ALASKA STATE LEGISLATURE
HOUSE SPECIAL COMMITTEE ON OIL AND GAS
April 11, 2006
8:05 a.m.

MEMBERS PRESENT

Representative Vic Kohring, Chair
Representative Lesil McGuire
Representative Norman Rokeberg
Representative Ralph Samuels
Representative Nancy Dahlstrom
Representative David Guttenberg

MEMBERS ABSENT

Representative Berta Gardner

OTHER LEGISLATORS PRESENT

Representative Jay Ramras

COMMITTEE CALENDAR

HOUSE BILL NO. 498
"An Act authorizing tax credits against the production tax on oil and gas for qualified expenditures for challenged or nonconventional oil or gas and for qualified expenditures for nonconventional or renewable energy resources; giving the Act contingent effect; and providing for an effective date."

- MOVED HB 498 OUT OF COMMITTEE

PREVIOUS COMMITTEE ACTION

BILL: HB 498
SHORT TITLE: TAX CREDITS NONCONVENTIONAL OIL/GAS
SPONSOR(S): RULES

04/03/06	(H)	READ THE FIRST TIME - REFERRALS
04/03/06	(H)	O&G, RES, FIN
04/11/06	(H)	O&G AT 8:00 AM CAPITOL 120

WITNESS REGISTER

BRIAN R. WENZEL, Vice President
Finance and Administration

ConocoPhillips Alaska, Inc.
Anchorage, Alaska
POSITION STATEMENT: Testified in support of HB 498 and responded to questions.

JEFFREY A. SPENCER, Supervisor
Greater Kuparuk Area (GKA) Heavy Oil Development
ConocoPhillips Alaska, Inc.
Anchorage, Alaska
POSITION STATEMENT: During discussion of HB 498, indicated support, provided comments, and responded to questions.

FRANK PASKVAN, Subsurface Team Lead
Western Prudhoe Bay
"BP"
(No address provided)
POSITION STATEMENT: Provided comments and responded to questions during discussion of HB 498.

SAM W. FRENCH, PE, Project Lead
Lisburne field
"BP Exploration"
(No address provided)
POSITION STATEMENT: Provided comments and responded to questions during discussion of HB 498.

SCOTT DIGERT, Subsurface Manager
"BP"
Anchorage, Alaska
POSITION STATEMENT: Testified in support of HB 498.

ROBERT B. HUNTER, Project Manager
Arctic Slope Regional Corporation (ASRC) Energy Services
Anchorage, Alaska
POSITION STATEMENT: Provided comments and responded to a question during discussion of HB 498.

ROBYNN WILSON, Director
Tax Division
Department of Revenue (DOR)
Anchorage, Alaska
POSITION STATEMENT: During discussion of HB 498, expressed concerns and responded to questions.

BILL VAN DYKE, Acting Director
Central Office
Division of Oil & Gas

Department of Natural Resources (DNR)
Anchorage, Alaska
POSITION STATEMENT: During discussion of HB 498, expressed concerns and responded to questions.

ACTION NARRATIVE

CHAIR VIC KOHRING called the House Special Committee on Oil and Gas meeting to order at 8:05:25 AM. Representatives Kohring, Rokeberg, Samuels, and Dahlstrom were present at the call to order. Representatives McGuire and Guttenberg arrived as the meeting was in progress. Representative Ramras was also in attendance.

HB 498 - TAX CREDITS NONCONVENTIONAL OIL/GAS

[Includes brief mention of HB 488 and SB 305.]

8:05:33 AM

CHAIR KOHRING announced that the only order of business would be HOUSE BILL NO. 498, "An Act authorizing tax credits against the production tax on oil and gas for qualified expenditures for challenged or nonconventional oil or gas and for qualified expenditures for nonconventional or renewable energy resources; giving the Act contingent effect; and providing for an effective date."

REPRESENTATIVE ROKEBERG, speaking as chair of the House Rules Standing Committee, which sponsored HB 498, relayed that although the bill is designed to mesh with HB 488 via the inclusion of a conditional effect provision, it has been crafted as a free-standing bill. He indicated that [the tax credits provided for in Sections 1 and 2 of the bill can no longer be claimed] after March 31, 2016; the reason for this is that newer technologies might render the additional credits unjustified. House Bill 498 provides for a 15 percent tax credit for production of challenged or nonconventional oil and gas, and a 25 percent tax credit for investment in alternative energy projects; both of these tax credits would be applied against petroleum production taxes.

REPRESENTATIVE ROKEBERG explained that proposed AS 43.55.026(f) defines the qualified expenditures to which the aforementioned 15 percent tax credit may be applied and is meant to be consistent with HB 488; proposed AS 43.55.026(g) outlines what

constitutes challenged or nonconventional oil and gas as follows:

(g) In this section,

(1) "challenged oil or gas" means

(A) oil that is produced from a reservoir located, in whole or in part, north of 68 degrees, 15 minutes North latitude in this state, without regard to its API gravity or depth, if the oil is produced from

(i) the Ugnu Formation or West Sak - Schrader Bluff Formation; or

(ii) a formation that is stratigraphically equivalent to a formation described in (i) of this subparagraph;

(B) oil that is produced from a reservoir for which, as of January 1, 2006, one of the following participating areas had been formed: the Orion or Polaris participating area in the Prudhoe Bay Unit, the West Sak participating area in the Kuparuk River Unit, or the Schrader Bluff participating area in the Milne Point Unit;

(C) oil that has an API gravity of 25 or less produced from a reservoir or field located, in whole or in part, north of 68 degrees, 15 minutes North latitude in this state and at a true vertical depth as measured from sea level of 5,500 feet or less;

(D) oil that has an API gravity of 18 or less, regardless of depth or location within this state;

(E) oil produced from a reservoir whose reservoir rock is primarily made up of carbonates;

(F) oil produced through the application of one or more enhanced oil recovery techniques, including

(i) steam injection;

(ii) microemulsion flooding;

(iii) in situ combustion;

