

To: Senate Finance Committee

Attn: Senator Bert Stedman, Co-Chairman

From: David Wood

Date: 2 March, 2010

Re: Answer to Question & Request Raised by Senator Thomas during My Testimony (25 February 2010) – Fiscal Years 2008 and 2009

The very pertinent and perceptive question asked earlier today by Senator Thomas sought information with respect to how might the gas dilution / cross subsidy effect identified in Alaska's current production tax rules have impacted the production taxes actually paid in recent periods had a gas line been in operation at the time?

In order to provide an indicative answer to this question I have taken the data for price, volume and costs (excluding Cook Inlet Gas) for fiscal years 2008 and 2009 (i.e. July 2007 to June 2008 and July 2008 to June 2009), which are available from the Alaska Department of Revenue (DOR), Fall 2008 and 2009 Revenues Sources Books (RSB), (Dec 2008 and Dec 2009). These two periods encompass the wide range of oil prices that prevailed since the ACES rules were in place. The six tables attached (three for each fiscal period) to this document provide the necessary data and calculations to establish the impact of the cross subsidy effect.

Note that in this calculation the annual figures for production volumes and costs are distributed pro rata according to days / month across each month of the year. This assumption was necessary as DOR do not publish a monthly breakdown of the production tax calculation. This approximation is responsible for the small difference between the actual production tax paid and that calculated in the tables that follow. For fiscal year 2008 the calculated production tax shown in Table 1 is 2.7% higher than the actual production tax paid (\$6867.3 million). For fiscal year 2009 the calculated production tax shown in Table 1 is 4.5% higher than the actual production tax paid (\$3112.0 million). These slight differences are not considered significant in the context of the purpose of this analysis.

Fiscal Year 2008

Table 1 calculates the production tax for oil based on actual data showing the components of that calculation. As no gas is exported the calculations are based upon oil barrels only. This results in total production tax of **\$ 7.462 billion** which is reduced by investment credits of \$411.5 million to \$ 7.050 billion. The calculation shown essentially reproduces the figures from the RSB (2.7% difference attributed to monthly pro rata production and cost allocations).

Table 2 assumes a 4.5 bcf/day gas line and calculates production tax for this hypothetical gas stream on a stand-alone basis (i.e. not combined with oil). The calculation uses the U.S. wellhead natural gas prices from the EIA's records for the months in question. There would be some small differentials between these prices and AECO prices in Alberta, but I believe they are close enough for the purpose. I have also assumed gas transportation costs of \$4.5/mcf (\$27/boe) and field costs (capital costs plus operating costs) of \$400 million (\$1.46/ boe) which are those used by Commissioner Galvin in the examples he provided from the DOR in his testimony of 24 February 2010. This data computes a total production tax of **\$ 1.140 billion** to which no investment credits are applied.

By adding the computed production taxes in tables 1 and 2 the stand-alone oil and gas production tax for this FY 2008 (assuming 4.5 bcf /day) would be **\$8.599 billion** (reduced to \$8.187 billion by the deduction of \$411.5 million investment credits).

Table 3 calculates the production tax by combining the revenue cost and volume streams from tables 1 and 2 to provide a combined oil and gas production tax calculation of **\$6.776 billion** (reduced to \$6.365 billion by the deduction of \$411.5 million investment credits).

For this period the loss to the State in production tax revenue caused by the cross subsidy effect of combining oil and gas in the production tax calculation would have amounted to:

$$\mathbf{\$6.776\ billion\ less\ \$8.599\ billion = -\$1.822\ billion.}$$

This calculation is in line with the figures of potential loss in fiscal revenue discussed during the testimonies.

Fiscal Year 2009

Table 4 calculates the production tax for oil based on actual data showing the components of that calculation. As no gas is exported the calculations are based upon oil barrels only. This results in total production tax of **\$ 3.601 billion** which is reduced by investment credits of \$350 million to \$ 3.251 billion. The calculation shown essentially reproduces the figures from the RSB (4.5% difference attributed to monthly pro rata production and cost allocations).

