cents per pound in 2012.

Analysts predict these levels to be a floor for the galvanizing metal and foresee prices rebounding to around \$1.20 per pound by 2014.

Weakening dollar supports gold

Global miners and market analysts agree that the continued weakening of the U.S. dollar and other global currencies will continue to support a strong gold price.

“We think, as a result of a number of the monetary policies, other currencies are going to continue to be under pressure and on a relative basis gold will perform well,” Barrick Gold Corp. President and CEO Aaron Regent told attendees of BMO Capital’s 21st Global Metals & Mining Conference in Hollywood, Fla.

The Barrick executive pointed to the 440 million tons of gold hoarded by central banks in 2011 as validation of his bullish view of the safe-haven metal.

Gold, which fetched an average US\$271 per ounce in 2001, has made consistent price gains over the ensuing decade. In 2011, the price of the precious metal climbed from US\$1,389 per ounce to US\$1,531 per ounce peaking at US\$1,900 in September.

The precious metal averaged US\$1,571 per ounce for the year, a 28 percent jump from the average US\$1,225 per ounce for 2010.

BMO Capital Markets’ Metals & Mining Equity Research analysts foresee a continued upward climb in gold prices through 2012, though at a slower pace than in recent years. The financial firm forecasts the yellow metal will fetch an average of US\$1,700 per ounce for the year.

Silver, which averaged a little more than \$35 per ounce in 2011, is expected to sell for around \$32.50 per ounce this year.

Exploration funds scarce

Global financial fears have resulted in investors moving their money away from the mining sector. This is particularly tough for the junior explorers that depend on venture capital to seek the next deposits of copper, gold and other metals the world needs and desires.

BMO said share prices of the juniors it covers slid an average 35 percent over the past 12 months, and producer share prices have dropped 17 percent.

“We still see a dichotomy; we still see that share prices are weak but commodity prices are strong,” BMO Capital’s metals research team wrote.

Despite the robust exploration spending in recent years, Regent said the mining industry is struggling to keep up with the growing demand for metals.

“Continued industrialization and urbanization of countries like China and India will be strong pulls for demand,” the Barrick CEO said. “The industry is challenged to mount a supply response. It’s difficult to find deposits, and once you find them it is difficult to put them into production.”

While exploration in Alaska is expected to continue to be strong in 2012, due to constraints in venture capital Mining News expects spending to be down from the record \$300 million seen in 2011.

Proposed Projects - Mining

CHUITNA COAL PROJECT - QUICKFACTS

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 trestle constructed into Cook Inlet for the loading of ocean going coal transport ships. The estimated production rate is for 12 million tons of coal extracted per year over a minimum of 25 years, or about 300 million tons of coal over the current life of the project. 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, Tyonek Native Corporation, Cook Inlet Region Inc. and individuals. 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 projects design and to regulatory requirements since then which resulted in the United States Environmental Protection Agency requiring the project prepare a comprehensive, stand-alone Supplemental EIS (SEIS) which PacRim submitted late in 2010. The SEIS and permitting process is expected to be completed by 2013 at which point the Pac Rim Coal LP will decide whether or not to proceed with development based on market conditions.

Start Date: Currently estimated to begin construction in 2013 and commence production in 2015.

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: Not Available

DONLIN GOLD PROJECT - QUICKFACTS

Overview

The Donlin Gold project is a refractory gold deposit located 280 miles north of Anchorage. The deposit is situated on Native lands owned by the Kuskokwim Corporation (surface) and Calista Corporation (subsurface). The project has estimated reserves of 33.85 million ounces of proven and probable reserves grading approximately 2.09 grams gold per metric ton. Additionally, the project contains 5.16 million ounces of measured and indicated resources and 5.99 million ounces of inferred resources. Late in 2011, Donlin Gold LLC – a 50-50 partnership NovaGold Resources Ltd. and Barrick Gold Corp. – released a revised feasibility study for the Donlin Gold project that includes updated mineral reserves and resources, capital cost and operating cost estimates. The primary difference between the current feasibility study compared to one completed in 2009 is natural gas will be delivered to site via a buried pipeline that would run 310 miles northwest from Cook Inlet. The capital costs of building the mine and pipeline are estimated to be around \$6.7 billion. Donlin Gold plans to begin permitting in the first half of 2012.

Commodity: Gold

Start Date: Construction is anticipated to begin in 2015 with operations scheduled to start by 2019

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 - QUICKFACTS

Overview

The Livengood project, located adjacent to the Elliot Highway about 70 miles northwest 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 August, 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. Once in operation the project is expected to employ an estimated 500 workers. 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. Tower Hill anticipates the completion of a prefeasibility study for Livengood in the first half of 2012 and a feasibility study to

be finished about a year later. Construction is projected to begin in 2016 with production beginning about two years later.

Commodity: Gold

Start Date: Construction expected to begin in 2016 and production in 2018

Duration of Project: 23 years

Jobs: Current estimates at 500 workers depending on final mine design

Total Project Costs: Estimated at \$2.2 billion

PEBBLE COPPER-GOLD-MOLYBDENUM PROJECT - QUICKFACTS

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 will begin permitting in 2013. As of 2011, the Pebble Partnership had made roughly \$600 million in capital expenditures. It is estimated that an additional \$4.7 billion will be necessary to build the mine and \$1.3 billion will be needed for infrastructure costs. 2,080 people are expected to be employed over the four year construction period and 1,020 people will be necessary for the operations workforce.

Commodity: Copper, gold, molybdenum, silver, rhenium and palladium

Start Date: Unknown

Duration of Project: Undetermined. The project will likely be permitted for a 20-30 year mine life

Jobs: 2,080 during the four year construction phase, 1,020 during operations

Total Project Costs: Estimated at \$4.7 billion for the mine and \$1.3 billion for the infrastructure upgrades.

WISHBONE HILL COAL PROJECT - QUICKFACTS

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 with 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: Roughly 90 jobs based on an ISER socioeconomic study

Total Project Costs: Unknown

Projects to be watched - Mining

BOKAN MOUNTAIN RARE EARTH ELEMENTS PROJECT - QUICKFACTS

Overview

The Bokan Mountain Property is located within the Tongass National Forest on Prince of Wales Island some 35 miles southwest of Ketchikan. The land is currently managed by the US Forest Service and has no indigenous or residential populations. 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). An updated resource calculation based on 10,112 meters of drilling completed last year is underway. Due to the current shortage of REEs worldwide stemming from China's decision to dial back their REE exports this project has received significant government support from both the state and federal levels, including Sen. Lisa Murkowski, Sen. Mark Begich and Gov. Sean Parnell. In September, 2011, the State of Alaska hosted the "Alaska Strategic and Critical Minerals Summit," a one day event focused largely on exploring the state's rare earth potential. This summit was attended by more than 200 people, including Gov. Parnell, the Alaska Congressional Delegation, top state, federal and university scientists, mining executives, exploration geologists, Alaska Native leaders and foreign government representatives.

Commodities: Uranium, tantalum, niobium, dysprosium, terbium, and other REEs

Start Date: Due to its strategic importance it is possible this deposit could be developed within 10 years

Duration of Project: Not Available

Jobs: Not yet determined

Total Project Costs: Not Available

NIBLACK PROJECT - QUICKFACTS

Overview

The Niblack project is a copper-zinc-gold-silver prospect being advanced by Heatherdale Resources. This exploration project is located off Moira Sound on southeastern Prince of Wales Island, approximately 30 miles southwest of Ketchikan. Based on 373 holes drilled at Niblack the Lookout deposit now has an indicated resource of 5.64 million metric tons averaging 0.95 percent copper, 1.75 grams per metric ton gold, 29.52 g/t silver and 1.73 percent zinc. Lookout and the nearby Trio zone contain an additional inferred resource of 3.93 million metric tons averaging 0.81 percent copper, 1.32 g/t gold, 20.1 g/t silver and 1.29 percent zinc. The State of Alaska is investigating whether there might be ways for shared infrastructure between Niblack and the nearby Bokan Mountain REE project to reduce infrastructure costs. Representatives from AIDEA also participated in those meetings and there is a possibility they could play a role in the eventual infrastructure development and financing of the project. A preliminary economic assessment for Niblack is scheduled to be completed early in 2012 and Heatherdale anticipates advancing the project to the feasibility level over the following year. Dependent on a positive feasibility study the Niblack project could begin permitting in 2013. Projecting three years for permitting and two years for construction the project could be in operation in 2018.

Start Date: Unknown

Duration of Project: Unknown

Jobs: Early indications are about 300 jobs

Total Project Costs: Unknown

LIK ZINC PROJECT - QUICKFACTS

Overview

The Lik Project is located roughly 90 miles from Kotzebue and 14 miles northeast of Red Dog mine in northwest Alaska. The property is composed of 296 unpatented federal mining claims and contains an estimated 3.3 billion pounds of zinc, over one billion pounds of lead and over 31 million pounds of silver. Lik North, which is a deeper deposit that could extend the mines life, is thought to contain an additional 1.3 billion pounds of zinc, 500 million pounds of lead and ten million ounces of silver. A preliminary economic assessment for Lik South anticipates a 5,500 ton/day mine and mill with an eight year production span. A prefeasibility study for the development of the Lik deposit is currently underway and hammering out transportation infrastructure is a key component. The transportation system used by the nearby Red Dog mine is available for use by the owners of the Lik project. A current due diligence study on expanding the current transportation infrastructure to accommodate the increased activity is being undertaken by the DeLong Mountain Transportation Systems owner, the Alaska Industrial

Development and Export Authority. Depending on the results of the prefeasibility study, the Lik project could begin permitting by 2013, which would put it on a timeline to begin production within 10 years.

Commodity: Zinc, lead and silver

Start Date: Possibly within 10 years, Zazu has projected production could begin as early as 2018

Duration of Project: Roughly 8 years

Jobs: Estimated 300 jobs

Total Project Costs: Unknown

Existing Mines - Mining

FORT KNOX GOLD MINE - QUICKFACTS

Overview

The Fort Knox mine is an open-pit gold mine located approximately 26 miles northeast of Fairbanks. The mine was originally permitted in 1994 and currently produces roughly 300,000 ounces of gold annually. To date more than 5 million ounces of gold have been extracted from Fort Knox since it began production in 1997. The mine site is located on lands owned either by the State of Alaska or the Mental Health Trust. In 2009, Kinross completed construction of a heap leach facility and expansion of the existing mine. The company projects there are enough ore reserves in place to continue mill operations until 2018 and to continue heap leaching operation through 2021. Kinross added 700,000 ounces to the gold reserves in the Fort Knox area in 2011 but has not provided an update on the expected life of the mill or heap leach operations.

Commodity: Gold

Start Date: Currently Operating

Duration of Project: Current reserves projections mill operating till 2018 and heap leach operations till 2021

Jobs: Over 500 jobs

Total Project Costs: Unknown

GREENS CREEK MINE - QUICKFACTS

Overview

The Greens Creek Mine is located in southeast Alaska adjacent to Admiralty Island National Monument, an environmentally sensitive area. 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 holds 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 over 20 years ago with an estimated 2.9 million metric tons of ore reserves. Subsequent exploration has expanded on those estimates and the current reserves are estimated to be 8 million tons of ore. This level of reserve is enough to keep the mine in operation for an additional nine years. Exploration expenditures for 2012 are budgeted at \$7 million.

Commodity: Silver, Gold, Zinc and Lead

Start Date: Currently Operating

Duration of Project: Current reserves to last till 2020

Jobs: About 300 workers

Total Project Costs: Unknown

KENSINGTON GOLD MINE - QUICKFACTS

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. On June 22, 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 24th, 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 Coeur announced that production levels at Kensington have been curtailed during the first half of 2012 to complete several key projects designed to improve operational efficiency and consistency. The company expects to produce around 85,000 ounces of gold in 2012. When full operations are

resumed, annual production is anticipated to average about 125,000 ounces of gold. Based on gold reserves of 1.34 million ounces at the end of 2011, about 12 years of production is predicted. Coeur d'Alene Mines is continuing to add to its reserve estimates through exploration drilling in the area.

Commodity: Gold

Start Date: Currently Operating

Duration of Project: 2023 based on current reserves

Jobs: About 250 workers

Total Project Costs: \$338 million

NIXON FORK GOLD MINE - QUICKFACTS

Overview

The Nixon Fork mine is an existing underground lode mine located 32 miles northeast of McGrath that is currently not producing. The mine has been active sporadically between 1917 and the 1950s. Fire River Gold Corp. resumed production at the historical operation in July, 2012. 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: Began production in July, 2011

Duration of Project: Two years of resource currently delineated

Jobs: Approximately 75

Total Project Costs: Unknown

POGO GOLD MINE - QUICKFACTS

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 (SMM). The Pogo Mine 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. To date, exploration of these new zones has outlined a resource of nearly 2 million ounces of gold. Finding the full extent of these new zones and relationship of the three gold-rich ore bodies is the focus of the exploration at Pogo over the next two years. These new zones could extend the mine-life of Pogo by at least 10 years.

Commodity: Gold

Start Date: Currently in production

Duration of Project: Through 2017 based on 2009 reserve estimates

Jobs: 328

Total Project Costs: \$347 million startup

RED DOG MINE - QUICKFACTS

Overview

Red Dog is a zinc-lead mine located in northwest Alaska roughly 82 miles north of Kotzebue. In operation since 1989, the Red Dog mine is one of the worlds' largest producers of zinc concentrate. The mine was developed under an agreement between NANA Regional Corporation and Teck Alaska incorporated. Red Dog 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. There are an estimated 55.3 million metric tons of reserves averaging 15.9% zinc and 4% lead. The primary focus of Teck's exploration in 2011 was a region to the west of Red Dog called Noatak. Integrating modern geophysics, stream sediment sampling and detailed geological mapping – the company has produced around 20 drill targets on these state of Alaska mining claims. The company also had one drill at Anarraaq, a deep deposit that lies about seven miles

northwest of the current operation. According to a 2004 report, Anarraaq hosts a massive sulfide zone with an estimated resource of about 18 million tons at 18 percent zinc, 5.4 percent lead, and 85 grams per metric ton silver. Noatak and Anarraaq are high-priority targets as Teck continues to seek new high-grade deposits of zinc in the Red Dog District of Northwest Alaska.

Start Date: Currently in production

Duration of Project: Through 2031 due to permitting approval of the Aqqaluk deposit

Jobs: 475 full time and 80 temporary jobs

Total Project Costs: Unknown

USIBELLI COAL MINE - QUICKFACTS

Overview

Usibelli Coal mine is Alaska's longest lived large-scale mine, located south of Fairbanks. Usibelli coal supplies coal to six power plants in Interior Alaska and ships around one million metric tons overseas annually. The Usibelli Coal Mine provides about 100 jobs and has a projected commercial life of 350 years based on current production rates and reserve estimates of around 700 million tons. Usibelli 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: Currently in Production

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

Jobs: About 100

Total Project Costs: Unknown

APPENDIX A - OIL & GAS

BADAMI PRODUCING UNIT, EASTERN NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: Savant became the new operator in early 2012. Although originally a BP property, Savant has been heading up subsurface operations per a 2008 agreement between BP, Savant and ASRC Exploration to bring Badami back into production. The unit had been producing intermittently since being brought online in 1998.

Location: Eastern North Slope, onshore and offshore between Endicott and Point Thomson.

Status & importance: Farthest east producing field on North Slope. Its 35,000-barrel per day common carrier oil sales pipeline from Badami to Endicott, which in turn is connected to Central North Slope pipelines, is important for continued development of the Eastern North Slope. The commissioning of Point Thomson to the east will include a 22-mile, 70,000-bpd liquids pipeline connecting to Badami. At some point, that pipeline might have to be expanded or duplicated.

First oil: 1998 by BP, intermittent use, shut-in for last time by BP in 2007

Brought back into production: 2010, by Savant

Drill site, facilities: Single, compact central processing and well pad, B1, which also holds production facilities.

Wells by end of 2011: Six verticals by BP. Savant drilled one new well, B1-38, in the winters of 2008-09 and 2009-10 to test its Red Wolf prospect's Kekiktuk formation, a formation that contains oil reservoir for Endicott field to the west. Savant remains tight lipped about results from Kekiktuk, but said it discovered oil in higher-level secondary target in Cretaceous Killian sands. B1-38 production from Killian pool. Savant drilled a second well, the B1-18A horizontal sidetrack, to test use of horizontal drilling techniques to tease higher flow rate from field. Planning to use hydraulic fracturing techniques similar to those used to produce shale oil and gas in lower 48 in the B1-18A or another horizontal in 2013 to try to improve oil flow from Badami's Brookian sands. Hydraulic fracturing has been tried before at Badami, but only on vertical wells. Savant hopes to hydraulically fracture Killian formation in mid-2012.

Current production: In January of 2012, production was 1,042 barrels a day from 5 wells. Savant is in the process of adding artificial lift to two non-producing wells.

Recoverable reserves: In January, Savant said “most likely reserve estimate” for Kekiktuk accumulation was 33 million barrels. Before running into technical problems with highly compartmentalized Brookian reservoir, BP hoped to recover 120 million barrels from those sands.

