

Area/Region: Windsor - Kennetcook Basin Nova Scotia

Play Name: Horton Bluff Shale

Play Type: Shale gas

Estimator Name: PRCL team

Avg. Surface Temp. (°C): 15

Normal Pressure Gradient (kPa/m): 9.93

Temp. Gradient (°C/100 m.): 1.50

Raw Gas Gravity: 0.60

1. Risk Component

Risk Factors	Play risk
1. Source Rock	1.00
2. Charge	1.00
3. Migration	1.00
4. Reservoir Rock	1.00
5. Trap/Closure	1.00
6. Seal/Containment	1.00
Probability of Geological Success (P_g)	1.00

2. Hydrocarbon Volume Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01	NOTES
Reservoir Depth (mTVD)	250	1,022	3,130	1,593	568	940	1,564	2,291	2,736	
Reservoir overpressuring (x hydrostatic)	1.0	1.0	1.1	1.01	0.94	0.97	1.01	1.04	1.07	
Reservoir Pressure (MPa)	--	--	--	15.9	5.6	9.4	15.6	22.9	27.4	
Reservoir Temperature (°C)	--	--	--	39	24	29	38	49	56	
H ₂ S Content	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ Content	0.01	0.03	0.05	0.03	0.01	0.01	0.03	0.05	0.09	
Total Play Area (sqkm)	1,363	1,514	1,665	1,513	1,285	1,370	1,509	1,663	1,773	
Tested Play Area (sqkm)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Untested Play Area (sqkm)	--	--	--	1,513	1,285	1,370	1,509	1,663	1,773	
Fraction of Untested Play Filled	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Developable Fraction of Total Play	0.050	0.122	0.300	0.151	0.029	0.052	0.122	0.291	0.516	
Potential O&G Area (sqkm)	--	--	--	228.7	43.5	77.3	184.8	441.2	792.3	
Fraction of PV Oil Bearing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Oil Area (sqkm)	--	--	--	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Gas Area (sqkm)	--	--	--	228.7	43.5	77.3	184.8	441.2	792.3	
Average Net Pay (m)	578	691	799	689	528	586	684	800	887	
Matrix Porosity	0.01	0.02	0.03	0.020	0.008	0.011	0.018	0.031	0.044	
Natural Fracture Porosity	0.000	0.002	0.010	0.0039	0.0002	0.0004	0.0020	0.0095	0.0265	
Total Porosity	--	--	--	0.024	0.009	0.013	0.022	0.037	0.052	
Hydrocarbon Saturation	0.55	0.70	0.80	0.68	0.50	0.57	0.68	0.81	0.92	
Free Gas Parameters										
Initial Gas Compressibility "Z"	0.95	1.00	1.05	0.83	0.76	0.79	0.85	0.98	1.14	
Gas Formation Expansion Factor	--	--	--	175	63	108	172	209	225	
Adsorbed gas parameters										
Rock matrix density (g/cc)	2.48	2.53	2.60	2.54	2.44	2.48	2.54	2.59	2.63	
Total Organic content (TOC, % wt)	1.5	3.0	6.0	3.4	1.0	1.5	3.0	5.9	9.1	
Ratio Langmuir volume %TOC (sm3/tonne)	0.3	0.5	1.0	0.6	0.2	0.3	0.5	1.0	1.5	
Langmuir Pressure (MPa)	2.40	3.00	3.60	3.0	2.1	2.4	3.0	3.6	4.1	
Adsorbed gas saturation (fraction)	0.40	0.50	0.65	0.51	0.34	0.40	0.51	0.64	0.75	
Gas Recovery Factor	0.05	0.15	0.25	0.15	0.03	0.06	0.13	0.27	0.46	