Table 5 assumes a 4.5 bcf/day gas line and calculates production tax for this hypothetical gas stream on a stand-alone basis (i.e. not combined with oil). The calculation uses the U.S. wellhead natural gas prices from the EIA's records for the months in question. There would be some small differentials between these prices and AECO prices in Alberta, but I believe they are close enough for the purpose. I have also assumed gas transportation costs of \$4.5/mcf (\$27/boe) and field costs (capital costs plus operating costs) of \$400 million (\$1.46/ boe) which are those used by Commissioner Galvin in the examples he provided from the DOR in his testimony of 24 February 2010. This data computes a total production tax of **\$ 0.583 billion** to which no investment credits are applied.

By adding the computed production taxes in tables 1 and 2 the stand-alone oil and gas production tax for this FY 2009 (assuming 4.5 bcf /day) would be **\$4.185 billion** (reduced to \$3.835 billion by the deduction of \$350 million investment credits).

Table 6 calculates the production tax by combining the revenue cost and volume streams from tables 4 and 5 to provide a combined oil and gas production tax calculation of **\$3.381 billion** (reduced to \$3.031 billion by the deduction of \$350 million investment credits).

For this period the loss to the State in production tax revenue caused by the cross subsidy effect of combining oil and gas in the production tax calculation would have amounted to:

\$3.381 billion less \$4.185 billion = -\$0.804 billion.

This calculation indicates a lower potential loss in fiscal revenue for fiscal year 2009 compared to fiscal year 2008. This is due to the lower prices and value of oil and gas revenue streams in fiscal year 2009. However, \$0.8 billion remains a substantial potential loss in a relative low price / value environment.

Sincerely,

David Wood

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Table 1. Oil Stand-alone Production Tax Calculation (July 2007 to June 2008)

FY 2008 Production Tax Revenues: Actual Versus Potential Under Alternative Mechanisms (Analysis Based on Actual US West Coast Prices and Cost Data)													
Month	US West Coast Oil Price	Per Barrel Total Costs	Per Barrel Production Tax Value	PTV less Progressivity Threshold	Progressivity Threshold	PTV Rate per Dollar of Adjusted PTV	Incremental Progressivity Rate	Volume (Millions barrels)	Combined Progressivity Tax (CPT)	Base Production Tax (BPT) Rate	Base Production Tax Value	CPT + BPT Value	CPT + BPT less Investment Credits
Monthly Analysis, \$30 PTV \$/boe threshold and 0.004% progressivity parameter under Current Law as enacted in 2007													
Jul	75.93	-22.88	53.05	-30	23.05	0.40%	9.22%	19.4	95.0	25.00%	257.5	352.5	
Aug	73.83	-22.88	50.95	-30	20.95	0.40%	8.38%	19.4	82.9	25.00%	247.4	330.3	
Sep	79.92	-22.88	57.04	-30	27.04	0.40%	10.81%	18.8	115.9	25.00%	268.0	383.9	
Oct	84.77	-22.88	61.89	-30	31.89	0.40%	12.75%	19.4	153.3	25.00%	300.5	453.8	
Nov	92.98	-22.88	70.10	-30	40.10	0.40%	16.04%	18.8	211.3	25.00%	329.3	540.6	
Dec	88.64	-22.88	65.76	-30	35.76	0.40%	14.30%	19.4	182.7	25.00%	319.3	501.9	
Jan	91.16	-22.88	68.28	-30	38.28	0.40%	15.31%	19.4	203.0	25.00%	331.5	534.5	
Feb	94.42	-22.88	71.54	-30	41.54	0.40%	16.61%	18.2	215.9	25.00%	324.9	540.8	
Mar	105.06	-22.88	82.18	-30	52.18	0.40%	20.87%	19.4	333.1	25.00%	399.0	732.1	
Apr	112.37	-22.88	89.49	-30	59.49	0.40%	23.79%	18.8	400.2	25.00%	420.4	820.6	
May	125.41	-22.88	102.53	-30	72.53	0.40%	29.01%	19.4	577.6	25.00%	497.8	1075.4	
Jun	133.78	-22.88	110.90	-30	80.90	0.40%	32.36%	18.8	674.4	25.00%	521.0	1195.5	
Totals:										25.00%	4216.6	7461.9	7050.4
Data Source: Alaska Department of Revenue (DOR), Fall 2008 Revenues Sources Book (RSB), (Dec 2008)										16.78	6.10	Capex Credits (\$ millions):	411.5
FY2008 Taxable North Slope barrels /day: 625,456										229.3	229.3	Lease Expenditures (\$/bbl):	6.10
229.3										229.3	229.3	TT&T (\$/bbl):	6.10