Cost per horizontal well: \$10 million

Hydraulic fracturing per horizontal well: \$5 million

Jobs: As of 2012 Savant has 55, employees, contractors and consultants working at Badami.

Owners: 67.5 percent Savant Alaska, 32.5 percent ASRC Exploration.

Plans for future development: The Red Wolf No. 2 will be drilled in 2012

BEECHEY POINT UNIT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Exploration/delineation/development drilling start: Winter season 2012-13

Total time for drilling: Two more winter seasons, possibly more

Total drilling costs in winter 2013-13 (two wells): \$40 million

Drilling & construction costs, excluding what has been spent to date: \$400 million

Construction start: Winter season 2013-14

Total time for construction: One winter season

Total construction jobs: 100

Total drilling jobs: 100

Average number operation jobs: 16

Production start/life: First quarter 2015 or 2016, 15 years

East Shore and Pete’s Wicked prospects: Same as above

Operator: Brooks Range Petroleum Corp. (BRPC)

Location: Gwydyr Bay at Kuparuk River delta, north of Prudhoe Bay unit, between Milne Point and Northstar units. Mostly onshore North Slope; offshore leases accessible from onshore.

Exploration blocks, prospects: Five exploration blocks — North Shore, West Shore, Northwest Shore, East Shore and Offshore — identified in BRPC’s unit plan. Three prospects identified to date: East Shore, North Shore, Pete’s Wicked. Total: 52,876 acres.

Status: Since arriving in Alaska more than a decade ago, the various companies involved in the BRPC-operated joint venture have expended most of their efforts on what is now the Beechey Point unit, on the west side of the Kuparuk River delta. They are now considering a development on the east side of the Kuparuk River delta within the Beechey Point unit.

Seismic: Acquired 130 square miles of 3-D seismic data covering entire unit area in 2007.

Wells drilled in past: Area drilling began in 1969 with Hamilton Brothers’ Point Storkersen No. 1 well, testing oil in Sag River, flowing 315 bpd and 735 bpd from 2 different depths in Ivishak Sandstone; did not test Kuparuk River formation. Hamilton drilled Kuparuk Delta 51-1 well in 1970 in the then Kuparuk Delta unit, finding no flowing hydrocarbons in Kuparuk, Sag River, Shublik and Ivishak, but flowing 2,200 bpd, decreasing to 1,500 bpd, from lower Brookian “stray sandstone” at depth of some 7,100 feet. Conoco drilled 13,605-foot Kuparuk Delta 51-2 in 1970, with successful tests of oil from Ivishak and Kuparuk, with Ivishak flowing 695 bpd (bpd) and 520 bpd from 2 different depths; also was flow to surface from Kuparuk. Conoco became operator, renamed it Gwydyr Bay unit. Conoco didn’t drill until 1981, but more wells drilled in area by Mobil and Cities Service. Conoco’s Gwydyr Bay 2A well, a sidetrack from 11,365-foot Gwydyr Bay 2, flowed 3,000 bpd from Ivishak with stabilized flow of 740 bpd from Kuparuk. In 1997, BP drilled Pete’s Wicked, identifying 65 feet of oil pay in Ivishak on logs; no well tests. BP had plans for roadless, 3-well project, but plans dropped, acreage reverted to State of Alaska.

Wells drilled by BRPC by end of 2010: In 2007, drilled Sak River No. 1; did not encounter hydrocarbons. Also drilled North Shore No. 1, which tested at 2,092 bpd from the Ivishak; Sag River tests inconclusive. In 2010 drilled two wells: results of Sak River 1-A sidetrack led partner TG World to relinquish some interest in program. Remaining partners drilled North Shore No. 3.

Drilling anticipated: Work commitment with State of Alaska calls for one exploration well in each of the five blocks by July 2019.

Approximate cost per well: \$20 million

Noteworthy about prospect: UltraStar holds state lease contiguous on northern side.

Recoverable reserves: TG World said in December 2009 there was 100 million barrels in “reserve potential” in Gwydyr Bay area in 5 blocks, pointing to North Shore No. 1 and Pete’s Wicked for 2 million barrels and 3 million

barrels respectively, with estimates of undiscovered oil at Sak River No. 1A of 11 million barrels; another 4.5 million barrels at North Shore No. 3.

Working interest: Alaska Venture Capital Group, Brooks Range Development Corp., Ramshorn Investments

COLVILLE RIVER PRODUCING UNIT, WESTERN NORTH SLOPE (ALPINE) AND THE CD5 EXPANSION INTO THE NPRA

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: ConocoPhillips

Location: About 40 miles west of Kuparuk

First oil: 2000

Peak production: 123,000 bpd in fiscal year 2006 (before satellite development).

Oil produced through end of 2011 (including satellites): 414 million barrels.

Remaining producible oil: 400 million barrels

Current production from Alpine and satellites: In January 2011, produced an average of 77,514 bpd, two thirds from Alpine and one third from its satellites

Wells by end of 2011: 81 producing completions (58 in Alpine)

Noteworthy: A roadless development, the field is accessible only by air. The original pads (CD 1 and 2) constituted 97 acres, or less than two-tenths of a percent of the total surface acreage of 40,000 acres. CD 3 and 4 have expanded that footprint to 167 acres. A new 3-D seismic set acquired in 2010 is being used to evaluate additional infill and peripheral drilling opportunities. Part of the field lies under federal acreage in the National Petroleum Reserve- Alaska.

Alpine satellites: Fiord, Nanuq and Qannik. In January 2011, total production from the three satellites was about one third of total Unit production.

Fiord: Fiord is another roadless development accessible only by ice roads in the winter and air year round. It is six miles to the north of the Alpine field, and first produced oil in 2006. The largest of the three satellites, in January 2012, it produced roughly 22,000 bbls a day. The crude is piped to and processed in the Alpine production facilities.

Nanuq: Nanuq is six miles to the south of the Alpine field, and first produced oil in 2006. The crude is piped to and processed in the Alpine production facilities.

Qannik: Qannik was developed through a 7.5-acre expansion of the CD-2 drill site and the crude is processed in the Alpine production facilities. First oil was in 2008.

Capital budget for 2011: \$900 million capital budget for Alaska this year approved by ConocoPhillips. Spending will be directed toward development of existing Prudhoe Bay and Kuparuk fields, as well as the Western North Slope, the company said.

Jobs today: 1,000 people work for ConocoPhillips in Anchorage, excluding contractors.

Working interest owners: ConocoPhillips 78 percent, Anadarko 22 percent.

CD5 Expansion: With Kuparuk in the 1980s and Alpine in 2000, ConocoPhillips and its partners have been pushing west. The Alpine unit is close by the Colville River, the eastern edge of the NPRA and the western edge of state selected lands. Originally production was from CD-1 and CD-2, and was subsequently expanded to CD-3 and CD-4. Since 2005 ConocoPhillips has been trying to expand to Alpine West with CD-5, which would mark the first production facilities and pipelines in the NPRA. The expansion plan for CD-5 fits in with production from the only units approved so far west of the Colville in the NPRA – Moose's Tooth and Bear's Tooth. In 2010, Petroleum News calculated that ConocoPhillips was responsible for 20 of the 29 exploration wells drilled in the NPRA. ConocoPhillips first applied for the CD-5 permit in 2005.

However crossing the Colville to access those properties has proved difficult. ConocoPhillips withdrew that application, and after intense consultation with local stakeholders reapplied in 2009 with a revised plan, including a new location for the main bridge. The federal U.S Corps of Engineers, which issues the Section 404 permit in question, wanted ConocoPhillips to move the oil from CD-5 with a pipeline under the river channel using sophisticated horizontal directional drilling technology. In late December 2011, ConocoPhillips received a Christmas present – the USCOE approved the permit that includes a series of four bridges, the longest spanning 1,405 feet and the shortest only 250 feet. Current plans call for construction of those bridges in the winter of 2013-2014, completing the road over the bridges in the summer of 2014, laying pipeline in the winter of 2014-2015 and producing first oil in late 2015. Because the bridges will not be large enough to handle drilling equipment, rigs

will still be moved to CD-5 on ice roads. ConocoPhillips anticipates peak production from Alpine West to be in the 10,000-15,000 thousand barrel a day range.

CD-6 Expansion: In its 2011 E&P Fact Book, ConocoPhillips lists 22 major projects leading to start up dates in the 2013-2015 period. Included are both the CD-5 or Alpine West expansion and a CD-6 or Lookout pad shown as currently being in the optimization stage with anticipated gross peak production between 15,000 and 20,000 barrels of oil per day. ConocoPhillips put Lookout on hold in 2005 as it worked through the westward expansion permitting issues described above. Now that those issues are resolved, the economics of CD-6 and other Alpine satellites must be reevaluated before proceeding. ConocoPhillips has stated that a key consideration will be favorable changes to the progressivity element of Alaska's severance tax law (ACES).

DEWLINE UNIT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Expected next drilling: First quarter 2013

Expected drilling completion: By May 31, 2014

Expected construction start: Early 2014

Total construction & drilling costs: \$80-110 million

Total time for construction: 2 years

Total construction jobs: 150

Jobs expected during first quarter 2012 development drilling: 100

Jobs expected during 2013 drilling: 100

Jobs expected during road & pipeline construction: 150

Average number operation jobs: 4

Production start/life: 2015, 20 years

Operator: North Dewline LLC, owned by UltraStar Exploration

Location: Just west of Prudhoe Bay unit's Point McIntyre and north of Midnight Sun PAs.

Status: On March 15, the State of Alaska expanded the unit, requiring another well. Must drill N. Dewline No. 1 well by May 31, 2013, and the N. Dewline No. 2 well by May 31, 2014. Leases include: Dewline Lease ADL 389944; North Dewline Lease ADL 390419; Far North Dewline Lease 390608; Storkersen Lease 389943 for total of 4,533 acres.

Development, additional investment: Operator offering percentage interest in three leases to venture capital investors who put up 100 percent of risk capital of \$18-19 million to drill primary production well and sidetrack to casing point through the Ivishak level into lease ADL 390419. A well to this depth would also test Kuparuk and Sag River potential in both primary hole and sidetrack. A successful well or sidetrack will require additional capital to complete and test. If first well and/or planned sidetrack are successful, there will be a need to drill additional development and water injection wells over ensuing five to seven years. In mean reserve case those investments for North Dewline investors are estimated at an additional \$83 million, for project development cost of \$15.10/bbl. At \$80/bbl, the value of the North Dewline investors share of mean case reserves is \$542 million. At \$60/bbl, it is \$244 million, and at \$100/bbl, it is \$678 million. Upside case of 18 million barrels nearly doubles these numbers for little additional cost.

Wells drilled to date by operator: 2009 Dewline No. 1, onshore 9,900-foot vertical well targeted oil in the Ivishak formation.

Second well: In 2012 North Dewline No. 1 would be a 14,000 to 15,000-foot directional well to offshore target from onshore pad, with a 6,000-foot horizontal displacement.

Third well: By May 31, 2014. N. Dewline No. 2 well.

Possible production start date: 2015

Reserves: The range of potential reserves on three leases is 5 million to 20 million barrels of oil, with geological chance factors in 50-70 percent range. There are known accumulations to east and west. Prospects in same fault system as those accumulations. Offsetting wells have been tested at between 350 and 750 bpd at Kuparuk level; 500 to 3,500 bpd from Ivishak. On lease ADL 389943, there is 100 percent chance of having 700,000 to 1 million barrels of oil, as it's the Point Storkersen prospect that was drilled and proved up by Hamilton Brothers in 1969, testing 735 bpd from Ivishak. The economic analysis for development was done on the mean case for reserves, or 11 million barrels.

Noteworthy: Part of unit offshore but all wells can be drilled from onshore locations. State production tax, ACES, allows reimbursement of 45 percent of qualified exploration expenses. Charter for Development obligates North Slope processing facility operators BP and ConocoPhillips to grant access to facilities at "reasonable

commercial terms,” and if parties can't come to agreement, there is provision for expedited, binding arbitration. Another provision obligates BP and ConocoPhillips to purchase oil from small producers with limited balance sheets at Pump Station I, using a pre-agreed pricing mechanism tied to the State's Royalty in Kind (RIK) value of oil.

Prior Wells: The only other well drilled to date in the area now included in the Dewline unit is the Point Storkersen No. 1 well drilled by the Hamilton Brothers in 1969 to a measured depth of 11,473 feet. That well tested an oil target in Sag River formation, flowing at 315 barrels per day and 735 bpd from two different depths in the Ivishak Sandstone.

GREAT BEAR PETROLEUM SHALE SOURCE ROCK DEVELOPMENT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not from the operator.

Drilling of test wells: 2012

Cost of drilling: Unknown

Total drilling jobs: Unknown

Life of project: Up to 80 years

Operator: Great Bear Petroleum LLC

Location: South of Kuparuk and Prudhoe units, brackets the Dalton Highway and the trans-Alaska oil pipeline.

Status: In the October 2010 State of Alaska areawide North Slope lease sale the newly formed independent, which only plans to do business in Alaska, won leases covering approximately 500,000 acres — the maximum it is allowed to hold under Alaska law — containing a chunk of the geologic “kitchen” that generated the 100 billion barrels of oil-in-place that flowed north into traps along the Barrow Arch, such as the Prudhoe Bay, Kuparuk, Alpine and Point Thomson reservoirs. In November 2011 Great Bear announced that Halliburton would be participating in the “test of concept” wells.

Noteworthy: Alaska has three of the most prolific source rocks in the world, stacked one above the other, the deepest and oldest being the Triassic-age Shublik; in the middle the Jurassic-age Kingak shale; and the youngest and shallowest being the Cretaceous-age Hue shale, which is also referred to as the Pebble, HRZ or GRZ shale. At least 100 billion barrels (oil-in-place), a maximum of 20 percent of the crude generated in them, has migrated north to traps along the Barrow Arch on Alaska's northern coast filling the reservoirs of all those fields, which include Alpine, Kuparuk, Prudhoe Bay, and Point Thomson, and spilling over the arch into the reservoirs under the Beaufort and Chukchi seas. Left behind, trapped in the shale source rocks, are approximately 400 billion barrels (oil-in-place). With today's rapidly advancing technology, 5 to 6 percent, or 20-24 billion barrels, of that oil is recoverable. Although Great Bear declines to speculate along these lines, in 2011 at least one expert opined that by now, 7 percent, or 28 billion barrels (oil-in-place) should be technically recoverable. In addition to oil, these same three source rocks also contain huge quantities of natural gas and natural gas liquids that would be extracted as a part of the production process. Great Bear's land position was very well thought out, per State of Alaska geologist Paul Decker, in terms of the availability and maturity of all three source rocks and in its position to the Dalton Highway, allowing the company to truck oil to Prudhoe production facilities from its 2013 test wells, prior to building its own facilities.

KITCHEN LIGHTS UNIT, UPPER COOK INLET EXPLORATION

This data is extrapolated from public and industry sources, not necessarily from the operator.

FIVE-WELL EXPLORATION PROGRAM (FROM ESCOPETA, THE PRIOR OPERATOR)

Corsair prospect exploration, first two wells:

Exploration drilling started: 2011

Construction of first platform start: TBD by drilling results

Total time for drilling: 1 year, depending on demand for rig by other operators

Total exploration drilling jobs: 412

Total cost of exploration: \$60 million

Production start/life: TBD by drilling results, possibly 2014, 30 years

East Kitchen & Kitchen prospects, three wells: Exploration drilling start: 2012 or 2013, depending on demand for rig by other operators

Total time for drilling: 2-3 years, depending on demand for rig by other operators

Total exploration drilling jobs: 412

Total cost of exploration: \$90 million

DEVELOPMENT SCENARIOS FOR FIRST THREE PROSPECTS

Development estimates derived from East Kitchen projections done in 2007 (in 2007 dollars):

Total wells: 48 development wells (30 oil producers including the discovery well, 10 gas producers and 8 water injectors.)

Construction start: 2014

Total time for construction of platform & associated on and offshore facilities: 2 years

Development drilling start: After platform installed, possibly 2016

Total construction & drilling costs: \$660 million

Production start/life: 2016, 30 years

Operator: Furie Operating Alaska (formerly Escopeta)

Location: Upper Cook Inlet. 83,394-acre unit formed in 2009

Status: In 2011, the Houston independent oil and gas company Escopeta Oil Company, LLC, the original operator of the Kitchen Lights Unit (KLU), became Furie Operating Alaska, LLC (Furie) through an acquisition. In late 2010 Escopeta Oil of Alaska, LLC became Cornucopia Oil and Gas Co. LLC via acquisitions and is the majority working interest owner in KLU. Cornucopia Oil and Gas Co, LLC holds a majority working interest in the KLU.

In 2012, the Kitchen Lights Unit received a four-year extension through 2016, and Furie also submitted an amended Plan of Exploration (POE) that reflects its desire to continue responsible exploration of the KLU and future development drilling and production of much needed natural gas reserves.