3. Yield Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01
Oil-in-Place (stm3/m3)	--	--	--	0	0	0	0	0	0
Recoverable Oil (stm3/m3)	--	--	--	0	0	0	0	0	0
Solution Gas-in-Place (sm3/m3)	--	--	--	0	0	0	0	0	0
Free Gas-in-Place (sm3/m3)	--	--	--	2.8	0.7	1.2	2.4	4.5	6.9
Adsorbed Gas-in-Place (sm3/m3)	--	--	--	2.1	0.3	0.6	1.6	4.2	8.4
Total Gas-in-Place (sm3/m3)	--	--	--	5.0	1.5	2.4	4.3	7.6	12.0
Raw Recoverable Gas (sm3/m3)	--	--	--	0.7	0.1	0.2	0.5	1.4	2.9
Marketable Gas (sm3/m3)	--	--	--	0.6	0.1	0.2	0.5	1.2	2.5
Gas Liquids Yield (stm3/e6sm3)	10	20	30	20	8	11	18	31	44
Gas to BOE Conversion (Mscf/BOE)	--	6.00	--						
Surface Loss (Fuel gas, etc...)	--	10%	--						
Marketable Gas (Fraction of Raw)	--	--	--	0.87	0.82	0.85	0.88	0.89	0.89

4. Play Totals

	Risked Mean volumes			Volumes given Geological Success in Play					
	Mean	P99	P90	P50	P10	P01			
In Place									
Oil (10 ⁶ stm ³)	0.0			0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)	8.9			8.9	0.6	1.6	5.6	18.6	46.3
Total Liquids (10 ⁶ stm ³)	8.9			8.9	0.6	1.6	5.6	18.6	46.3
Total Liquids (MMstb)	56.0			56	4.0	10.2	35.1	116.7	291.2
Solution gas (10 ⁶ sm ³)	0.00			0	0	0	0	0	0
Free gas (10 ⁶ sm ³)	447			447	41	99	305	893	1,960
Adsorbed gas (10 ⁶ sm ³)	334			334	20	55	201	729	1,964
Total gas (10 ⁶ sm ³)	781			781	85	191	552	1,556	3,371
Total gas (Bscf)	27,734			3,002	6,777				
MMBOE	4,678			4,678	504	1,140	3,298	9,322	
Recoverable									
Oil (10 ⁶ stm ³)	0			0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)	1.3			1	0	0	1	3	8
Total Liquids (10 ⁶ stm ³)	1.3			1	0.05	0.17	0.70	2.90	8.42
Total Liquids (MMstb)	8.3			8	0.3	1.0	4.4	18.2	53.0
Associated gas (10 ⁶ sm ³)	0			0	0	0	0	0	0
Non associated gas (10 ⁶ sm ³)	116.5			116	7	19	69	252	659
Total gas (10 ⁶ sm ³)	116.5			116	7.0	18.8	69.5	251.6	659.1
Marketable Gas (10 ⁶ sm ³)	101.7			102	6.1	16.4	60.4	219.6	578.4
Marketable Gas (Bscf)	3,608			3,608	217	581	2,143	7,794	
MMBOE	610			610	36	98	362	1,317	3,474

Note for parameter estimates:
Calculations Require Low < Best < High

Area/Region:	Windsor - Kennetcook Basin Nova Scotia
Play Name:	Lower Horton Bluff Sandstone
Play Type:	Tight sandstone
Estimator Name:	PRCL team
Avg. Surface Temp. (°C):	15
Normal Pressure Gradient (kPa/m):	9.93
Temp. Gradient (°C/100 m.):	1.50
Raw Gas Gravity:	0.60

Risk Factors	Play risk
1. Source Rock	1.00
2. Charge	1.00
3. Migration	1.00
4. Reservoir Rock	1.00
5. Trap/Closure	1.00
6. Seal/Containment	1.00
Probability of Geological Success (P_g)	1.00

