Exhibit No. ___ (BJC-7T)
Docket No. UG-11____
Witness: Barbara J. Cronise

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of	)	
	)	
NORTHWEST NATURAL GAS	)	Docket No. UG-11____
COMPANY, dba NW Natural,	)	
	)	
Revision to Schedule P to include	)	
acknowledging the recovery of the cost	)	
of gas acquired through Gas Reserves.	)	

NORTHWEST NATURAL GAS COMPANY

EXHIBIT OF BARBARA J. CRONISE

KPMG Report

REDACTED

July 6, 2011

KPMG

TRANSACTION ADVISORY SERVICES

Encana Partnership

Economic Assessment and
Comparison of Long-Term Gas Supply Alternatives
April 7, 2011

Prepared for the Northwest Natural Gas Company

AUDIT ▪ TAX ▪ ADVISORY

Glossary (1)

2P	Proved plus Probable reserves
Anadarko	Anadarko Petroleum
Bcf	Billion cubic feet
Boe	barrell of oil equivalent
BP	British Petroleum
CUB	Citizens Utilities Board
Deloitte	Deloitte & Touche LLP
Dth	Decatherm
Encana	Encana Oil & Gas (USA) Inc., a wholly-owned subsidiary of Encana Corporation
GBM	Geometric Brownian Motion
Henry Hub	Pricing point for natural gas futures contracts located in Erath, Louisiana
ICE	Intercontinental Commodities Exchange
IRR	Internal rate of return
KPMG	KPMG LLP
Jonah	The Jonah Field
LNG	Liquefied natural gas
NWN	Northwest Natural Gas Company
NSAI	Netherland Sewell and Associates Inc.
Mcf	Million cubic feet
MMbtu	Million British thermal units
MMcf/d	Million cubit feet per day
Monte Carlo	Simulation
NIGU	Northwest Industrial Gas Users
NPV	Net present value
NYMEX	New York Mercantile Exchange
Opal	The principle market centre for the Jonah and Anticline fields located in south-east Wyoming
OPUC	Oregon Public Utilities Commission
Probable	Probable reserves
Proved	Proved reserves
Shell	Royal Dutch Shell
Tcf	Trillion cubic feet
Ultra	Ultra Petroleum
Xcel	Xcel Energy

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Contents (1)

The contacts at KPMG LLP in connection with this report are:

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Introduction (1)

Terms of Engagement

- Northwest Natural Gas Company ("NWN" or the "Utility") has agreed on terms for a "drill-to-earn" partnership with Encana Oil & Gas (USA) Inc. ("Encana") whereby NWN will fund a defined drilling program in return for certain working interests in related wells and leases (the "Transaction" or "Deal").
- KPMG LLP ("KPMG") was asked by management and the Board of Directors of NWN to assist with the following:
  - A "drill-to-earn" economic assessment – provide an opinion as to whether the Transaction is in accordance with the price paid for similar investments and whether the consideration to be paid is reasonable
  - Evaluate the deal economics in detail to assess value v. risk as it relates to pricing, production/supply volumes, costs, well/producer performance and other factors.
  - Comments on the scope of due diligence work performed by NWN
  - Review of long-term gas supply alternatives – a comparison of the Transaction with other options available to the Utility to secure a long-term gas supply
- We believe we are acting independently of NWN and are acting objectively. We have no present or contemplated interest in NWN or its affiliates nor are we an insider or associate of any of these parties.
- Fees payable to KPMG pursuant to our engagement are not contingent in whole or in part on the conclusions reached or the completion of the Transaction.
- We agree that our report may be shared with the Oregon Public Utilities Commission ("OPUC"), Citizens Utilities Board ("CUB"), Northwest Industrial Gas Users ("NIGU") and potential other parties to the OPUC proceedings.

Summary of Findings

- The proposed Deal provides NWN with a reliable long-term supply of long-term gas at a reasonable price.
- The financial models prepared by NWN agree with the proposed terms contained in supporting agreements.
- The scope of due diligence performed by NWN management was comprehensive.
- A key element of the due diligence relates to the reserve evaluation.
- The engineering firm Netherland Sewell and Associates ("NSAI") is well regarded within the energy sector across North America, particularly with respect to tight gas.
- With respect to the NSAI reserve study:
  - Pricing assumptions are consistent with market estimates
  - The reserve study contains several conservative assumptions and few, if any, aggressive assumptions
  - There is additional upside in the Deal that has not been considered by NSAI
- In many aspects, the Deal is consistent with a standard "farm-in" agreement commonly seen in the industry. However, a substantial number of NWN's risks in this deal have been mitigated.

Introduction (2)

Summary of Findings (cont'd)

- There are several non-standard terms in the Deal that benefit NWN, including:
  - Working interest in existing production
  - [redacted]
  - Tax partnership
  - Land title
  - Cancellation clause
- We did not identify any material risks to NWN that have not already been considered by management.
- Key risk remaining is volumes in an area with consistent production history.
- Deal metrics imply NWN's investment equates to an [redacted] pre-tax discount rate.
- Based on recent transactions found for the Jonah Field ("Jonah") and adjacent shale plays. NWN appears to be paying $12.60/boe, a premium of $3 to $4/boe, which is still lower than the average price found for shale gas acquisitions across North America ($16/boe).
- The implied full cycle cost to NWN is not significantly different than the estimated average cost to industry producers of shale gas ($4.20/Mcf).
- The Transaction compares favorably to other long-term gas supply alternatives.
- We believe that it would be difficult for NWN to replicate this Deal with a credible partner, open negotiations, flexible terms and an asset with a similar risk profile.
- Our analysis and the basis of our conclusions are outlined in this report.

Scope of Work

- The information we reviewed and relied upon in arriving at our conclusions is provided in Appendix A. In addition, we attended the NWN offices and met with their management and other stakeholders from OPUC, CUB and NIGU. We discussed the Transaction with the following representatives from NWN:
  - Barbara Cronise, Director, Business Development
  - Keith White, Vice President, Business Development and Energy Supply
  - Kevin McVay, Manager, Integrated Resource Planning
  - Randy Friedman, Director, Gas Supply
  - Robert McAnally, Senior Gas Buyer
  - Jerry Fulps, Manager, Middle Office
- We also spoke with:
  - Jim Zadvorny, Advisor, Business Development and Julia Gwaltney, Team Lead, Jonah Field (Encana)
  - Bob Barg, Senior Vice President (NSAI)
  - Jerry Fish, Partner (Stoel Rives)
- Our review was limited in that:
  - We have not addressed any legal or other non-financial issues
  - We did not have access to Encana's data room. As such, our review was limited to the documents provided by NWN.
  - We have accepted the benefits associated with the tax credits reflected in the financial models provided

Introduction (3)

Currency

- All amounts contained in this report are in US dollars, unless otherwise noted.

Assumptions

- The financial information provided by NWN is complete and accurate, including Encana's historical performance at Jonah
- The economics of the underling reserves as determined by NSAI are reasonable
- The tax benefits reflected in the reflected in the financial models are reasonable
- There is no additional information contained in the data room that would impact our assessment of the Transaction economics.
- There are no significant factors relevant to our analysis that have not been considered in reaching the conclusions herein
- Final agreements between NWN and Encana will not materially change from draft forms provided for the purpose of our analysis

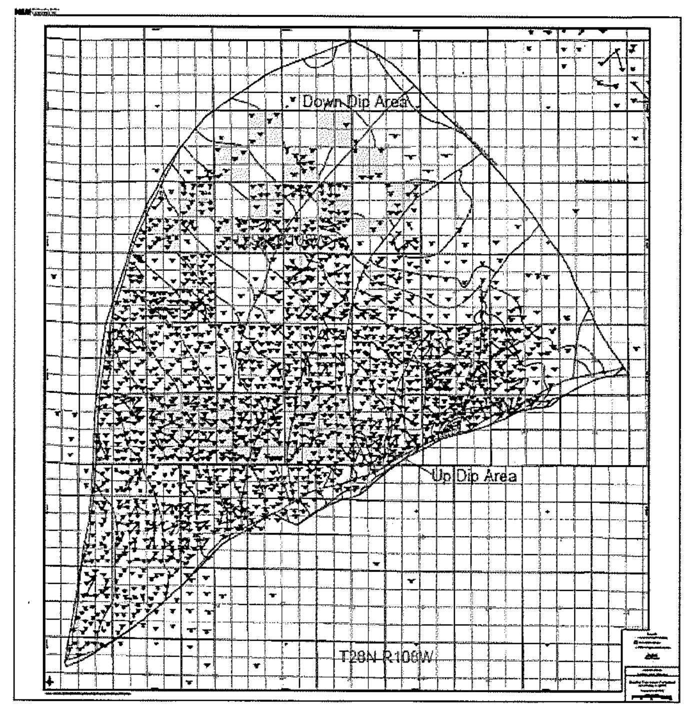
Summary of Transaction (1)