Furie has successfully brought a jack-up rig into Cook Inlet and drilled KLU No. 1 well to a depth of 8805 feet last fall. In March 2012, Damon Cade, president of Furie Operating Alaska, told the Alaska Senate Resources Committee that his company estimates that the gas resource encountered in its drilling last year amounts to a probable gas reserve of 750 billion cubic feet, with a potential gas production rate of up to 30 million cubic feet per day. Furie is targeting mid-April, 2012 for mobilization of the jack-up rig and plans to re-enter KLU No. 1 well in mid-May. There it plans to drill to depths in the range of 16,000 – 20,000 feet, into the Jurassic. Future plans are to drill either two exploration wells in two undrilled KLU blocks or one exploration well in an undrilled block and one development well. The 2012-2015 POE requires a minimum of five exploratory wells.

Oil and gas prospects in unit: Its first five wells in its Kitchen Lights development plan with the State of Alaska include Corsair, East Kitchen and Kitchen wells, in that order. The Northern Lights prospect is not included in its initial drilling plans.

Water depth: Average water depth in unit is 105 feet.

Jack-up rig: Spartan 151 rig

Approximate cost per Kitchen Lights unit exploration well: \$30 million

Approximate cost per Kitchen Lights development well from platform: \$10 million

Well depths: Wells would extend vertically to depths in the range 16,000 to 20,000 feet into the Jurassic.

Operator must drill into a pre-Tertiary zone, such as the deep Jurassic, to take advantage of certain tax credits available from the state. Department of Revenue Advisory Bulletin 2011-03 limits the usefulness of that particular incentive for expensive wells, and consequently may have little effect on drilling plans. That depth would allow Furie to test both the gas and the deeper oil potential of the region.

Previous wells: The only one of these prospects that has ever been drilled is Corsair, where Shell, Phillips and ARCO drilled a total of five exploration wells between 1962 and 1993. The wells all had gas shows and some also tested for small quantities of oil.

Recoverable reserves: In 2004, current working interest owner and then-operator Escopeta said East Kitchen is a structural trap holding possibly 2.33 trillion cubic feet of gas and 457 million barrels of oil, while Kitchen is a faulted stratigraphic trap with perhaps 9.35 tcf of gas and 829 million barrels of oil. In 2003, Forest said that a pre-drill analysis of the Corsair prospect indicated that the prospect might hold as much as 137 million barrels of oil, split between the Tertiary-age Tyonek and Hemlock formations. The prospect, with 10,000 acres of subsurface closure, might also hold 480 bcf of natural gas, the company said. Mark Landt, whose company has overriding interest in the Northern Lights leases and once was involved with the companies that had it under lease, said in 2003 that the geological data showed these was a potential of finding 104-488 million barrels in Northern Lights.

Noteworthy: Then-operator Escopeta named its offshore prospects Kitchen and East Kitchen, to reflect a view that the prospects lie over the deep center of the Cook Inlet basin, close to the oil source “kitchen” where organic material is cooked into oil. Those estimates, if correct, would make Kitchen Lights the largest Cook Inlet gas and oil play. The gas estimate alone is similar to the recoverable natural gas reserves that ExxonMobil estimates it has in its Point Thomson field, the second largest known gas deposit on Alaska’s North Slope.

Geology: The prospects all lie along a major Tertiary fold structure that extends south-southeast from the ConocoPhillips North Cook Inlet gas field. While many geologists believe there is still a large quantity of

undiscovered natural gas in subtle prospects known as “stratigraphic traps” in the Cook Inlet basin, the prospects in the Kitchen Lights unit represent perhaps the best remaining opportunities in the basin for an especially large oil or gas find. In fact, there is a known oil pool, variously known as Tyonek Deep or Sunfish, underneath the North Cook Inlet gas field and in proximity to the Northern Lights prospect in the Kitchen Lights unit. ARCO and Phillips Petroleum, precursors to ConocoPhillips, drilled the Sunfish prospect in the early 1990s, and later that decade Phillips drilled into Tyonek Deep from its Tyonek offshore platform, the platform for the North Cook Inlet field. In January 1999, having drilled three wells into the oil pool, Phillips pulled the plug on the Tyonek Deep project because of low oil prices.

KUPARUK RIVER PRODUCING UNIT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: ConocoPhillips

Location: About 40 miles west of Prudhoe Bay

First oil: 1981

Peak production: 322,000 bpd in 1992.

Oil produced through end of 2011: 2.4 billion barrels.

Remaining producible oil, excluding heavy oil: 1 billion barrels

Current production from Kuparuk and satellites: In January 2012, produced an average of 122,752 bpd (including satellites but not production from Oooguruk), as compared to 141,000 bpd as of year-end 2009.

Original oil in place (gross): 6 billion barrels

Investment by Kuparuk owners through 2009: More than \$5 billion to develop and implement programs to optimize oil recovery since its start up in 1981.

Drill pads for Kuparuk and all satellites: 46, including 1B, 1C, 1D, 1E, 1J, and 3K which are shared with the West Sak satellite.

Wells by end of 2011: 501 producers, more than 200 water injectors, 165 water alternating gas injectors

Noteworthy: Drill pads reduced from 65-acre pads (original Prudhoe Bay design) to about 11-acre drill sites at Kuparuk. High-performance Beaufortian reservoir of ConocoPhillips Palm discovery on western edge of Kuparuk led to construction of new drill site, 3S, and expansion of Kuparuk River unit. This development serves as reminder of how profitable exploration success close to existing infrastructure can become, with cluster of small satellite fields now operated by BP and ConocoPhillips around major fields of Prudhoe Bay, Kuparuk and Alpine. In 2011 Kuparuk satellites West Sak, Tarn, Meltwater and Tabasco accounted for 35,000 bpd

In-field drilling and development for Kuparuk Participating Area: Using a new Nabors rig CDR2-AC, custom-built rig in 2009, ConocoPhillips implemented a nine-well coiled-tubing drilling program that generated a “peak incremental oil rate” of 4,300 bpd. The company says 21 laterals were drilled. A workover program added 6,000 bpd to Kuparuk’s production. A similar program was initiated in 2010, helping offset, but not reversing the production decline. Conoco says Kuparuk development plan “assumes the current business climate of increased regulation and taxation will continue, increasing field operating costs. For example, the transition to Ultra Low Sulfur Diesel use in 2009 added tens of millions of dollars to Kuparuk’s annual operating costs.” Still, the company anticipates extensive investments, but point out that assumes success in oil tax reform. Seismic analysis has revealed “a significant number of leads for infill or sidetrack drilling,” Conoco said in mid-2010. “Candidate wells developed from these leads will be a mix of “grass root” wells, rotary sidetracks and coiled-tubing sidetracks, depending on the volume of expected oil recovery and the design and operational status of proximal wells,” using the new Nabors rig CDR2-AC, custom-built rig described above. ConocoPhillips is looking at a low-salinity waterflood pilot project using trademarked LoSal process at drill site 2X, with injection possibly starting by 2014. ConocoPhillips expects Kuparuk’s production decline to continue unless changes are made in the state’s production tax to encourage more investment.

Kuparuk satellites: West Sak, Tarn, Meltwater, Tabasco, Palm. West Sak, Tarn are the biggest producers.

West Sak: West Sak is vast viscous oil deposit overlaying Kuparuk field. West Sak produced average of 15,805 bpd in January 2012 and has tallied over 57 million barrels over its lifetime. At end of 2009, field had 44 active producer wells and 46 water injectors on six drill sites. Additional West Sak reservoir potential lies outside current Participating Area; those areas currently being evaluated by operator for development potential. In core area, priority is for pads 1E and 1J to be developed by long-reach, multilaterals. Plans in mid-2010 were to drill first pattern of wells in late 2011 or early 2012. Conoco anticipated beginning development drilling in NEWS area of West Sak in 2011, with possible new drill site, but these plans have not been approved.

Tarn and new South Tarn development: Daily average production peaked in December 2002 at 36,879 bpd. Producing less than 10,000 bpd in January 2011, with average water cut of above 68 percent. As of July 2010, 63 wells drilled in and near Tarn pool: six exploratory wells, 18 injectors, 39 oil producers. Pool developed on 10-acre spacing. Four of six new wells finished in last part of 2010 and early 2011 in South Tarn, but losing Doyon 15 rig per agreement with Eni. ConocoPhillips said in mid-2010 about Tarn: "More than 15 new wells and sidetracks could be drilled as part of a future infill and peripheral development drilling program. Targeted areas include the thinner distal lobes that previously were considered uneconomic." The two Tarn wells drilled in first part of 2011 were horizontal wells with multistage fracs.

Meltwater: About 10 miles south of Tarn, Meltwater began production in 2001; produced 3,291 bpd in January 2012 from recoverable reserves of 31-52 million barrels. 19 wells on single drill site; over its lifetime has produced slightly more than 16 million barrels of original oil in place of 222 million barrels. Challenging because of sand bodies "highly discontinuous with structural barriers that limit fluid movement through the reservoir," ConocoPhillips said in mid-2010, noting Meltwater "shows a large incremental target for additional development." 3-D seismic survey completed in 2008, and "horizontal or undulating wells to help connect multiple reservoir sands will be considered." Rumor has it unit expansion might occur in six leases that fill un-unitized fairway between Kuparuk and Meltwater satellite; leases expiring Jan. 31, 2012. In December 2010 state records show ConocoPhillips transferred a 0.3648 percent working interest and a 0.304 percent royalty interest in those six leases to ExxonMobil, which is reportedly willing to help fund development drilling.

Tabasco: Heavy oil field on Kuparuk's western flank, has 12 development wells and produced 1,370 bpd in January 2012. Since startup in 1998 it has produced almost 17 million barrels. In mid-2010 Conoco said geological and reservoir simulation models will help "evaluate alternative recovery strategies and additional development opportunities" for Tabasco, which it now waterfloods.

Capital budget: Total ConocoPhillips \$900 million capital budget announced for Alaska in 2012, was about the same as the budget for 2011, though what it spends will be greatly influenced on what its partners, are willing to approve for their share of project funding, which was a problem in 2010 when Conoco budgeted \$854 million, but only spent \$730 million. Spending will be directed toward development of existing Prudhoe Bay and Kuparuk fields, as well as the Western North Slope, the company said.

Jobs today: 1,000 people work for ConocoPhillips in Anchorage, excluding contractors, a chunk of those people also work on Alpine and its satellites, as well as Conoco's plans for the OCS.

Exploration: In a year when all the attention is focused on the new entrants' exploration plans, ConocoPhillips drilled the Sharks Tooth No. 1 exploration well in the southeast corner of the Kuparuk Unit. The drillsite was accessed by an ice road of approximately 4 miles from the 2K drillpad.

Working interest owners: ConocoPhillips 55.2 percent, BP 39.2 percent, Chevron 5.0 percent, ExxonMobil 0.6 percent.

Challenges: During 2009, Kuparuk imported an average of 18,391 bpd of Prudhoe natural gas liquids to make miscible injectant, which greatly enhances production. Kuparuk faces a looming problem — insufficient natural gas. Field gas production is expected to decline significantly in coming years, which will leave Kuparuk short of gas for enhanced oil recovery and to fuel field operations. "The most technically feasible known alternative gas source is Prudhoe Bay," ConocoPhillips said in mid-2010. Prudhoe, unlike Kuparuk, has a vast gas cap. Most likely, gas imports from Prudhoe Bay will begin around 2015.

LIBERTY DEVELOPMENT, BEAUFORT SEA OCS, OFF CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Development drilling start: 2013 or later

Total development drilling costs: \$600,000

Total time for development drilling: 2-plus years

Total development drilling jobs: 170 on rig, 30 other for total of 200

Average number operation jobs: 12

Production start/life: 2013, 30 years

Operator: BP

Location: Beaufort Sea outer continental shelf (OCS) approximately 15 miles east of Prudhoe Bay, 8 miles east of Endicott Island.

Status: Unitized. BP has halted rig construction to divert resources to review design and engineering of giant Parker drilling rig that was special built for Liberty. Company moved earlier start-up date of spring 2010, then 2011 and 2012, out to 2013.

Seismic: 3-D seismic data acquired winter 1995-96. In 2008 seismic survey, BP commissioned Savant to log subsurface above oil prospect in Kupcake well that Savant drilled near Liberty. BP's 2008 seismic program investigated subsurface rock formations along the proposed drilling corridor from Endicott to the Liberty oil field.
Drill site: Drilling will be from completed extension of Endicott satellite drilling island, using ultra-extended reach wells by one of most powerful rigs in world, \$200 million Parker rig designed to drill eight-mile-long directional wells.

Wells drilled by others in the prospect: Shell originally drilled two wells in 1982 and one well in 1987 in Tern prospect within Liberty prospect area. Shell found evidence of producible hydrocarbons in 1987 well, but subsequently dropped leases.

Wells drilled by current operator through end of 2010: One. In 1997 BP discovered Liberty accumulation when drilling an exploration well from Tern gravel island.

Wells drilled in future: Plan involves drilling of up to four ultra-extended reach production wells and up to two water injection wells.

Production facilities: Production will utilize existing Endicott facilities and pipelines.

Expected production start date: 2013 or later

Production: Plateau production rate 40,000 bpd.

Noteworthy about Liberty: Producing the oil through these long-reach wells eliminates the need for construction of new facilities, an offshore drilling island and subsea oil pipeline.

Recoverable reserves: 100 million barrels.

Working interest owners: BP is sole owner.

Challenges to exploration and development: Requires record-setting ultra-extended reach up to eight miles. The uncertainty in this project comes from technology — rig might not work.

MILNE POINT PRODUCING UNIT, NORTHSTAR PRODUCING UNIT, AND ENDICOTT PRODUCING UNIT, NORTHERN NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: BP

Location: Milne Point is to the north of Kuparuk drawing on reservoirs that are both onshore and offshore. Northstar is north of Prudhoe Bay – so far north that it is entirely offshore, produced from an island and including significant federal OCS acreage. Endicott is also produced from an offshore island to the northeast of Prudhoe Bay.

Production: These three units combined are producing about 40,000 barrels per day (in January of 2012); cumulatively they have produced more than 900 million barrels, and may reach a billion. Milne Point was first brought on line in the eighties, and in January 2012 produced about 20,000 barrels per day, a little under half its peak production. Endicott came on line in 1987 producing over 100,000 barrels per day into the earlier nineties, but is now around 10,000 barrels per day. Northstar began production in 2001, and its current 12,500 barrels per day compares to about 66,000 barrels per day at its peak.

Original Oil in Place: At Milne Point 3.1 Billion barrels. At Northstar 310 million barrels. At Endicott 1 billion barrels.

Milne Point heavy oil project: Milne Point was the site of the first North Slope CHOPS program – or “cold heavy production with sand.” In 2008 a test program produced several hundred barrels of oil. The pilot program that grew from that involved building a special heavy oil processing facility and — targeting the Ugnu heavy oil deposits — drilling two CHOPS wells and two additional wells with downhole artificial lift. In 2011 the first production from this \$100 million dollar project began from one of these horizontal wells. BP anticipates three to five years of production from this pilot program. The Ugnu is estimated to hold 20 billion barrels of original oil in place. Even a 10 percent recovery rate would generate billions of barrels of additional oil.

Endicott Islands The Endicott production facilities are on two artificial islands set in about 30 feet of water. There is a causeway connecting the islands to the shore. The Liberty prospect will be drilled with extended reach wells drilled from Endicott Island.

Wells (as of 2011): Milne Point 138 oil producers, 92 Gas, Water or WAG (water alternating gas) injectors Northstar 19 oil producers, 8 injectors, Endicott 60 producers, 26 injectors.

Northstar Pipeline: The Northstar island is in about 39 feet of water. There is no causeway to the land; instead the oil flows through a 6-mile sub-sea pipeline. Unlike Gulf of Mexico subsea pipelines, ice scouring or gouging is perceived as one of the biggest risks for the pipeline, so it is buried at several times the depth of the deepest observed ice scours.

Ownership: BP has over 98 percent of both NorthStar and Milne Point, while ExxonMobil (roughly 21 percent) and Chevron (roughly 10.5 percent) and several other smaller owners have interests in Endicott.

Satellites: There are two small satellites at Endicott, Eider which is no longer producing and Sag Delta North, that produces several hundred barrels a day.

MUSTANG PAD DEVELOPMENT IN THE SOUTHERN MILUVEACH UNIT (FORMERLY NORTH TARN), CENTRAL NORTH SLOPE PROSPECT

This data is extrapolated from public and industry sources, not necessarily from the operator.

Construction & development drilling start: Winter 2011-12

Total construction costs: \$200 million for micro-processing facility, pipeline and a permanent pad.

Total time for construction and development drilling: 2 years

Total development drilling costs: Spending \$17.5 million right in 2011-2012 season. Another 13 wells \$200 million.

Peak construction and development drilling jobs: 250

Average number operation jobs: 16

Production start/life: 2013, 20-30 years

Operator: Brooks Range Petroleum Corp.

Location: Alaska North Slope, adjacent to west side of Kuparuk River unit, near Miluveach River, just north of the Alpine pipeline.

