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Memorandum

TO: Senator Resources Committee
FROM: Chuck Burnham, Legislative Analyst
DATE: March 29, 2011
RE: *Review of Selected Claims Made by the Supporters of SB 49*
LRS Report 11.245

You asked that we review certain claims made in a publication by the "Make Alaska Competitive Coalition" regarding the state's oil taxes and the impact of those taxes on investments and jobs. Specifically, you wanted us to examine the veracity of that organization's claims that Alaska's current oil tax structure is "driving away business" and motivating petroleum industry employers to move jobs out of Alaska. You were particularly interested in learning about variables other than taxation that impact the decisions of petroleum producing companies as to where and when to invest their resources.

Summary

We address your request, in part, through an analysis of the Fraser Institute's 2010 *Global Petroleum Survey*, which garnered responses from 645 respondents representing 345 companies regarding 133 oil producing jurisdictions.¹ To our knowledge, it is the largest publicly-available survey of its kind. In hearings for HB 110 (the companion bill to SB 49) before the House Resources Committee, representatives of the Governor's administration referred to elements of the survey as evidence of Alaska's competitive disadvantage in attracting investment from the oil and gas industry, and to support the claim that state taxes on the industry need to be reduced. It appears that in using the results of the survey to support those views, the Administration, industry groups, and other advocates of cutting oil taxes, such as the "Make Alaska Competitive Coalition," may have oversimplified and/or misinterpreted the survey results and the degree of negativity it reflects on Alaska.

Our analyses of the data collected by the survey, and of reports published by the Alaska Department of Revenue, suggest that a minority of industry officials hold negative views of Alaska's overall attractiveness for investment. With specific regard to taxation, a majority of survey respondents found Alaska's system attracts or has no impact on investment. These respondents combined with those who find the state's tax regime to be nothing more than a "mild deterrent," leave fewer than twenty percent of survey respondents who view taxes to be a significant barrier to investment in the state.

We located no research that definitively concludes that Alaska's petroleum taxation system, or that of other jurisdictions, is the primary driver of industry investment. Clearly, taxation is an important variable that impacts business decisions; however, it is equally clear that it is but one among many such significant variables. The massive expansion in petroleum exploration and production in North Dakota, where the oil tax system is viewed relatively favorably by industry (and has been for years), clearly demonstrates how variables other than taxation can drive increased investment.

¹ It is important to note that while 645 individuals responded to the survey, none of those individuals has sufficient knowledge of every variable in each of the 133 jurisdictions to provide responses to questions on those areas. Therefore, the number of responses for any given area on any specific variable is likely well below the number of overall respondents to the survey. In order to be included in the survey report, a jurisdiction was required to have garnered at least five responses for all seventeen variables. At least eleven jurisdictions were excluded due to lack of response. We contacted the authors of the survey to determine how many respondents are represented in the information on Alaska presented in their report to get a clearer picture of the extent of industry opinion represented therein; however, the Fraser Institute considers that information to be confidential. Dr. Gerry Angevine, lead researcher on the survey, suggested that the number of responses was "more than five but fewer than 200." Without knowing the precise number of individuals who provided responses on Alaska, we cannot discuss the accuracy of the survey's findings on the state with any authority. It is an established fact of statistical sampling practice, however, that as a sample grows smaller relative to the entire population being examined, the margin of error increases and, therefore, confidence in the survey's results decreases. Dr. Angevine can be reached via email at gerry.angevine@fraserinstitute.org.

As you know, in advocating for lower taxes on the petroleum industry in the state, the MACC has made a number of claims regarding oil and gas jobs in Alaska. Primary among those claims, in this case published on its website, is the following:

Exploration jobs are down: Department of Labor statistics show jobs in the oil industry has shed 1,700 jobs over the last two years.

In a television commercial funded by the MACC, which is currently in broadcast circulation on a number of stations, the narrator makes the following statement:

Alaska has lost almost 2,000 oil industry jobs, while North Dakota added 25,000.²

The advertisement provides a timeframe for neither the Alaska job losses, nor for the North Dakota gains; however, we assume that it approximates the same two-year time-period cited in the MACC's other media on the topic. The commercial does not directly claim that oil explorers and producers have transferred jobs directly from Alaska to North Dakota, but that appears to be the intended implication. Our final assumption on these claims is that the MACC is referring to the two-year period from November 2008 to November 2010—the most recent two-year period for which the Alaska Department of Labor and Workforce Development (DOLWD) has compiled data.

Our review of data on “oil and gas” employment compiled by the DOLWD suggests that, in the course of the past two years, roughly 2,000 jobs in that sector were “lost.” However, that calculus is only true if one selects the month with the highest level of employment and compares it to the month with the lowest level of employment. Looking at the entire period in question, Alaska experienced a reduction of about 1,300 oil and gas jobs (11/2008-11/2010). However, selecting a given month in one year and comparing it to a month in another year produces highly volatile results. For example, by simply choosing the two-year period from February 2008-February 2010, instead of the period the MACC chose, job losses are reduced to only 400. We believe a more appropriate means of comparison is to use *average annual employment*, which eliminates a degree of the volatility that accompanies selectively comparing monthly employment. Using annual measures, Alaska lost approximately 700 oil and gas jobs over the three years 2008-2010. Nevertheless, the number of such jobs in the state remains above the ten-year average, and an argument can be made that the decline is part of a normal cycle of increases and decreases in what has historically been a volatile industry sector with regard to numbers of employees.³

Determining whether jobs are leaving Alaska for North Dakota, or any other petroleum producing jurisdiction, is not possible with the data available to us. As we detail below, among the points that are clear is that, relative to overall petroleum production levels, Alaska's oil and gas workforce has always been smaller than those of other oil producing areas.

To be clear, we take no position on the Governor's tax proposals, nor is it our intention to disparage the *Global Petroleum Survey* or to impugn the motives of the Administration and others who have used it to support their position. Rather, this report is meant to examine claims that have been made by those supporting tax cuts from a perspective that has not yet been presented to the Legislature, and to review some of the numerous variables besides taxation that impact the decisions of oil and gas industry executives in the course of their determining where to invest and expand or decrease workforces.

Fraser Institute *Global Petroleum Survey*

The Fraser Institute—a Canada-based research organization—conducts an annual *Global Petroleum Survey* to measure the views of executives, managers, and other influential members of petroleum exploration and production companies regarding the barrier to investment of petroleum-producing areas. It does so by asking those executives to rate jurisdictions on seventeen variables divided among three broader topics as follows:

² The commercial “Change Our Economic Tune” is available on the MACC website at <http://www.makealaskacompetitive.com/ads-photographs/>.