- NWN will enter into a drill-to-earn partnership whereby it will pay a $1 million "transaction" fee and $250 million over a five year period to fund drilling and completion costs in Encana's Jonah natural gas field located in Sublette County, Wyoming. In return, NWN will earn a working interest in Proved natural gas reserves that will allow it to deliver approximately 93.1 Bcf (approximately 104 million dth) to NWN customers over a 30 year period.
- The majority of the volumes (approximately 83%) will be delivered over the first 15 years of the agreement. NWN expects the volume of gas produced to provide an average of 4% to 5% of the total annual gas volumes it will deliver to its customers over the next 30 years. Volumes from Jonah will represent up to 15% of total annual volumes during the period when production is expected to peak sometime in 2015.
- NWN estimates that rate payers will save more than $50 million based on the net present value (NPV) of the project in comparison with other long-term supply alternatives.
- NWN's customers have experienced significant price volatility over the past 10 to 15 years.
- In practice, it is difficult to secure long term physical fixed price supply contracts at a reasonable price for a term extending beyond five years. Moreover, NWN is currently not authorized by its Board of Directors to enter into supply agreements longer than 3 years.
- NWN typically allocates approximately 10% of its supply portfolio to longer term physical supply arrangements. These have traditionally been executed either as fixed price agreements or index-based deals with financial hedges.
- With gas prices currently at or near historic lows relative to production costs, NWN is looking for ways to lock in longer term sources of low cost supply while prices remain subdued.
- The Transaction with Encana presents an opportunity to secure a significant source of low risk, long term supply (30 years) at a reasonable price and on terms that mitigate many of the risks the end user would normally assume in this type of structure.
- Encana is one of the largest producers of natural gas in North America and has been an industry leader in deploying new technology to develop previously uneconomic shale gas deposits.
- Encana currently has a massive project inventory; its value is not being maximized because low gas prices are restricting the generation of free cash flow required to fund drilling programs and draw the potential cash flows closer to the present (thus increasing the NPV's of these projects).
- To accelerate the development of these resources Encana is actively pursuing two strategic initiatives:
  - Execute a number of joint venture agreements in order to fund its drilling projects; and
  - Open new markets to increase demand for natural gas both in North America and over-seas.
- To date, Encana has focused primarily on the formation of joint ventures with sovereign energy companies from China and Korea, which it hopes will increase production volumes to levels required to justify a pipeline to liquefied natural gas (LNG) export facilities on the west coast of British Columbia to access over-seas markets.
- However, Encana is also very interested in creating new markets for its gas within North America by entering into long term farm-in / drill-to-earn agreements with large natural gas consumers such as power generation companies and domestic gas distributors.
- The Transaction with NWN is the first of what Encana hopes will be many partnerships that will increase demand for its natural gas in North America.

Summary of Transaction (2)

- NWN will farm-in on a minimum of four sections of Encana lands at Jonah and contribute $250 million of capital towards the drilling and completion costs of [redacted] wells. In return it will earn a working interest in approximately [redacted] Bcf [redacted] Bcf net revenue interest) of low risk, high probability reserves to be produced and delivered to its customers over a 30 year period.
- [redacted] wells will be drilled in the "Up-dip" or shallower area of Jonah in Sections [redacted] and [redacted] An additional [redacted] wells will be drilled in the "Down-dip" or deeper part of the Field located to the northeast of the Up-dip portion.
- Based on current well costs, NWN will pay an average of [redacted] of the drilling and completion costs or [redacted] million per well.
- ,or each well that is drilled in the Up-dip area, NWN will earn a 1.2% gross working interest in one of sections 32 and 33 (to a maximum of 45%) and in section 34 (to a maximum of 32.4%).
- Importantly, the working interests assigned will include production already in existence at the time the wells are drilled.
- For wells drilled in the Down-dip area of the Jonah field where the producing horizon is further from the surface, NWN will earn a 1.2% gross working interest in one of sections 32, 33 or 34 plus 5% of Encana's net revenue interest in the wellbore being funded.
- [redacted]
- If the drilling costs fall below [redacted] million, NWN will be credited with the "savings'" which will be rolled forward and applied to the cost of drilling an additional well.

Jonah Field – Up Dip and Down Dip Areas



Source: NSAI

Summary of Transaction (3)

- NWN and Encana have agreed upon a drilling schedule, in which approximately twenty wells will be drilled in each of the first five years of the agreement. Encana is required to adhere to the drilling schedule regardless of the market price for natural gas.

Drilling Schedule

	Wells Rig Released				Maximum Interest Accrued		
	Section			Down	Section		
Year	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]%	[redacted]%	[redacted]%
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]%	[redacted]%	[redacted]%
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]%	[redacted]%	[redacted]%
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]%	[redacted]%	[redacted]%
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]%	[redacted]%	[redacted]%
	[redacted]	[redacted]	[redacted]	[redacted]			

- If Encana drills a dry hole, NWN will still earn its working interest in the section where the well is drilled, including the existing production.

NWN Working Interest - Net Revenue Gas

	Gas Reserves (MMcf)	%
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]

* As at May 1, 2011

- This means that of the approximately [redacted] Bcf of revenue interest reserves that will accrue to NWN through this Transaction, only [redacted] Bcf or [redacted] are subject to drilling risk. The remainder will come from earned interests in wells that are already producing.
- NWN will have an option to participate in additional future wells (beyond the [redacted] specifically contemplated in the Transaction) in the sections where working interests have been earned.
- For these wells, NWN will pay its pro-rata share in return for the same share of the production and reserves from the well.
- These wells will not earn any additional interests in other acreage or production. However, all of the other terms and conditions covering the original [redacted] wells will extend to these additional wells.
- NWN may opt out of participating in these additional wells, in which case they will still earn their working interest after 300% of their pro-rata share of wells costs are recovered by other well participants from the revenue stream.
- As part of the Transaction a tax partnership will be formed to facilitate the timely recovery of drilling tax credits.
- NWN expects to receive more than $[redacted] in tax credits over the term of the Deal. [redacted].

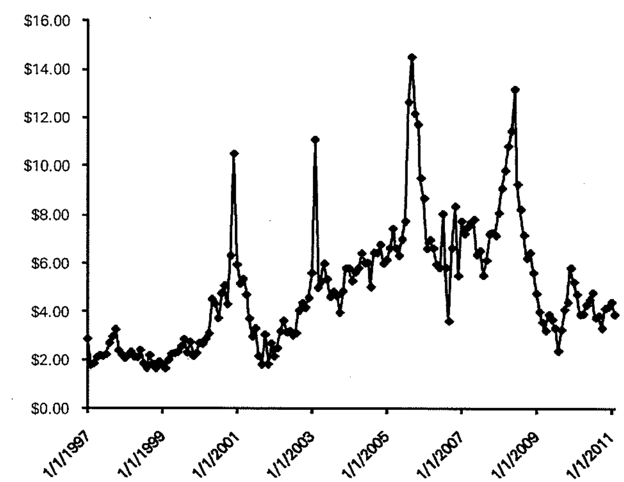
Summary of Transaction (4)

- Encana will be responsible to pay for all surface equipment and gathering and processing infrastructure required to produce the NWN funded wells. This includes the costs for both new construction and capital improvements in the future.
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
- If Encana decides it wants to retain its interests in the sections covered by the agreement but does not want to be the operator, it has the right to do so and appoint another party to operate the Field.
- Under this scenario, the terms of NWN's agreement with Encana will remain in place so long as the new operator performs as a prudent operator would be expected to do.
- With the consent of NWN, Encana could choose to either delay or accelerate the drilling schedule.

Natural Gas Market

- Over the past decade, North American natural gas prices have been volatile. Prices have oscillated as demand growth has stayed on a relatively steady trajectory.
- Conventional supplies first fell during the middle of the last decade, and then increased dramatically as producers began booking large quantities of new, low cost shale gas reserves.
- ͵or reasons beyond the scope of this report, North American producers have aggressively drilled these new shale plays even as falling gas prices have rendered the economics of many of these plays marginal. As a result, the North American continent is currently in a state of over-supply with a storage surplus so large that that natural gas prices are at or near historic lows relative to production costs, and on an absolute basis, are at their lowest point since the early 2000's.
- However, there are factors now emerging that suggest gas prices may not remain in the current band of low prices indefinitely.
- The extended period of low prices may finally be forcing producers to reduce their rabid pace of drilling. Rig counts are now starting to roll over and some industry experts are now beginning to look for prices to turn some time later in 2011 or early in 2012.
- Moreover, substantial investments in the past several months by sovereign energy companies and investment funds (particularly from Asia) in North American shale gas plays and associated pipeline and LNG terminals could transform North American natural gas into a global commodity subject to global pricing mechanisms over the next decade.
- Global natural gas prices are currently much higher than in North America (close to $10/Mcf as of March 7, 2011) because the pricing mechanism includes an explicit tie to the price of oil.
- ͵inally, there is evidence emerging that the low cost structures often referred to in the shale gas economics equation may be overstated. Although the jury is still out, confirmation of this trend will be another factor that points towards a higher natural gas price environment in the future.
- The result is that end users in North America are looking for ways to secure longer term sources of supply at low prices now.
- One option that is emerging is entry into joint ventures (also known as farming-in) in known natural gas fields. In return for funding a portion of the capital cost to drill wells, end users can secure a source of supply at a fixed price and over a longer term than that offered by the traditional sources of long term supply.
- NWN is an early mover in this regard with its farm-in on Encana's Jonah natural gas field.