Status: BRPC formed the Southern Miluveach unit, covering 8,960 acres over leases held by its joint venture partners. BRPC committed to two exploration wells and sanctioning development by the end of 2012. This unit is just the southeastern corner of the area that BRPC had applied for to be a much larger unit. However DNR approved two smaller units within the applied for acreage with the Kachemach unit to the west. BRPC must drill two wells in the Kachemach by 2013 to preserve the unit.

Drill site, pad description, location: Ice pad two miles west of Kuparuk River unit, with four-mile ice road connecting pad to drill site 2M in KRU.

Rig to be used in winter 2011-12: Nabors 7ES

No. of wells drilled by BRPC: In March 2011, North Tarn No. 1 reached a 6,440 foot measured well depth. Q1 2012 – North Tarn No. 1A sidetrack and Mustang No. 1 were drilled.

Seismic: Acquired 3D seismic and currently reprocessing

Capital budget for 2012: \$30 million

Cost estimated for field facility and pipeline construction: \$200 million

Approximately cost per well: \$15 million

Peak production expected: 15,000 bpod.

Recoverable reserves: 2008 seismic produced 16 leads — 10- 20 million, some 30-40 million barrels of oil in size.

Noteworthy about prospect: This prospect had the only exploration wells drilled on the North Slope over the winter of 2011-12. Because of closeness to Alpine pipeline, doesn't need to be huge to be economic. "We think we could get there with a discovery in the Kuparuk at that 6 million barrel number," company executive Jim Winegarner told Petroleum News in 2010.

Facilities if and when sanctioned: If BRPC makes commercial discovery, partners will likely build dedicated micro-processing facility to bring crude oil to sales quality. Mustang Pad's location, one mile from Alpine pipeline, greatly improves economics.

Working interest owners: BRPC is leasehold operator on behalf of its parent company, Kansas-based Alaska Venture Capital Group (AVCG), as well as partner Ramshorn Investments

Geologic targets Kuparuk is main formation at Kuparuk unit, which has produced over 2.2 billion barrels of oil to date.

Primary contractors during exploration & development drilling: Nabors Alaska Drilling and Peak Oilfield Services Halliburton, ASRC

Challenges to exploration and development: Resource size.

NIKAITCHUQ PRODUCING UNIT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Construction of offshore drill site at Spy Island: Completed as of winter 2011

Total construction & drilling costs: \$2 billion

Total construction jobs: 400

Development drilling: Under way, balance of 40 wells to be drilled by 2014 (12 already drilled)

Total development drilling jobs: 125

Average number operation jobs: 40

Production start/life: Jan. 30, 2011, 30 years

Operator: Eni US Operating Co. Inc.

Working Interest Owner: Eni Petroleum US LLC (100 percent)

Location: Immediately north of Kuparuk unit and northeast of Oooguruk unit, nearshore Alaska's North Slope in Beaufort Sea.

Status: Unitized, has pool rules for Schrader Bluff oil pool from AOGCC.

Water depth: 9 to 10 feet of water

First oil: Jan. 30, 2011

Peak production: anticipated to be 28,000 barrels of oil per day (bopd).

Current production: 7,315 bopd (January 2012) (not including Oooguruk production)

Recoverable reserves: 220 million barrels of oil.

Processing: Oliktok Point processing facility can handle up to 40,000 bpd of heavy crude with sand and up to 120,000 bpd of water, allowing Eni to ship sales-quality oil down trans-Alaska oil pipeline. Eni has other leases in OCS offshore from Nikaitchuq, that they are looking at developing that could utilize the Nikaitchuq processing facility, which can be expanded.

Drill sites: Eni developing unit through combination of onshore and offshore drill sites. Production began from onshore pad; currently building offshore drill site at Spy Island.

No. of wells: 23 of the 52 extended reach wells have been drilled as of March 2012; 26 of the 52 will be producers, 21 water injectors, 3 water source wells and 2 disposal wells, with 24 wells drilled from onshore and 28 from offshore. Balance of wells to be drilled by end of 2014.

Drill rigs: Oliktok Point Nabors rig 245-E; Spy Island Doyon 15.

Capital expenditure to develop: \$2 billion

Noteworthy: Third company to operate production facilities on Alaska's North Slope; other production facility operators are BP and ConocoPhillips. Eni considers some of the Nikaitchuq wells, drilled using proprietary technology, to be "leading-edge," because they extend 4,000 feet vertically and up to 20,000 feet horizontally.

Pipelines (completed in 2010): Pipeline bundle carries oil from Spy Island drill site to Oliktok Point processing facilities. Bundle includes 18-by-14-inch production flowline, 12-inch water injection flowline and 6-inch spare flowline. Fiber optic cable and power cable part of bundle. 10-inch export pipeline carries processed oil from Oliktok processing plant to Kuparuk pipeline.

Primary construction/development contractors: INTECSEA, pre-FEED and FEED contractor for subsea pipeline; Nanuq, offshore gravel island constructor; H.C. Price, pipelines contractor; ASRC Energy Services, support services provider; ATCO, on-site camp constructor.

Natural gas: Produces only enough for in-field use.

Commercial life of unit: 30-plus years.

Reservoirs: Eni first targeting deeper Schrader Bluff OA sand; will decide whether to develop shallower Schrader Bluff N sand (bigger accumulation) and minor light oil accumulation in low quality Triassic Sag River sandstones based on drilling and seismic results.

Challenges: The challenge at Nikaitchuq is that it is a marginally economic field based on viscous oil development.

NUNA PROJECT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Nuna Project: Onshore development of Torok from outside of Oooguruk unit

Location: The Nuna Project is south and southwest of the Oooguruk unit boundary on the eastern bank of the Colville River. The Nuna Project, which began with a 2012 appraisal well from a drill site just outside the unit boundary, seeks to produce liquids from the Torok formation, which is within the existing Oooguruk unit. A second well site is being evaluated. Although it is also onshore, it is within the unit boundary. The rest of Oooguruk unit production is from wells on an artificial island in the Beaufort Sea.

Operator: Pioneer Natural Resources Alaska

Status: Oooguruk is already unitized. Pioneer has stated that Nuna sanctioning will not occur until completion of appraisal work offshore and receipt of major agency approvals – according to its unit expansion agreement with

the state it has until June, 2014 to make the sanctioning decision. Initial development targeted and drilled the northern area of the Torok pool, reachable from the existing Oooguruk offshore drill site. Wells, including injectors, were hydraulically fracture-stimulated to enhance productivity and improve vertical injection sweep. The initial development served as a pilot flood of the Torok and provided critical performance and injection data. As of April 2012, Pioneer has filed a plan of development that envisions the first pad finished in 2013 with drilling continuing through 2018.

Appraisal and Exploration Drilling within Oooguruk unit: 2011-12, 1 well

Development onshore drilling in core area of Torok start: Winter 2012-13

Development drilling end: Winter 2014-18

No. of wells for appraisal & development drilling: 15- 20, all extended reach horizontals

Total time for construction: 2 years, 2013-15

Total construction & development drilling costs: \$400-450 million.

Total appraisal & drilling jobs: 100-225 for four months and 20 jobs for year round drilling

Total construction jobs: 250

Average number operation jobs: 16

Production start/life: 2015, 20-30 years

Onshore drill sites for proposed Nuna development: 1-2 new drill sites on eastern bank of Colville River. Second potential tie-in pad adjacent to KRU drill site 3S (DS-3S).

Peak unit production: Approximately 15,000-20,000 bpd.

Peak unit Torok production: Pioneer said there is considerable uncertainty in production rates for the Oooguruk-Torok pool given limited data on well performance and uncertainty in drilling time, but the company estimates that over the project life of 20 to 30 years production could average from 4,000 to 9,000 bpd, with a peak production rate of 7,000 to 15,000 bpd.

Nuna infrastructure: Utility service, including water, gas, and power, would be provided on elevated flowlines from OTP to drill sites via DS-3S. Drill sites would be connected to DS-3S by gravel roads. 3-phase production transported for processing to KRU via flowline tie-in at DS-3S, where the oil will be produced.

Working interest owners of Oooguruk: Pioneer Natural Resources 70 percent; Eni 30 percent.

For more details see the Oooguruk Producing Unit section

OOOGURUK PRODUCING UNIT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Ongoing development drilling in Oooguruk unit, same every year through 2018: \$120 million per year, 4-5 wells, 125 jobs.

Operator: Pioneer Natural Resources Alaska

Location: Oooguruk is northwest of Oliktok Point, in the Beaufort Sea's Harrison Bay, northwest of Kuparuk unit. Onshore proposed Nuna project is south and southwest of Oooguruk unit boundary on eastern bank of Colville River, stretches under river delta.

Water depth: 4 to 5 feet of water. (note: the Nuna pad would be onshore.)

First oil from main Oooguruk unit: June 2008

Current Offshore existing drill site: Oooguruk is a six-acre artificial gravel island northeast of the mouth of the Colville River and 5.7 miles from shore, with facilities for development drilling and field operations.

Number of wells in initial unit plan: About 40 horizontal wells, approximately half producers, half injection.

Capital expenditure: Approximately \$1 billion through end of 2011.

Peak unit production: Approximately 15,000-20,000 bpd.

Noteworthy: Pioneer Natural Resources, Alaska was the first independent to operate a producing field on Alaska's North Slope. Crude is processed at Kuparuk River unit (KRU) under facility sharing agreement with KRU.

Recoverable reserves in unit: 120-150 million barrels of oil equivalent (boe); 29 million boe proved up in 2010. (In filings Pioneer gives only its net oil; these numbers include Eni's portion.)

Oil in place in core area in this onshore project: Some 7,000 acres with 290 million barrels of original oil in place (OOIP); an expansion area of some 15,000 acres, 350 million barrels of OOIP.

Pipelines: Produced fluids are gathered and transported to shore in buried subsea 3-phase flowline, which on shore transitions to above-ground insulated line. 12-inch subsea flowline sits within 16-inch pipe that provides leak detection, secondary containment.

Working interest owners of Oooguruk: Pioneer Natural Resources 70 percent; Eni 30 percent.

Commercial life of Oooguruk unit: 30-plus years from startup.

Reservoirs: Jurassic Nuiqsut sandstone, Kuparuk C sandstone and Torok. (See the Nuna project for the production from the Torok pool.)

Challenges: Commercial uncertainties surrounding availability and deliverability of water to unit for enhanced recovery, high lease and severance tax burdens and competing for funds against high rate of returns in source rock (shale) plays Pioneer invested in outside Alaska.

CHUKCHI SEA AND BEAUFORT SEA, OUTER CONTINENTAL SHELF

This data is extrapolated from public and industry sources, not necessarily from the operator.

Ongoing exploration drilling in Chukchi and Beaufort, same every year through 2015: 3-5 wells, 1,200 to 1,600 jobs.

Ongoing development drilling & infrastructure development 2016-2022: 1,700 to 4,800 jobs

Operator: Shell Exploration and Production Company

Location: Chukchi Sea Burger Prospect, 80 miles offshore; Beaufort Sea Sivulliq prospect and Torpedo Prospect

Water depth: Under 160 feet

Capital expenditure: Unknown

Noteworthy: The Outer Continental Shelf waters off Alaska's northern coastline encompass the Chukchi Sea and the Beaufort Sea. Resource estimates by the U.S. Minerals Management Service projects 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 the \$44 million bid in 2005 for 84 leases in the Beaufort Sea. Since 2008, Shell has proposed several drilling plans that have all been challenged by various interest groups during the various permitting processes and in a number of cases in court. Beginning in the fall of 2011, Shell was successful in overcoming a number of these challenges and now appears on track to perform its first exploration drilling in July, 2012. Shell's stated plan calls for 2 exploration wells drilled in the Beaufort Sea and up to 3 exploration wells drilled in the Chukchi Sea.

Reservoirs: The Chukchi Sea Burger prospect contains a known natural gas pool with an estimated at 14 trillion cubic feet in size. Shell thinks that the Burger structure may also hold a substantial amount of undiscovered oil. The Beaufort Sea Sivulliq prospect, which used to be known as Hammerhead, contains a known oil pool estimated at 200 million barrels. Shell has not released any information about the resource potential of the Torpedo prospect.

Challenges: Limited summer/fall drilling season will constrain exploration drilling due to ice conditions existing the rest of the year. Significant lack of regional infrastructure will require mobilization of large sealift capacity to provide adequate support services for drilling operations and to maintain adequate spill response and well capping capacities on-site during drilling operations. Controversy over the potential environmental impacts of Arctic offshore drilling continues to drive litigation against Shell's Alaska program, with the litigation leading to significant uncertainty over the speed and extent with which Shell can progress its plans.

POINT THOMSON UNIT, EASTERN NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Construction start: 2008

PTU-15 and PTU-16 completion: 2010

Production start: 2015-2016 winter season (pending requisite permits)

Operator: ExxonMobil

Location: On state acreage along remote Beaufort Sea shoreline approximately 60 miles east of Prudhoe Bay and 60 miles west of the village of Kaktovik.

Status: On March 30, 2012, Gov. Sean Parnell announced that settlement of the dispute concerning the Point Thomson unit and associated leases had been reached between the state of Alaska and Point Thomson's working interest owners. The Settlement Agreement, which was registered with the Alaska Superior Court on March 29, 2012, includes several provisions that the owners must fulfill in order to retain their right to the leases.

These obligations include bringing the Initial Production System (IPS) – which includes the two existing wells drilled in 2009-2010, as well as gas cycling facilities designed to process 200 million standard cubic feet per day (MMSCFD) of natural gas – into production by the 2015-16 winter season (pending requisite permits) and adding a third production well by the 2016-2017 winter season. Initial development also includes constructing a 12-inch carbon steel export pipeline and connecting to the Badami export line 22 miles to the west for feeding gas condensate liquids into the Trans Alaska Pipeline System. The owners must also continue the permitting process

for the Point Thomson project as described in ExxonMobil permit application – three drilling pads and five wells – and analyzed in the Draft Environmental Impact Statement (a necessary component of the permitting process that is issued by the U.S. Army Corps of Engineers) for additional wells as may be needed to keep the IPS fully loaded with gas.

Following completion of the IPS, there are three optional development scenarios set out in the Settlement Agreement, including:

- An IPS gas cycling expansion project that would add between 10,000 and 20,000 BPD of condensate, depending on the technology employed.
- A major gas sale (MGS) that would move 4 to 5 MMSCFD of North Slope natural gas to market.
- A Point Thomson unit blow down / Prudhoe Bay unit injection project that would enhance Prudhoe Bay oil recovery.

Commitment by the owners to any of these options prior to year-end 2019 will result in full retention of the Point Thomson acreage, as specified in the Settlement Agreement.

Currently, detailed engineering, contracting and procurement of long-lead equipment are under way for the IPS. Pending completion of the Environmental Impact Statement and issuance of required permits, start-up of the initial development at Point Thomson is expected during the 2015-16 winter season.

Unit formed: 1977

Leases: When it was first formed in 1977 the unit included 18 leases covering 40,768 acres. Over time the unit grew to 45 leases encompassing 106,201 acres.

History: Hydrocarbons were first discovered in 1975 with the Alaska State A-1 well, which tested a zone of the lower Tertiary Flaxman sand and flowed at a rate of 2,507 BPD and 2.2 million cubic feet of gas. A second discovery well, the Point Thomson Unit No. 1, was drilled in 1977 and conducted flow tests in the Lower Cretaceous Thomson sand. One test yielded 2,283 BPD and 13.3 million cubic feet of gas. Six more wells were drilled over the next seven years to delineate the two discoveries. In the process, other hydrocarbon reservoirs were encountered. In 1994, BP and Chevron drilled the Sourdough No. 2 well targeting Brookian sands of the Canning formation in the southern portion of the Point Thomson unit, and followed up with the Sourdough No. 3 well in 1996. In a 1997 press release, BP announced a discovery of potentially 100 million barrels of recoverable oil. Altogether, 17 wells were drilled within the boundaries of the PTU between 1975 and 1996. State officials certified seven wells as “capable of producing oil or gas in paying quantities,” a legally significant designation.

Development planning at Point Thomson, dating back to 1983 was challenged by the lack of infrastructure to produce and transport natural gas, coupled with technology limitations to drill the abnormally pressured, retrograde condensate reservoir located largely offshore under the Beaufort Sea.

Wells drilled in 2009-2010: The two wells anticipated to come into production, PTU-15 and PTU-16, were drilled to a measured depth of more than 16,000 feet. The shore-based Nabors 27-E rig drilled directionally under the Beaufort Sea to the targeted reservoir more than 1.5 miles offshore. A relevant 60-mile ice road from Endicott to Point Thomson was constructed for the project.

Additional wells: A third production well will be drilled from a new pad located west of the existing wells. Drilling will commence in 2015 and is anticipated to be completed by the 2016-2017 winter season. Because the Settlement Agreement for Point Thomson requires the IPS to remain fully loaded with gas, ExxonMobil’s permit application includes two additional delineation/production wells, one of which will be located on an existing pad located east of the existing wells while the other may be located on any of the pads, as needed.