2. Hydrocarbon Volume Component	Low	Best	High	Mean	P99	P90	P50	P10	P01	NOTES
Reservoir Depth (mTVD)	50	1,783	3,600	1,819	478	980	1,817	2,645	3,171	
Reservoir overpressuring (x hydrostatic)	1.0	1.0	1.1	1.01	0.94	0.97	1.01	1.04	1.07	
Reservoir Pressure (MPa)	--	--	--	18.2	4.8	9.8	18.1	26.5	31.7	
Reservoir Temperature (°C)	--	--	--	42	22	30	42	55	63	
H ₂ S Content	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ Content	0.01	0.03	0.05	0.03	0.01	0.01	0.03	0.05	0.09	
Total Play Area (sqkm)	1,356	1,507	1,658	1,486	1,277	1,358	1,489	1,610	1,655	
Tested Play Area (sqkm)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Untested Play Area (sqkm)	--	--	--	1,486	1,277	1,358	1,489	1,610	1,655	
Fraction of Untested Play Filled	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Developable Fraction of Total Play	0.050	0.122	0.300	0.151	0.029	0.052	0.122	0.291	0.516	
Potential O&G Area (sqkm)	--	--	--	224.5	42.7	76.2	181.7	434.1	765.1	
Fraction of PV Oil Bearing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Oil Area (sqkm)	--	--	--	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Gas Area (sqkm)	--	--	--	224.5	42.7	76.2	181.7	434.1	765.1	
Average Net Pay (m)	29	47	76	50	22	29	47	75	102	
Matrix Porosity	0.01	0.02	0.06	0.030	0.006	0.010	0.024	0.058	0.103	
Natural Fracture Porosity	0.00	0.00	0.02	0.0050	0.0002	0.0005	0.0024	0.0125	0.0370	
Total Porosity	--	--	--	0.035	0.008	0.013	0.030	0.065	0.110	
Hydrocarbon Saturation	0.55	0.70	0.80	0.68	0.50	0.57	0.68	0.81	0.92	
Free Gas Parameters										
Initial Gas Compressibility "Z"	0.95	1.00	1.05	0.86	0.76	0.80	0.87	1.10	1.34	
Gas Formation Expansion Factor	--	--	--	191	52	113	189	214	228	
Gas Recovery Factor	0.15	0.30	0.45	0.30	0.11	0.16	0.28	0.47	0.66	

3. Yield Component	Low	Best	High	Mean	P99	P90	P50	P10	P01
Oil-in-Place (stm ³ /m ³)	--	--	--	0	0	0	0	0	0
Recoverable Oil (stm ³ /m ³)	--	--	--	0	0	0	0	0	0
Solution Gas-in-Place (sm ³ /m ³)	--	--	--	0	0	0	0	0	0
Free Gas-in-Place (sm ³ /m ³)	--	--	--	4.6	0.6	1.4	3.4	8.1	14.6
Adsorbed Gas-in-Place (sm ³ /m ³)	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0
Total Gas-in-Place (sm ³ /m ³)	--	--	--	4.6	0.6	1.4	3.4	8.1	14.6
Raw Recoverable Gas (sm ³ /m ³)	--	--	--	1.4	0.1	0.3	1.0	2.6	5.4
Marketable Gas (sm ³ /m ³)	--	--	--	1.2	0.1	0.3	0.8	2.2	4.7
Gas Liquids Yield (stm ³ e6sm ³)	10	20	30	20	8	11	18	31	44
Gas to BOE Conversion (Mscf/BOE)	--	6.00	--						
Surface Loss (Fuel gas, etc...)	--	10%	--						
Marketable Gas (Fraction of Raw)	--	--	--	0.87	0.82	0.85	0.88	0.89	0.89