NYMEX Natural Gas Price History

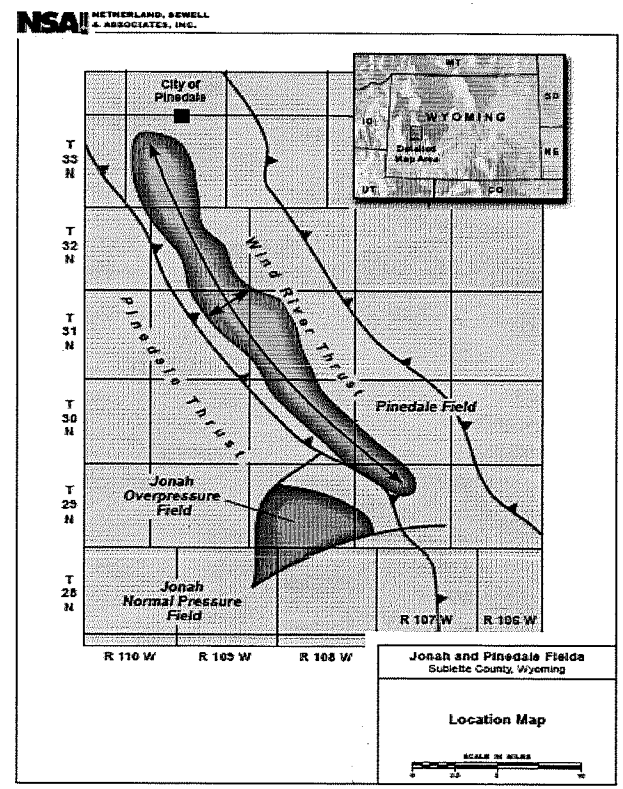


Source: Bloomberg

The Jonah Field (1)

- Jonah is located in Sublette County, Wyoming and lies in the southeastern portion of the Hoback Basin, which is a northwestern extension of the Greater Green River Basin.
- Over the past several years, improvements in hydraulic fracturing technology have opened up massive new tight gas reserves in shale basins across North America. Within this context, Jonah is significantly ahead of its time.
- The Field was discovered in the 1990s, and was the proving ground for much of the new technology being deployed in other shale plays today.
- It now has a history of consistent production and reserves growth in excess of 10 years, while most other shale plays in North America are still in their infancy with production histories of less than three years.
- As such, Jonah is likely the most well understood of all the shale plays in North America in terms of production profile, reservoir parameters and projected reserves recovery.
- Today Jonah has more than 1,500 producing wells with a total field gas production rate of nearly 890 MMcf/d. Encana, British Petroleum ("BP") and Ultra Petroleum ("Ultra") are the principal operators of the Field, while several other companies have smaller operations in the area.
- A long history of consistent reserve and production growth combined with a steady improvement in the cost structure has propelled Jonah to its current status as a world class natural gas field.
- At the end of 2008, Jonah was one of the top ten US gas fields as measured by Proved reserves.

ocation of the Jonah Field



Source: NSAI

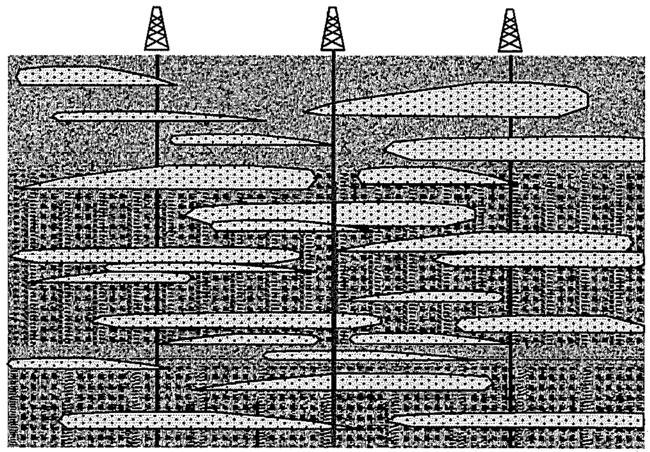
The Jonah Field (2)

- Most of the natural gas at Jonah is found in the Lance Formation at depths of 8,000 to 13,000 feet.
- The gas is contained in ancient sandstones deposited in a series of meandering river channels that are interbedded between impermeable shale sequences, and are essentially stacked one on top of another.
- The gas bearing sandstones have very low permeability and porosity (making them known as "tight" in industry speak). This means that the gas is trapped in very small spaces between the grains of sediment, and it does not flow easily to a well bore because the pathways between these spaces are narrow or even non-existent.
- In order to make the gas flow, hydraulic fracturing techniques are employed to force open or stimulate the tight sandstone formations so that gas can flow at economic rates.
- The sandstone at Jonah contains much more gas than a typical conventional formation, so more wells are required to efficiently drain the reservoir than the typical one per 160 acres drilled into conventional reservoirs.
- At Jonah, one well is required for up to every 5 to 10 acres of surface area. As a result, a large drilling inventory remains.
- [redacted]

- Encana entered the Jonah field in 2001 and has since become the dominant operator in the area.
- Over the past decade Encana has consistently increased production and reserves, while becoming one of the lowest cost operators in the region.
- Encana is now producing approximately 725 MMcf/d from more than 1,175 wells.
- During the time it has operated at Jonah, Encana has also established a strong environmental track record and has become a leader among its peers in the preservation of the region's ecology.
- Some of the initiatives that have contributed to this reputation include aggressive land reclamation programs (the bar is set high with the goal of reclaiming at the same rate as any corresponding disturbances) and an 80% reduction in harmful atmospheric emissions over the past five years, largely through the introduction of natural gas powered rigs.
- Encana has received a number of environmental awards over the past several years for its efforts.

The Jonah Field (3)

Jonah Field Geological Profile



Source: NSAI

Due Diligence

- We understand that NWN's due diligence on the Transaction was managed internally and led by Barbara Cronise, Director, Business Development. Jerry Fish of Stoel Rives also played a key role.
- Based on our understanding of the due diligence work performed by NWN, we concluded that the scope of work performed was comprehensive and appears to have covered the major risk areas.
- We note that only a high level summary of NWN's due diligence process was provided.
- As such, our comments are based solely on our review of a limited number of documents provided by NWN and discussions with Ms. Cronise and Mr. Fish.
- In summary, we understand NWN addressed the following areas:
  - Reserves (retained NSAI)
  - Historical costs
  - Land title (local counsel in Denver provided updated title opinion)
  - Environmental issues (addressed by Stoel Rives and environmental consultants ENVIRON)
  - Permits (reviewed by Stoel Rives)
  - Contracts (reviewed by Stoel Rives and covered existing contracts including drilling, gathering & processing, insurance)
  - Review of Encana documents (considered wells, contracts, regulatory and right of way issues)
  - Tax and tax partnership structure (opinion from Deloitte)
  - Legal matters including litigation (addressed by Stoel Rives)
  - Risk of Encana bankruptcy
  - Commercial terms of the Deal (negotiated terms to mitigate risk while maintaining the economic benefits of the Deal)

Financial Model Review

- In the course of our work, we reviewed the following economic and financial models provided by and relied upon by NWN (collectively the "Models"):
  - Encana's Jonah production model
  - NWN's Jonah production model
  - NWN's economic model (including estimated costs to the rate payers)
- Based on our review, we were satisfied that the Models accurately reflected the agreed terms of the Transaction.
- We confirm that the production forecasts contained in the Models agree with one another.
- We note that logic employed in the NWN production model yielded slightly different month to month production profiles than the Encana production model.
- In our view, the differences are not significant and have little impact on our assessment of the economics of this Transaction.

Risk Analysis (1)

Risk Mitigation

- NWN has negotiated a number of terms that are not typically seen in farm-in agreements, and serve to reduce the risk normally assumed in this type of investment.
- The inclusion of these terms, in addition to the parties openly sharing technical data and relying on the same independent reserve evaluator (NSAI), has resulted in a highly transparent negotiation and terms that strongly align the interests of all parties.
- [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]

[redacted]

- [redacted]

Drilling Risk

- [redacted]

Reservoir Risk

- [redacted]
- [redacted]

Cost Inflation

- [redacted]
- [redacted]

Counterparty Risk

- [redacted]
- [redacted]
- [redacted]

Risk Analysis (2)

Price Volatility

- The Transaction includes the formation of a tax partnership [redacted]

Regulatory Risk

- NWN and Encana both have the right to terminate the joint venture agreement if regulatory changes take place which eliminate substantially all of the tax benefits currently contemplated in the Transaction.