Cost estimated for initial development: The combination of scheduling delays, improved project definition and market trends has led to upward cost pressures. Currently, the Environmental Impact Statement process is being led by the U.S. Army Corps of Engineers and the resulting permitted project could have additional impacts on the cost. That work is continuing.

Capital expenditures through 2012: Since construction started in 2008, approximately \$1 billion has been invested in Point Thomson.

Expected start date: Pending approval of the Environmental Impact Statement and other required permits, start-up of the initial development at Point Thomson is anticipated during the 2015-16 winter season.

Daily production expected from the IPS: Up to 10,000 BPD of condensate to be shipped down the Trans Alaska Pipeline System.

Total estimated recoverable reserves: 8 trillion cubic feet of natural gas, 200 million barrels of condensate, excluding non-Thomson sands reservoirs.

Major working interest owners: Exxon Mobil Oil Corporation, ConocoPhillips Alaska, Inc., and BP Exploration (Alaska) Inc.

Geologic targets: Well log and production or drill stem test data indicate that much of the Point Thomson geographic area is underlain by the Cretaceous (Neocomian) Thomson sand that contains abundant natural gas and hydrocarbon liquids in the form of gas condensate, ranging from 35° to 45° American Petroleum Institute (API) gravity. In addition to gas and condensate, the Thomson sand also contains a thin and potentially discontinuous oil-rim at the bottom of the reservoir interval that has tested oil as high as 18° API gravity. The Point Thomson area contains the potential of oil in the shallower Tertiary Brookian reservoirs. Another potential productive reservoir is composed of carbonates and bedded metasedimentary strata in the 'Pre-Mississippian' basement below the Thomson sand reservoir.

PRUDHOE BAY PRODUCING UNIT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: BP Exploration (Alaska) Inc.

BP on exploration: In April 2011, BP President John Minge said the company knew of 5 billion barrels of resources. "Our focus is not on finding more, but finding ways to develop the huge volumes that we have already found."

Location: Central North Slope of Alaska, 400 miles north of Fairbanks, 250 miles north of Arctic Circle, 1,200 miles from North Pole.

First oil: Prudhoe Bay was discovered in 1968 and came online June 20, 1977. Production averaged more than 1.5 million barrels of oil and gas liquids per day for more than a decade.

Oil produced from Prudhoe field through end of 2012: 12 billion barrels from Prudhoe reservoir; 13 billion barrels from Greater Prudhoe Bay area, including satellites Orion, Polaris, Aurora, Midnight Sun and Borealis, as well as Lisburne, Point McIntyre and Niakuk.

Recoverable oil and gas: When production started at the Prudhoe Bay field the recovery rate of the 25 billion barrels of oil in place was expected to reach 40 percent. By 2009, using new technologies that estimate has increased to more than 60 percent, leaving 2 billion barrels of conventional oil (excluding heavy oil) still recoverable and 26 tcf of natural gas.

Constraints: Prudhoe Bay is becoming "gas constrained" that is its ability to produce oil is constrained by the amount of gas that it has to handle and the kit that it has in place to handle.

Current production (January 2012) from Prudhoe and satellites Aurora, Borealis, Midnight Sun, Orion and Polaris: 296,203 bpd (One year ago – February 2011 it was 327,924 bpd.)

Oil in place for satellites: Orion 1.2 billion barrels, Polaris 500,000 barrels, Aurora 100,000 barrels, Midnight Sun 600,000 barrels; Borealis 100,000 barrels.

Current production (January 2012) from Lisburne, Point McIntyre and Niakuk, part of greater Prudhoe Bay: 28,524 (One year ago – February 2011 it was 33,672 bpd)

Status: Unitized. Satellites currently producing (liquids processed through Prudhoe's main facilities) are: Aurora and Borealis fields, which produce from similar formations; Midnight Sun, which produces from sandstone formation at 8,000 feet below sea level, and; Orion and Polaris fields, which both produce viscous oil from Schrader Bluff formation, at depths of 4,000 to 5,000 feet below sea level.

Noteworthy: Largest oil field in North America.

Number of wells by end of 2010 in Prudhoe and 5 satellites: 1,500-plus

Number of wells in 2011: Similar to 2010, with about 20 rotary drilling penetrations and almost 40 coiled tubing penetrations.

Number of wells in 2012 and beyond: BP is looking to add a seventh rig at Prudhoe in 2012 and a rig at Milne Point. After the last oil spill, when BP temporarily halted production, a lot more Milne wells than expected would not come back online, typical with Milne. The rig at Prudhoe is likely dependent on State of Alaska production tax changes.

Investment by Prudhoe owners through 2009: Development of Prudhoe Bay and the transportation system necessary to move its crude oil to market cost more than \$40 billion, which includes the recent addition of 4 modern, Alaska-class double-hulled tankers by BP.

Capital and operational spending for BP in Alaska in 2012: In November 2010, BP laid out an \$800 million capital budget (down about 20 percent from 2009, which was about 33 percent above 2008) and a \$1.3 billion operating budget for Alaska in 2011, describing both as "broadly flat" from 2010. BP said capital budget roughly

split in equal thirds, between infrastructure renewal; drilling to sustain base which offsets and mitigates production decline; and growth projects, primarily Liberty, a new field being developed in Beaufort Sea OCS. At “Meet Alaska,” BP President Minge stated that the 2012 capital budget would be about \$660 million. Although no details were given, in that same speech he stated that 40 percent is going to infrastructure maintenance and renewal because “Safety and operational risk management is our first priority.” An additional 25 percent is going to advancing technologies and the challenging projects around heavy oil, viscous and gas. The remaining 35 percent is for drilling, well work, equipment, seismic and the like. Since BP is only a 26 percent owner of the PBU, spending on that unit is more driven by ExxonMobil and ConocoPhillips.

Cost of wells: In neighborhood of \$6 million on average; a multilateral off of that is anywhere from \$2.5 million to \$3 million, per 2009 numbers from BP.

Employees, company and contractor, today: More than 2,000 full-time employees (including contractors) involved in Prudhoe operation, with 300 of those jobs adding to oil production volumes through techniques such as perforating wells and stimulating the oil reservoir. Presumably at least half the jobs are dedicated to Prudhoe infrastructure renewal.

Employees, company and contractor, over next 10 years: Expected to stay about the same for infrastructure renewal and drilling to sustain base, which offsets and mitigates production decline. Growth project capital investment could increase, depending on technological success with heavy and viscous oil projects.

Remaining commercial life: “At the start of the 1980s, the field was expected to last about 30 years,” Howard Mayson, BP’s vice president of technology, said in 2009. “There could easily be another 50 years to go. It’s very long-legged, and a lot of that is down to technology.”

Infrastructure renewal: Upgrading of unit’s pipeline infrastructure got under way in 2006. BP completed replacing 16 miles of oil transit lines in late 2008. The project, which cost \$500 million, included rebuilding main Prudhoe Bay oil delivery system, pigging modules, corrosion inhibitor injection facilities, state-of-the-art leak detection, metering facilities and all the affiliated electrical and emergency systems. But Greater Prudhoe Bay has more than 1,600 miles of pipelines and a significant effort since 2006 has been put into evaluating, inspecting and understanding long-term pipeline requirements. Right-sizing critical pipelines will involve replacing some lines, upgrading others and abandoning some. **Second step of field renewal** is also under way: the upgrade of the automation, fire protection and gas handling facilities. Upgrades will recognize advances in electronic and computer technology since field was built in 1970s. **Third step of field renewal** also under way—planning and engineering design work for modernization of field facilities, including possible installation of facilities designed for gas production if North Slope gas line is built. For example, supplying sufficient electrical power to operate new facilities, including enhanced oil recovery programs or heavy oil facilities, will likely require replacement of Prudhoe Bay power plant, the largest power plant in Alaska. Facilities consolidation, roads and pads consolidation, and similar types of longer-term renewal, is largely dependent on what the future holds with regards to gas and additional oil development.

Reservoirs: Prudhoe Bay produces from the Sadlerochit sandstone formation, nearly 9,000 feet below sea level. The oil-bearing column is 500 feet thick in some areas. The main reservoir is the 450-foot thick Permo-Triassic Ivishak formation, with the much thinner Sag River formation forming a second reservoir above the Ivishak.

Interesting tidbit: BP has been working with Halliburton to test new tool for downhole separation and re-injection of gas, with field testing expected by mid-2012.

Working interest owners: BP holds a 26.36 percent working interest in the Prudhoe Bay unit, ExxonMobil owns 36.40 percent, ConocoPhillips owns 36.08 percent, and Chevron holds 1.16 percent.

REPSOL/ARMSTRONG/GMT PROSPECTS, CENTRAL NORTH SLOPE, ON AND OFFSHORE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Exploration start: Winter 2011-12

Total exploration costs: \$768 million (minimum)

Total time for exploration: 3-plus years

Total exploration jobs: 550 (about 4 months per year), 45 of those annual positions

Combined development drilling and construction investment: Potentially up to 12 fields, 30-250 million barrels, \$9-plus billion, dependent on geological success and tax structure

Construction start: 2012-13

Peak construction jobs: 200-650 jobs per year for an average of two years each for each of potentially 12 fields

Average number operation jobs: Does not apply

Production start/life: Potentially as soon as 2016 for first field, each field 20-30 years

Operator: Repsol

Acreage: 494,211 acres (2,000 square kilometers) on Alaska's North Slope and nearshore Beaufort Sea, including large areas south of the Kuparuk River unit, in the White Hills area and near the Ooguruk unit. All of GMT Exploration LLC's and 70 & 148 leases were included in the transaction, including recent sale acreage that has not yet been assigned.

Investment: "Minimum exposure" of \$768 million for multiyear drilling program.

Prospects: "More than a dozen ideas outside of existing producing units" on project list, in many cases companies know oil is in place.

Average cost per well: \$5-30 million, depending on depth and location and well design

Recoverable reserves: possibly 1.5 billion barrels

Working interest owners: Repsol holds a 70 percent working interest in the acreage; the remaining 30 percent is 75 percent held by Armstrong and 25 percent by GMT.

Geologic targets: Multiple

Operational challenges to exploration and development: Although the project had originally hoped to drill 15 wells over the winter of 2012-2013, the scope was narrowed to nine during the permitting process. On February 15, two of those wells Kachemach No. 1 and Qugruk No. 2 were being drilled. The Qugruk well hit an unexpected pocket of gas and although no hydrocarbons were reported as spilling, 42,000 gallons of drilling muds were ejected from the well. All operations were suspended while the situation was evaluated. Subsequently work was resumed on the Kachemach well, while Qugruk No. 2 will be plugged and abandoned though it is possible that Repsol will drill in that area again. As of April 2012, Repsol had completed the Kachemach well, and re-permitted and completed the Qugruk No. 4 well.

Economic challenges to exploration and development: Repsol and its partners have indicated that tax reform would encourage additional capital investment in Alaska. In 2011, just three weeks before the long-awaited deal closed with Repsol, Armstrong Vice President Ed Kerr submitted a letter to the co-chairs of the Alaska Legislature's House Resources Committee, saying that the governor's bill, "HB 110 will have a significant impact on our capital expenditures and future activities in Alaska. The improved fiscal terms as proposed by HB 110, particularly the portions of the bill that apply to activities outside of existing units, will give us the needed incentive to not only drill multiple new wildcat and delineation wells, but the motivation to drive certain projects to development."

STINSON PROSPECT, OFFSHORE EASTERN NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: Dan Donkel and Samuel Cade.

Status: Within the project there are five older leases with expiry dates between 2012 and 2016. Donkel had applied for a unit to encompass seven leases, but in 2011 the Department of Natural Resources rejected the application and five of the leases expired. The investors reacquired the acreages and some nearby leases in the December 2011 lease sale, meaning that the clock has been reset for another ten years and the proposed work commitments and higher rentals are not in force. Current Stinson Project acreage appears to be approximately 28,000 acres. Donkel and Cade have a wide variety of positions on the North Slope. Donkel is encouraging the state to establish new permitting, regulatory, fiscal standards and rules to make the development of prospects like the Stinson prospect more economic for small independents. The properties are also being actively marketed.

Water depth: Shoreline to around 50 feet

Wells drilled in past by other operators: ARCO Stinson No. 1 well, drilled in 1990, certified capable of producing, and was granted extended well data confidentiality because of proximity to unleased acreage in ANWR's 1002 area.

Wells drilled by operator: none

Seismic acquisition: No new seismic was shot, however operators purchased license for eight seismic lines from Geophysical Services, Inc. (1978 vintage, 24-fold CDP, approximately 170 miles). Seismic data was used to create structure maps on two horizons.

Capital budget for 2011: N/A

Cost estimated for development: N/A

Noteworthy about the prospect: The deeper of the two oil-bearing horizons involves the basement complex, a horizon relatively new to North Slope production. An openhole DST produced 37 to 51 degree API oil at a rate of 430 BOPD, with 7.1 to 18.0 MMCFGPD and 520 BWPDP. (Cleanhole production rate estimated at 700 to 800 bopd).

Total estimated recoverable reserves: The Tertiary horizon contains 150 million barrels of oil probable reserves within a single 100-foot thick sand (P90: 80 million; P10: 420 million). Reserves for the basement are currently under assessment.

Facilities and pipelines description for development if sanctioned: A pipeline tie in to Point Thomson would be required.

Geologic targets: ARCO Stinson No. 1 discovered flowable gas and oil in both the basement and in a shallower Tertiary horizon. Donkel/Cade believes these horizons, especially the Tertiary, expand and thicken to the southeast. They also say that these horizons bespeak much about the hoped for un-deformed belt of the ANWR 1002 coastal plain, as detailed in USGS Open File Report 98-34. Seismic data indicate turbidite sand potential both above and below the Tertiary horizon that was assigned 150 MMBO reserves, including Paleocene strata that are equivalent to the Flaxman Island discovery at the Point Thomson Unit.

Other Donkel/Cade northern Alaska prospects: “Regarding other leaseholdings, although very prospective, at present no defined prospects have been generated, with the exception of a potential play in the Hemi Springs area.”

TOFKAT UNIT, CENTRAL NORTH SLOPE (PREVIOUSLY NAMED TITANIA)

This data is extrapolated from public and industry sources, not necessarily from the operator.

Delineation drilling start: 2012-13

Construction start: 2013-14

Total construction costs: \$200 million

Total time for construction: 2 seasons

Total drilling jobs: 125

Total construction jobs: 200

Average number operation jobs: 16

Production start/life: 2015, 15-20 years

Note: This project might never get developed; much depends on resource size and economics.

Operator: Brooks Range Petroleum Corp.

Location: East and south of Nuiqsut, southwest of Kuparuk River unit, near Colville River.

Status: In 2011, BRPC applied to form the Putu unit around its Tofkat acreage, however the Department of Natural Resources instead approved the smaller Tofkat and Putu units. Because Titania was a prospect Phillips (now ConocoPhillips) proposed in 2002 as part of expansion of Colville River unit, BRPC changed name to Tofkat. BRPC must drill wells in both new units by 2013 to preserve the unit

Wells drilled in past by other operators: None, but Phillips shot 3-D seismic over area.

Number of wells drilled by BRPC: Winter of 2007-08 drilled Tofkat No. 1 well, taking 10 oil samples from four different sandstone reservoirs and finding six feet of net pay in Kuparuk formation, deepest zone tested. Drilled two sidetracks to find edge of Tofkat reservoir.

Wells possible in winter 2012-2013: 2

Seismic acquisition, future plans: Winter 2007-2008 acquired 210 square miles of 3-D seismic. Per TG World, the “seismic was unable to map the Tofkat No. 1 oil play as the reservoir was too thin. Additional analysis of the Kuparuk prospect at Tofkat No. 1 is ongoing in an attempt to determine the commerciality of this oil play. The joint venture has added to its land position around Tofkat and is in the process of identifying additional targets.”

Approximately cost per well: \$15 to \$20 million.

Noteworthy about the prospect: Distance between North Tarn and Tofkat (less than 10 miles) does not mean the two prospects are automatically candidates for joint development.

Working interest owners: BRPC is leasehold joint venture operator on behalf of its parent company, Kansas-based Alaska Venture Capital Group, or AVCG, as well as joint venture company Ramshorn Investments.

Geologic targets: Kuparuk, Jurassic

Primary contractors during exploration: Nabors Alaska Drilling and Peak Oilfield Services Halliburton, ASRC

Challenges to exploration and development: Resource size, per BRPC.