4. Play Totals	Risked Mean volumes			Volumes given Geological Success in Play					
				Mean	P99	P90	P50	P10	P01
In Place									
Oil (10 ⁶ stm ³)	0	0	0	0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)	1.0	1.0	1.0	1.0	0.0	0.1	0.5	2.2	6.5
Total Liquids (10 ⁶ stm ³)	1.0	1.0	1.0	1.0	0.0	0.1	0.5	2.2	6.5
Total Liquids (MMstb)	6.5	6.5	6	6	0.2	0.8	3.4	13.8	40.6
Solution gas (10 ⁹ sm ³)	0.00	0	0	0	0	0	0	0	0
Free gas (10 ⁹ sm ³)	52	52	52	52	3	8	29	107	292
Adsorbed gas (10 ⁹ sm ³)	0	0	0	0	0	0	0	0	0
Total gas (10 ⁹ sm ³)	52	52	52	52	3	8	29	107	292
Total gas (Bscf)	1,831	1,831	1,831	1,831	89	266	1,036	3,810	10,000
MMBOE	312	312	312	312	15	45	176	649	1,768
Recoverable									
Oil (10 ⁶ stm ³)	0	0	0	0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)	0.3	0.3	0.3	0.3	0.01	0.03	0.15	0.65	2.10
Total Liquids (10 ⁶ stm ³)	0.3	0.3	0.3	0.3	0.01	0.03	0.15	0.65	2.10
Total Liquids (MMstb)	1.9	1.9	2	2	0.1	0.2	0.9	4.1	13.2
Associated gas (10 ⁹ sm ³)	0	0	0	0	0	0	0	0	0
Non associated gas (10 ⁹ sm ³)	15.4	15.4	15	15	1	2	8	33	98
Total gas (10 ⁹ sm ³)	15.4	15.4	15	15	0.6	1.9	8.0	32.6	97.6
Marketable Gas (10 ⁹ sm ³)	13.4	13.4	13	13	0.5	1.7	7.0	28.5	84.8
Marketable Gas (Bscf)	476	476	476	476	18	59	248	1,011	3,012
MMBOE	81	81	81	81	3	10	42	173	515

Note for parameter estimates:
Calculations Require Low < Best < High

Area/Region:	Windsor - Kennetcook Basin Nova Scotia
Play Name:	Upper Windsor Group – clastics and carbonate
Play Type:	Stratigraphic
Estimator Name:	PRCL team
Avg. Surface Temp. (°C):	15
Normal Pressure Gradient (kPa/m):	9.93
Temp. Gradient (°C/100 m.):	1.50
Raw Gas Gravity:	0.60

1. Risk Component

Risk Factors	Play risk
1. Source Rock	0.95
2. Charge	0.30
3. Migration	0.90
4. Reservoir Rock	0.80
5. Trap/Closure	0.80
6. Seal/Containment	0.45
Probability of Geological Success (P_g)	0.07

2. Hydrocarbon Volume Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01	NOTES
Reservoir Depth (mTVD)	50	230	1,940	910	164	411	875	1,464	1,789	
Reservoir overpressuring (x hydrostatic)	1.0	1.0	1.1	1.01	0.94	0.97	1.01	1.04	1.07	
Reservoir Pressure (kPa)	--	--	--	9	2	4	9	15	18	
Reservoir Temperature (°C)	--	--	--	29	17	21	28	37	42	
H ₂ S Content	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ Content	0.01	0.03	0.05	0.03	0.01	0.01	0.03	0.05	0.09	
Total Play Area (sqkm)	1,008	1,120	1,232	1,120	950	1,014	1,117	1,230	1,312	
Tested Play Area (sqkm)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Untested Play Area (sqkm)	--	--	--	1,120	950	1,014	1,117	1,230	1,312	
Fraction of Untested Play Filled										
Developable Fraction of Total Play										
Potential O&G Area (sqkm)	--	--	--	16.5	2.2	4.4	12.3	34.5	68.2	
Fraction of PV Oil Bearing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Oil Area (sqkm)	--	--	--	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Gas Area (sqkm)	--	--	--	16.5	2.2	4.4	12.3	34.5	68.2	
Average Net Pay (m)	8	14	25	16	6	8	14	25	35	
Matrix Porosity	0.08	0.11	0.15	0.112	0.066	0.081	0.110	0.148	0.181	
Natural Fracture Porosity	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Total Porosity	--	--	--	0.112	0.066	0.081	0.110	0.148	0.181	
Hydrocarbon Saturation	0.45	0.60	0.85	0.62	0.37	0.45	0.61	0.81	0.94	
Gas Compressibility "Z"	0.95	1.00	1.05	0.82	0.76	0.79	0.84	0.91	0.98	
Gas Formation Expansion Factor	--	--	--	105	17	44	100	164	192	
Gas Recovery Factor	0.35	0.55	0.70	0.53	0.30	0.37	0.51	0.71	0.86	