Cost of Mitigation

- We note that NWN has sacrificed some degree of upside in return for mitigating risk.
- [redacted]
- [redacted]
- NWN will still have an option to commit additional capital and participate in the drilling of Probable reserves in the future. However, it will have to pay its pro-rata share of the well costs at the time of drilling in order to participate and will earn no additional working interest outside of the interest it earns in the wellbores it funds.

Risk Analysis (3)

Remaining Risks and Sensitivities

- Notwithstanding the risks that NWN mitigated, some risks still remain. These include:
  - Drilling risk
  - Production risk
  - Operator risk
  - Market risk
  - Regulatory risk
  - Counterparty risk
  - Termination risk

Drilling Risk

- Drilling risk consists of:
  - Risk of drilling a dry hole; and
  - Risk of delays
- Although Jonah is very well understood and the wells NWN will fund are low risk infill locations, the parties are still exposed to the risk of drilling a dry hole.
- The infill nature of the drilling means that there is near 100% probability of success for each drill, and the well understood reservoir parameters make it virtually certain that a wellbore will intersect gas bearing horizons. Therefore, a dry hole would only occur in a circumstance where mechanical issues in the wellbore rendered it unable to produce.
- [redacted].
- There would still be some loss of reserves and production potential but not of a magnitude to dramatically impact the projected economics of the Transaction.
- A delay in executing the drilling schedule could result in lost reserve volumes and a lower project NPV.
- NWN has run three alternative scenarios to the base case drilling schedule and have determined that the worst case scenario, a 12 month delay, would result in no more than a 1% decrease in net gas volumes. The NPV of the base case would decline by approximately $350,000.

Production Risk

- NSAI is a highly regarded reserves evaluator and has employed a number of conservative assumptions in preparing their reserves report.
- Moreover, NSAI has been granted access to reservoir data for Jonah dating back to 1996 and has completed an evaluation of Encana's reserves at Jonah since 2002.
- This gives us comfort in the accuracy of the production and reserve recovery forecasts assumed in this Transaction.
- However, there is still some uncertainty in even the best reserve evaluations, so we consider here the reservoir-related risk factors that could ultimately affect the economics of this transaction, either positively or negatively. These include:
  - Actual recovery factor
  - Reservoir decline rates
- NSAI has used a recovery factor of 85% in its analysis, meaning that it is more than 90% probable that 85% of the original gas in place will be recovered. We believe this is a conservative assumption.

Risk Analysis (4)

Sensitivity - Changes to Recovery Factor			
Recovery Factor	Reserves (Bcf)	Variance** ($MM)	
90.0%	95.7	$	4.9
87.5%	94.6	$	3.0
85.0%*	93.1	$	-
83.0%	91.3	$	(3.4)

*Base case based on 85% recovery factor

** NPV for project calculated by NSAI based on a pre-tax discount rate of 10%

Sensitivity - Change to Exponential Decline Rate			
Decline Rate	Reserves (Bcf)	Variance** ($MM)	
11.0%	89.2	$	(4.5)
10.5%	90.5	$	(3.3)
10%*	93.1	$	-
9.0%	97.7	$	4.8

*Base case based on 85% recovery factor

** NPV for project calculated by NSAI based on a pre-tax discount rate of 10%

- We note that the change is not perfectly linear, as the recovery factor is interrelated with other variables that contribute to NPV, such as the decline rate.
- However, we calculate that a 1% change in the recovery factor from the base case will change the NPV benefits to the rate payer by approximately $1.3 million.
- Given the production history and deep understanding of the reservoir parameters, we believe that the probability of exceeding the 85% base case recovery factor is greater than the probability of falling short.
- The NPV benefit to the rate payer is also sensitive to the decline rate.
- The faster the reservoir is depleted, the lower the recoverable reserves and NPV. NSAI used a 10% exponential decline in their analysis.
- Based upon the production history at Jonah, we consider it unlikely that the decline rate will exceed 10%, but believe it could ultimately be lower, perhaps 9%.
- Once again we note that the change is not perfectly linear as a change in recovery factor will in turn influence other factors that contribute to NPV.
- We calculate that a 1% change in the exponential decline rate from the base case will change the NPV benefits of this project to the rate holder by approximately $4.7 million.

KPMG

Risk Analysis (5)

Operating Risk

- Encana is widely regarded in the natural gas industry as a world class operator, and has achieved low and stable operating costs at Jonah due to its operating skill and the economies of scale achieved through the concentration of its activities within a 36 square mile area.
- We expect their operating acumen to result in continued low operating costs and minimize the risks associated with sub-optimal reservoir performance and poor maintenance or performance of infrastructure.
- In spite of these benefits NWN could still be exposed to potential increases in gathering and processing fees beyond those currently negotiated, and to the degree that not every circumstance or challenge can be perfectly addressed, to the potential for poorer than anticipated reservoir performance.
- However, given Encana's size, track record and skill as an operator, we consider these risks to be minor.
- We also note that operating costs [redacted]
- We have examined the sensitivity of project NPV to changes in operating costs, the majority of which would likely come from changes in gathering and processing fees.
- We calculate that a 1% change in operating costs from the base case will change the NPV benefits of this project to the rate payer by approximately $750,000.
- NWN is also exposed to the risk associated with disruptions in gathering and processing service due to outages related to extended maintenance or repair of unforeseen damages.

- Encana is the dominant operator at Jonah and the attractive economics of this resource are due in no small part to Encana's technical skills in operating the field.
- Therefore, as long as Encana owns its interests at Jonah, we think it unlikely that they would abdicate their role as the operator.
- However, improbable as this may be, there can be no assurance that it will never happen.
- If Encana were to appoint another operator NWN would be exposed to potential erosion in operating margins and the possibility of diminishing reservoir performance should the new operator be less skilled than Encana.

Sensitivity - Change in Operating Costs

Operating Costs ($/Mcf)	Reserves (Bcf)	Variance** ($MM)
[redacted]	[redacted]	$ [redacted]
[redacted]	[redacted]	$ [redacted]
[redacted]	[redacted]	$ [redacted]
[redacted]	[redacted]	$ [redacted]
[redacted]	[redacted]	$ [redacted]

*Base case based on 85% recovery factor

** NPV for project calculated by NSAI based on a pre-tax discount rate of 10%

Risk Analysis (6)

Market Risk

- North American natural gas markets are undergoing rapid and dramatic change in terms of supply / demand dynamics, the emergence of new low cost shale gas plays, the consequential changes in transportation infrastructure and the direction and magnitude of product flows.
- In this context, we believe that natural gas prices are likely to move away from their current price band over the medium to long term.
- Although our bias is to price upside, further development of shale plays in both North America and across the world could potentially increase world supply to levels that push natural gas prices to levels below the current band.
- Under this scenario, the benefits of the Transaction to the end user would be eroded.
- The base case year 1 price of $4.60 and prices for the following years is that employed in the NSAI reserve report.
- We calculate that the project NPV will increase by approximately $910,000 for a 1% increase in price from the base case, while a decrease of 1% will lower the project NPV by approximately $2.9 million.
- The discrepancy is due to the impact of natural gas price on ultimate reserve recovery.
- NSAI has calculated that an increase in gas prices above the base case year 1 price of $4.60 per Mcf will have no impact on the 85% recovery rate.
- On the other hand, lower gas prices reduce the amount of recoverable reserves because less gas is economically recoverable the lower the price goes.

Sensitivity - Change in Natural Gas Price

Year 1 Price	Reserves (Bcf)	Variance** ($MM)
$2.50	83.9	$ (133.9)
$4.60*	93.1	$ -
$9.00	93.1	$ 97.1
$12.00	93.1	$ 168.5

*Base case based on 85% recovery factor

** NPV for project calculated by NSAI based on a pre-tax discount rate of 10%

Risk Analysis (7)

Regulatory Risk

- The regulatory regime in Wyoming is progressive and friendly to the natural gas industry, and Encana has developed a reputation as an environmentally responsible producer.
- However, this does not preclude the possibility of future changes to environmental or tax laws that could increase taxes or operating costs.
- Should such change occur, the tone of the current regulatory regime suggests to us that changes in this regard would not be of a magnitude that would render production uneconomic and shut down the industry – the significant benefits from the industry to the State of Wyoming should place limits on the degree of change and financial cost that might be expected.
- Despite the friendly stance of the current regulatory regime, there is potential for increased interference and/or new regulations pertaining to the use of well fracturing techniques.
- Various environmental groups across North America have expressed concern that the chemicals and other materials used in frac fluids could contaminate valuable sources of underground water supply.
- Public awareness and concern over this issue is increasing and regulatory bodies in Pennsylvania and New York (Marcellus shale gas play) and Quebec (Utica shale gas play) are currently conducting environmental reviews on the impact of hydraulic well fracturing activities.
- If it is determined that this process does put underground water resources at risk, then there is a high probability that well fracturing activity could be curtailed or entirely outlawed.
- However, by the time all of the hearings and legal proceedings required to enact new laws are completed, we expect that most, if not all, of the wells NWN is committed to fund will already be drilled; we see little risk to NWN in this regard.