(iv) polymer-augmented water-flooding;

(v) alkaline or caustic flooding;

(vi) immiscible nonhydrocarbon gas displacement;

(vii) microbial;

(viii) low-salinity water flooding; or

(ix) any other method not described in (i) - (viii) of this subparagraph that is certified by

the department to be a qualified enhanced oil recovery technique or that is certified by the Alaska Oil and Gas Conservation Commission for purposes of this section;

(G) oil requiring ultra-extended reach drilling where the total step-out of the well is greater than 25,000 feet laterally away from the surface hole location;

(H) oil production not described in (A) – (F) of this paragraph that is inherently difficult and expensive to produce and is certified by the department to be challenged oil; and

(I) gas produced from or in association with oil that is produced as described in (A) - (H) of this paragraph;

(2) "nonconventional gas" means

(A) gas produced or recovered from or in association with nonconventional oil;

(B) gas produced or recovered from or in association with hydrates formed from hydrocarbons, including free gas trapped beneath gas hydrates;

(C) gas manufactured from the gasification of coal;

(D) tight gas produced from reservoirs with average permeabilities less than 0.1 millidarcies; and

(E) gas not described in (A) – (D) of this paragraph that is inherently difficult and expensive to produce and is certified by the department to be nonconventional gas;

(3) "nonconventional oil" means:

(A) oil produced or recovered from or associated with tar sands;

(B) oil produced or recovered from or associated with oil shale; and

(C) oil production not described in (A) or (B) of this paragraph that is inherently difficult and expensive to produce and is certified by the department to be nonconventional oil.

REPRESENTATIVE ROKEBERG concluded by offering his belief that the enhanced oil recovery (EOR) techniques outlined in proposed AS 43.55.026(g)(1)(F) are all new, cutting edge technologies, and relaying that the remaining bill sections provide for transition regarding regulations and retroactivity of regulations, and for the aforementioned conditional effect.

8:13:24 AM

REPRESENTATIVE ROKEBERG, in response to a question, indicated that language in proposed AS 43.55.026(f) might present somewhat of a problem.

REPRESENTATIVE SAMUELS opined that the higher costs for heavy oil should be incorporated without extra credit because [those] costs are going to be recovered before taxes are paid.

REPRESENTATIVE ROKEBERG offered his understanding that the tax credits have a valuation of approximately 300 basis points, under the 15 percent tax credit, against the tax rate itself on a ratio of 5:1 at $60 per barrel. He mentioned that he's had an amendment drafted that would include carbon dioxide injection as one of the listed EOR technologies because it's in use now, and that "some of these costs are going to be assumed and credited anyway." Another portion of the aforementioned amendment would account for all the oil that is lifted; the aforementioned amendment was labeled 24-LS1817\F.1, Chenoweth, 4/10/06, and read:

Page 4, line 12, following "flooding;":
Insert
"(ix) carbon dioxide (CO_2) injection;"

Renumber the following sub-subparagraph accordingly.

Page 4, line 13:
Delete "(i) - (viii)"
Insert "(i) - (ix)"

Page 4, line 22, following "oil;"
Insert
"(I) all oil recovered from a separate and distinct zone or geological horizon that is produced as described in (A) - (H) of this paragraph, but only if the average API gravity of the oil produced from that zone or geological horizon does not exceed the API gravity limits set in (C) and (D) of this paragraph, as appropriate;"

Reletter the following subparagraph accordingly.

Page 4, line 24:
Delete "(A) - (H)"
Insert "(A) - (I)"

CHAIR KOHRING asked whether there is any overlap or redundancy between HB 498 and HB 488.

REPRESENTATIVE ROKEBERG reiterated that currently HB 498 is designed to dovetail with HB 488. However, the legislature could either pass HB 498 as a stand-alone bill - by removing the conditional effect clause - redesign the tax credit slightly, or use it as an amendment to [HB 488]. He indicated that one of the distinctions between HB 498 and HB 488 is that HB 498 limits the transfer of credits to only affiliates.

CHAIR KOHRING characterized HB 498 as another way for the industry to help offset taxes.

8:20:14 AM

BRIAN R. WENZEL, Vice President, Finance and Administration, ConocoPhillips Alaska, Inc. ("ConocoPhillips"), testified in support of HB 498 and its conditional effect clause, adding, however, that HB 498 will not have its intended effect unless the right balance in HB 488 is arrived at.

8:21:42 AM

JEFFREY A. SPENCER, Supervisor, Greater Kuparuk Area (GKA) Heavy Oil Development, ConocoPhillips Alaska, Inc., via a PowerPoint presentation, relayed that the North Slope has very large, heavy oil resources, as well as currently-developed light oil reservoirs. The viscous oil resource is contained in five fields - "West Sak field, Milne Point [Unit], Orion, Polaris, and the shallower horizon in the Ugnu ... [formation]" - and there are approximately 23-24 billion barrels of heavy oil about evenly split between "the West Sak - or Schrader Bluff formation - and the shallower Ugnu horizon." Within the ConocoPhillips-operated Kuparuk River Unit itself, there are approximately 16 billion barrels of oil in place, also somewhat evenly split between the West Sak and Ugnu formations.

MR. SPENSER stated that these viscous oil resources are located below the permafrost in the shallow reservoirs from approximately 3,000 to 4,500 feet; the shallow depths and thick permafrost result in low reservoir temperatures and this in turn results in high viscosities, which makes the oil very difficult to produce and can result in lower rates of recovery as compared to light oil or gas.

MR. SPENCER briefly outlined the GKA heavy oil development history and the various well designs that are being used, and explained that all of the North Slope heavy oil developments are subject to certain operating conditions - harsh arctic conditions, minimal footprint, limited contractor resources, and pushing limits of drilling technology; to geologic complexity - shallow depths and permafrost issues, unconsolidated formations, low reservoir temperature, and highly faulted; and to viscous oil properties - artificial lift required, fluid separation difficulties, solids handling and disposal issues, and lower quality crude. This translates into higher cost, lower rate wells, lower overall recovery, and lower price per barrel. He posited that if it weren't for the rapid advances in horizontal drilling and multi-lateral technologies made over the last several years, the vast North Slope heavy oil resources would likely remain fallow.