³ Employment figures for 2010 are preliminary. Data are from the Alaska Department of Labor and Workforce Development, Research and Analysis, <http://laborstats.alaska.gov/>. The Department defines oil and gas jobs as those related to oil and gas extraction, drilling oil and gas wells, and support activities of oil and gas operations, as delineated by the North American Industry Classification System.

Commercial Environment	Regulatory Climate	Geopolitical Risk / Stability
Fiscal terms	Cost of regulatory compliance	Political stability
Taxation regime	Uncertainty regarding regulatory issues (interpretation, enforcement)	Security of personnel and assets
Trade barriers	Uncertainty regarding environmental regulation	Disputed land claims
Quality of infrastructure	Labor regulations, employment agreements, and local hiring requirements	Uncertainty over what lands can be protected as wilderness, parks, etc.
Labor availability	Regulatory duplications and inconsistencies	Socio-economic agreement / community development conditions
	Legal system	Quality of geological database

For each of these seventeen variables, respondents were asked to choose one of the following responses for each jurisdiction with which they were familiar:

- 1—Encourages investment
- 2—Is not a deterrent to investment
- 3—Is a mild deterrent to investment
- 4—Is a strong deterrent to investment
- 5—Would not invest due to this criterion

Survey Reporting Methodology

In the “Survey Methodology” section of their report, the authors of the *Global Petroleum Survey* begin with the following explanation:

The survey is designed to identify the provinces, states, and countries with the highest barriers to investment in oil and gas exploration and production.⁴

As this quote indicates, the survey is intended to identify the *worst* jurisdictions for petroleum investment as perceived by the industry. This is reflected in the scoring mechanism, which effectively considers only the three levels of *negative* response. That is, for each of the seventeen variables and jurisdictions for which a sufficient level of response was received, the authors measured the proportion of responses that indicated a “mild deterrent to investment,” “strong deterrent to investment,” and those that indicated that the respondent “would not invest” due to a given criterion. For each variable, the jurisdiction with the highest proportion of negative responses was given a score of “100,” with other jurisdictions listed in descending order of negative responses received. The authors included numerous bar graphs based on this method, with the least attractive area reflected by the highest bar on the far right of the graph and the least negative area represented on the far left of the graph by the shortest bar.

There is nothing inherently wrong, in our view, with this methodology, and the survey report provides interesting data. Problems can arise, however, in readers’ interpretation of survey data as they are presented graphically in the Fraser Institute report. Further, it can be argued whether response number 3—indicating that a variable is “a mild deterrent to investment”—should be included and generally given the same weight in graphic representations as the other clearer and more definitive negative responses 4 and 5, which indicate that a variable is a “strong deterrent,” and one that wholly precludes investment in an area, respectively. Finally, the debate over HB 110 is primarily about oil taxes. As we’ve outlined,

⁴ Gerry Angevine, Ph.D. and Miguel Cervantes, “Global Petroleum Survey 2010,” Fraser Institute, p. 7. The entire report can be accessed online at <http://www.fraserinstitute.org/publicationdisplay.aspx?id=16223&terms=global+petroleum+survey>. The Fraser Institute describes itself as an “independent non-partisan research and educational organization.”

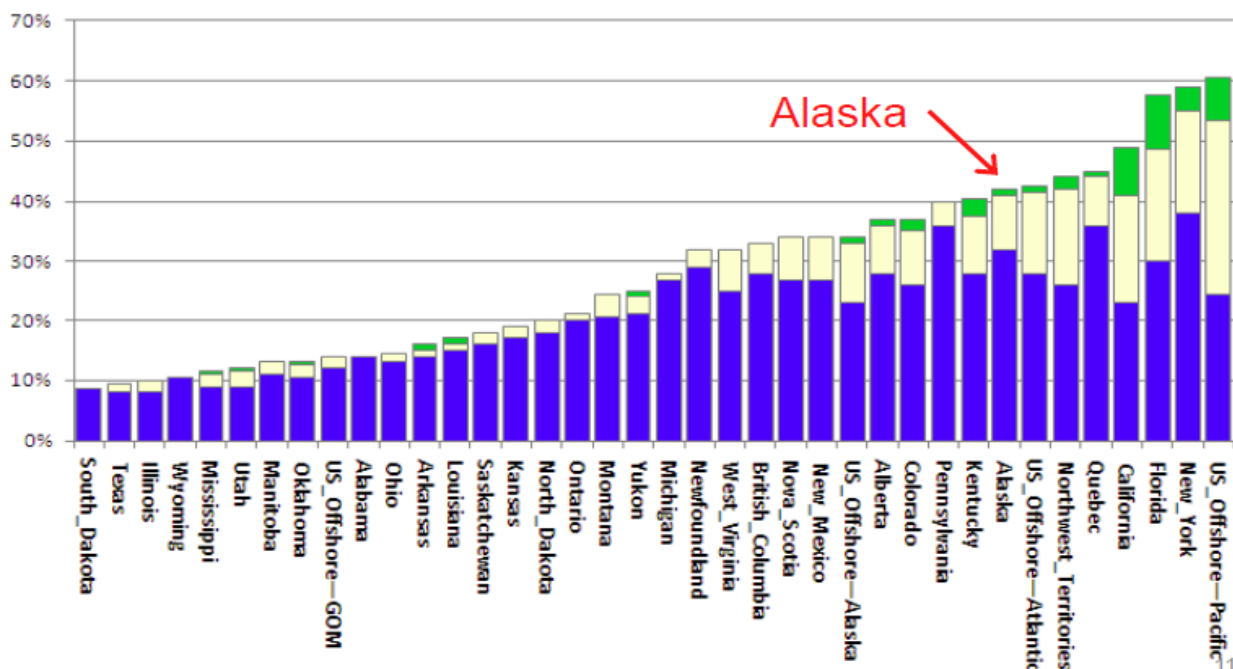
the *Global Petroleum Survey* measured sentiment on 17 variables. Taxation was but one of these variables, none of which were given more “weight” than another in determining the overall attractiveness of a given area. It is very difficult, therefore, to determine the degree to which Alaska would improve its standing as a region for investment were its tax structure to be changed in the manner sought in HB 110. We discuss each of these potentially problematic issues below.