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Risk Analysis (8)

Counterparty Risk

- Encana is one of North America's largest natural gas producing companies and is in a solid financial position.
- Given its current financial stability and dominant industry position, Encana's status as a going concern is not presently in question. However, the terms of this Transaction cover a 30 year period, a very long time in the lifespan of a corporation.
- Therefore, although it is unlikely the Encana could cease to be a going concern, there is no guarantee that they will remain a viable entity over the entire length of the Deal.
- If Encana does become insolvent, NWN would retain legal title to the leases and ownership of the reserves in which it has earned an interest.
- However, it would be exposed to potential performance and cost management issues associated with the replacement of Encana by a new owner and/or operator.
- [redacted]
- This would not in itself be catastrophic and would likely have only a minor impact on the overall economics of the Transaction.
- [redacted]
- [redacted]

Termination Risk

- NWN is participating in a world class natural gas asset run by an industry leading operator in Encana, with whom its interests are closely aligned.
- Although the partnership structure has mitigated many of the risks that could sour the relationship between the two parties, it is possible that NWN could at some point determine that termination of the partnership is in its best interest.
- [redacted]
- [redacted]
- [redacted]

Risk Analysis (9)

Summary of Deal Risks and Sensitivity Analysis

- The table below shows that the decline rate is the most important of the variables impacting project NPV that we were able to analyze.

Summary of Sensitivities		
Based on 1% Change		**Variance****
Variable:		**($MM)**
Decline Rate	$	4.7
Recovery Factor	$	1.3
Operating Cost	$	0.8
Gas Price (Increase)	$	0.9
Gas Price (Decrease)	$	2.8

*Base case based on 85% recovery factor

** NPV for project calculated by NSAI based on a pre-tax discount rate of 10%

Economic Assessment (1)

Market Benchmarks

- To assess the fairness of the implied pricing of the Transaction in the context of the current market, we considered the following:
  - Comparable transactions
  - Implied discount rates
  - Implied full cycle costs
  - Supply costs

Comparable Transactions

- An examination of 14 transactions weighted to tight or shale gas assets yielded the following conclusions:
- NWN acquired a total of 119.4 Bcf of gross Proved reserves in the Transaction, which translates into a price of $12.60/boe.
- When compared to the average price of $15.92/boe for tight/shale gas plays in the broad North American market it appears that the reserves were acquired at discount.
- Within Jonah, and the neighboring tight gas fields on the Pinedale Anticline and in the Piceance Basin there has not been much of any merger and acquisition activity in recent years.
- However, several transactions we observed suggest that there is support for valuations in this geographic area in the $9.00 to $10.00/boe range.
- On this basis, NWN appears to have paid a modest premium. However, we believe it is justified given the risk profile of the reserves acquired and the other risk mitigating factors inherent in the Deal compared to other transactions.
- The Transaction was also compared to a similar gas supply agreement between Anadarko Petroleum ("Anadarko") and Xcel Energy ("Xcel") that received regulatory approval in early 2011.
- This agreement provides Xcel with gas supply at fixed price of $5.48/Mcf for a ten year period.
- The average price to NWN's end users is $5.09 over the entire 30 years of the agreement with Encana and $5.21 over the first 10 years.
- The Xcel contract also requires that customers bear the risk of finding replacement supplies in the event of a contract default by Anadarko, while NWN customers do not bear this risk in their Transaction.

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Economic Assessment (2)

Comparable Transactions (cont'd)

- This further supports our view that the Transaction is financially fair from a market perspective.
- Overall, given the highly predictable nature of the reserves and other risk mitigating deal terms, we conclude that the price NWN paid to enter this joint venture is fair from a broad market perspective.

Comparable Transactions

	No.	Mean	Median	Low	High
$/boe					
Green River / Piceance	4	$ 8.53	$ 9.82	$ 3.73	$ 10.76
Other shale/ tight gas	14	$ 15.05	$ 9.63	$ 1.03	$ 68.36

Implied Discount Rates

- The present value of reserves calculations in the NSAI reserves report suggest that the pre-tax discount rate implied in this transaction is approximately [redacted]
- There was not sufficient publicly available information from the aforementioned tight/shale gas transactions we observed to determine the implied discount rates.
- However, KPMG has observed numerous gas transactions in Western Canada over the past six months that suggest the implied pre-tax discount rates for natural gas transactions for 2P reserves over the past six months have been in the range of 12% to 14% (discount rates on Proved reserves would be lower). We believe this is consistent across North America, not just in Western Canada.
- Based on the implied discount rates, the Transaction appears to have been priced at a premium but one which we believe is justified given the risk profile of the assets acquired.

Implied Full Cycle Costs

- The full cycle cost of a natural gas asset is defined as all of the costs required to find, develop, produce and sell the reserves.
- Specifically, this includes the cost of land, exploration and development (seismic, geophysical work, drilling and completions, etc), royalties, taxes, operating costs and fees for gathering, processing and product marketing.
- Assets of the highest quality are the ones with the lowest full cycle cost, as they produce the best returns on investment.
- We estimate that full cycle costs for tight / shale gas reserves in North America average approximately $4.20/ Mcf, which is in line with the implied full cycle cost of $4.30 for the Transaction.
- In accruing full cycle costs, natural gas producers assume substantial risk at the front end of the cycle as there is considerable uncertainty associated with exploration drilling and the development of a gas deposit to the point where reserves can be booked.

Economic Assessment (3)

Implied Full Cycle Costs (cont'd)

- Thereafter, the producers bear the risk of capital and operating cost inflation, environmental liabilities and a requirement to incur plug and abandon costs when the reserves are depleted.
- NWN is assuming virtually none of these risks and could therefore be seen as acquiring the Jonah reserves at a lower price on a on a risk adjusted basis.

Full Cycle Costs for Select Tight/Shale Gas Companies

Full Cycle Cost ($/Mcf)	EnCana (Jonah)	Ultra (Pinedale)	NWN	Questar (Pinedale etc)	Nextraction (Pinedale)	Sample Average	Industry Mean
Finding & Development[1]	1.36	1.48	2.10	1.07	2.25	1.65	2.61
Royalties[2]	0.88	0.88	0.88				
Production Taxes3	0.53	0.53	0.53				
Operating Cost4	0.20	0.20	0.78				
Transportation & Selling5	0.73	0.73		2.77			
Total Full Cycle Cost[6]	**3.70**	**3.82**	**4.30**	**3.84**	**3.64**	**3.86**	**4.23**
F&D % of Full Cycle Cost	37%	39%	49%	28%	62%	0.43	62%

1. For Encana as per Encana Investor presentation, for Ultra as per 2010 Annual Report for NWN based on cost to acquire gross reserves at Jonah, for Questar as per January 2011 Investor presentation, for Nextraction as per 2010 Investor presentation
2. Royalties of $0.88/Mcf for Encana based on 22% (as per Encana Investor presentation) and a natural gas price of $4.00/Mcf (chosen by KPMG). Extrapolated to NWN as it operates in same field as Encana and to Ultra, as royalty structures in Pinedale are assumed by KPMG to be very similar to Jonah due to the close geographic proximity of the two fields.
3. Production taxes as per Encana Investor presentation.
4. Operating cost for Encana as per Encana Investor presentation. Cost has been extrapolated to Ultra by KPMG as Pinedale and Jonah fields have similar operating cost requirements. Operating cost for NWN as per NWN economic model.
5. Transportation and selling cost for Encana as per Encana Investor presentation. Cost has been extrapolated to Ultra by KPMG as Pinedale and Jonah fields have similar operating cost requirements. Cost for Questar is composed of Q2/10 cash costs (lease operating expense plus production taxes plus G&A plus interest plus DD&A) as per company reports.
6. Full Cycle Cost for Encana, Ultra, NWN and Questar calculated as the sum of finding & development and cash costs. For Nextraction, the sample average and the industry mean, full cycle costs calculated by taking the average of F&D costs as a percentage of the full cycle cost, and then backing out the extraction cost and the sample and industry means based upon this information.

Source: Company reports, Tudor Pickering Holt & Co. LLC, KPMG

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Economic Assessment (4)

Supply Costs

- A Morgan Stanley study referenced in a September 2010 investor presentation by Ultra concluded that the breakeven gas price (the flat NYMEX strip price required for a shale gas play to generate a 10% IRR) for North American shale gas plays averaged approximately $4.20/Mcf.
- We have previously stated that evidence is now emerging that the cost structures for many of North America's shale gas plays may be understated.
- If true, the supply cost will rise above the current estimate of $4.20 and require that gas prices increase to higher levels than we are observing today.
- In a January 2011 investor presentation, Encana indicated that its expected supply cost (8% IRR, not including land costs) for Jonah would be in the $3.00 to $4.00 range.
- Given the long production history of the Jonah field and the consequent abundance of reservoir data, we believe that the cost structure (i.e. supply cost) of the natural gas assets NWN has acquired will not be subject to the upward revisions that could be in the cards for other shale gas plays in North America.
- If the cost structures of other shale plays are revised upwards, NWN will receive further validation that it has paid a fair and reasonable price for the assets it has acquired.