3. Yield Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01
Yield: Oil-in-Place (stm3/m3)	--	--	--	0	0	0	0	0	0
Yield: Recoverable Oil (stm3/m3)	--	--	--	0	0	0	0	0	0
Solution Gas-in-Place (sm3/m3)	--	--	--	0	0	0	0	0	0
Free Gas-in-Place (sm3/m3)	--	--	--	7.3	1.0	2.7	6.5	12.5	19.2
Adsorbed Gas-in-Place (sm3/m3)	--	--	--						
Yield: Gas-in-Place (sm3/m3)	--	--	--	7.3	1.0	2.7	6.5	12.5	19.3
Yield: Raw Recoverable Gas (sm3/m3)	--	--	--	3.9	0.5	1.3	3.3	6.9	11.3
Yield: Marketable Gas (sm3/m3)	--	--	--	3.4	0.4	1.1	2.9	6.0	9.9
Gas Liquids Yield (stm3/e6sm3)	20	30	50	33	15	20	31	48	65
Gas to BOE Conversion (Mscf/BOE)	--	6.00	--						
Surface Loss (Fuel gas, etc...)	--	10%	--						
Marketable Gas (Fraction of Raw)	--	--	--	0.87	0.82	0.85	0.88	0.89	0.89

4. Play Totals

	Risked Mean volumes			Volumes given Geological Success in Play					
				Mean	P99	P90	P50	P10	P01
In Place									
Oil (10 ⁶ stm ³)		0.0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.0		0.1	0.0	0.0	0.0	0.1	0.4
Total Liquids (10 ⁶ stm ³)		0.0		0.1	0.0	0.0	0.0	0.1	0.4
Total Liquids (MMstb)		0.0		0	0.0	0.0	0.2	0.9	2.7
Solution gas (10 ⁹ sm ³)		0.00		0	0	0	0	0	0
Free gas (10 ⁹ sm ³)		0		2	0	0	1	4	12
Total gas (10 ⁹ sm ³)		0		2	0	0	1	4	12
Total gas (Bscf)		5		66	3	9	38	150	423
MMBOE		1		11	0	2	7	26	73
Recoverable									
Oil (10 ⁶ stm ³)		0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.0		0	0	0	0	0	0
Total Liquids (10 ⁶ stm ³)		0.0		0	0.00	0.00	0.02	0.07	0.23
Total Liquids (MMstb)		0.0		0	0.0	0.0	0.1	0.5	1.4
Solution gas (10 ⁹ sm ³)		0		0	0	0	0	0	0
Non associated gas (10 ⁹ sm ³)		0.1		1	0	0	1	2	7
Total gas (10 ⁹ sm ³)		0.1		1	0.0	0.1	0.6	2.2	6.5
Marketable Gas (10 ⁹ sm ³)		0.1		1	0.0	0.1	0.5	1.9	5.7
Marketable Gas (Bscf)		2		31	1	4	17	69	202
MMBOE		0		5	0	1	3	12	35