Problems of Interpretation

Figure 1 (following page) is a graph produced by the Alaska Department of Revenue, using data from the *Global Petroleum Survey*, which was included in a February 7, 2011, presentation introducing HB 110 to the House Resources Committee.⁵ The graph is generally in the same style as those included in the Fraser Institute’s report on the survey except, of course, the particular emphasis on Alaska. The bars of the graph in Figure 1 have up to three color-coded sections. The bottom section, in dark blue, represents the “mildly deterrent” responses. The middle tan section reflects responses indicating a tax regime strongly deters investment; while the top section, in green, shows the proportion of respondents who indicate that they would not invest in a jurisdiction.

As you can see, of the 38 jurisdictions in North America for which survey responses were received, the “US Offshore Pacific” is viewed most negatively, while South Dakota is seen as the area with the fewest negatives for investment. Alaska is shown in position 31, near the “least attractive” far right of the graph. The reader sees that the “Alaska” bar reaches over half-way to the top of the graph, while Florida, New York, and U.S. Offshore are one line of delineation from the top. This gives the impression that these jurisdictions are viewed nearly universally as unattractive places for petroleum investment. One must keep in mind, however, that only the negative responses to survey questions are reflected in the bars of the graph. Looking at the far-left, vertical, or “Y,” axis of the graph, it becomes clear that the uppermost line of delineation equates to 70 percent of responses being negative. Therefore, the *worst* jurisdictions for investment were identified as such in about 60 percent of responses, while Alaska was viewed negatively by slightly over 40 percent. Said another way, the overall attractiveness of Alaska to petroleum investment was not viewed as even a minor deterrent in almost 60 percent of responses. To put this in context, about three in ten respondents viewed South Dakota—the state with the lowest proportion of negative responses on taxation—as being more attractive than Alaska, while two in ten found that North Dakota—the state with the fastest growing levels of oil exploration and production—presents fewer negatives than Alaska.

Figure 1: Excerpt from Alaska Department of Revenue Presentation to House Resources, Feb. 7, 2011



Source: Fraser Institute 2010 Global Petroleum Survey, as compiled by DOR

⁵ Slides for the presentation are available online at http://www.legis.state.ak.us/basis/get_documents.asp?session=27&bill=HB110.

There is no denying that to the extent that Alaska is viewed negatively impacts investment in the state, the survey data are troubling. Our point here is that the differences among the states in overall negative ratings—and particularly between Alaska and states legitimately competing for petroleum investment dollars—may not be as dramatic as some interpretations of the graphic portions of both the survey and presentations by the Administration on HB 110 have suggested.⁶

“Mild Deterrent”

As we mentioned, the meanings of four of the possible responses to questions in the *Global Petroleum Survey* are obvious: Responses 1 and 2 indicate that a given variable encourages investment and does not deter investment, respectively; while responses 4 and 5 state that a variable strongly discourages investment and causes a company to forego investment completely. Between these responses is the, to our ears, less definitive language of response 3, which indicates that a variable is a “mild deterrent” to investment. The survey report does not provide a precise definition for this term, so we presume it to follow the common definition of something that may be rather easily overcome or outweighed by other considerations.

Again, we understand that the survey was designed to measure the level of negativity that members of the oil and gas industry associate with petroleum-producing jurisdictions and do not take issue with that approach. We do, however, believe that the data collected through the survey could have been reported in a fashion that more clearly identifies issues that are fundamental problems as opposed to those that either may be easily addressed or are not serious obstacles. In other words, the survey report provides no “weight” to the relative importance of the variables reviewed.⁷ Similarly, negative responses could have been weighted to provide a more nuanced understanding of the severity of that sentiment on a given variable by assigning higher values to the two most negative responses. The larger point is that we believe it legitimate to question whether industry players would be discouraged from an otherwise promising investment by a variable that is “mildly deterrent.” We believe it reasonable to conclude that the answer to that question is no, at least with respect to a single mildly deterrent variable having the impact of driving away investment.

In light of that conclusion, we compiled Table 1 (following page), which shows the proportions of each of the 5 possible responses on the issue of taxation regime for all of the states and provinces covered by the survey. We include an additional column that combines the results for responses 1-3. Therefore, this column can be viewed as including all responses that characterized the taxation regimes as mildly deterrent, not a deterrent, or encouraging investment.

⁶ For this report we leave aside the question of whether it is legitimate to compare and rank Alaska’s attractiveness to investors with states that have a minute fraction of its proven oil and gas reserves.

⁷ To be fair, the bar graphs of the Fraser Institute’s survey color code the proportion of the bars represented by the three levels of negativity (the presentation by DOR to House Resources does so as well, but does not provide a key to the coding).

Table 1: Petroleum Industry Views on Tax Systems from the 2010 *Global Petroleum Survey*

States						
	1	2	3	1 - 3	4	5
Alabama	25%	58%	17%	100%	0%	0%
Alaska	25%	31%	25%	81%	16%	3%
Arkansas	36%	43%	21%	100%	0%	0%
California	8%	41%	26%	75%	21%	5%
Colorado	15%	50%	23%	88%	13%	0%
Florida	10%	40%	10%	60%	30%	10%
Illinois	14%	86%	0%	100%	0%	0%
Kansas	20%	67%	13%	100%	0%	0%
Kentucky	0%	71%	29%	100%	0%	0%
Louisiana	24%	58%	13%	95%	2%	2%
Michigan	20%	50%	30%	100%	0%	0%
Mississippi	41%	47%	12%	100%	0%	0%
Montana	19%	63%	16%	98%	3%	0%
New Mexico	35%	39%	22%	96%	4%	0%
New York	13%	38%	33%	84%	17%	0%
North Dakota	32%	52%	16%	100%	0%	0%
Ohio	0%	83%	17%	100%	0%	0%
Oklahoma	24%	62%	12%	98%	0%	3%
Pennsylvania	11%	56%	26%	93%	7%	0%
South Dakota	29%	57%	14%	100%	0%	0%
Texas	36%	55%	8%	99%	1%	1%
Utah	38%	56%	6%	100%	0%	0%
West Virginia	30%	30%	40%	100%	0%	0%
Wyoming	24%	64%	12%	100%	0%	0%
Provinces						
Alberta	25%	42%	27%	94%	5%	2%
British Columbia	19%	65%	16%	100%	0%	0%
Manitoba	17%	72%	10%	99%	0%	0%
Newfoundland	10%	65%	23%	98%	3%	0%
N.W. Territories	20%	60%	20%	100%	0%	0%
Nova Scotia	17%	59%	17%	93%	7%	0%
Ontario	18%	53%	29%	100%	0%	0%
Quebec	16%	47%	37%	100%	0%	0%
Saskatchewan	19%	66%	15%	100%	0%	0%
Yukon	18%	73%	9%	100%	0%	0%
Notes and Source: This table shows responses to a question regarding the impression of petroleum industry executives in the Fraser Institute's 2010 Global Petroleum Survey. The column "1 - 3" is an aggregate of responses in columns 1, 2, and 3, and represents the proportion of responses indicating that the tax system of a given jurisdiction encourages investment, does not deter investment, or is a mild deterrent to investment, respectively.						