Summary of Market Comparison

- Based upon the preceding analysis, we believe that the Transaction with Encana is fair from a financial and market perspective.
- On some measures, NWN is paying a small premium. On other measures the assets are being acquired at a discount. However, when the valuation metrics we have used are observed in aggregate, the results suggest that NWN has paid a fair price for the Jonah assets.
- Moreover, the low risk nature of the reserves acquired, combined with the potential upside to be discussed later in this report, suggest that on a "risk adjusted" basis, the price paid by NWN will prove to be lower than $12.60/boe.

Other Considerations

- There are a number of sources of potential upside to the economics of the Transaction. These include:
  - Probable reserves
  - Conservative reserve assumptions
  - Favorable changes to the drilling schedule
  - Reduction in capital costs
  - Increases in natural gas prices

Probable reserves

- The Transaction only gives consideration to the Proved reserves that NWN is expected to own and produce. [redacted]
- NSAI has assumed a reasonable and prudent drilling schedule to determine that these wells could add approximately $16 million of incremental NPV benefit to NWN's rate payers.
- Regulatory approval to drill these locations has not yet been granted, but historic experience in this regard suggests approval should be little more than a formality.

Economic Assessment (5)

Conservative Reserve Assumptions

- In calculating the 93.1 Bcf of net Proved reserves being acquired by NWN, NSAI has assumed a 10% annual decline rate on the exponential portion of the decline curve (the portion of the decline curve that flattens out after the period of high initial production when a well first comes on stream).
- NSAI has acknowledged that this is a conservative assumption. An exponential decline rate of 9% would result in the production of approximately 4.6 Bcf of additional reserves during Jonah's productive life and add incremental NPV of approximately $4.9 million.
- The 93.1 Bcf of Proved reserves projected to be recovered is predicated upon an 85% recovery factor.
- However, producers will often exceed the estimated recovery factor due to either natural factors or the skill of the operator. Exceeding the recovery factor by 5% would result in an estimated 2.6 Bcf of additional reserves and an incremental NPV benefit to the end user of $4.1 million.

Favorable Changes to the Drilling Schedule

- If Encana should choose to accelerate the drilling program, the recoverable reserves and NPV accruing to NWN's end users would increase. NWN approval would be acquired for any increase in the pace of drilling.

Reduction in Capital Costs

- If drilling costs were to fall below the $[redacted] of capital [redacted]
- At this time, we project that the aggregate "savings" from lower capital costs could approach but would not likely exceed the cost of one additional well. An extra well drilled with these savings would likely add 0.8 to 1.0 Bcf of incremental volumes to NWN.

Increase in Natural Gas Prices

- Our previous discussion of scenarios where shale gas cost structures may be revised upwards or gas prices are exposed to world market forces show that price increases far in excess of those assumed in the generation of reserves reports today area possible.
- We add to this the possibility that large price increases could also come about if new environmental regulations regarding the use of hydraulic well fracturing were to come into effect.
- Although we are not in the business of forecasting natural gas prices, we believe there is a possibility that the unfolding of these scenarios could result in natural gas prices rising over the medium to long term and offer additional upside to NWN in the form of:
  - Potential opportunities to attract new customers because of lower gas costs, and therefore lower rates, than competitors may be in a position to offer
  - Opportunities to generate trading profits by entering financial derivatives contracts and using the low cost physical gas from Jonah to back the trades. Profits could be used to subsidize the cost of gas to consumers in high price environments

Conclusion

- The Transaction price to NWN is reasonable in comparison with prices currently observed in the market.

Long-Term Natural Gas Supply Alternatives

Overview

- KPMG was asked to review alternative gas supply transactions including but not limited to the review of indicative price quotes obtained by NWN.
- We note that all of the following scenarios are likely academic in nature, since:
  - The terms are shorter than the Encana Deal
  - There is no guarantee a counterparty would commit to these price, and
  - It is unlikely that NWN could in fact enter into any of these arrangements in any event.

Approach

- KPMG performed the following:
  - Compare the reasonableness of the quoted natural gas alternative transactions
  - Evaluate alternative gas supply transactions against identified risk categories

Summary of Findings

- [redacted] and [redacted] quotes are close approximations to KPMG's simulated price:
  - Indicative price obtained by KPMG from a financial institution is equivalent to the indicative price obtained by NWN from [redacted] before credit costs were applied
  - KPMG model simulated price of $6.54/MMbtu is in line with the [redacted] and financial institution indicative price assuming a $0.50 to $0.10 market premium additive
  - Credit requirement may be less than calculated by NWN due to the fact they are an investment grade rated entity and would be granted unsecured credit when dealing directly with a natural gas supplier/producer
  - Indicative prices include a credit cost assuming the transactions are cleared on ICE

Comparison to Other Supply Alternatives

	Cost of Gas Fixed ($/Mcf)	Cost of Gas Fixed ($/Therm)	Term (Years)
[redacted]	5.71	0.51	30
[redacted] *	6.68	0.60	20
[redacted] *	6.62	0.59	20
KPMG Physical	6.54	0.58	20
[redacted]	6.64	0.59	20

* Includes credit

Long-Term Natural Gas Supply Alternatives

Summary of Findings (cont'd)

- ,orward spot prices represent today's transaction prices and have limited predictive value in forecasting the price NWN could execute hedges three years from today.
  - NYMEX spot prices represent future prices executed today versus a future date
  - Unknown global and economic factors could impact a future spot price executed at a future date
- NWN's $0.40 per dth cost associated with a $3.00 price shock represents a close approximation to a 5% probability market event and related margin calculations appear reasonable:
  - KPMG calculated a two standard deviation price movement of $2.81/MMbtu based on 10 years of historical price; a close approximation to the $3.00 price shock assumption used by NWN
  - ICE has a standard margin calculation applied to initial and variation margin
- NWN's internal credit policy requires a counterparty to be rated "AAA" by a public rating agency to transact long-term fixed price deals
  - KPMG credit cost assumes NWN will clear all long-term fixed price transactions with ICE

Projected Henry Hub Natural Gas Prices

- In our analysis, we have relied on a Monte Carlo approach to estimate future natural gas prices from year 2021 to 2030.
- A Monte Carlo simulation is a technique used to approximate the probability of certain outcomes by running multiple scenarios, called simulations, based on a normally distributed random variables.
- We have run 100,000 random simulations in the projection of natural gas prices.
- The model we used to project natural gas prices is the Geometric Brownian Motion (GBM) with the following assumptions:
  - Spot price - $3.96 natural gas as at inception (Feb 11, 2011)
  - Variance – 76% calculated as 10 year historical weekly volatility on natural gas prices
  - Risk free rate – 4.36% US swap rate 20 year mark
  - Yield – 0%
  - Error term – randomly generated with mean of 0 and standard deviation of 1
- Under the GBM model, assets have continuous prices evolving continuously in time and are driven by Brownian motion processes.
- The model requires an assumption that asset prices have no jumps; that is there are no surprises in the market.
- This last assumption can be viewed as a potential limitation in using a GBM model to project natural gas prices which can have large jumps due to factors such as weather, natural disasters and unexpected constraints on pipeline transportation.

Long-Term Natural Gas Supply Alternatives

- NWN obtained two indicative quotes on ten year fixed deals from [redacted] and [redacted] The indicative quotes provide NWN directional alternative gas supply prices vis-a-vis the Encana "drill-to-earn" deal. The table below summarizes KPMG's analysis of both indicative quotes. Note that the market premiums are proprietary to each supplier and KPMG is unable to model this price component due to lack of available market data.

Summary Analysis of NWN Assumptions

Category	NWN Assumption	KPMG Position	Rationale
Encana Comparable Price	Indicative quotes from [redacted] and [redacted] do not serve as firm execution prices or commercial commitments.	Obtained an indicative price quote from a financial institution market participant	Spoke with 3 industry marketers/traders who indicated that it is not likely to execute a fixed priced deal greater than 10 years. As you approach year 9 the market becomes thin with lower liquidity.
Forward curve (Fixed Price)	Ten year HH forward prices quoted in NYMEX serve as reasonable market data source for long-term deals.	Observed NYMEX transaction volume out ten years indicating long-term price transparency.	Calculated based on public market available data. Producers have supply and pipeline information to produce a quote where they would be willing to deliver physical natural gas.
Forward curve (Basis)	[redacted] and [redacted] indicative prices include OPAL basis.	Observed published OPAL basis quotes out 3 years only indicating short-term price transparency.	Utilized published 3 year OPAL basis quote. The following years were kept constant for the remainder of the analysis.
Credit Cost	[redacted] and [redacted] indicative prices exclude a risk premium based on NWN's creditworthiness. NWN expects [redacted] and [redacted] to request credit collateral / enhancements as a form of credit mitigation (See page 2 "Credit Cost" for further analysis).	Collateral requests are subject to NWN's cost of credit assumption is viewed as conservative.	NWN is a publically traded high A potential cost of credit adder would be equivalent to an 'A' rated industrial corporate debt issuer yield curve.
Market Premium	[redacted] and [redacted] indicative prices include a market premium (i.e., a price adder to cover the costs associated with physical settlement).	Inclusion of market premium in fixed price physical deals is considered industry practice.	KPMG did not calculate a market premium but interviewed select suppliers who indicated a market premium range between $0.05 - $0.10 / mmbtu.