Table 2. Gas Stand-alone Production Tax Calculation (July 2007 to June 2008) [Assuming Gas Line Operational]

FY 2008 Production Tax Revenues: 4.5 bcf /day Hypothetical Gas Sales (Standalone Production Tax Calculation)															
(US Gas Price Data from EIA)															
Month	A	B	C	D=	E	F=	G	H=	I	J=	K	L=	M=	N=	
	EIA U.S. Wellhead Price \$/mcf	Per BOE Total Costs for Gas \$/boe	Per Barrel Production Tax Value PTV \$/boe	(B + C)	Progressivity Threshold \$/boe	PTV less Progressivity Threshold \$/boe	Dollar of Adjusted PTV %	Incremental Progressivity Rate %	Volume (Millions boe)	Progressivity Tax (Gas Calculated Separately) \$ millions	Base Production Tax (BPT) Rate %	Base Production Tax Value \$ millions	Base Production Tax (BPT + Progressivity) Value \$ millions	Total Production Tax (BPT + Progressivity) Value \$ millions	
2007/2008				(D + E) >= 0	(D + E) >= 0	(D + E) >= 0	(F * G)	(F * G)	(D * H * I)	(D * H * I)	(D * I * K)	(D * I * K)	(J + L)	(M - P)	
Monthly Analysis, \$30 PTV \$/boe threshold and 0.004% progressivity parameter under Current Law as enacted in 2007															
Jul	6.32	-28.46	9.46	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	55.0	55.0		
Aug	5.87	-28.46	6.76	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	39.3	39.3		
Sep	5.42	-28.46	4.06	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	22.9	22.9		
Oct	5.90	-28.46	6.94	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	40.4	40.4		
Nov	6.58	-28.46	11.02	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	62.0	62.0		
Dec	6.97	-28.46	13.36	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	77.7	77.7		
Jan	6.99	-28.46	13.48	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	78.4	78.4		
Feb	7.55	-28.46	16.84	0.00	-30	0.00	0.40%	0.00%	21.8	0.0	25.00%	91.6	91.6		
Mar	8.29	-28.46	21.28	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	123.7	123.7		
Apr	8.94	-28.46	25.18	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	141.7	141.7		
May	9.81	-28.46	30.40	0.40	-30	0.40	0.40%	0.16%	23.3	1.1	25.00%	176.7	177.9		
Jun	10.82	-28.46	36.46	6.46	-30	6.46	0.40%	2.59%	22.5	21.2	25.00%	205.1	226.3		
Totals:									274.5	22.3	25.00%	1114.3	1136.7	1136.7	
Data Source: EIA for gas price															
Hypothetical gas production (bcf/day)	4.5				274.5 millions boe in FY2008				Lease Expenditures (\$/boe)		27.00		Capex Credits (\$ millions):		0.0
Combined Production Tax Calculated on an oil + gas stand-alone calculation:													8998.5	8187.0	

Table 4. Oil Stand-alone Production Tax Calculation (July 2008 to June 2009)