As you can see, 16 percent of those responding to questions on Alaska's tax system found that variable to be a strong deterrent (response 4), while three percent indicated that taxes preclude investment (response 5). Among these 35 jurisdictions, these negatives are relatively high; however, collectively those negative responses represent fewer than two out of ten respondents. By contrast, the aggregate of responses for those that see the tax system as, at worst, a mild deterrent, was 81 percent, and a majority—56 percent—view the tax system as encouraging or having no impact on investment.

Assuming that the *Global Petroleum Survey* is a reasonably accurate reflection of sentiments in the petroleum industry, those who claim that Alaska's taxes are "driving away business" must be referring to the business of the roughly 19 percent of industry leaders who view those taxes as a serious deterrent. If that is the case, an important question for the Legislature is the extent to which it will benefit the state to cut taxes or offer incentives to win over that proportion of the industry. Of course, it is possible that cuts and credits may increase the efforts of industry players who do not hold a negative view of Alaska's taxes as well; however, members of the industry have generally declined to definitively confirm or deny the extent to which this is the case or, for that matter, whether any level of tax cuts or credits will increase their activities in the state. In the current debate over petroleum taxes in Alaska, it appears that one of the few firm conclusions that can be reached is that, with the data available and information presented thus far to the Legislature, the calculus for determining the mix of taxes and credits that are optimum to attract investment to the state is extremely challenging.

Variables Other than Taxation—The North Dakota Boom

As we mentioned, the researchers who compiled the *Global Petroleum Survey* asked industry leaders questions on seventeen variables, all of which, the researchers identify as important in the making of investment decisions. Although this point is fairly obvious, it is important to keep it in mind when considering HB 110/SB 49 because the focus of those bills is almost exclusively on taxation and credits.

The importance of any of the variables considered in the survey (and indeed those not considered) relative to other variables in the investment decision-making process depends largely on the very precise circumstances of the company, region, project, geology, and value of the commodity being sought, among other factors. For example, an oil producer may be offered very attractive fiscal and taxation terms, low costs of regulatory compliance, few barriers to trade, and favorable labor agreements by the country of Sudan but decline to pursue investment strictly out of concern about security and the political stability of the government. Conversely, Canada's Northwest Territories may offer generous exploration credits and other attractive terms but industry may be discouraged by aboriginal land claims and stringent environmental regulation. More likely than either of these examples, however, is that industry executives carefully weigh *all* variables when making long-term plans for development, and that it is rare for any one or two variables to be *the* determining factor in deciding where to invest. A review of the recent experience of North Dakota may be an instructive insight into how a confluence of variables brings investment to an area.

North Dakota

As you know, North Dakota has experienced an oil boom in recent years, and is frequently identified by the Make Alaska Competitive Coalition and others as a major competitor for industry investment.⁸ That state's production tax on oil is 5 percent of the wellhead value plus an extraction tax of 6.5 percent, which may be reduced or eliminated if oil prices fall below a statutory minimum "trigger," which stands at \$46.79 per barrel for FY 2011. If the average price of a barrel of oil remains above the trigger price for any consecutive five-month period, the 6.5 percent rate applies; however, if the price falls below the trigger for five-consecutive months, the rate is reduced or the tax suspended for certain wells based on their type or age. Generally, at recent oil prices, these taxes are lower than in Alaska; however, North Dakota's tax system is not viewed by industry as the most attractive. Respondents to the *Global Petroleum Survey* collectively ranked the state 13th among the 38 jurisdictions in North America that were reviewed.

Given that relatively low levels of taxation have existed in North Dakota for years, one would expect that the recent oil boom was driven by the discovery of a major new oil field. However, the existence of very large petroleum deposits in North Dakota has been common knowledge since the early 1950s. Much of this petroleum lies in the shale strata of the geological areas known as the "Bakken" formation and, to a lesser extent, the "Three Forks" formation. These areas encompass most of the western third of North Dakota and smaller portions of eastern Montana and southeastern Saskatchewan Province. Estimates

⁸ According to the U.S. Energy Information Administration, the current oil boom moved North Dakota from the seventh-highest petroleum producing state in the U.S. in 2009, to the fourth highest in 2010. In 2009, an average of 53 rigs and roughly 4,500 wells were in operation; by the fall of 2010, over 140 rigs were operating on nearly 5,200 wells (<https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp>). Over the next 20 years the North Dakota Oil and Gas Division foresees 2,140 new wells per year replacing depleted wells, requiring the operation of up to 165 rigs at any given time. Recent rig counts bear out that estimate, as the NDOGD lists 170 rigs in the state as of February 14, 2011. Rig counts are available online at <https://www.dmr.nd.gov/oilgas/riglist.asp>.

of the volume of the area's oil deposit range widely, from around 38 billion barrels (BBbl) to 500 BBbl; likewise, approximations of the portion of this petroleum that is recoverable range widely from 3 percent to 50 percent. Relatively conservative estimates put the amount of recoverable oil between 3 BBbl and 5 BBbl.⁹

So, why, in light of low taxes and a large oil field near extensive pipeline infrastructure in a stable, secure area, is it only in recent years that oil production has exploded in North Dakota? In fact, the Bakken spawned previous "oil booms" in the 1960s and early 1980s, but the easily recoverable oil in the area was exhausted in just a few years in each of those cases. The recent growth in exploration and production was spawned by technological advancements in horizontal well drilling and hydraulic fracturing ("fracking") techniques, which have facilitated access to reserves in the formation's mostly high-density rock structures.¹⁰ As a result, even at the low-end estimates of reserves and recoverable oil, the amount of economically recoverable product in the formation will engender substantial oil and gas production for many years, but only if petroleum prices remain high enough to support these more expensive extraction methods.¹¹ According to a presentation by the Director of the North Dakota Oil and Gas Division (NDOGD), current levels of drilling and production are sustainable at oil prices above \$50 per barrel.