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Long-Term Natural Gas Supply Alternatives

- A comparative analysis of long-term natural gas supply alternatives is summarized in the table below:

Summary Analysis - Alternative Natural Gas Supply Scenarios

Price Analysis	[redacted]	[redacted]	KPMG Physical	[redacted]
Term 1 - 10 yr price *	$5.75	$5.64	$5.43	$5.64
Credit Cost	$0.37	$0.37	$0.39	$0.39
Term 1 total price	$6.12	$6.01	$5.82	$6.03
Term 2 - 10 yr price	$7.30	$7.30	$7.30	$7.30
OPAL basis	-$0.42	-$0.42	-$0.42	-$0.42
Credit cost	$0.37	$0.37	$0.39	$0.39
Term 2 total price	$6.99	$6.99	$6.99	$6.99
20 yr fixed price	**$6.68**	**$6.62**	**$6.54**	**$6.64**

* includes credit

Long-Term Natural Gas Supply Alternatives

- KPMG evaluated a 3 year rolling hedge strategy by segmenting twenty-one years of forward prices into seven three year tranches. Each tranche's price represents the average NYMEX futures price over each three year period up to the first 10 years. KPMG then simulated forward spot prices for years 11 through 20 and calculated three year average price for the remaining tranches. The table below highlights the estimated pricing associated with a three year rolling hedge.
- KPMG believes there are too many market factors to model an approximate hedge transaction price. Forward spot prices represent today's transaction prices and have limited predictive value in forecasting the price NWN could transact three years from today. The prices below are intended to provide directional insight on executing a three year rolling hedge strategy.

Three Year Rolling Hedge Strategy – Estimated Pricing

Tranche	1	2	3	4	5	6	7
Years	2011 - 2013	2014 - 2016	2017 - 2019	2020 - 2022	2023 - 2025	2026 - 2028	2029 - 2031
Average Price	$ 4.71	$ 5.65	$ 6.32	$ 6.52	$ 7.35	$ 7.56	$ 8.92

Long-Term Natural Gas Supply Alternatives

- Similar to a 3 year rolling hedge, KPMG evaluated a 5 year rolling hedge strategy by segmenting twenty-one years of forward prices into four 5 year tranches. Each tranche's price represents the average NYMEX futures price over each five year period up to the first 10 years. KPMG then simulated forward spot prices for years 11 through 20 and calculated five year average price for the remaining tranches. The table below highlights the estimated pricing associated with a five year rolling hedge.
- As discussed, KPMG believes there are too many market factors to model an approximate hedge transaction price. Forward spot prices represent today's transaction prices and have limited predictive value in forecasting the price NWN could transact five years from today. The prices below are intended to provide directional insight on executing a five year rolling hedge strategy.

Five Year Rolling Hedge Strategy - Estimated Pricing

Tranche	1	2	3	4
Years	2011 - 2015	2016 - 2020	2021 - 2025	2026 - 2030
Average Price	$5.03	$6.31	$6.98	$8.11

Long-Term Natural Gas Supply Alternatives

- Assuming alternative gas suppliers are unwilling to offer a 10 year fixed price physical deal, NWN performed a scenario analysis whereby fix/ float swaps are executed over ICE to synthetically lock in a price. ICE requires its market participants to post initial and variation margin as a mechanism to mitigate counterparty credit exposure. Executing exchange traded transactions are capital intensive and the table below analyzes NWN assumptions associated with financial hedges.

Summary Analysis of Financial Hedges Margin Calls

Evaluation Category	NWN Assumption	KPMG Position	Rationale
Price	A negative price shock of $2, $3 and $4 is appropriate to calculat price volatility.	Stressed volatility based on a statistical calculation to shock current natural gas prices	A two standard deviation price shock captures 95% of the movement in price based on historical Henry Hub prices.
Initial Margin Requirement	Initial margin requirement is based on a standard margin calculation model available in ICE and margin is required to transact with ICE participants.	Verified the NWN calculation and determined that the calculation was correct.	ICE standard calculation model used for initial margin requirement.
Variation Margin Requirement	Variation margin can be calculated by using a dollar price shock.	Calculated the variation margin based Applied the volatility shock to the ICE margin calculation.	Stress testing volatility rather than shocking prices is considered a more robust approach.
Stress Test	Volatility in market price movements is captured by the three different price shock assumptions.	Calculated based on a two standard deviation volatility shock based on historical prices.	Stress testing volatility rather than shocking prices is considered a more robust approach.

Long-Term Natural Gas Supply Alternatives

- KPMG performed a two standard deviation stress test based on ten years of historical prices. A two standard deviation price movement represents a 5% probability that natural gas prices will decrease to $2.81 /MMbtu. Based on this analysis, NWN's $0.40 /dth cost associated with a $3.00 price shock represents a close approximation to a 5% probability market event and is therefore determined reasonable.

Summary Analysis of Financial Hedges Margin Calls

	Initial Margin	($2.00)	($3.00)	($4.00)	KPMG ($2.81)	
Initial Margin	$50,677,440	$50,677,440	$50,677,440	$50,677,440	$50,677,440	
Variation Margin		$21,322,560	$57,322,560	$92,322,560	$52,642,560	
Total _inancing	$50,677,440	$72,000,000	$108,000,000	$143,000,000	$103,320,000	
Interest Rate Spread	0.50%	0.50%	0.50%	0.50%	0.50%	Interest cost over benchmark
Borrowing Cost	$253,387	$360,000	$540,000	$720,000	$516,600	Annual cost
Upfront Facility Fee Cost*	$76,016	$108,000	$162,000	$216,000	$154,980	Assume 150 bps
Facility Fee Cost*	$380,081	$540,000	$810,000	$1,080,000	$774,900	Assume 75 bps
Total Cost of Credit Facility*	$709,484	$1,008,000	$1,512,000	$2,016,000	$1,446,480	
Cost Per Dth Annualized	$0.19	$0.27	$0.40	$0.54	$0.39	

* annualized

- KPMG identified six key business risks associated with long-term gas supply contracts and performed a high level risk-based assessment. KPMG's assessment applied the definitions presented in the table below.

Risk Categories and Definitions

Risk Category	**Risk Definitions**
Credit Risk	The financial loss when a supplier/counterparty fails to perform (i.e., defaults on its contractual obligations.
Regulatory Risk	Potential financial event arising from public utility industry regulatory violations (e.g., rules misinterpretation, incorrect implementation, willful disregard(, rate recovery disallowance (e.g., imprudent procurement costs), adverse regulatory amendments / rulings decisions or unfavorable regulatory environment.
Market Risk	The financial loss resulting from adverse market movements in commodity prices due to risk factors such as weather, load and resource uncertainty, liquidity, and changes in price correlation.
Model Risk	The risk that model outputs fail to closely approximate or predict reality causing unexpected financial losses.
Liquidity Risk	The risk of an adverse cost or return stemming from the lack of a liquid market for a commodity or financial instrument. Liquidity risk may arise because a transaction's size and/or contract tenor is large relative to typical trading volumes, contracts are complex and customized, or market conditions are unstable. Wide bid-ask spreads and large price movements indicate illiquid markets. An organization facing the need to quickly unwind illiquid positions or portfolio may either find it necessary to sell at prices below fair market value or not be able to sell the instrument at the desired time.
Environmental Risk	The financial loss resulting from detrimental environmental (air, land, water) incidents (e.g., spill, emissions) and unexpected remediation costs.

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Long-Term Natural Gas Supply Alternatives

- The table below provides a summary of risks inherent in each long-term natural gas supply alternative.