MR. SPENCER, in response to questions, explained that vertical wells average 200-300 barrels of oil per day, whereas horizontal multi-lateral wells average 1,500-2,000 barrels per day. He added that well costs average between $8 million and $10 million. In response to further questions, he said that light oil would make higher oil rates and have less producing problems with solids production.

MR. SPENSER, returning to his PowerPoint presentation, relayed that there have been some expensive lessons as [ConocoPhillips] continues to push the technical limits regarding drilling on the North Slope. He discussed a typical West Sak tri-lateral producer with horizontal laterals from 4,500-8,500 feet in the D, B, and A sands. In the A sands, ConocoPhillips tends to undulate between the upper and lower sands to try to contact more reservoir rock and increase its recovery from the formation. Furthermore, ConocoPhillips changed the well types - from vertical to multi-lateral - the recovery mechanisms, the sand control, the well spacing, and drilling mud systems.

8:30:45 AM

MR. SPENCER, referring to PowerPoint slides, explained that ConocoPhillips usually has to cross multiple faults and yet remain within a tiny window of the reservoir rock, from 20-50 feet, while reaching out to lengths of nearly 13,000 feet from a surface location. Once the wells are drilled and the oil is brought to the surface - usually by means of downhole pumps or other artificial lift methods - other issues remain regarding production of heavy and viscous oils. He said that higher

operating costs are also a result of having to use more heat and/or chemicals to separate the water from the entrained oil from Central Production Facility (CPF) 1, where the West Sak developments are taking place. Essentially, the total cost for heavy oil is double what it is for light oil because of the requirement for artificial lift, the additional separation problems, the handling of the solids, and waste disposal.

CHAIR KOHRING, returning to the comparisons made on an earlier PowerPoint slide, asked, "Are these improvements in technology or are you just simply trying different techniques in order to increase production?"

MR. SPENCER informed the committee that there was a rapid advance in technology between 1998 and 2004, both in the extended reach drilling as well as in multi-lateral technology; for example, ConocoPhillips was able to go to tri-laterals and beyond. In response to another question, he posited that the past tax credits granted by the legislature have been instrumental in encouraging that technological change and growth.

CHAIR KOHRING, in response to a question, indicated that he is pondering how the tax credits provided for in HB 498 might affect the future development of heavy oil, the use of new technologies, and further advances in technology.

8:34:07 AM

MR. SPENCER relayed that in addition to fluid separation, there are also solids production problems related to producing heavy and viscous oils from shallow unconsolidated reservoirs. He further described the viscous nature of the oil, how it creates a lot of drag and frictional forces in the reservoir, and how that tends to pluck sand grains off from the reservoir thus bringing them to the surface. He stated that the solids in the tanks generally have the consistency of glacial mud or silt, and are transported in trucks to the grind and inject facilities in Prudhoe Bay. This increases the operating costs, relative to light oil developments. In response to a question, he explained that the photos in the PowerPoint slide are of solids after the oil has been separated.

MR. SPENCER relayed that another problem with transporting solids along with the fluids is that it can greatly increase the wear on equipment, particularly on rotating equipment such as downhole pumps and surface pumps. He summarized that with the

North Slope operating conditions, the geologic complexities, and the viscous nature of the oil leading to the high costs, lower rate wells, lower overall recovery, and the lower price per barrel, the development of heavy oil on the [North] Slope is economically challenged. He mentioned that ConocoPhillips would like to continue development of the eastern West Sak area, and - assuming a stable fiscal environment and pushing the limits of technology - development in the northeast West Sak area; this series of developments could total over $1 billion over the next five to seven years. Beyond that, to develop the western West Sak and the Ugnu resources would require new technology applications because viscosity and, hence, production difficulty, is greater.

8:37:49 AM

MR. SPENCER expressed his hope that ConocoPhillips and its partners can move forward with these projects and the development of North Slope heavy oil resources, which are vast; development of those resources is key to minimizing Alaska North Slope production decline. In conclusion, he remarked, ConocoPhillips supports HB 498 and believes it could be beneficial in accelerating investment.

MR. SPENCER, in response to questions, said that typically the wells that are producing in the viscous fields are dedicated viscous oil wells; that he is not sure ConocoPhillips has a cutoff regarding acceptable API gravity; that thermal stimulation is used in Canada to improve the ability of oil to flow; and that dedicated wells are used for heavy oil development; and that some EOR techniques possibly could be used within the West Sak reservoir itself.

MR. WENZEL, in response to other questions, said that ConocoPhillips looks at HB 498 as an incremental incentive for developing both the heavy oil resource and the necessary technology, though the still-evolving PPT legislation will provide additional recognition of the higher costs of developing "resources like this"; HB 498 is intended to incentivize the development of a number of new technologies for the long term in Alaska. He added, "I don't think we are looking at this provision as the way to get gas for the pipeline necessarily."

REPRESENTATIVE SAMUELS expressed disfavor with providing a tax credit for hydrate research.

MR. WENZEL opined that doing so would still be good for Alaska. In response to further questions, he indicated that there is support, among the large producers and the industry in general, for the balance proposed in the original PPT legislation, with that balance being a foundation for HB 498.

8:49:25 AM

FRANK PASKVAN, Subsurface Team Lead, Western Prudhoe Bay, "BP", relayed that he would be speaking to the provision of HB 498 regarding credits for expenditures for challenged oil as it pertains to viscous oil. He said that based on the knowledge he gained from working on a number of fields on the North Slope, he believes that the "challenged oil bill" would materially impact whether the oil industry will remain in Alaska in the future, and that viscous oil development in Alaska is the next big development target. However, it won't be easy, he added, referring to the economics of the upcoming Western Region Development project in Western Prudhoe Bay that will focus on developing viscous oil resources that lie above the "main Prudhoe accumulation."