In light of the above information, claims that petroleum industry investment in North Dakota, at the expense of such investment in Alaska, is occurring primarily due to differences in tax structure appear to be problematic. To the contrary, it is clear that the rapid expansion of oil and gas production in North Dakota was initiated by advances in oil recovery technologies. To be sure, many other variables in the state must be viewed as favorable to the industry members doing business there; however, even had the oil tax rate in North Dakota been zero, in the absence of technological improvements, its petroleum resources would still be locked deep underground. It is also worth noting that despite North Dakota's relatively low oil tax rates, the petroleum industry is aggressively lobbying the state Legislature for tax cuts.¹²

Alaska Department of Revenue Oil and Gas Production Tax Status Report

Pursuant to AS § 43.55.180, the Department of Revenue (DOR) is required to annually provide a report to the Legislature describing the effects of the state's petroleum production tax system on oil and gas development, exploration, production, revenue, and a number of other variables. In the summary for the most recent such report, published January 18, 2011, the DOR makes the following comments:

Industry Investment – Investment in the form of capital expenditures has increased in each of the four fiscal years since implementation of the net profits tax, however, it is unclear how much of the capital expenditures were drilling or well-related and how much were maintenance or facilities-related.

Impact on Exploration, Development, and Production – Exploration has generally increased from 2003, when the EIC credit was implemented, but has dropped off in 2010. Development continues in three relatively new North Slope projects, yet production continues to decline.

Industry Employment and New Entrants – Industry employment rose steadily from 2006 through 2009, but dipped slightly in 2010. The number of companies filing annual tax returns doubled

⁹ More information on attempts to estimate the Bakken's reserves is published by the State of North Dakota at <http://www.nd.gov/ndic/ic-press/bakken-form-06.pdf>.

¹⁰ Ben Casselman, "Oil Industry Booms—In North Dakota," *The Wall Street Journal* online edition, February 26, 2010, <http://online.wsj.com/article/SB10001424052748703795004575087623756596514.html>.

¹¹ Hydraulic fracturing is a resource intensive process that significantly increases the cost of petroleum recovery. It is also a controversial technique that has raised concerns among certain members of the public, environmental groups, and regulators. The U.S. Environmental Protection Agency is currently studying the process and its consequences. More information is available on the EPA website at http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_hydrowhat.cfm. The Canadian province of Quebec recently placed a moratorium on the procedure in order to further study its environmental impacts (<http://ca.finance.yahoo.com/news/Does-shale-gas-industry-capress-5532805.html?x=0>)

¹² Dale Wetzel, "North Dakota Oil Pressing for Tax Cuts," *Bloomberg News*, February 1, 2010, <http://www.bloomberg.com/news/2011-02-01/north-dakota-oil-industry-pressing-for-tax-cuts.html>.

between 2006 and 2009, indicating interest by companies that are either new or returning to the Alaska oil and gas industry.

Use and Expansion of Tax Credits – The amount of credits used has increased annually since 2006 and we expect the trend to continue as new credit programs were added in the 2010 legislative session.

The DOR cautions that multiple changes to the tax laws in recent years makes drawing conclusions about impacts on investment in Alaska difficult, and warns that production continues to decline. Nonetheless, these recent statements, made by the agency that is the primary advocate for the Governor’s tax proposals before the Legislature, do not support the claim that the state’s oil taxes are “driving away business.” As we have said, this report is not intended to in any way deny that Alaska faces significant challenges to increasing oil production and maintaining current revenue levels. However, the publicly available evidence on Alaska’s taxation system, some of which we have reviewed in this report, does not appear to support the level of certainty that some supporters of cutting taxes have displayed in claiming that the tax system is the exclusive culprit in driving away industry investment.¹³

The Context of Recent Job Losses

As we mentioned, based on annual averages, Alaska saw a reduction of 700 oil and gas jobs between 2008 and the preliminary total for 2010; however, if one selects the month of highest employment over that two-year period—December 2008, with 13,700 jobs—and subtracts the month in which the fewest number of oil and gas employees were working—September 2010, with 11,600 jobs—a claim of job losses totaling roughly 2,100 jobs can be made. Comparing annual averages with monthly totals begins to illustrate the problems with such a claim. That is, the number of oil and gas jobs in Alaska is a highly volatile measure, which, since 2001, has regularly increased or decreased by 200-600 jobs per month. As a result, selecting data on the extremes in a given pairing of months can be misleading in the larger context of industry employment. Further, as Table 2 (following page) shows, the most recent two-year period is one of historically volatile levels of both oil prices and related employment in Alaska, which followed a steep, years-long expansion in that workforce—an increase of 34 percent from 2001-2007.¹⁴ While it is true that the oil and gas workforce has decreased overall in the past two years, the 12,100 preliminary average for of such jobs in 2010 is 19.3 percent above the cumulative average annual employment of 10,145 since the year 2000.

¹³ The entire report is available online at <http://www.revenue.state.ak.us/2011%20OG%20Tax%20Report%201-18-2011%20on%20Letterhead.pdf>.

¹⁴ The reasons for this expansion, and their relative impacts, are subjects of significant debate. Although we make comparisons in this report with employment, production, and oil prices, we draw no firm conclusions on their relationships. In recent years, a number of maintenance issues, accidents, production activities requiring additional manpower, and other factors have been present that likely contributed to greater demand for oil field workers. The extent to which each of these variables led to increases in the workforce, however, remains unclear.