Long-Term Natural Gas Supply Transaction Risks

Risk Category	10-Year Physical Transaction	ICE Financial Hedge	Financial Institution Physical
Credit Risk	Low risk as producers generally have higher credit ratings than energy marketers due to their asset base. NWN's strong credit rating positions itself as a desirable counterparty with expectations to receive favorable credit terms (e.g., minimum collateral requirements).	Little to no counterparty credit risk associated with ICE cleared transactions.	Low to moderate risk depending on the financial institution. Canadian Financial Institutions have strong investment grade ratings. Risk is mitigated due to NWN internal credit policy and standards.
Regulatory Risk	Low risk as many producers have a diversified portfolio of natural gas supply. If regulations on drilling/production or pipeline infrastructure development were to change in a specific state, region or country the producer could procure the required natural gas from other producing properties.	Low regulatory risk but Dodd/Frank bill will alter the way exchange-traded financial derivatives are traded and cleared.	Moderate regulatory risk because Do dd/Frank bill will alter the way OTC financial derivatives are traded and cleared.
Market Risk	Moderate risk as producers want to compensate themselves for the additional risk of offering deals over a longer time horizon (i.e., producers assume long-dated price risk). NWN's hedged exposure to price risk increases when natural gas price decreases but NWN has obtained cash flow and price certainty with a fixed price hedge.	Moderate risk as ICE hedges have limited time horizon. NWN could be exposed to market risk as the hedges expire.	Moderate risk as financial institutions want to compensate themselves for the additional risk of offering deals over a longer time horizon (i.e., financial institutions assume long-dated price risk).
Model Risk	Moderate risk as price uncertainty increases in future years and the ability to model a reasonable offer price becomes more difficult.	Low risk as ability to roll financial hedges in the forward market is limited based on ability to model future forward curves.	Moderate risk as price uncertainty increases in future years and the ability to model a reasonable offer price becomes more difficult.
Liquidity Risk	Low to moderate as market is liquid for the first 3 to 5 years and the bid / ask spread widens beyond 5 years. Market liquidity is non-existent after 10 years	Low risk as Henry Hub is a very liquid market with little trading constraints.	Low to moderate as market is liquid for the first 3 to 5 years and the bid / ask spread widens beyond 5 years. Market liquidity is non-existent after 10 years.
Environmental Risk	Low risk but specific to producer and pipeline. Risk can be mitigated based on contract terms between the counterparties.	Not applicable	Not applicable

Long-Term Natural Gas Supply Alternatives

- KPMG identified six key business risks associated with long-term gas supply contracts and performed a high level risk-based assessment. KPMG's assessment is illustrated in the picture below.

Comparison - Transaction Risk v. Alternative Supply Scenarios

Risk Category	Encana Partnership	10 Year Physical	ICE Financial Hedge	Financial Inst. Physical
Credit Risk[1]	Very Low	Low	Very Low	Low to Moderate
Regulatory Risk[2]	Very Low	Low	Moderate	Moderate
Market Risk[3]	Low	Moderate	Moderate	Moderate
Model Risk[4]	Low	Moderate	Low	Moderate
Liquidity Risk[5]	None	Low	Low	Moderate to High
Environmental Risk[6]	Very Low	Low	NA	NA

Notes:

1. Credit Risk – The financial loss when a supplier / counterparty fails to perform (i.e. defaults) on its contractual obligations.
2. Regulatory Risk – Potential financial events arising from public utility industry regulatory violations (i.e. rules misinterpretation, incorrect implementation, willful disregard), rate disallowance (i.e. imprudent procurement costs), adverse regulatory amendments, rulings and decisions or an unfavorable regulatory environment.
3. Market Risk – The financial loss resulting from adverse market movements in commodity prices due to risk factors such as weather, load, resource uncertainty, liquidity, and changes in price correlation.
4. Model Risk – The risk that model outputs fail to closely approximate or predict reality causing unexpected financial losses.
5. Liquidity Risk – The risk of an adverse cost or return stemming from the lack of a liquid market for a commodity or financial instrument.
6. Environmental Risk – The financial loss resulting from detrimental environmental (air, land, water) incidents (i.e. spills or emissions) and unexpected remediation costs.

Source: KPMG LLP

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- We reserve the right (but will be under no obligation) to review all calculations included or referred to in this report and, if we consider necessary, to review our conclusions in light of any information which becomes known to us after the date of this report.

Appendix A – Scope of Work

- Draft Carry and Earning agreement between Encana and NWN dated February 16, 2011
- Draft reserve report: estimate of reserves and future revenue to the NWN interest in certain oil and gas properties located in the Jonah Field, Sublette County, Wyoming as of April 30, 2011 prepared by NSAI
- ˏinal Reserve Report as of April 30, 2011 prepared by NSAI
- Reserve estimates provided by NSAI based on sensitivities to certain economic factors
- Submissions by Xcel to the Public Utilities commission of Colorado regarding projected coal and natural gas costs
- List of documents requested form Encana by Environ and documents uploaded by Encana to the ˏTP site
- Wellbore Assignment and Conveyance
- Record Title Assignment, Conveyance and Bill of Sale
- Model Form Operating Agreement
- Exhibit A to the Operating Agreement
- Article XVA. Other Provisions to the Operating Agreement
- Exhibit D to the Operating Agreement – Insurance
- Gas Gathering Agreement Attornment Letter
- COPAS Accounting Procedures Joint Operation
- Gas Balancing Agreement
- Non-Discrimination and Certification of Non-Segregated Facilities
- Tax Partnership Provisions
- Memorandum of Operating Agreement, and Mortgage, Fixture Filing and Financing Statement
- UCC ˏiling Statement and Exhibits
- [redacted]
- Transaction financial model (file name: Encana working 2-16-2011.xls) prepared by NWN
- Drilling, production and reserves model (file name: Duct TC's BASE new opex and excel) prepared by NWN
- Drilling, production and reserves model (file named: 2011.02.17_ProjectionModel_asof_5.1.2011_EncanaDrillSchedule_021711a_revised)
- Encana reserves model – 10 Year natural gas futures price analysis
- 10 Year supply model – NWP Rocky Mountains prepared by NWN
- 30 Year price curves model prepared by NWN
- NYMEX hedging cost summary dated February 18, 2011

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Appendix B – Shale Gas Transactions

Comparable Transactions - Tight Gas / Shale Transactions in North America

			Proved Reserve Information							
Buyer	**Seller**	**Announced**	**Price $MM**	**Oil (MMBBL)**	**Gas (BCF)**	**Total (MMBOE)**	**$/Mcfe**	**$/BOE**	**% Gas**	**R/P Ratio**
PetroChina Company	Encana	2/10/2011	5,451.2	12.5	925.0	166.7	5.45	32.71	92%	10.7
National Fuel / Seneca Resources	EOG Resources	1/10/2011	23.0	0.0	42.0	7.0	0.55	3.29	100%	0.0
Nagnum Hunter Resources	Postrock Energy	12/27/2010	19.9	0.0	24.3	4.1	0.82	4.91	100%	73.6
Exxon Mobil; XTO Energy	Petrohawk Energy	12/23/2010	575.0	0.0	299.0	49.8	1.92	11.54	100%	8.4
Harvest / KNOC	Hunt Oil	12/14/2010	520.5	8.5	106.8	26.3	3.29	19.76	68%	7.7
Chevron	Atlas Energy	11/9/2010	3,006.6	1.6	837.7	141.2	3.55	21.30	99%	27.9
Atlas Pipeline Holdings	Atlas Energy	11/9/2010	30.0	0.0	175.0	29.2	0.17	1.03	100%	13.7
Milagro Exploration	Ram Energy	11/1/2010	43.7	2.4	11.9	4.4	1.66	9.93	45%	12.8
Enervest	Talon Oil & Gas	10/26/2010	667.0	35.3	519.1	121.9	0.91	5.47	71%	33.3
EV Energy Partners	Talon Oil & Gas	10/26/2010	300.0	15.9	233.2	54.8	0.91	5.48	71%	33.3
Undisclosed private company	Denbury Resources	10/12/2010	217.5	0.0	180.0	30.0	1.21	7.25	100%	14.5
Exxon Mobil	Ellora Energy	7/21/2010	695.0	0.1	60.4	10.2	11.39	68.36	99%	12.7
Noble Energy	Suncor Energy	1/5/2010	494.0	23.9	174.9	53.0	1.55	9.32	55%	14.3
Williams Companies	Orion Energy	8/10/2009	258.0	0.0	150.0	25.0	1.72	10.32	100%	17.1
						Mean	$2.51	$15.05		
						Median	$1.60	$9.63		
						High	$11.39	$68.36		
						Low	$0.17	$1.03		

Source: JS Herold
R/P Ratio = reserves to production

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Appendix B – Shale Gas Transactions

Comparable Transactions - Green River Basin (Jonah, Pinedale etc.) and Piceance Basin

				Proved Reserve Information						
Buyer	**Seller**	**Announced**	**Price $MM**	**Oil (MMBBL)**	**Gas (BCF)**	**Total (MMBOE)**	**$/Mcfe**	**$/BOE**	**% Gas**	**R/P Ratio**
Denbury Resources	Undisclosed	9/15/2010	115.0	0.0	185.0	30.8	0.62	3.73	100%	0.0
Fidelity / MDU Resources	Undisclosed	3/15/2010	113.0	0.8	58.0	10.5	1.79	10.76	92%	11.9
Noble Energy	Suncor Energy	1/5/2010	494.0	23.9	174.9	53.0	1.55	9.32	55%	14.3
Williams Companies	Orion Energy	8/10/2009	258.0	0.0	150.0	25.0	1.72	10.32	100%	17.1

Range		
Mean	$1.42	$8.53
Median	$1.64	$9.82
High	$1.79	$10.76
Low	$0.62	$3.73

Source: JS Herold
R/P Ratio = reserves to production