FY 2009 Production Tax Revenues: Actual Versus Potential Under Alternative Mechanisms (Analysis Based on Actual US West Coast Prices and Cost Data)																							
Month	A	US West Coast Oil Price	B	Per Barrel Total Costs	C	Per Barrel Production Tax Value	D=	PTV \$/barrel	E	Progressivity Threshold	F=	PTV less Progressivity Threshold	G	H=	I	J=	K	L=	M=	N=	P		
																						\$/barrel	\$/barrel
Monthly Analysis, \$30 PTV \$/boe threshold and 0.004% progressivity parameter under Current Law as enacted in 2007																							
Jul		132.87		-26.15		106.72		76.72		0.40%		30.69%		18.6		607.6		25.00%		495.0		1102.5	
Aug		115.98		-26.15		89.83		59.83		0.40%		23.93%		18.6		398.8		25.00%		416.6		815.5	
Sep		101.86		-26.15		75.71		45.71		0.40%		18.28%		18.0		248.5		25.00%		339.8		588.3	
Oct		73.65		-26.15		47.50		17.50		0.40%		7.00%		18.6		61.7		25.00%		220.3		282.0	
Nov		53.94		-26.15		27.79		-2.21		0.40%		-0.88%		18.0		-4.4		25.00%		124.7		120.3	
Dec		37.70		-26.15		11.55		-18.45		0.40%		-7.38%		18.6		-15.8		25.00%		53.6		37.8	
Jan		39.01		-26.15		12.86		-17.14		0.40%		-6.86%		18.6		-16.4		25.00%		59.6		43.3	
Feb		42.78		-26.15		16.63		-13.37		0.40%		-5.35%		16.8		-14.9		25.00%		69.7		54.8	
Mar		47.75		-26.15		21.60		-8.40		0.40%		-3.36%		18.6		-13.5		25.00%		100.2		86.7	
Apr		46.56		-26.15		20.41		-9.59		0.40%		-3.84%		18.0		-14.1		25.00%		91.6		77.5	
May		58.23		-26.15		32.08		2.08		0.40%		0.83%		18.6		4.9		25.00%		148.8		153.7	
Jun		69.80		-26.15		43.65		13.65		0.40%		5.46%		18.0		42.8		25.00%		195.9		238.7	
Totals:																218.4	1285.3	25.00%	2315.8	3601.1	3251.1		
Data Source: Alaska Department of Revenue (DOR), Fall 2009 Revenues Sources Book (RSB), (Dec 2009)																							
FY2009 Taxable North Slope barrels /day: 598,463																218.4	millions barrels in FY2009	Lease Expenditures (\$/bb):	19.67	TT&T (\$/bb):	6.48	Capex Credits (\$ millions):	350.0

Table 5. Gas Stand-alone Production Tax Calculation (July 2008 to June 2009) [Assuming Gas Line Operational]

FY 2009 Production Tax Revenues: 4.5 bcf /day Hypothetical Gas Sales (Standalone Production Tax Calculation)															
(US Gas Price Data from EIA)															
Month	A	B	C	D=	E	F=	G	H=	I	J=	K	L=	M=	N=	
	EIA U.S. Wellhead Price \$/mcf	Per BOE Total Costs for Gas \$/boe	Per Barrel Production Tax Value PTV \$/boe	Per Barrel Production Tax Value PTV \$/boe	Progressivity Threshold \$/boe	PTV less Progressivity Threshold \$/boe	PTV Rate per Dollar of Adjusted PTV %	Incremental Progressivity Rate %	Volume (Millions boe)	Progressivity Tax Calculated Separately \$ millions	Base Production Tax (BPT) %	Base Production Tax Value \$ millions	Total Production Tax (BPT + Progressivity) Value \$ millions	CPT + BPT less Investment Credits \$ millions	
			(B + C)	(D + E) >= 0	(F * G)	(D + E) >= 0	(F * G)	(H * I)	(D * H * I)	(D * H * I)	(D * I * K)	(J + L)	(M - P)		
Monthly Analysis, \$30 PTV \$/boe threshold and 0.004% progressivity parameter under Current Law as enacted in 2007															
Jul	10.62	-28.46	35.26	5.26	-30	5.26	0.40%	2.10%	23.3	17.2	25.00%	204.9	222.2		
Aug	8.32	-28.46	21.46	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	124.7	124.7		
Sep	7.27	-28.46	15.16	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	85.3	85.3		
Oct	6.36	-28.46	9.70	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	56.4	56.4		
Nov	5.97	-28.46	7.36	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	41.4	41.4		
Dec	5.87	-28.46	6.76	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	39.3	39.3		
Jan	5.15	-28.46	2.44	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	14.2	14.2		
Feb	4.19	-28.46	-3.32	0.00	-30	0.00	0.40%	0.00%	21.0	0.0	25.00%	0.0	0.0		
Mar	3.72	-28.46	-6.14	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	0.0	0.0		
Apr	3.43	-28.46	-7.88	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	0.0	0.0		
May	3.45	-28.46	-7.76	0.00	-30	0.00	0.40%	0.00%	23.3	0.0	25.00%	0.0	0.0		
Jun	3.45	-28.46	-7.76	0.00	-30	0.00	0.40%	0.00%	22.5	0.0	25.00%	0.0	0.0		
Totals:									273.8	17.2	25.00%	566.2	583.4	583.4	
Data Source: EIA for gas price															
Hypothetical gas production (bcf/day)					4.5	273.8 millions boe in FY2009				Lease Expenditures (\$/boe)	4.5	TT&T (\$/mcf):	27.00	Capex Credits (\$ millions):	0.0
											Combined Production Tax Calculated on an oil + gas stand-alone calculation:	4184.5	3834.5		