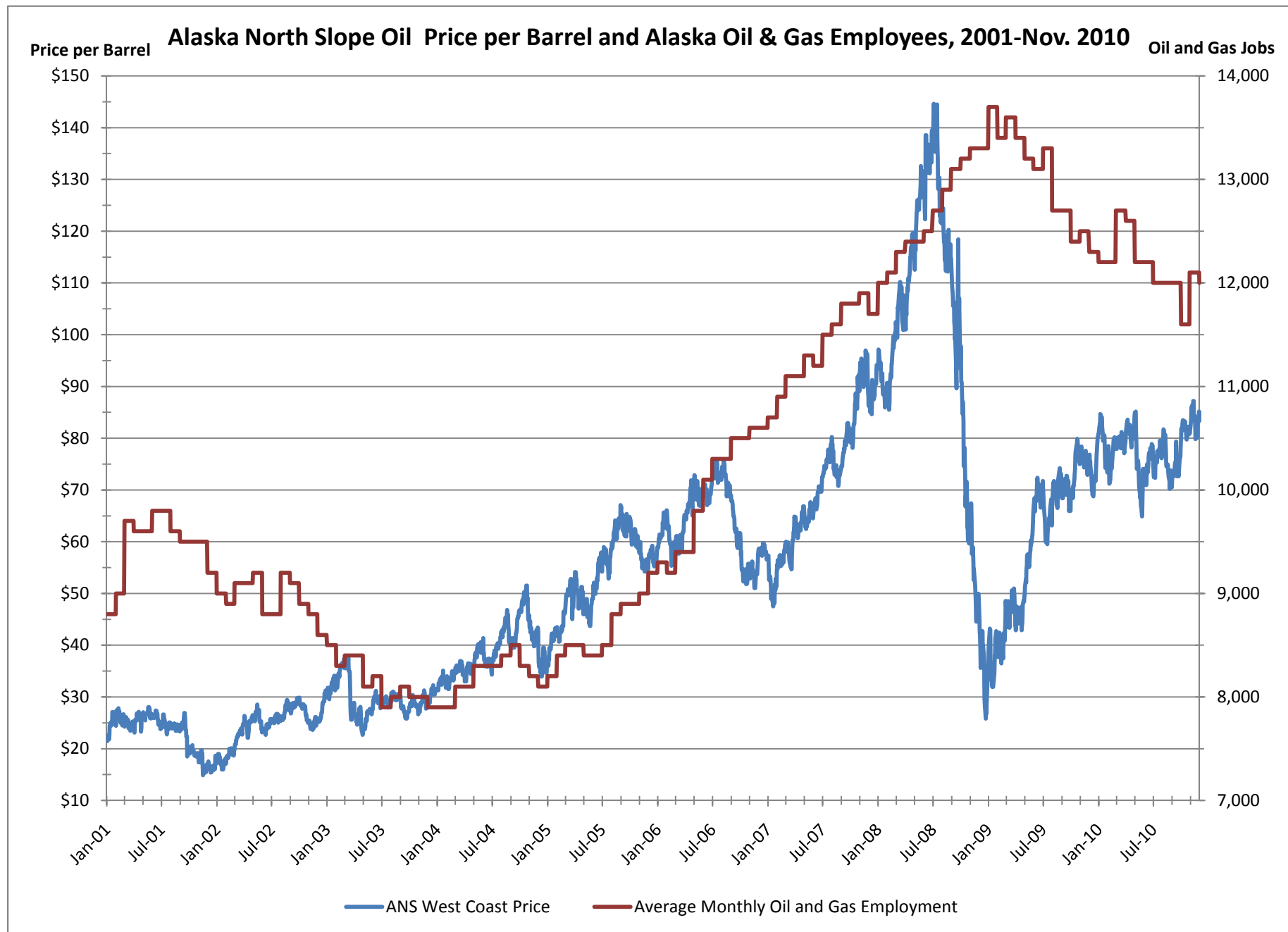
Table 2: Average Annual Alaska Oil and Gas Jobs and North Slope Oil Price and Production, 2001-2010

Year	Annual Oil & Gas Employment ¹	ANS for West Coast Delivery ² (nominal \$ per barrel)	ANS Production ² (barrels per day)
2000	8,800	\$28.40	997,821
2001	9,500	\$23.23	993,844
2002	8,900	\$24.81	996,856
2003	8,100	\$29.57	988,950
2004	8,200	\$38.86	939,170
2005	8,700	\$53.59	889,498
2006	10,100	\$63.65	758,957
2007	11,500	\$71.54	737,206
2008	12,800	\$98.40	705,681
2009	12,900	\$61.00	671,845
2010	12,100	\$77.93	619,044
Overall Average	10,145	\$51.91	845,352
Notes and Sources: 1) 2010 employment figures are preliminary. Alaska Department of Labor and Workforce Development, Research and Analysis, http://laborstats.alaska.gov/ . The Department defines oil and gas jobs as those related to oil and gas extraction, drilling oil and gas wells, and support activities of oil and gas operations, as delineated by the North American Industry Classification System. 2) Alaska North Slope oil prices and production levels are annual averages we calculated based on information from an online database on the website of the Alaska Department of Revenue at http://www.tax.alaska.gov/programs/oil/dailyoil/dailyoil.aspx . Please note that because these figures are based on daily prices and production, they may differ somewhat from figures published elsewhere derived from a different methodology.			

The data in Table 1 are annual averages that, while useful, do not fully capture the volatility of the daily and monthly changes that occur. The data lines in Figure 1 (following page) are based on daily oil prices and monthly employment levels, and provide better insight into the volatility of these variables and the dramatic changes they have undergone in recent years.