MR. PASKVAN characterized viscous oil as a huge resource for the state, referred to a chart illustrating the shallow fields challenged by high viscosity, and described various viscosity ratings. Shallower reservoirs have thicker oil because the crude is colder and has a heavier API gravity, and such fields are just starting to be developed because of investments in technology, and such investments are really just a step towards really high viscosity targets - even targets with a tar-like consistency.

MR. PASKVAN relayed that the bottom part of the aforementioned chart characterizes the size of the target for future development, that being about one half of the known North Slope oil remaining; however, that oil is "challenged by high viscosity," and requires drilling multi-lateral wells, which is costly in terms of time and money even though such wells make less than the oil rate of "a decent light oil producer." That's why BP needs HB 498's incentives Consider also that one out of every eight barrels belongs to Alaska. He mentioned that some wells have low production rates and that sometimes more injectors per producer must be drilled, and relayed that viscous oil development is difficult because of having to separate oil from water at lower temperatures. The various challenges of producing viscous oil result in higher operating costs. He

remarked that BP would like to keep the pipeline full and is encouraged by the introduction of HB 498.

MR. PASKVAN, in response to questions, said that as part of the Western Region Development project, BP is spending over $100 million in infrastructure modifications; that there will also be somewhat higher operating costs, though he didn't have an exact figure per barrel; that viscous oil is separated into different depths, with the shallower fields being thicker; that those wells being drilled are specifically targeted to "those horizons"; and that there shouldn't be too much overlap between light oil and heavy oil targets.

MR. PASKVAN, in response to further questions, relayed that the lighter the oil, the more associated gas there is; that HB 498 "clearly demarks the different bands"; that the API gravity is a measurement that can be made at the surface very accurately; that the data represented in his charts pertains to reservoir viscosity as calculated from a sample taken downhole via an expensive sampling methodology but which is difficult to acquire on a well-by-well basis; that BP wouldn't recommend any change to the bill regarding its terminology; and that to date BP has not run into any viscous oil reservoir that also has light oil.

MR. PASKVAN, in response to other questions, said it is possible that BP could discover a deeper heavy oil that might meet the "18 API criteria", but such would need specific technologies to develop; that an injector well is used to inject water or gas in order to help coral the oil and push it to production; that BP is doing research on the potential applicability of CO2 for viscous oil reservoirs, though it is difficult to say whether such will be advantageous to ultimate recovery; that in the Orion reservoir, BP is using immiscible injection gas EOR from the "Prudhoe central gas facility"; that each reservoir is a separate formation and so injectants - of any kind - into one reservoir won't affect others; and that polymer augmented water flooding constitutes an area of research.

9:09:02 AM

SAM W. FRENCH, PE, Project Lead, Lisburne field, "BP Exploration", relayed that the Lisburne field has a lot of potential in a large resource space, and that BP is focused on redevelopment of that field in order to increase recovery. The Lisburne reservoir is adjacent to the Prudhoe Bay reservoir; the top of the Lisburne reservoir is about 100 feet deeper than the bottom of the Prudhoe Bay reservoir; the Lisburne reservoir, a

fractured carbonate reservoir, is the only producing carbonate field in Alaska; and the majority of the other fields are sandstone reservoirs.

MR. FRENCH explained that carbonate reservoirs throughout the world are known to be some of the most complex reservoirs from which to produce oil and gas because the rock is very dense and thus it is difficult to get oil to flow through it. What helps BP get commercial production rates at the Lisburne field are drilling wells that intersect the fractures, which have higher permeability - the oil seeps into those fractures and then moves at a higher rate to BP's wells - but the key is being able to locate the reservoir's fractures. However, not only do the fractures vary throughout the reservoir, the reservoir's quality of rock and permeability varies significantly, both vertically and laterally.

MR. FRENCH posited that the Lisburne field would qualify for the tax credits proposed by HB 498, and relayed that the original oil in place (OOIP) in the zones that BP is currently producing from is estimated to be 2 billion barrels, with a recovery factor of about 8 percent based on BP's current cumulative production. Without new technology, BP probably won't recover significantly more than that, even though the statistical mean recovery factor in oil carbonate reservoirs worldwide is about 36 percent. A key to attaining that global benchmark is new technology, and any tax credits will help BP get new technology projects approved. He noted that currently, BP can't predict the location of the fractures in the Lisburne field, and thus there is no guarantee that any new wells drilled in that field will be successful; furthermore, with conventional drilling technology, fractures are typically damaged by drilling fluids.

9:16:04 AM

MR. FRENCH indicated that this is another area where new technology can help - both in terms of prevention and fixing the problem after it occurs - because production rate depends on the fractures. He pointed out that the Lisburne field is located in a high cost environment; not only does it have the costs associated with all oil fields in the arctic environment, but it is also deeper than many other fields and the rock is so hard that there is a low rate of penetration while drilling and that too increases costs. The potential for recovering additional oil from the Lisburne field lies in the application of new technology because currently some of the projects are marginal.

In conclusion, he said that BP supports HB 498, and believes it will help the Lisburne field.

MR. FRENCH, in response to questions, relayed that the aforementioned fractures are naturally occurring; that attempts to artificially create fractures have not been successful; that conventional water flooding has not been successful; that BP is studying some other options for injecting water such as low-salinity water flooding.

MR. PASKVAN, in response to a question, said that the Liberty field is a sandstone reservoir similar to the Endicott formation.

9:20:43 AM

SCOTT DIGERT, Subsurface Manager, "BP", relayed that the Milne Point field has been at the forefront of BP's viscous oil development on the North Slope, and that over the past four years viscous oil production has been pushed as high as 20,000 barrels a day - approximately 40 [percent] of Milne Point's total production - and this has been accomplished via heavy investment in new drilling technology and facility upgrades. This investment has been enabled by the current favorable fiscal framework; BP was also able to take advantage of the upturn in oil prices, which allowed good returns on its viscous oil development. He indicated that BP is in support of HB 498 - which he hopes will encourage ongoing viscous oil development to the benefit of both the industry and the citizens of Alaska - and intends to invest "for a 50-year future in Alaska."