Note for parameter estimates;
Calculations Require Low < Best < High

Area/Region:	Windsor - Kennetcook Basin Nova Scotia
Play Name:	Macumber Fm (Gays River equiv.) – basal Windsor
Play Type:	Carbonate banks & shoals - stratigraphic traps
Estimator Name:	PRCL team
Avg. Surface Temp. (°C):	15
Normal Pressure Gradient (kPa/m):	9.93
Temp. Gradient (°C/100 m.):	1.50
Raw Gas Gravity:	0.60

1. Risk Component

Risk Factors	Play risk
1. Source Rock	0.95
2. Charge	0.90
3. Migration	0.90
4. Reservoir Rock	0.60
5. Trap/Closure	0.95
6. Seal/Containment	0.95
Probability of Geological Success (P_g)	0.42

2. Hydrocarbon Volume Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01	NOTES
Reservoir Depth (mTVD)	50	510	1,950	946	172	437	922	1,490	1,805	
Reservoir overpressuring (x hydrostatic)	1.0	1.0	1.1	1.01	0.94	0.97	1.01	1.04	1.07	
Reservoir Pressure (kPa)	--	--	--	9	2	4	9	15	18	
Reservoir Temperature (°C)	--	--	--	29	18	22	29	37	42	
H ₂ S Content	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ Content	0.01	0.03	0.05	0.03	0.01	0.01	0.03	0.05	0.09	
Total Play Area (sqkm)	1,013	1,125	1,238	1,125	955	1,018	1,122	1,236	1,318	
Tested Play Area (sqkm)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Untested Play Area (sqkm)	--	--	--	1,125	955	1,018	1,122	1,236	1,318	
Fraction of Untested Play Filled										
Developable Fraction of Total Play										
Potential O&G Area (sqkm)	--	--	--	46.2	10.1	17.2	38.5	85.9	146.7	
Fraction of PV Oil Bearing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Oil Area (sqkm)	--	--	--	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Gas Area (sqkm)	--	--	--	46.2	10.1	17.2	38.5	85.9	146.7	
Average Net Pay (m)	4	14	43	19	2	4	13	41	85	
Matrix Porosity	0.05	0.09	0.13	0.089	0.039	0.053	0.084	0.134	0.181	
Natural Fracture Porosity	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Total Porosity	--	--	--	0.089	0.039	0.053	0.084	0.134	0.181	
Hydrocarbon Saturation	0.45	0.60	0.85	0.62	0.37	0.45	0.61	0.81	0.94	
Gas Compressibility "Z"	0.95	1.00	1.05	0.82	0.76	0.79	0.84	0.90	0.97	
Gas Formation Expansion Factor	--	--	--	109	18	47	106	166	194	
Gas Recovery Factor	0.35	0.55	0.70	0.53	0.30	0.37	0.51	0.71	0.86	

3. Yield Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01
Yield: Oil-in-Place (stm3/m3)	--	--	--	0	0	0	0	0	0
Yield: Recoverable Oil (stm3/m3)	--	--	--	0	0	0	0	0	0
Solution Gas-in-Place (sm3/m3)	--	--	--	0	0	0	0	0	0
Free Gas-in-Place (sm3/m3)	--	--	--	6.0	0.7	2.1	5.2	10.7	17.8
Adsorbed Gas-in-Place (sm3/m3)	--	--	--						
Yield: Gas-in-Place (sm3/m3)	--	--	--	6.0	0.7	2.1	5.2	10.7	17.8
Yield: Raw Recoverable Gas (sm3/m3)	--	--	--	3.2	0.4	1.0	2.6	5.9	10.4
Yield: Marketable Gas (sm3/m3)	--	--	--	2.8	0.3	0.9	2.3	5.1	9.1
Gas Liquids Yield (stm3/e6sm3)	20	30	50	33	15	20	31	48	65
Gas to BOE Conversion (Mscf/BOE)	--	6.00	--						
Surface Loss (Fuel gas, etc...)	--	10%	--						
Marketable Gas (Fraction of Raw)	--	--	--	0.87	0.82	0.85	0.88	0.89	0.89