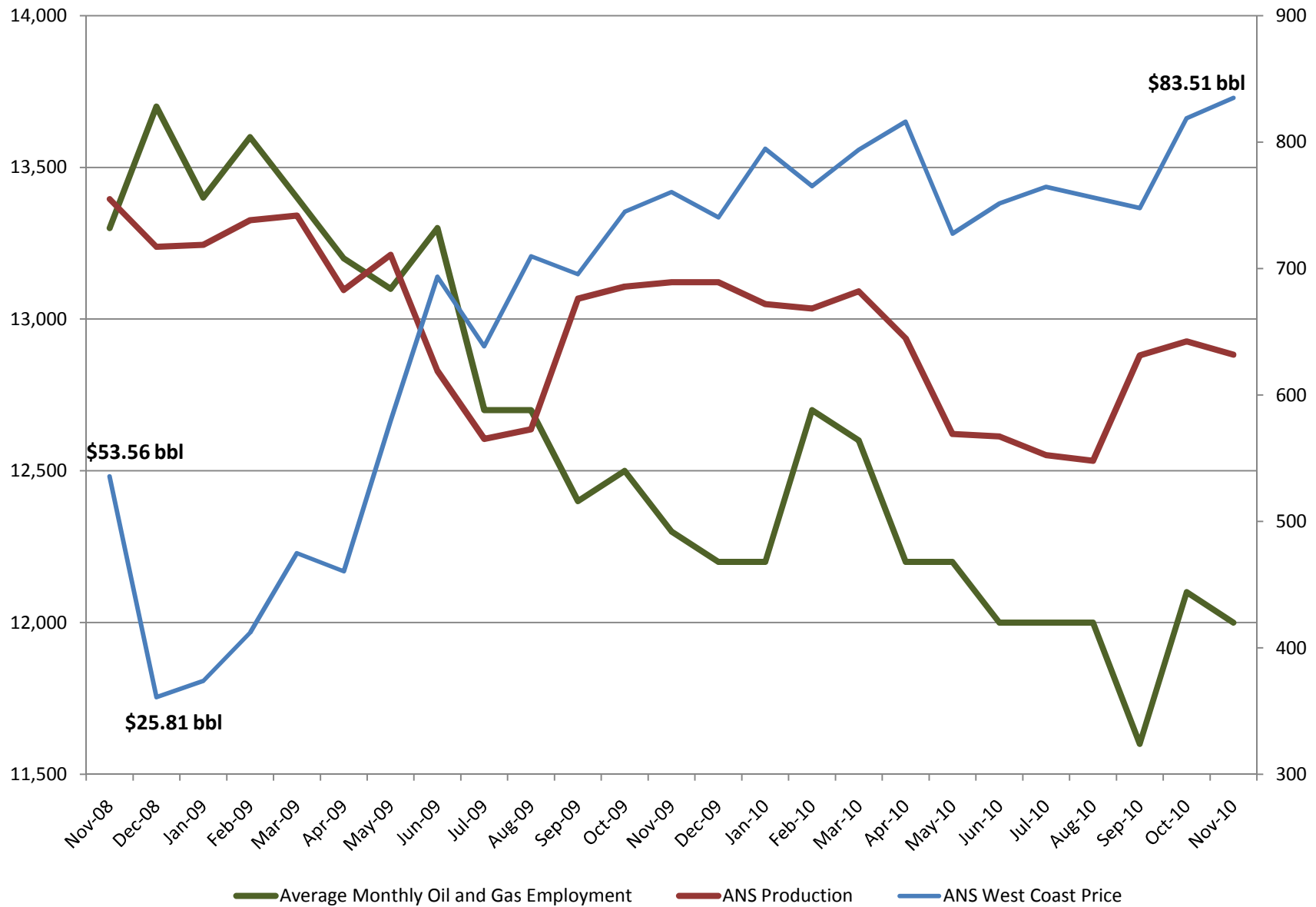
As you can see in Figure 2 (following page), both Alaska North Slope (ANS) oil prices (blue line, left vertical axis) and oil and gas employment (red line, right vertical axis) began an extended period of increases in early 2005. Oil prices suffered a relatively brief swoon in mid-2006 but initiated another steep climb in early 2007 that ultimately saw per barrel prices climb from the mid-\$40 range to over \$144 in July of 2008. Over that two-year period, oil and gas employment expanded by approximately 2,000 jobs—roughly equal to the decrease between December 2008 and September 2010.

Figure 3 (page 12) represents the same variables as Figure 1, but for only the two most recent years of data, and includes an overlay of the price of ANS oil. As you can see, oil production and employment trended down over this period while prices generally moved higher. Beyond showing the relationship between these variables, the graph illustrates again their significant degree of volatility.



Alaska Oil and Gas Employment and Alaska North Slope Production and Price, Nov. 2008-Nov. 2010

Oil and Gas Jobs



We do not intend to imply through these figures and discussion that the causal relationships between prices, production, and/or oil and gas employment are clear or reducible to a simple graph, nor are we suggesting that price and production are the only variables that impact employment—they are not. That there is some relationship is obvious; however, equally apparent is that many other variables influence employment levels. In 2008, the DOLWD dedicated an issue of its *Alaska Economic Trends* magazine to the oil industry in the state, and included substantial discussion of the industry workforce and the various issues that have had significant impacts on employment levels over the years.¹⁵ We review a number of the significant points in that article below.

According to Neal Fried, Economist III with DOLWD and the primary author of the *Trends* issue on the state's oil industry, despite comprising 29 percent of Alaska's gross state product in 2007, the petroleum industry provided just four percent of the state's jobs. Nonetheless, these jobs are important both because of their high average wages and due to their obvious importance to the state's most vital industry. Mr. Fried describes the levels of oil and gas employment in Alaska since 1991, when the industry had 10,700 workers, as having "fluctuated from year to year, with an overarching declining trend accompanied by periods of recovery."¹⁶ The following excerpts from Mr. Fried's article outline a number of these fluctuations, and provide some of the reasons that they occurred:

Other factors aside from production levels and prices explain the changing size of the oil industry's work force, both nationally and in Alaska. Dramatic improvements in technology in the last decade have had a powerful effect on employment levels . . . According to the Federal Reserve Bank of Dallas, the national oil and gas industry was the leader in productivity gains throughout the 1990s and continues to be an above-average performer. In other words, the oil industry has been able to perform more work using fewer workers.

One of the largest contractions in Alaska's oil industry work force took place from 1991 to 1992. BP, along with other oil industry employers and contractors, went through a period of major restructuring and consolidation in response to declining oil prices. The downsizing cost the industry 1,300 jobs – a record one-year loss. Weak oil prices and other factors buffeted the industry again in 1995, when Atlantic Richfield Co. made major cuts to the size of its work force. By 1998, employment in Alaska's oil patch began to recover with the development of the Alpine, Tarn and Badami fields, the drilling at West Sak, and preliminary work at North Star, Liberty and other fields. Oil prices plunged from nearly \$19 per barrel in 1997 to \$13 in 1998 and record job losses followed. For the first time since 1983, Alaska's oil industry employment fell below 8,000 and the losses reverberated throughout the state's economy.

Finally, in 2000, recovery kicked in and by 2001, oil industry employment reached a 10-year high, nearly 2,000 jobs higher than the industry's nadir in 1999. The near concurrent development of both the Alpine and North Star oil fields were the two major reasons for the upswing in activity. What gave the oil industry's employment numbers some extra loft was the construction of large oil modules in Kenai and Anchorage. Before that, they were built in the Lower 48 or overseas. The year 2000 marked a historic event: Alaska's largest oil industry employer and discoverer of Prudhoe Bay, Atlantic Richfield, disappeared from the scene when it sold its assets to BP and ConocoPhillips. The sale was a signal to many observers that Alaska's oil industry was moving into its very "mature" stage of development, and – barring any major field discoveries, the opening of ANWR for exploration or construction of a gas line – the industry's employment trajectory was most likely on a permanent downward sloping curve.