MR. DIGERT relayed that a key element in that investment plan is the Alaska gas pipeline project; that project needs to be built on a strong and stable foundation for BP's oil business, because it is that oil business that will provide the bridge to gas. His company is striving to maximize recovery of its substantial known oil resources in Alaska, and should be fully aligned with the state in seeking to maximize production. Production from BP's fields is steadily declining, and in order to stabilize that decline steps must be taken to bring on new production of the viscous oil reservoirs. However, it will be costly to develop those reservoirs, requiring innovation, advances in technology, and a tolerance for increased risk; the wells required are complex and costly, and existing production facilities require substantial retrofitting to handle cold, viscous oil.

MR. DIGERT spoke of the need for Alaska to remain competitive in the global marketplace [in order for producers to] continue developing the aforementioned reserves, and noted that BP is developing Schrader Bluff and West Sak reservoirs, has mapped 5 billion to 10 billion barrels of OOIP in those reservoirs, and hopes to recover up to 20 percent of the oil in the best performing areas. To date, however, BP has only recovered about 1 percent of the total available and that's after investing several hundred million dollars, so major continued investment will be needed as will further technological advances. The risk of such must be balanced by the opportunity to obtain attractive returns; BP's viscous oil business needs to be robust enough to survive a low-price oil cycle, and be positioned to thrive when prices are favorable. House Bill 498 will help offset some of the tax burden, and is very welcome.

MR. DIGERT characterized the bill's definitions of challenged and nonconventional oil and gas as appropriate and suitable for encouraging further development. He encouraged the committee to pass HB 498 and seek its inclusion in a broader PPT package as it moves forward. In conclusion he said, "I remain very concerned about the future investment climate in Alaska; I strongly encourage the legislature to continue to seek a fair and balanced tax package which fundamentally continues to attract investment [and] provides the opportunities for innovation and developing our resources."

9:26:34 AM

ROBERT B. HUNTER, Project Manager, Arctic Slope Regional Corporation (ASRC) Energy Services, relayed that for the past four years he has managed a joint U.S. Department of Energy (DOE) and "BP" cooperative research project to study gas hydrates on the Alaska North Slope. This research is designed to determine the resource potential of gas hydrates; the Alaska North Slope may provide a relatively accessible and natural laboratory to help determine the technical feasibility of recovering natural gas from gas hydrates and associated free gas. A gas hydrate is a solid combination of gas and water - called a clathrate - that occurs within distinct pressure, temperature, and stability regions within porous and permeable reservoirs; gas hydrates can occur in sufficient concentrations to potentially become a significant resource if the clathrates can be changed, within the reservoir, into liquid water and natural gas components by modifying the pressure, temperature, and/or the chemistry of the system.

MR. HUNTER said that although 44-100 trillion cubic feet (Tcf) of in-place gas hydrates are estimated to be on the Alaska North Slope by the United States Geological Survey (USGS), the potential recoverable resource remains unproven and unknown at present. This uncertainty is reflected in studies from reservoir modeling that estimate that 0-12 Tcf of this type of gas could potentially be recovered from the 33 Tcf in place within the Eileen Trend; additional data is required to narrow this uncertainty and learn more about gas-hydrate-bearing reservoir properties, and BP and the DOE look forward to continuing this gas hydrate research, and have recently approved drilling of a dedicated North Slope stratographic test to that end. There are many remaining technical challenges to be addressed in this project before potential gas hydrate productivity is better understood, and although it is too early to tell, this research may contribute to determining whether this large, potential gas resource might one day become part of the overall U.S. gas supply portfolio.

MR. HUNTER, in response to a question, said that typically reservoir units contain both hydrates and free gas, with free gas being at or just below the gas hydrate's stability zone depth, which is commonly around 3,500 feet "in the subsurface" though it can be deeper.

9:33:11 AM

ROBYNN WILSON, Director, Tax Division, Department of Revenue (DOR), relayed that the division has concerns about administering HB 498, which provides a [tax] incentive in three areas - certain oils and areas, certain methods of EOR, and the development or use of renewable energy. For each of these categories, the DOR thinks it is very important to define the time, the place, and the allowable costs; that is: the time when the costs that will be creditable are incurred, the place where the activities that would be creditable are taking place, and what the allowable costs are. Some of those points are not as clear as they could be. For example, are costs allowable if a project is already underway on the effective date of the bill? Also, in terms of place, research and development of new technology are eligible activities even if they occur in Venezuela, for example, and therefore the bill should clarify exactly what is creditable.

MS. WILSON said it would also be helpful if HB 498 were clearer with respect to the locations of EOR projects; for example, would BP's "Liberty project," which is located on the federal

outer continental shelf but would likely have surface facilities on state land, qualify for the bill's credit. She noted also that some of the EOR activities listed in the bill appear to be "piggybacked" off of federal rules, which are very specific that a project needs to be on federal land or adjacent seabed. In terms of allowable costs, she said, the division is concerned that HB 498 is not clear regarding what types of costs qualify or the scope of those costs. Furthermore, the bill uses the term "qualified expenditure", but does not define that term; and so although the intent might be to mesh HB 498 with the PPT bill, that legislation uses the term "qualified capital expenditure", which encompasses exploration and items that are capitalized for federal purposes.

MS. WILSON said that if the intention is to allow the same kinds of costs that the federal government allows for EOR projects, there are some federal costs which are normally expensed that would be subject to the federal EOR credit; for example, the cost of the injectant is expensed federally, not capitalized, and so would not fit under the PPT legislation's term, "qualified capital expenditure". She encouraged the committee to be very clear about what kind of costs it intends to be covered under HB 498. Also, in the area of allowable costs, the language on page 5, lines 17-18, that speaks to the development or use of renewable energy is pretty broad. She reiterated that she simply wants to be certain regarding what costs the committee envisions as being qualifying.