Table 6. Oil & Gas Combined Production Tax Calculation (July 2008 to June 2009)

FY 2009 Production Tax Revenues: Oil plus Gas Combined (Analysis Assumes Actual Oil Plus Hypothetical Gas)																													
Month	Oil + Gas Effective BOE Price			Oil + Gas Effective BOE Total Costs			Per Barrel Production Tax Value			PTV less Progressivity Threshold			PTV Rate per Dollar of Adjusted PTV		Incremental Progressivity Rate		Oil + Gas Volume (Millions boe)		Combined Progressivity Tax (CPT)		Base Production Tax (BPT)		CPT + BPT less \$400 in credits						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z			
	\$/boe	\$/boe	\$/boe	\$/boe	\$/boe	\$/boe	%	%	millions boe	millions boe	%	%	%	%	%	%	%	millions boe	millions boe	millions boe	millions boe	millions boe	millions boe	millions boe	millions boe	millions boe			
Monthly Analysis, \$30 PTV \$/boe threshold and 0.004% progressivity parameter under Current Law as enacted in 2007																													
Jul	94.41	-27.44	66.97	-30	36.97	0.40%	14.79%	41.8	414.1	25.00%	699.9	1114.0																	
Aug	79.24	-27.44	51.80	-30	21.80	0.40%	8.72%	41.8	188.8	25.00%	541.4	730.2																	
Sep	69.47	-27.44	42.03	-30	12.03	0.40%	4.81%	40.5	81.8	25.00%	425.1	506.9																	
Oct	53.91	-27.44	26.47	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	276.7	276.7																	
Nov	43.86	-27.44	16.43	-30	0.00	0.40%	0.00%	40.5	0.0	25.00%	166.1	166.1																	
Dec	36.32	-27.44	8.88	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	92.8	92.8																	
Jan	34.50	-27.44	7.06	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	73.8	73.8																	
Feb	32.97	-27.44	5.53	-30	0.00	0.40%	0.00%	37.8	0.0	25.00%	52.2	52.2																	
Mar	33.61	-27.44	6.17	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	64.5	64.5																	
Apr	32.11	-27.44	4.67	-30	0.00	0.40%	0.00%	40.5	0.0	25.00%	47.3	47.3																	
May	37.36	-27.44	9.92	-30	0.00	0.40%	0.00%	41.8	0.0	25.00%	103.7	103.7																	
Jun	42.49	-27.44	15.06	-30	0.00	0.40%	0.00%	40.5	0.0	25.00%	152.3	152.3																	
Totals:															492.2	684.7	2693.7	3380.5	3030.5	-804.1	350.0								
Difference Between Production Tax Calculated on a combined Oil & Gas Basis Minus Standalone Oil and Gas Basis:																													
															Capex Credits (\$ millions):														
															350.0														