UMIAT PROSPECT, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Total time for appraisal and development drilling: 5 years

Cost estimated for one-year appraisal program: \$45 million

Cost estimated for construction and development drilling: \$1.3 billion

Development drilling and construction to begin: 2012-13

Jobs expected during appraisal drilling: Unknown

Jobs during field construction and development drilling: Unknown

Jobs to operate field: Unknown

Production start/life: 2015, 30 years

Operator: Linc Energy (Acquired from previous operator Renaissance Alaska in July 2011)

Location: Upper Foothills, North Slope, Alaska

Current Status: Linc signed First Right of Refusal on Kuukpik No. 5 rig in January 2012, for use at Umiat during the 2012-13 drilling season. Program currently being permitted includes up to five wells to be drilled during the 2012-13 winter season to gather fresh core and additional reservoir data, flow test wells, run new open hole log suites and to confirm drilling fluids program for development drilling. Long term environmental studies required for project development are being commenced now with placement of a Meteorological Monitoring Station at Umiat, and will be continued with wildlife and other studies this summer. Community engagement has been underway since just after Linc purchased the Umiat Property with various meetings in Barrow, Anaktuvuk Pass, and Nuiqsut on-going since August 2011.

Drill site, pad description, location: Multiple

Wells drilled in past by other operators, including date completed, operator, and name: 11 shallow wells drilled by U.S. Navy in late 1940s and early 1950s. One deep test, Seabee No. 1 well, drilled by U.S. Government (contract with Husky) in 1978-79.

Total capital expenditures through 2010: \$43 million by Renaissance Alaska, prior to being acquired by Linc

Peak production: Anticipated 50,000 BOPD

Noteworthy: 37 degree gravity oil, target formations between 200 feet and 1,500 feet, upper portion of reservoir in permafrost.

Recoverable reserves: 250 million barrels of oil

Facilities and pipelines description when sanctioned: Oil processing facilities with 110-mile buried pipeline to trans-Alaska oil pipeline.

Geologic targets: Upper and Lower Grandstand formations, located in Cretaceous

Challenges to exploration and development: Lack of year round seasonal access.

Note: Linc notes that a road to Umiat under consideration by the state could have a huge positive impact on this project. However the project is not dependent on the road.

VISCOUS AND HEAVY OIL, CENTRAL NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Stepped-up viscous oil development:

Construction and drilling start: 2012

Total construction and drilling costs: \$20-30 billion

Total time for construction and drilling: 10 years

Total construction and drilling jobs: 3,500 per year

Average number operation jobs: 300-plus

Production start/life: 2013, 50 years

Note: BP and ConocoPhillips have been very public in arguing that the viscous oil step-up won't happen without the governor's tax bill or similar relief passing into law.

Viscous oil description: Viscous oil is oil that has a higher resistance to flow and a higher specific gravity than lighter crudes, typically making it more difficult to produce than lighter crudes. Viscous oil on the North Slope of Alaska has the consistency of maple syrup.

Heavy oil description: Heavy oils on the North Slope have a greater resistance to flow and higher specific gravity than viscous oil. In the producing units on the North Slope, heavy oil is found at shallower depths and is therefore also at colder temperatures than the deeper viscous oil. North Slope heavy oil has the consistency of molasses.

Current viscous oil production: Viscous oil production from Alaska's North Slope currently is about 40,000 bopd, depending on the definition of viscous used by the reporting company or agency. That production is drawn from an estimated 6 billion barrels of in-place viscous oil that is located within currently producing North Slope units (4 billion barrels in the West Sak sands/Schrader Bluff formation in the Milne Point and Kuparuk River units and 2 billion barrels in the Schrader Bluff formation in the Prudhoe Bay unit (Orion and Polaris satellites),

Nikaitchuq and Oooguruk units. In addition to the 6 billion barrels within the existing producing units, another 4-6 billion barrels of undeveloped in-place resource is estimated to be present close to infrastructure.

Viscous potential, per BP: BP's Alaska president, John Minge, said in November 2010 that as a "result of the scoping work ... we believe it is possible to develop 2 billion barrels of gross viscous oil with technology advancements that we believe are achievable. ... A project like this would require on the order of 2,000 more wells on 50 pads with a new gathering center and a hundred miles of new pipelines." Such a project using "economies of scale" has "the potential to flatten the North Slope's production decline."

Price tag: Possibly \$20-30 billion.

Jobs in the first 10 years: Minimum 3,500 a year.

Heavy oil development:

Construction & drilling start: 2014 or later

Total construction & drilling costs: \$20-30 billion

Total time for construction & drilling: 10 years

Total construction & drilling jobs: 3,500 per year

Average number operation jobs: 300-plus

Production start/life: 2015, 50 years

Viscous potential per ConocoPhillips: In its 2011 E&P Fact Book ConocoPhillips lists 26 major long-range projects leading to start up dates after 2016. Included is Ugnu – shown as currently being in the appraisal stage with an anticipated Gross Peak Production of between 20,000 and 30,000 thousand barrels a day of oil.

Note: The technology to produce North Slope heavy oil is still being developed. Once the technical challenge is overcome, there will be the challenge of economics. Several of the potential developers have stated that meaningful reform of Alaska's production tax is likely essential.

Heavy oil potential: Heavy oil is not in production but it represents a bigger prize; perhaps 20 billion barrels in place in the Ugnu formation close to and within existing infrastructure. BP, ConocoPhillips, ExxonMobil and other legacy field partners are working on technology that will allow part of this resource to be commercially extracted, but that could change.

Heavy oil pilot project: In the spring of 2011 BP completed commissioning a \$100 million heavy oil pilot project on the Milne Point S-Pad, with the goal of finding a technically viable way to extract heavy oil from the relatively shallow Ugnu formation that overlies much of the Central North Slope's producing reservoirs. The pilot uses a technique called cold heavy oil production with sand (CHOPS). "Even if we only get a fraction of that, say 10 percent (3 billion barrels, including Kuparuk's Ugnu), to the surface, it's still a huge potential oil field," Eric West, manager of BP's Alaska renewal team, said in March 2011.

Peak production: 250,000 BOPD for first 3 billion barrels

Price tag: Possibly \$30 billion.

Jobs in the first 10 years: Minimum 3,500 a year.

Challenges of heavy oil production: One, in order to ship the heavy oil in pipelines, BP will have to mix in an equal amount, or more, of lighter oil, so conventional oil and/or natural gas liquids from the North Slope through the trans-Alaska oil pipeline will stay steady or increase in order to deliver heavy oil to market. Two, heavy oil has less of the light, high-hydrogen components, valued for refining into high-value products such as gasoline, than does light oil, thus giving the heavy oil a lower market value than its lighter cousin. Three, in addition, the production and usage of heavy oil would involve the use of the same value chain of pipelines, oil tankers and refineries as light oil, but with the addition of costly new technology. Heavy oil is unlikely to ever be more economic than light oil. According to BP, "Heavy oil is not light oil that happens to weigh more. It is in fact a different commodity. It has different technical challenges."

Timing: Although BP's test facility should this year provide some clarity over whether the physics of heavy oil production from the Ugnu works, it will likely take another couple of years, and perhaps another pilot project, to flesh out the production characteristics of the heavy oil resource, BP said.

Noteworthy: In Canada, extraction rates in the tar sands are as high as 50 percent, thanks to advances in technology by producers and government.

Definition of specific gravity: Specific gravity is calculated by dividing the density of a fluid by the density of water. If a fluid is denser than water, it sinks. If it is less dense than water, it floats.

Definition of API gravity: Specific gravity is especially important for the petroleum industry. When crude oil is taken from the ground, refineries separate the crude into tar, kerosene, gasoline, hydraulic oil and many other compounds. The knowledge of specific gravities and boiling points allows refineries to separate these compounds efficiently. Values of specific gravity vary widely, and the American Petroleum Institute (API) found it convenient to

create a new unit, the eponymous API gravity. To calculate API gravity, you need to know the fluid's specific gravity. Divide 141.5 by the fluid's specific gravity and subtract 131.5. If that seems arbitrary, it is because the equation was designed for convenience's sake. Values of specific gravity vary widely, but by using this formula, API gravity values of petroleum products are closer together than specific gravity values.

YUKON GOLD, EASTERN NORTH SLOPE

This data is extrapolated from public and industry sources, not necessarily from the operator.

Operator: Savant Alaska

Location: About 50 miles east of Prudhoe Bay. Two leases along Staines River on western boundary of ANWR 1002 area; a third lease is adjacent to northern of 2 leases along river.

Status: Like the Sourdough wells to the north drilled by BP along the edge of the 1002 area (in former Point Thomson unit), BP's 1994-96 Yukon Gold No. 1 is on the state's extended confidentiality list.

Water depth: Onshore

Noteworthy: Similar to Sourdough, Yukon Gold is not likely to be developed until a pipeline is built to nearby Point Thomson because Yukon Gold's reserves are not large enough to justify a pipeline connecting it to Badami, the farthest east producing field on the North Slope. Point Thomson output will flow to the Badami field 20 miles away, bringing infrastructure within 10-15 miles of Yukon Gold. Once the lines reach Sourdough or Yukon Gold, they are on the doorstep of ANWR's 1002 area, set aside by Congress for its oil and gas potential.

Recoverable reserves: 120 million barrels of oil per State of Alaska.

Cost estimated for development sans production facilities: \$450 million

Approximately cost per well: \$10 million

If project sanctioned, development drilling and construction expected to begin: TBD

First oil expected: TBD

Peak production expected: 10,000 BOPD

Drill site: When a BP engineering feasibility study indicated an insulated ice pad in March 1993 at Yukon Gold No. 1 well, which would significantly extend winter drilling season, BP built 390-by-280-foot ice pad covered with 600 wind-resistant insulating panels. Summer visits confirmed ice beneath panels remained sufficiently frozen. When panels were disassembled in October 1993, they had not bonded to resting surface, or scattered; nearly 90 percent were in excellent condition and reusable. BP began drilling in November, two months ahead of conventional Arctic practice. BP had time to drill nearby Sourdough No. 2, where insulated panels were placed under drilling rig to give BP option of leaving rig on location over summer and avoiding remobilization if well wasn't completed. Proved to be unnecessary since the Sourdough well was completed during same season. BP netted cost savings of more than \$2.3 million from the two single-season well completions, according to the Department of Energy. In addition, tundra endured significantly less impact than would have been the case had BP's crews been required to move equipment back and forth between two drilling seasons. The DOE also reported that subsequent site monitoring showed no long-term environmental impacts from use of insulated ice pads.

Wells drilled in past by other operators: 1993 BP's Yukon Gold No. 1

Wells drilled to date by operator: None

Next well: TBD

Geologic targets: Thomson sands, Brookian. Some geologists suspect Yukon Gold's reservoir extends east under Staines River into ANWR's 1002 area. If Yukon Gold develops, wells on state lands might cause oil and gas fluids to migrate across border. Per federal law, backed by court decisions, if they don't hold lease sale for their side of reservoir, the U.S. government wouldn't be able to claim revenue from federal oil drained from Yukon Gold's state leases. Per 1998 assessment, the 1002's northwest corner holds some 10.4 billion barrels of oil.

Jobs expected during development drilling and pipeline construction: 300-400

APPENDIX B - MINING

BOKAN MOUNTAIN RARE EARTH ELEMENT PROJECT

Operator: Ucore Rare Metals Inc.

Location: Prince of Wales Island in Southeast Alaska

Reserves: Bokan Mountain hosts an inferred mineral resource of 5.3 million metric tons grading 0.65 percent total rare earth oxides (TREO), with 40 percent of the TREO being the higher value heavy rare earth oxides (HREO). This comes to about 34,450 metric tons TREO, and about 13,780 metric tons HREO.

Jobs: Not yet determined

Noteworthy: The swift development of Bokan Mountain is increasingly being seen as vital to securing a domestic supply of dysprosium, terbium and other heavy rare earth elements critical to national defense and green technologies in the United States.

Though Bokan Mountain is a relatively early stage exploration project, Ucore believes it can have a REE mine in operation there by 2016. The proposed mine has advantages, including being small in scale and enjoying government support on both the state and federal levels.

In September, 2011, the Department of Natural Resources organized the Strategic and Critical Minerals Summit, a daylong event that brought together Gov. Parnell, the Alaska Congressional Delegation, top state, federal and university scientists, mining executives, exploration geologists, Alaska Native leaders and foreign government representatives. The summit focused largely on development of Alaska's REE potential.

Ucore President and CEO Jim McKenzie told summit attendees that the in-situ value of the metals at Bokan at current REE prices exceeds US\$3,000 per metric ton, pushing the total value of the deposit above US\$10 billion.

In the works for 2012 and beyond: An updated resource estimate based on 10,112 meters of drilling completed in 34 holes at Bokan Mountain in 2011 is pending. A preliminary economic assessment is also being conducted for the REE project.

In addition to building a mine, Ucore is investigating the viability of developing a metallurgical refining complex to capture the value-added segment of the rare-earth processing chain. The location of this facility has yet to be determined. The state is investigating whether there are any state lands nearby that might be suitable for such a facility.

For the latest Mining News articles on Bokan Mountain visit:

<http://www.petroleumnews.com/pnads/15189304.shtml>

<http://www.petroleumnews.com/pnads/439194857.shtml>

CHUITNA COAL PROJECT

Operator: PacRim Coal LP

Location: Beluga Coal Field, about 45 miles west of Anchorage

Reserves: 300 million tons of ultra-low-sulfur, sub-bituminous coal.

Jobs: 350 to 400 workers.

Noteworthy: Chuitna was originally evaluated through an environmental impact statement and nearly permitted in the 1990s, but a coal mine was never developed. With the increased demand and price of steam coal, PacRim has put the project back on the regulatory track.

PacRim has made several modifications to the design of the Chuitna project aimed at reducing the environmental impact of the proposed mine.

Commercial life of deposit: The current project predicts a minimum 25 year mine life with a production rate of around 12 million tons a year.

In the works for 2012 and beyond: Due to these design alterations as well as changes in coal regulations, PacRim submitted a supplemental Environmental Impact Statement for Chuitna project in 2010. A draft SEIS for public comment is expected to be published early in 2012.

The SEIS and permitting process for the coal project is expected to be completed in 2013. If the permits are approved by state and federal agencies, PacRim will evaluate market conditions and make a decision whether to proceed with development.

DONLIN GOLD PROJECT

Operator: Donlin Gold LLC

Working interest owners: NovaGold Resources Inc. 50%, Barrick Gold Corp. 50%

Location: Kuskokwim region of western Alaska

Capital expenditure: According to a 2011 feasibility study, the costs for the construction of the mine and related infrastructure is estimated to be US\$6.7 billion.

Noteworthy: Donlin Gold LLC completed an updated feasibility study for the project in December, 2011, that includes building a 320-mile natural gas pipeline to run from the west side of Cook Inlet to the Donlin Gold project.

Reserves: 33.85 million ounces of proven and probable gold reserves. Additionally, the gold deposit contains about 5 million ounces of measured and indicated resources and nearly 6 million ounces of inferred resources.

Jobs: An estimated 3,000 jobs during a three-year construction period, about 1,000 jobs during operations.

Commercial life of deposit: The 53,500-metric-ton-per-day mine proposed in the feasibility study is expected to produce about 1.5 million ounces of gold per year over its first five years of operation. Based on current reserves, the mine should produce about 26.2 million ounces of gold, or an average of about 1.1 million ounces per year, over a 27-year mine life.

In the works for 2012 and beyond:

Donlin Gold LLC has budgeted \$37.2 million for the 2012 work program, which will focus on permitting activities, community development and planning for future development. Project permitting is expected to begin the first half of 2012. Estimating that permitting will take 3.5 years and construction will take about as long, Barrick and NovaGold anticipate the Donlin Gold project will begin production toward the end of 2019.

For more information on the Donlin Gold project, visit:

<http://www.petroleumnews.com/pnads/329784516.shtml>

FORT KNOX GOLD MINE

Operator: Kinross Gold Corp.

Location: 26 miles north of Fairbanks.

Reserves: 4.3 million ounces of gold.

Jobs: Approximately 500.

Noteworthy: Fort Knox has produced more than 5 million ounces of gold since 1997.

Commercial life of deposit: In 2009 Kinross completed construction of a heap leach facility and expansion of the current mine through exploration. The company currently projects that it has enough ore in reserves to feed the mill through 2018 and continue heap leach operations through 2021.

In the works for 2012 and beyond:

Kinross continues to seek new ore in the immediate Fort Knox area. In 2011 the company spent approximately \$8 million on exploration at and near the mine. The level of exploration spending in recent years and the addition of 700,000 of gold reserves in 2011 suggests that production at Fort Knox will extend beyond current estimates.

GREENS CREEK MINE

Operator: Hecla Mining Co.

Location: Near Juneau.

Reserves: Greens Creek has 7.99 million tons of proven and probable reserves containing 98.38 million ounces of silver, 742,400 ounces of gold, 733,140 tons of zinc and 281,620 tons of lead.

Jobs: Around 300 workers.

Noteworthy: In 2011 Greens Creek produced 6.5 million ounces of silver at a negative cash cost of \$1.29 cents after credits for gold, lead and zinc.

Commercial life of deposit: At current production rates the mine has enough reserves to last about nine years. The mine began production in 1989 with seven years of reserves and has continued to replenish and add to its reserves through exploration.

In the works for 2012 and beyond:

In 2012, Hecla is planning the largest investment in Greens Creek's history – approximately US\$90 million. Some of the key capital expenditures include Deep 200 South access development (US\$18 million), mining fleet replacement and additions (US\$14 million), tailings dam expansion (US\$10 million), East Ore access and ventilation rehabilitation (US\$6 million), definition drilling (US\$5 million), and the construction of expanded and upgraded camp facilities (US\$5 million).