The following four years appeared to reinforce that view. With most of the work completed on the North Star and Alpine fields, oil industry employment began to fall steeply in 2001 and then hover

¹⁵ *Trends* is a monthly publication that studies a wide variety of issues that impact Alaska's economy. Previous issues of the publication, including the September 2008 issue on the oil industry, can be accessed online at <http://labor.alaska.gov/trends/>.

¹⁶ *Trends*, September 2008, p. 6.

at the 8,000 level through 2004. What made that peculiar was the fact that the price of oil was recovering nicely from its 2001 low of \$23 a barrel to \$39 in 2004. Even so, it appeared as if Alaska's oil work force was entering an era of stagnation and enduring decline. Finally, and possibly due to four years of above average oil prices that by 2005 had more than doubled from the 2001 low, the oil industry began to stir again in 2005. Unlike many earlier recoveries, this one wasn't tied to one or two projects. Instead, there were a lot of smaller ones: continued work on heavy oil in West Sak, an increase in the production of viscous oil, the repair of Prudhoe Bay production wells, work around Alpine, the building of new connecting pipelines, and the continued development of a number of satellite fields.

Then in early 2006, a section of BP's pipeline sprung a leak. It eventually turned out to be the largest oil spill in the North Slope's history. Soon afterward, BP discovered additional corrosion problems, forcing the company to shut down the pipeline for a short period. The spill and corrosion led BP to spend more than \$260 million in 2007 and 2008 to replace 16 miles of pipeline in Prudhoe Bay and up-grade the company's facilities. Undoubtedly, that helped turbo-charge Prudhoe Bay employment numbers in late 2006 and early 2007.

Again, we are not suggesting that recent decreases in oil industry employment are not a cause for some concern. We do note, however, that according to the DOLWD, oil and gas workers represented 4.1 percent of claimants for unemployment insurance, which is roughly equal to the portion of the overall Alaska workforce comprised by the oil and gas sector.¹⁷ Further, as the above excerpt makes clear, regular fluctuations and occasional dramatic changes are the norm, rather than the exception, in oil and gas employment levels in Alaska. To be clear, such volatility is not seen in Alaska alone. According to the North Dakota Department of Commerce, that state's oil and gas worker turnover, or "replacement," rate for 2010 was 34 percent, and similar turnover levels are expected through in coming years.¹⁸

Oil and Gas Jobs Moving to Other States

As we mentioned, we are aware of no publicly available data that show oil and gas jobs have been transferred directly from Alaska to North Dakota or any other state. It is true that, on the whole, such employment has decreased over the past two years in Alaska, while North Dakota has seen a large increase due to rapidly expanding production in the Bakken formation in the western third of the state. However, the growth in the North Dakota industry's employment, while quite dramatic, does not appear to reach the levels suggested by the MACC.

According to data published by the North Dakota Petroleum Council, direct employment in its oil and gas industry increased 264 percent, from 5,051 to 18,328, between 2005 and 2009.¹⁹ A study prepared for the North Dakota Department of Commerce reports that industry employment is expected to continue to rise through 2011, to approximately 20,500 workers, and remain at that level through 2015. To be sure, a quadrupling of the oil and gas workforce since 2005 is nothing short of a boom for the industry; however, the roughly 15,000 jobs added in that time period fall well short of the 25,000 jobs that the MACC cites. Since 2009, growth in North Dakota oil and gas employment slowed compared to the 2005-2009 period, adding fewer than 2,000 jobs over the past two years—roughly comparable to the number that the MAAC claims Alaska has lost.²⁰

When measured by the amount of oil produced per employee, Alaska's oil industry is the most efficient in the U.S.—typically by a wide margin. For example, preliminary data from the U.S. Energy Information Administration show that, in 2010, North

¹⁷ "Unemployment Insurance Claimant Characteristics 2010," Alaska Department of Labor and Workforce Development

¹⁸ North Dakota employment figures are from "North Dakota Oil and Gas Workforce Needs and Skills Study," prepared by Electronic Media for the North Dakota Department of Commerce, December 2010, <http://www.commerce.nd.gov/uploads%5Cresources%5C315%5Coil-and-gas-executive-summary.pdf>.

¹⁹ The North Dakota Petroleum Council represents and advocates for over 250 companies in states the oil and gas industry. More information on the group and its activities is available online at <http://www.ndoil.org/?id=25&ncid=4&nid=162>.

²⁰ "North Dakota Oil and Gas Workforce Needs and Skills Study," p. 1.

Dakota produced an estimated 122,471,000 barrels of oil and employed an average of 19,070 oil and gas employees.²¹ This equates to per employee production of about 6,422 barrels for that year. By contrast, an average of 12,100 oil field workers in Alaska produced 224,840,000 barrels of oil, or about 18,580 per worker—nearly three times the per employee rate of production in North Dakota. In other words, because North Dakota’s oil production is derived from a much higher and more geographically dispersed number of wells, the state needs far more workers than Alaska to produce its oil. Therefore, in that state, it appears that the number of workers employed is more directly tied to production than is the case in Alaska.

According to labor economist Neal Fried, this disparity is typical between Alaska and other states. In his 2008 *Trends* article, Mr. Fried compared production levels and numbers of employees in Alaska to those of seven other oil production states. In every case, Alaska workers were more efficient, sometimes to a stunning degree. For instance, Colorado produced 23,903,000 barrels of oil in 2007 and had 18,913 oil and gas employees. That same year Alaska produced ten-times the amount of oil with about 6,700 fewer employees.²²

Compared to the per employee oil production rate in Alaska for 2007, the 2010 rate decreased by over 5,000 barrels, or nearly 20 percent. By contrast, over the same time period, overall oil production has decreased by about 17 percent, but average annual oil and gas employment in the state has increased over 5 percent. Again, we believe the complex interplay of these variables with the many other factors that help determine oil and gas employment levels in the state belie simplistic attempts to explain changes in those levels or claims that jobs have been “moved” to another jurisdiction.

We hope this is helpful. If you have questions or need additional information, please let us know.

²¹ The U.S. Department of Energy, Energy Information Administration, provides a wide variety of data on its website at <http://www.eia.gov/>. Oil production data are available at http://www.eia.gov/dnav/pet/pet_crd_crdn_adc_mbb1_m.htm.

²² Neal Fried, *Trends*, September 2008, p. 11. Please note that the oil and gas employees in other states have produced much more natural gas than Alaska, which mitigates the differences in per worker production levels somewhat. Even controlling for gas production, however, Alaska appears to have higher levels of efficiency than other areas.