9:40:32 AM

MS. WILSON posited that the issue of cost allocation also needs to be addressed in the bill; for example, cost allocation may be necessary when two grades of oil are pulled up, and for any jointly-owned facilities or shared operations. In response to a question, she indicated that in requesting that the committee be specific regarding what costs should qualify, she is pointing out that she is not sure what the intention is regarding overhead, adding that although she has not thought through a specific allocation methodology, the department would be willing to assist the committee on that issue.

MS. WILSON remarked that defining challenged oil as having an API gravity of 25 degrees or less for depths of less than 5,500 feet subsurface is generous, and suggested that the committee consider using 20 degrees as the threshold instead. Also, API gravity is not the ideal parameter to use, she opined; a more appropriate parameter would be oil viscosity, which is measured

in units called centipoise (cP) and refers to the ability of a liquid to flow. Consider that some so-called heavy oils actually have a more favorable viscosity and flow as well as that with a higher API due to gas content and reservoir temperature. For example, some of the Orion and Polaris participating areas are 5-10 cP, and the Kuparuk [River Unit] formation oil has an API gravity of 22-25 but also has a favorable viscosity. Care must also be taken with regard to where and under what conditions the API gravity and viscosity of oil are measured, because different pressure, temperature, and gas-to-oil ratio conditions can give different values for API gravity and viscosity, with temperature being the more important variable.

9:45:26 AM

MS. WILSON pointed out that one of the oil reservoirs described under the bill as containing challenged oil is already under production at Lisburne and has been since 1986; the Lisburne participating area was approved by the Division of Oil & Gas in December 1986. The other possible known reservoir defined by proposed AS 43.55.026(g)(1)(E) is the Shublik formation, which is one of the Permotriassic reservoirs in the Prudhoe Bay Unit (PBU), and the Permotriassic reservoirs are the main producing reservoirs in the PBU and are known as the initial participating areas. Some of the projects identified in proposed AS 43.55.026(g)(1)(F) are currently under valuation in the PBU and Duck Island Unit, and BP has already performed pilot/test projects involving polymer-augmented water-flooding [at] the Brightwater project at the Flow Station 2 area in the PBU, and low-salinity water flooding in the PBU and Duck Island Unit. Single-well tracer tests in these two units have yielded 8-20 percent recovery improvements, and the Internal Revenue Service (IRS) has certified low-salinity water injection as an EOR process for federal investment tax credit.

MS. WILSON referred to proposed AS 43.55.026(g)(1)(H), and said that the North Slope producers have already drilled extended reach drilling ("ERD") wells of over 22,000 feet at Niakuk and Milne Point; numerous development projects on the North Slope are easily designed around drilling 15,000-20,000 feet and beyond. Such drilling may be more expensive but it allows access to oil through centrally located and more environmentally friendly locations. She pointed out that many of the aforementioned projects already qualify for the 15 federal EOR credit and could potentially benefit by a 35 percent federal tax rate, and under both this bill and the PPT legislation, a

project could also qualify for a 20 percent tax deduction, a 20 percent credit, and potentially another 15 percent credit. That potentially adds up to over a 100 percent, and does not include the state income tax deduction, which is based on the federal credit.

MS. WILSON, in conclusion, said she would be happy to work with the committee to clarify the aforementioned issues.

CHAIR KOHRING indicated that clarification might come in the form of a committee substitute (CS).

[Following was a brief discussion regarding how the committee would be proceeding.]

The committee took an at-ease from 9:51 a.m. to 9:53 a.m.

CHAIR KOHRING then recessed the House Special Committee on Oil and Gas to a call of the chair.

CHAIR KOHRING called the meeting back to order at 11:34 a.m.

11:35:54 AM

BILL VAN DYKE, Acting Director, Central Office, Division of Oil & Gas, Department of Natural Resources (DNR), opined that viscous oil projects are challenged on the North Slope, and that the economics are generally not on par with comparable light oil projects. He urged restraint, however, when considering incentives for viscous oil projects and the other types of projects addressed in HB 498. As currently drafted, with respect to viscous oil, HB 498 cuts a pretty broad swath across the entire North Slope, and with respect to nonconventional gas, it cuts a pretty wide swath across the entire state. Furthermore, HB 498 also contains some unintended consequences; therefore, he said, he would recommend that the bill be more narrowly focused, perhaps limiting the proposed tax credits to new capital investments pertaining to viscous oil, and then only with regard to certain pools and formations. He said he would also recommend thinking about providing tax credits for EOR, nonconventional and renewable energy, and research and development at a later time.

MR. VAN DYKE, on the issue of unintended consequences, directed the committee's attention to the language of proposed AS 43.55.026(g)(1)(A)(ii) and noted that it says "a formation that is stratigraphically equivalent to" the Ugnu Formation or West

Sak - Schrader Bluff Formation; this leaves the bill pretty wide open with regard to depth, location, and oil gravity. The word, "field" as used in proposed AS 43.55.026(g)(1)(C) also leaves the bill open to unintended consequences; he opined that it would be preferable to look at specific pools and formations, because fields are generally groups of pools and formations. For example, in the Prudhoe Bay field, there are 12 or 13 separate oil pools.

MR. VAN DYKE referred to proposed AS 43.55.026(g)(1)(D), which speaks of oil that has an API gravity of 18 or less, and noted that almost every light oil pool on the North Slope has a tarmat at its base and so under the bill a credit would be given for tarmat production in light pools; this language will create challenging production and cost allocation issues down the road, though those issues will have to be dealt with regardless when they pertain to joint-use facilities, drill sites, production facilities, and separators. There is also the question of how to define viscous or heavy oil - currently there is no bright line - and the committee needs to consider the API gravity of the oil, the temperature of the oil, and the dissolved gas content of that oil. All of the aforementioned must be measured down in the reservoir where the oil actually has to flow into the well bores. He posited that although API gravity can serve as an acceptable parameter to define viscous oil, there must also be appropriate "sideboards" in place. In situ viscosity is really a better metric to use, he opined, even though it is a little harder to measure.