Exploration expenditures at Greens Creek in 2012 are expected to be \$7 million.

KENSINGTON GOLD MINE

Operator: Coeur d'Alene Mines Corp.

Location: 45 miles northwest of Juneau

Reserves: Kensington has an estimated 6 million tons of ore containing 1.34 million ounces of gold in proven and probable reserves.

Jobs: About 250 workers.

Noteworthy: Kensington produced 88,420 ounces of gold in 2011, more than double the 43,143 ounces produced in 2010. Kensington began production in July, 2010.

Commercial life of deposit: About 12 years based on current reserves

In the works for 2012 and beyond:

In November Coeur announced that production levels at Kensington have been curtailed during the first half of 2012 to complete several key projects designed to improve operational efficiency and consistency.

One of the key initiatives Coeur is undertaking at Kensington is accelerated underground development, which will result in more working faces and greater operational flexibility. The company said it will also complete and commission the underground paste backfill plant and related distribution system, providing access to stopes located in previously mined areas; upgrade and complete construction of several underground and surface facilities; and improve the overall safety of the operation.

Gold production for 2012 is anticipated to be around 85,000 ounces. Kensington is expected to produce 125,000 ounces of gold per year once in full production.

LIK ZINC PROJECT

Operator: Zazu Metals Corp.

Working interest owners: Zazu Metals 50%; Teck Resources Ltd. 50% (Zazu has the exclusive right to increase its stake in Lik to 80 percent by spending US\$25 million on the project by 2018.)

Location: 14 miles northeast of Red Dog Mine in Northwest Alaska

Reserves: Lik South – which is being considered in a current feasibility study – contains more than 3.3 billion pounds of zinc, more than 1 billion pounds of lead and more than 31 million ounces of silver. Lik North – a deeper deposit that could extend the mine life – contains an additional 1.3 billion pounds of zinc, 500 million pounds of lead and nearly 10 million ounces of silver.

Jobs: An estimated 300 jobs.

Commercial life of deposit: A preliminary economic assessment envisions a 5,500 ton-per-day mine and mill with an eight-year mine life. (By comparison, Red Dog processes about 9,800 tons per day.)

In the works for 2011 and beyond:

Zazu's work at Lik is focused on the completion of a positive feasibility study for the project. According to a provisional timeline presented by the company, Zazu estimates production could begin at Lik by 2018.

LIVENGOOD GOLD PROJECT

Operator: International Tower Hills Mines Ltd.

Location: Adjacent to the Elliot Highway about 70 miles north of Fairbanks

Resources: The Money Knob deposit at the Livengood project contains a measured and indicated resource of 933 million metric tons averaging 0.55 grams per metric ton gold (16.5 million ounces) plus an inferred resource of 257 million metric tons averaging 0.50 g/t gold (4.1 million ounces).

Commercial life of deposit: An updated preliminary economic assessment released by Tower Hill in August, 2011, describes a 91,000-metric-ton-per-day mill producing an average of 562,000 ounces of gold per year for 23 years.

Jobs: Around 1,000 jobs during construction and more than 400 jobs once in operation.

Noteworthy:

According to the 2011 updated PEA, initial capital costs of building a mine of this scale at Livengood will run about \$1.6 billion and another \$585 million or so of sustaining capital.

In the works for 2012 and beyond:

The completion of the Livengood feasibility study and the start of project permitting are scheduled for mid-2013. With about three years slated for permitting and two years for construction, Tower Hill anticipates firing up the mill in 2018.

In December, 2011, Tower Hill announced the acquisition of mining claims covering the Livengood Bench and said it is studying the viability of mining the alluvial deposit. In March the company reported that the deposit contains a historical resource of 230,000 ounces of gold. Tower Hill began a 9,000-meter drill program on May 1. This program consists of 3,000 meters of exploratory drilling in an area northeast of the Money Knob deposit and 6,000 meters of condemnation drilling to either sterilize or establish the presence of significant mineralization in the area surrounding the Money Knob deposit and extending northeast towards existing mineralized exploratory holes.

For the latest Mining News articles on developments at Livengood, visit:

<http://www.petroleumnews.com/pnads/927060776.shtml>

<http://www.petroleumnews.com/pnads/825188802.shtml>

NIBLACK PROJECT

Operator: Heatherdale Resources Ltd.

Location: Prince of Wales Island in Southeast Alaska.

Resources: Based on 373 holes drilled through Nov. 4, 2011, Niblack has an indicated resource of 5.64 million metric tons averaging 0.95 percent copper, 1.75 grams per metric ton gold, 29.52 g/t silver and 1.73 percent zinc. The project has an additional inferred resource of 3.93 million metric tons averaging 0.81 percent copper, 1.32 g/t gold, 20.1 g/t silver and 1.29 percent zinc.

Jobs: Unclear at this time, but early indications are that the deposit would support an operation similar in scale to Hecla's Greens Creek Mine. (Approximately 300 workers)

Noteworthy: Heatherdale is investigating locations for ore processing facilities, including the option of barging ore from Niblack to a suitable offsite location.

The company's efforts to identify sites that meet specific criteria for development of a processing plant and tailings storage facility for Niblack have been met with positive encouragement from a broad range of local entities as well as the State of Alaska.

Heatherdale also has engaged with the Alaska Energy Authority and the Alaska Industrial Development and Export Authority, which regularly provides financing to public-private partnerships to facilitate infrastructure development and economic growth in the state.

In the works for 2012 and beyond:

A preliminary economic assessment for the Niblack Project is scheduled for completion early in 2012, which is expected to be followed by prefeasibility-level studies. In a corporate presentation Heatherdale indicated it could begin permitting as early as 2013.

Considering the current pace of advancements, the project could go into production within 10 years. Heatherdale has not proposed a timeline for production.

For the latest Mining News article on developments at Niblack visit:

<http://www.petroleumnews.com/pnads/900128699.shtml>

NIXON FORK GOLD MINE

Operator: Fire River Gold Corp.

Location: 35 miles northeast of McGrath

Reserves: In December, 2011, Fire River Gold reported that Nixon Fork has an indicated resource of 129,060 metric tons averaging 24.9 grams per metric ton gold, or 103,438 ounces of gold. The mine has an additional inferred hardrock resource of 53,980 metric tons averaging 28 g/t gold, or 48,545 ounces of gold.

Jobs: About 75

Noteworthy: Nixon Fork began production on July 4, 2011. When running at its full capacity, the reinstated operation is expected to churn out around 50,000 ounces of gold per year.

About half of Fire River Gold's revenue from Nixon Fork is from the sale of 1,000-ounce doré containing 60 percent gold and 30 percent silver. Additional cash flow is being generated from the sale of a gold-rich copper concentrate. The company shipped the first batch of this concentrate in mid-September. The US\$1.8 million advanced payment for this 42.6-metric-ton for this shipment marks the first payment from the renewed operations at Nixon Fork.

Commercial life of deposit: The indicated resource provides enough ore to keep the mine in production for about two years. Fire River plans to replenish its resource on an annual basis.

In the works for 2012 and beyond:

The underground workings at Nixon Fork are divided into two unconnected mines, Crystal and Mystery. While mining the upper portions of Crystal, crews are driving a shallow ramp to Mystery Mine about 600 meters to the northeast and ramping down to the lower portions of Crystal. The underground connection will provide easier access to some 20,900 ounces of gold in the Mystery Mine and provide a drill platform for the Southern Cross, J5A and 3100 zones – three promising targets between the two mines. Fire River targeted these regions with surface drilling in 2011 and is completing a more comprehensive evaluation of these ore-bodies from underground.

For the latest Mining News article on developments at Nixon Fork visit:

<http://www.petroleumnews.com/pnads/141015274.shtml>

PEBBLE COPPER-GOLD-MOLYBDENUM PROJECT

Operator: Pebble Limited Partnership

Working interest owners: Anglo American plc; 50%; Northern Dynasty Minerals Ltd. 50%

Location: Near Iliamna in the Bristol Bay region of Southwest Alaska.

Development costs: An estimated \$4.7 billion for the mine, plus \$1.3 billion for infrastructure.

Reserves: 80.6 billion pounds of copper, 107.4 million ounces of gold and 5.6 billion pounds of molybdenum. Additionally, the deposit contains rhenium, palladium and several million ounces of silver.

Jobs: 2,080 workers over a four-year construction period and an operations work force projected at 1,020.

Noteworthy: In January, the Pebble Partnership published the environmental baseline document for the Pebble Project. This 27,000-page document compiles some \$120 million of environmental baseline information collected in and around the Pebble project from 2004 through 2008.

Commercial life of deposit: Based on a preliminary assessment prepared for Northern Dynasty, over 45 years the deposit could produce 31 billion lbs copper, 30 million ounces gold, 1.4 billion lbs molybdenum, 140 million ounces silver, 1.2 million kilograms (2.6 million lbs) of rhenium and 907,000 ounces of palladium, while mining only 32 percent of the total Pebble mineral resource.

Assuming the total resource was mined, at the production rate of around 220,000 metric tons per day the deposit would last more than 100 years.

In the works for 2011 and beyond:

The Pebble Partnership is continuing work on a mine plan and project description for Pebble.

Due to the complexities of the project, the Pebble Partnership is reluctant to provide a timeline for the completion of the mine-plan and feasibility study currently underway for the project. Once completed, the company will present the mine-plan to regional stakeholders before submitting permit applications.

Indications are that the mine-plan will be completed by November and permitting could begin by mid-2013.

The permitting process is expected to take three to four years, and it is expected that the project will be tied up in litigation subsequent to the permitting process.

For the latest Mining News article on developments at the Pebble Project visit:

<http://www.petroleumnews.com/pntruncate/145847631.shtml>

POGO GOLD MINE

Operator: Sumitomo Metal Mining Pogo LLC

Working interest owners: Sumitomo Metal Mining Co. Ltd. 85%, Sumitomo Corp. 15%

Location: 110 miles southeast of Fairbanks.

Jobs: 325 workers

Noteworthy: At 383,434 troy ounces of gold recovered in 2010, Pogo is the highest producing gold mine in Alaska.

Over the past two years geologists at Pogo have discovered two new zones of gold mineralization adjacent to the ore zone currently being mined at Pogo. To date, exploration of these new zones has outlined a resource of nearly 2 million ounces of gold.

Commercial life of deposit: 2017

In the works for 2012 and beyond:

Two new zones of gold mineralization, North and East Deep, have been discovered adjacent to the Liese zone currently being mined at Pogo. Finding the full extent of these new zones and relationship of the three gold-rich ore bodies is the focus of the exploration at Pogo over the next two years. These new zones could extend the mine-life of Pogo by at least 10 years.

For the latest Mining News article on developments at Pogo visit:

<http://www.petroleumnews.com/pntruncate/979529220.shtml>

RED DOG MINE

Operator: Teck Resources Ltd.

Working interest owners: Teck Resources Ltd. 75%; NANA Regional Native Corp. 25%. NANA's stake increases by 5% every five years starting in 2007.

Commercial life of deposit: In 2010 Teck received permits needed to begin mining the Aqqaluk deposit, which will provide enough ore to keep Red Dog in operation until about 2031.

Location: Northwest Alaska about 82 miles north of Kotzebue.

Reserves: 51.6 million metric tons of reserves averaging 16.7 percent zinc and 4.4 percent lead.

Jobs: Red Dog provides 475 full-time jobs and about 80 temporary jobs annually. Nearly 58 percent of these positions are filled by NANA shareholders, many of whom have worked their way up to high-level positions at the mine.

Noteworthy: From 1990-2009, Red Dog provided \$1.5 billion in benefits, including wages to shareholders, joint venture contracts, payments in lieu of taxes and direct royalty payments to NANA. In 2009 alone, the mine provided \$116 million in federal and states taxes and invested \$217 million in the local and state economy through the purchase of goods and services from Alaska suppliers.

A total of \$471 million in royalties has been paid to NANA since the agreement was signed in 1982, and due to provisions of the Alaska Native Claims Settlement Act, 60 percent of the royalties are shared with the 12 other Alaska Native regional corporations.

NANA's increased interest in Red Dog has helped boost income from the mine over recent years. From 2005 to 2009, the Native corporation received \$373 million in royalty payments. NANA's working interest in Red Dog increases to 30 percent in 2012.

In the works for 2012 and beyond:

The primary focus of Teck's exploration in 2011 was a region to the west of Red Dog called Noatak. Integrating modern geophysics, stream sediment sampling and detailed geological mapping – the company has produced around 20 drill targets on these state of Alaska mining claims.

The company also had one drill at Anarraaq, a deep deposit that lies about seven miles northwest of the current operation. According to a 2004 report, Anarraaq hosts a 1-billion-metric-ton or so barite body and a zinc-lead-silver massive sulfide zone with an estimated resource of about 18 million tons at 18 percent zinc, 5.4 percent lead, and 85 grams per metric ton silver.

Noatak and Anarraaq are high-priority targets as Teck continues to seek new high-grade deposits of zinc in the Red Dog District of Northwest Alaska.

USIBELLI COAL MINE - HEALY OPERATIONS

Operator: Usibelli Coal Mine Inc.

Location: Near Healy

Reserves: 700 million tons of surface mineable coal reserves.

Jobs: 138 employees in 2011

Noteworthy: Alaska's longest lived large-scale mine. The fourth-generation family-owned company, founded in 1943 by Emil Usibelli, started off supplying coal to the newly constructed Ladd Army Air Field (now Fort Wainwright). In 2011, Usibelli transported about 1 million tons of coal to six power plants in Interior Alaska, and shipped about 1.2 million metric tons overseas.

In February, Usibelli received permits for mining the Jumbo Dome coal deposit, located some nine miles (14 kilometers) northeast of Healy, Alaska.

Commercial life of deposit: At current production rates Healy has more than 300 years of reserves.

In the works for 2012 and beyond:

Usibelli plans to begin mining the Jumbo Dome coal deposit in 2012. The Jumbo Dome Mine and the company's nearby Two Bull Ridge Mine will operate simultaneously for several years.

Usibelli anticipates 2012 coal production to increase to about 2.4 million tons. The company says it has the infrastructure in place to double production without significant capital investment, and it is positioned to supply both domestic and international markets in the foreseeable future.

WISHBONE HILL COAL PROJECT

Operator: Usibelli Coal Mine Inc.

Location: 10 miles northeast of Palmer.

Reserves: 14 million tons of bituminous coal.

Jobs: According to a socioeconomic impact study completed by ISER, the mine would provide around 90 jobs.

Noteworthy: If Alaska-based Usibelli decides to develop Wishbone Hill, some 500,000 tons a year of the cleaner-burning bituminous coal will likely be shipped to Japan via newly constructed loading facilities at Port MacKenzie on the west side of upper Cook Inlet directly across from Anchorage.

Commercial life of deposit: Based on the 6 million tons of coal reserves being considered in a feasibility study currently underway, Wishbone Hill would operate for about 12 years.