MR. VAN DYKE said he would be willing to work with the committee and bill sponsor [to address his concerns].

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MR. VAN DYKE, in response to questions, said that there are commercial laboratories, which all the North Slope producers have access to, that can measure the aforementioned aspects while mimicking reservoir conditions; that the producers are going to want to know what an oil's viscosity is anyway; that he would prefer to see in situ oil viscosity used as the parameter, though he could live with API gravity being used; that the measurements would have to made for each separate pool and at each of a pool's different elevations; that it is very possible to get different API measurements from different wells in the same pool based on depth and the geographical location within the pool; that the API gravity will not be the same, necessarily, for every well in a given pool; and that there are

lenses of lighter oil in the West Sak - Schrader Bluff formation, and so one must look at what's coming out of the well bores as a mixture rather than attempting to dissect the layer cake and grant a credit for the third layer, for example, but not the forth layer.

MR. VAN DYKE, in response to further questions, said that one would estimate the centipoise measurements for separate zones if they are different, and then do some sort of volume weighted average; that he could live with an API gravity measurement if it had a couple more sideboards than are currently in the bill; that it would be appropriate to replace the word, "field" - as currently used in proposed AS 43.55.026(g)(1)(C) - with either the word, "reservoir" or the word, "pool"; that the term, "reservoir" is more focused than the term, "pool"; and that the terms, "horizon" and "zone" generally refer to layers of rock regardless of whether they contain oil.

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MR. VAN DYKE, in response to more questions, said that although some of the oils on the North Slope have different chemical compositions, it might not be possible to chemically tell certain oils apart; and that proposed AS 43.55.026(g)(1) ought to be clarified.

REPRESENTATIVE ROKEBERG concurred with the latter point, and acknowledged Mr. Van Dyke's comments regarding narrowing the bill.

MR. VAN DYKE, in response to questions regarding proposed AS 43.55.026(g)(1)(F), said that most of the EOR techniques listed therein could be applied to either light or heavy oil; that steam injection and in situ combustion target viscous oil; and that if one were just looking at capital credits for investments for facilities to operate an EOR project or an injection well or a new-production well, as long as it was targeted to a heavy oil reservoir, a definition could be arrived at, though there will still be an allocation issue to deal with once the oil is brought to the surface because it's all going to processed at joint-use facilities.

MR. VAN DYKE, in response to a question regarding proposed AS 43.55.026(g)(1)(E), remarked that the wells in the Lisburne reservoir produce too much gas in association with the oil they are producing and thus are not competitive with other Prudhoe Bay and satellite wells, though a number of horizontal-well

techniques have been tried in order to stay away from the gas production - to increase the oil production in relative terms, in relative amounts. In response to further questions, he noted that the Lisburne reservoir from day one has had a large gas cap, and although it has a large amount of recoverable oil, the gas flows more easily to the well bore than does the oil, adding that the rock in "the Northern foothill area" is tighter rock - less permeable rock - and probably more gas prone than oil prone. He remarked that a lot of the tight gas reservoirs are also fractured, so it would be hard to say that just because the bulk of the rock has low permeability that the reservoir isn't highly productive at the same time.

MR. VAN DYKE, in response to a question, recommended that the committee delay consideration of a tax credit related to gas because at this time he is not entirely comfortable with utilizing a "tight gas standard for incentive for exploration." In response to more questions, he said he would agree that once folks are comfortable with a start-up date for gas sales, that it will change the economics significantly, and that he doesn't know whether gas should be incentivized at this point in time.

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REPRESENTATIVE SAMUELS mentioned that a similar debate occurred in the House Resources Standing Committee regarding whether to have a credit apply to Point Thomson gas development. The argument went along the lines of, "If you have a gas line, do you need the incentive, [but] if you don't have a gas line, there's not going to be any developed," and so the language was left in HB 488.

REPRESENTATIVE McGUIRE noted that HB 498 could focus on heavy oil at this time and then the legislature could come back at a later point in time and deal with the issue of gas.

REPRESENTATIVE ROKEBERG, in response to comments, indicated that if the bill could be moved from committee today he would be willing to work with all the interested parties before the bill is heard in its next committee of referral.

MR. PASKVAN, in response to comments and questions, said that "Prudhoe" has a free gas cap that's above the oil and that's not associated with hydrates, and that gas hydrates can form and actually plug wells when "gas lift" is used to move oil through cold zones such as those that are shallower than 3,500 feet. Below that zone, methane hydrate ice can be trapped underneath;

dropping the pressure in systems where that occurs can generate replacement gas, and this is one way to "start to produce off" from the hydrates. He relayed that the free gas beneath the gas hydrates isn't a huge target for BP because it does not constitute a large accumulation, though it is appreciable because the North Slope is a big place.

MR. PASKVAN, in response to further comments, concurred that the gas hydrate resource on the North Slope is huge, but pointed out that currently there isn't an economic means of recovering that resource; therefore, the committee should think carefully about what it chooses to incentivize. "Right now there ... is no line of sight to a clear economic development, and research and development that might be spurred or incentivized by this would be applicable to what is one of our larger potential gas resources," he added.

REPRESENTATIVE SAMUELS offered his understanding that there is 10,000 Tcf of [gas hydrates] beneath the Beaufort Sea.

12:15:20 PM

REPRESENTATIVE ROKEBERG, referred to gas hydrate potential in the Gulf of Mexico, and remarked that it is a policy call whether the legislature should grant an extra credit for gas hydrate research.

MR. WENZEL, in response to comments and a question, expressed a willingness to work with the administration regarding future cost allocations and the allocation mechanism that would be used; "we'd want to address those issues to be sure that there wasn't a double dipping, if you will, between expenditures for non-heavy non-viscous [oil] and ... new expenditures to develop this resource." He added, "I won't dispute the fact that getting into allocations between one type of resource and another is going to create [an] administrative burden - no doubt about that; is that burden worth while in the face of an additional credit that helps us accelerate the development of this resource - yes."