In the works for 2012 and beyond:

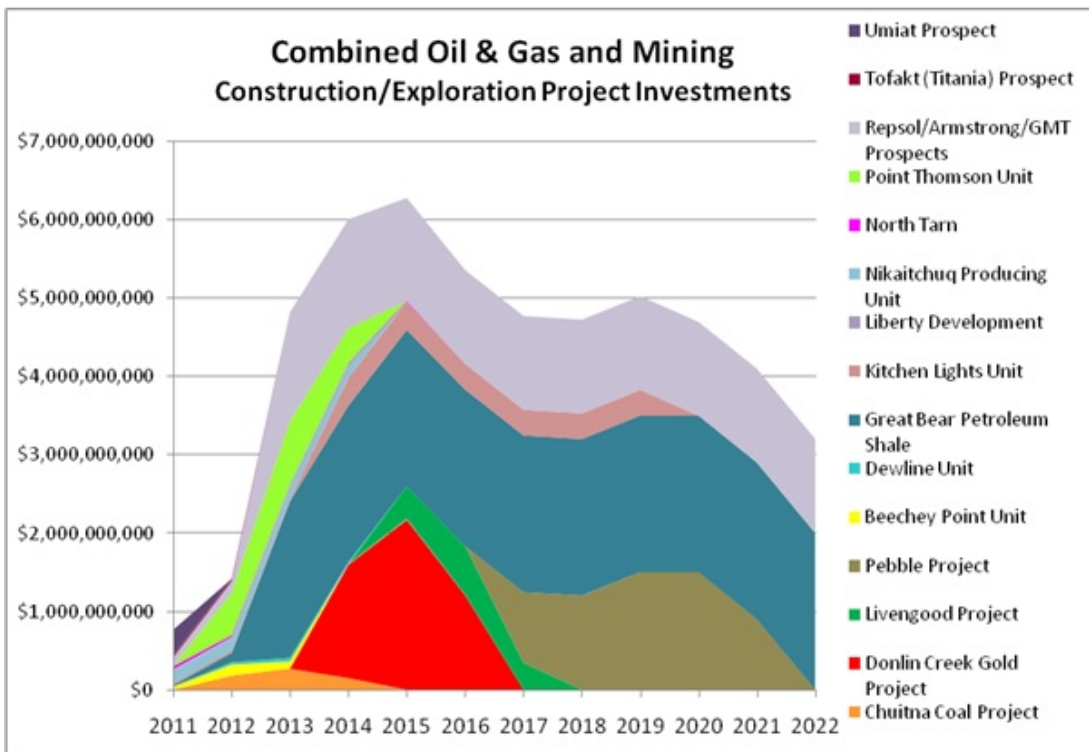
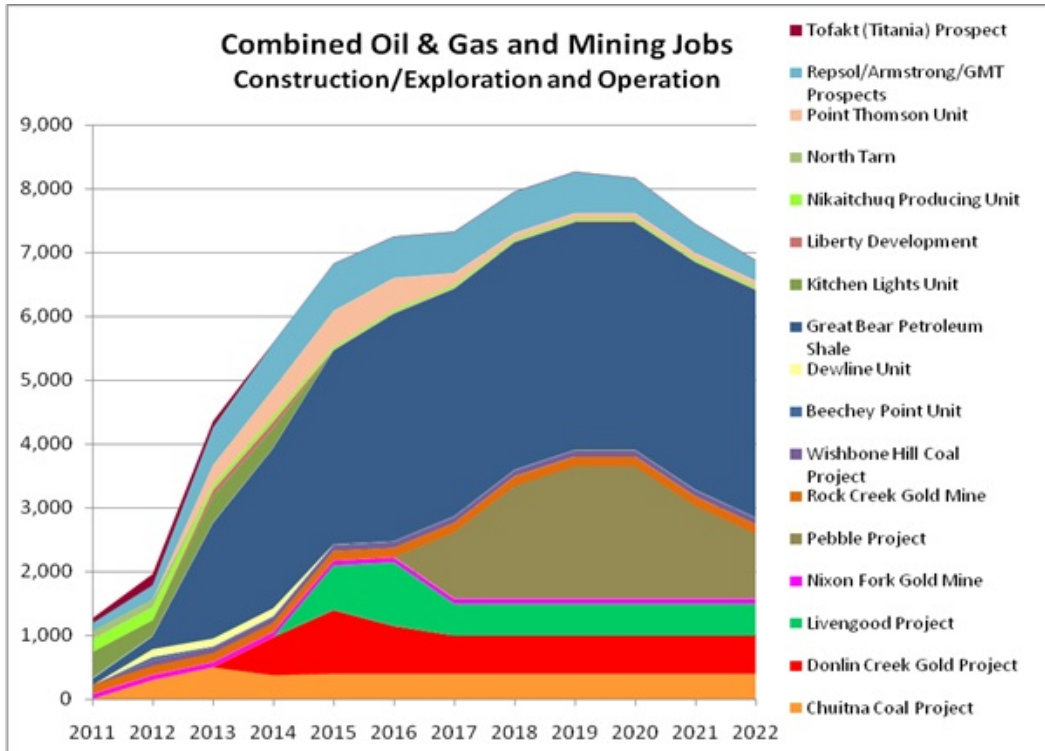
Usibelli is continues to advance Wishbone Hill toward a production decision. Mining could start as early as 2013.

APPENDIX C - 2011 RESOURCE EXTRACTION EXECUTIVE SUMMARY

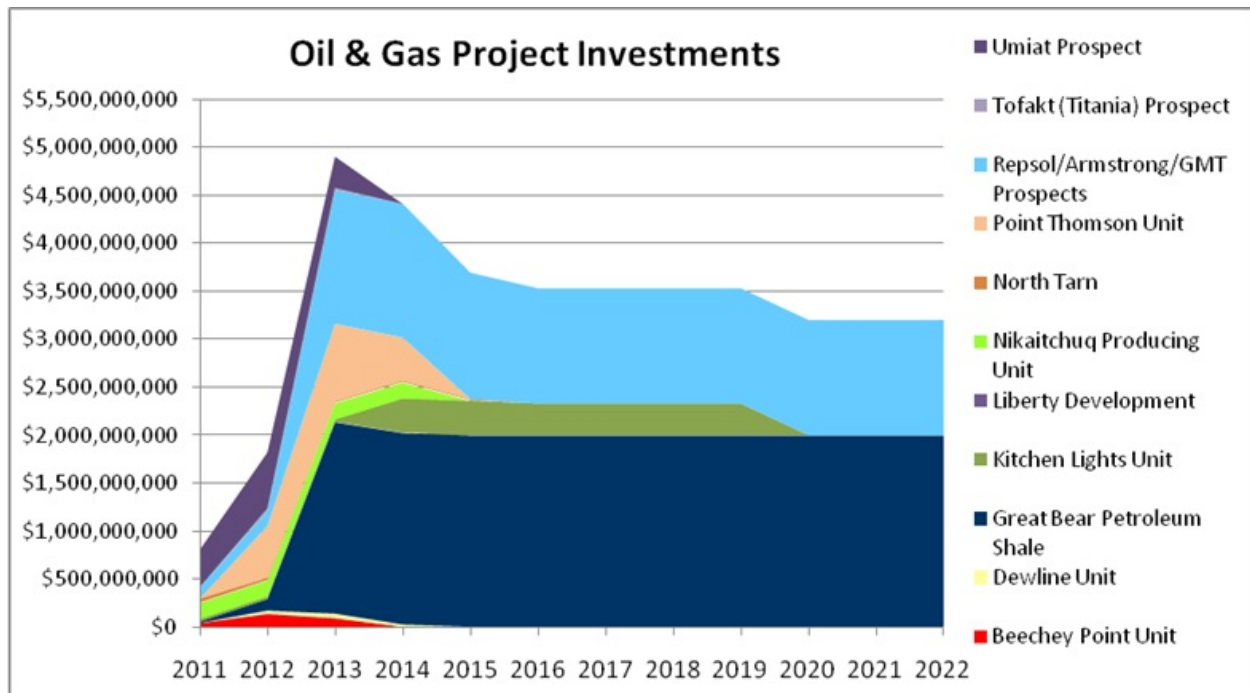
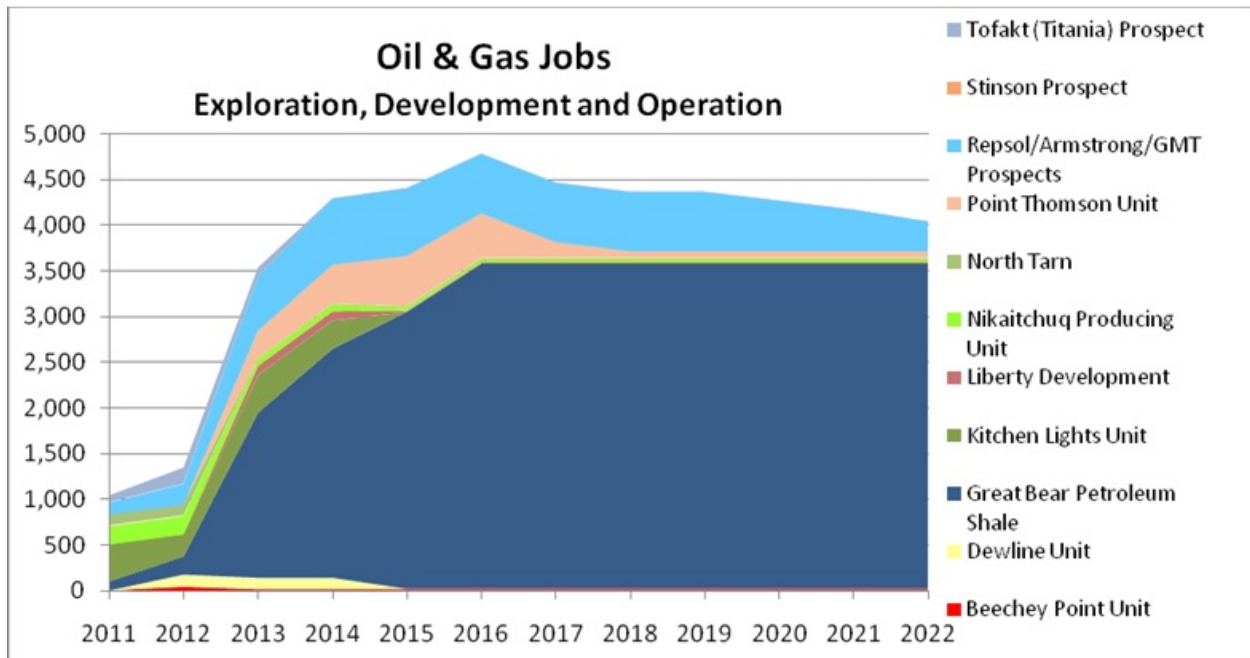
In the next decade, Alaska has the potential to generate as many as 10,460 jobs that would be created through \$33.7 billion of investments in 18 resource extraction projects that are proposed for development within our state. These oil and gas and mining projects are located in regions across Alaska 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.

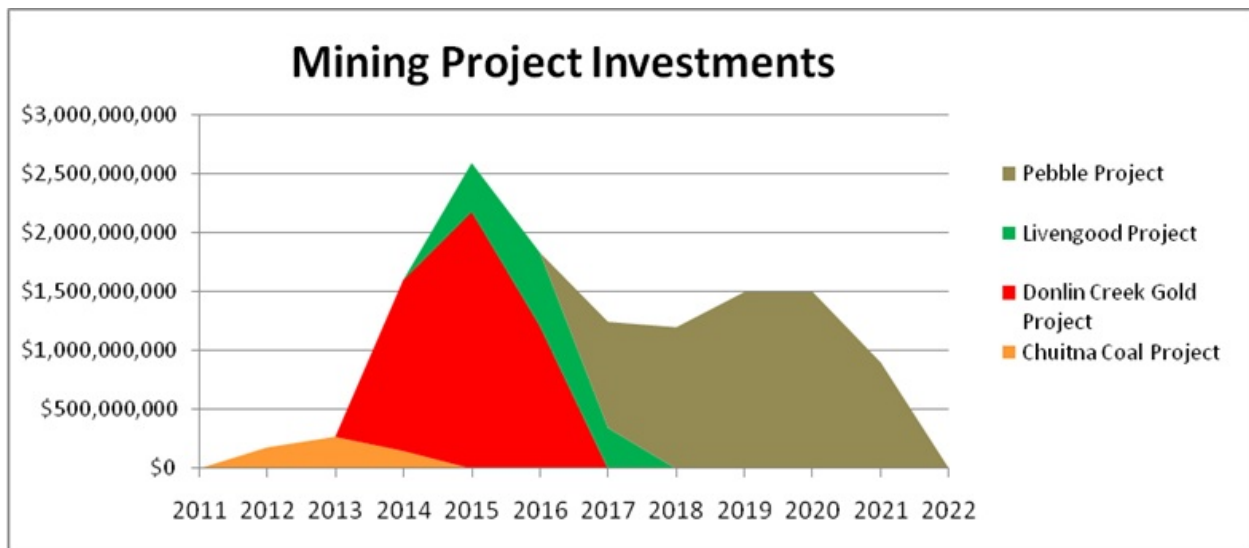
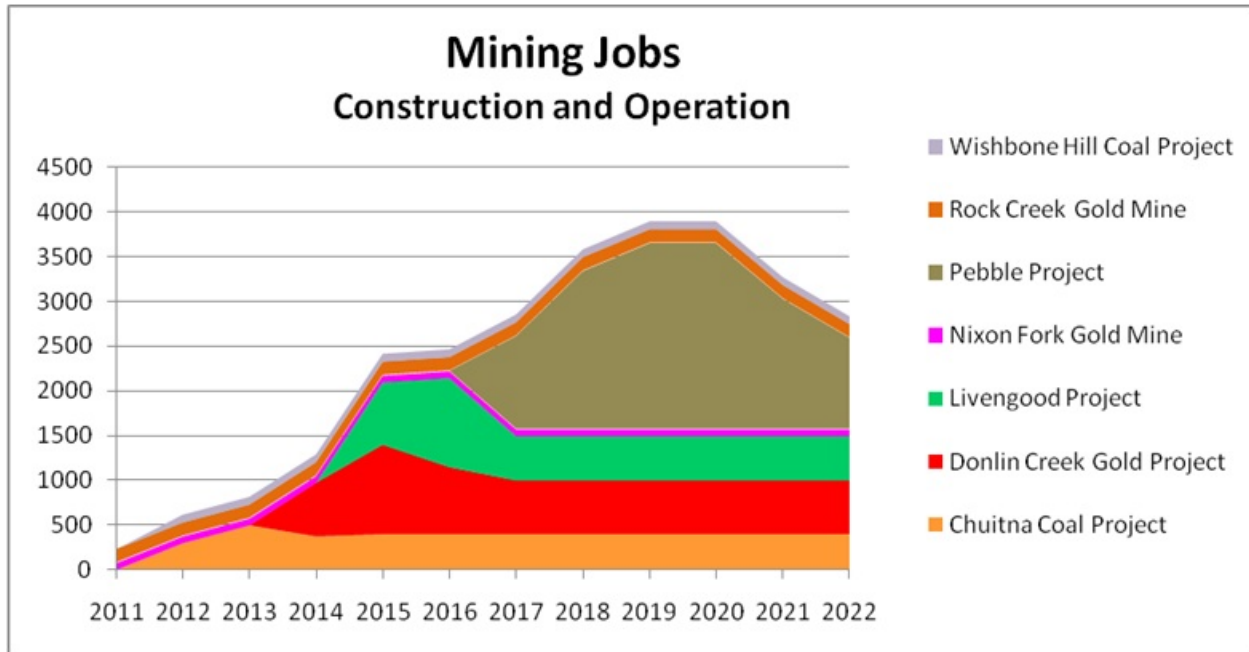
The following are the graphed views of the projects profiled in this projection. The first two graphs present a combined view of oil and gas and mining projects from two perspectives. The first is the view of total jobs these projects will create and when. The second graph presents an overview of total 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 (NPR). 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.

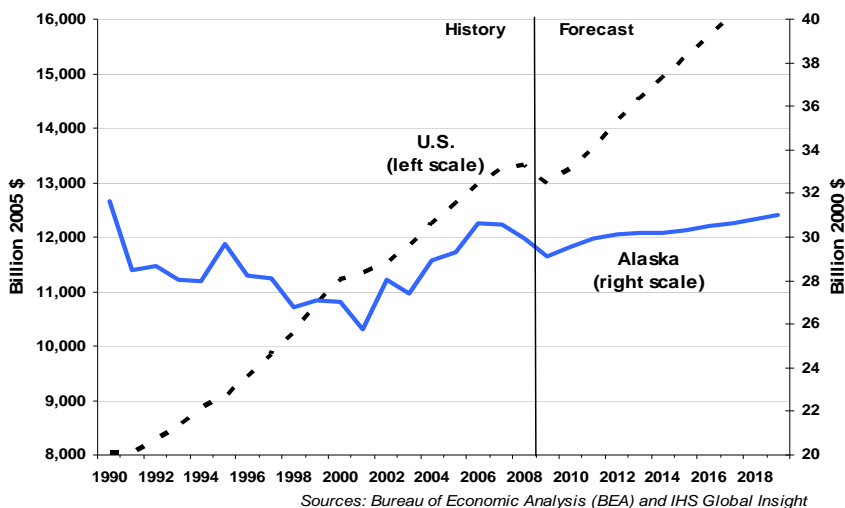
Another insidious impact of these issues is that they create an environment of ever growing timeframes required to develop a project. The specific issues include increased uncertainty of when final permits, particularly federal permits, will be issued, and seemingly unending litigation further delaying 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.

Real Gross Domestic/State Product

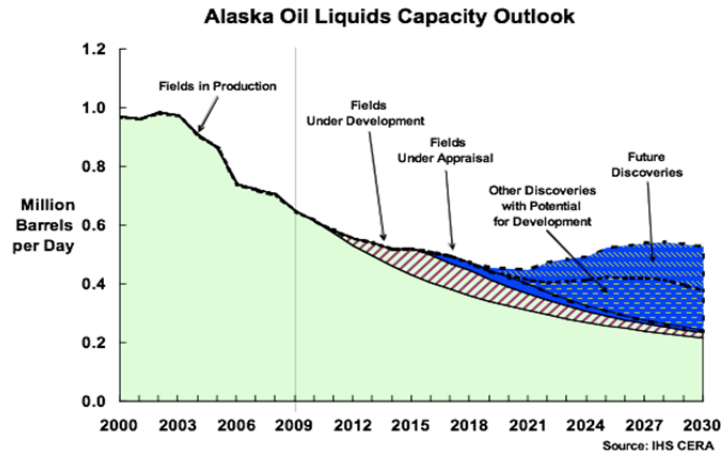


Alaska's economy has been stagnating when looked at in comparison to the U.S. national economy.

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 GDP 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 with these higher prices, the outlook for Alaska GDP 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.