REPRESENTATIVE SAMUELS asked whether new facilities for heavy oil will be needed.

MR. PASKVAN said that there is specific equipment that is being added into the existing infrastructure; for example, production heaters to assist the separators, solids handling equipment, and de-sanding equipment. His company is cognizant of the fact that

in planning drilling wells, investments in the facilities must be made to enable them to deal with heavy oil - investments in heat, hygiene, and chemicals. In response to another question, he said that heavy oil does have impacts on the processing equipment at the refineries. He indicated that BP supplies data on the crude that's being produced to the potential recipients of that crude, and they in turn make in investments in their facilities to enable them to better handle that product.

12:22:23 PM

REPRESENTATIVE ROKEBERG asked whether BP tries to harvest tarmats.

MR. PASKVAN indicated that tarmats are out of his current geographical area, but offered that they are difficult targets to access, tend to remain immobile, and bring with them technical challenges such as high amounts of associated water production; BP has not yet been able to effectively develop that resource with standard technology.

REPRESENTATIVE ROKEBERG asked Ms. Wilson whether inserting a start date after the effective date would alleviate some of her concerns. In this way, only expenditures that occur after that point in time would qualify for the proposed credits.

MS. WILSON indicated that such a provision would add clarity and accountability. In response to another question, she relayed that she had observed earlier that HB 488 has clauses that are modified by the term, "in this state", as well as other clauses that don't specify that point; therefore, the bill should be clarified with regard to the committee's intention on that issue.

REPRESENTATIVE ROKEBERG asked how the current versions of HB 488 and SB 305 have handled the deductibility of out-of-state labor costs.

MS. WILSON said they provided for an allocation of overhead and rely on operating agreements and standard industry practices.

REPRESENTATIVE ROKEBERG reiterated that he would like to make HB 498 consistent with HB 488. He asked whether research and development is considered a deductible expense under HB 488.

MS. WILSON offered her recollection that that issue is not specifically addressed in HB 488, and so whether research and

development would be allowed or precluded as an expense would depend on whether it's specific to a particular lease and direct and necessary to that lease. In response to another question, she said that under the PPT legislation, operating expenses are deductible and capital expenditures are both deductible and creditable; furthermore, under the federal code, a company can elect whether to list research and development as an operating expense or as a capital expenditure.

REPRESENTATIVE ROKEBERG said he would appreciate feedback from the committee regarding which direction the legislature should take on this issue. He pondered the question of whether the legislature should mandate specifically whether research and development should be considered a deductible expense or a capital expense.

MS. WILSON posited that as long as it's "spelled out," the administration can handle the accounting aspect.

REPRESENTATIVE ROKEBERG asked whether mandating that research and development be handled as a deductible expense would make HB 498 more consistent with "the PPT-type concept."

MS. WILSON said, "That might be a little bit of a disconnect with PPT, because I think that under the PPT, if it's capitalized for federal then it's treated as a capital expenditure and subject to a credit - not to say we couldn't do that."

12:31:03 PM

MS. WILSON, in response to a question, said that if the producer "expenses that," for example, then there would be that disconnect; it's not impossible to handle as long the bill is clear with regard to how the legislature wants that issue handled.

REPRESENTATIVE ROKEBERG asked whether the legislature should not allow a special provision for research and development, even if that seems to be counterproductive.

CHAIR KOHRING noted that there is also the issue of the Alaska legislature providing a tax credit for research and development that could be used to benefit other countries.

REPRESENTATIVE ROKEBERG posited that that issue could be addressed by stipulating that the research and development be done in state.

12:32:18 PM

REPRESENTATIVE SAMUELS said he sees an allocation problem, from an accounting or auditing standpoint, with providing a credit for research and development, even that which is done in state.

MR. WENZEL said that his company's view regarding research and development is that it's going to be done sooner or later, and the benefit of HB 498 is that it will accelerate research and development. So it's a policy call as to whether Alaska wants to wait for "someone else to do it" and then use that technology without paying for it; if Alaska does pay for researching and developing new technology, then that technology could very well be shared and used around the world. He said he can see some validity for trying to tie investments for research and development to Alaska projects.

MR. WENZEL, in response to a question, said that his company has a budget line item for research and development - blue-sky-type research and development - to the extent that it can't be associated with a specific project. He offered his understanding that right now, the PPT legislation allows both capital expenditures and exploration expenditures to qualify for the 20 percent credit; the reason for this is that exploration involves both operating expenses and capital expenditures. He suggested that heavy oil could be treated the same way by having the bill cover expenditures related to Alaska projects on viscous heavy oil up to a certain point.

CHAIR KOHRING suggested that the committee move the bill from committee along with a letter from him requesting that the House Resources Standing Committee address the issues that have been raised thus far; doing so would provide the bill's sponsor with an opportunity to craft any necessary amendments or committee substitute (CS) that would address everyone's concerns.

REPRESENTATIVE ROKEBERG concurred, and questioned whether the bill should address the issue of gas hydrates. He said he wishes to work with the department to narrow it down and improve accountability and conformity.

CHAIR KOHRING after ascertaining that no one else wished to testify, closed public testimony on HB 498.

12:40:17 PM

REPRESENTATIVE DAHLSTROM moved to report HB 498 out of committee with individual recommendations, the accompanying fiscal notes, and the aforementioned letter from the chair of House Special Committee on Oil and Gas to the co-chairs of the House Resources Standing Committee.

REPRESENTATIVE GUTTENBERG objected for the purpose of discussion. He said, "Certainly we wouldn't want to see research being done in Mississippi that could be done here, not just the field work, but the lab work also," adding that there seems to be quite a bit of tightening and refocusing that needs to be done [on the bill].

REPRESENTATIVE GUTTENBERG then removed his objection.

CHAIR KOHRING asked whether there were any further objections to reporting HB 498 from committee. There being none, HB 498 was reported from of the House Special Committee on Oil and Gas.

ADJOURNMENT

There being no further business before the committee, the House Special Committee on Oil and Gas meeting was adjourned at 12:43 p.m.