4. Play Totals

	Risked Mean volumes			Volumes given Geological Success in Play					
				Mean	P99	P90	P50	P10	P01
In Place									
Oil (10 ⁶ stm ³)		0.0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.1		0.2	0.0	0.0	0.1	0.4	1.4
Total Liquids (10 ⁶ stm ³)		0.1		0.2	0.0	0.0	0.1	0.4	1.4
Total Liquids (MMstb)		0.5		1	0.0	0.1	0.5	2.5	8.9
Solution gas (10 ⁹ sm ³)		0.00		0	0	0	0	0	0
Free gas (10 ⁹ sm ³)		2		5	0	1	3	12	39
Total gas (10 ⁹ sm ³)		2		5	0	1	3	12	39
Total gas (Bscf)		78		187	5	18	91	435	1,394
MMBOE		13		32	1	3	16	75	241
Recoverable									
Oil (10 ⁶ stm ³)		0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.0		0	0	0	0	0	1
Total Liquids (10 ⁶ stm ³)		0.0		0	0.00	0.01	0.04	0.21	0.77
Total Liquids (MMstb)		0.2		1	0.0	0.0	0.3	1.3	4.9
Solution gas (10 ⁹ sm ³)		0		0	0	0	0	0	0
Non associated gas (10 ⁹ sm ³)		1.2		3	0	0	1	6	21
Total gas (10 ⁹ sm ³)		1.2		3	0.1	0.3	1.3	6.5	21.5
Marketable Gas (10 ⁹ sm ³)		1.0		2	0.1	0.2	1.1	5.7	18.9
Marketable Gas (Bscf)		36		86	2	8	41	201	672
MMBOE		6		15	0	1	7	35	117

Note for parameter estimates;
Calculations Require Low < Best < High

Area/Region: Windsor - Kennetcook Basin Nova Scotia

Play Name: Upper Horton Cheverie Fm

Play Type: Low porosity sands - stratigraphic traps

Estimator Name: PRCL team

Avg. Surface Temp. (°C):	15
Normal Pressure Gradient (kPa/m):	9.93
Temp. Gradient (°C/100 m.):	1.50
Raw Gas Gravity:	0.60

1. Risk Component

Risk Factors	Play risk
1. Source Rock	0.95
2. Charge	0.90
3. Migration	0.90
4. Reservoir Rock	0.75
5. Trap/Closure	0.80
6. Seal/Containment	0.90
Probability of Geological Success (P_g)	0.42

2. Hydrocarbon Volume Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01	NOTES
Reservoir Depth (mTVD)	50	540	2,340	1,122	195	511	1,091	1,781	2,163	
Reservoir overpressuring (x hydrostatic)	1.0	1.0	1.1	1.01	0.94	0.97	1.01	1.04	1.07	
Reservoir Pressure (kPa)	--	--	--	11	2	5	11	18	22	
Reservoir Temperature (°C)	--	--	--	32	18	23	31	42	47	
H ₂ S Content	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ Content	0.01	0.03	0.05	0.03	0.01	0.01	0.03	0.05	0.09	
Total Play Area (sqkm)	1,251	1,390	1,529	1,390	1,180	1,258	1,386	1,527	1,628	
Tested Play Area (sqkm)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Untested Play Area (sqkm)	--	--	--	1,390	1,180	1,258	1,386	1,527	1,628	
Fraction of Untested Play Filled										
Developable Fraction of Total Play										
Potential O&G Area (sqkm)	--	--	--	40.3	5.5	10.8	30.1	83.5	164.0	
Fraction of PV Oil Bearing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Oil Area (sqkm)	--	--	--	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Gas Area (sqkm)	--	--	--	40.3	5.5	10.8	30.1	83.5	164.0	
Average Net Pay (m)	30	83	230	109	16	31	83	222	426	
Matrix Porosity	0.05	0.07	0.10	0.073	0.041	0.051	0.071	0.099	0.123	
Natural Fracture Porosity	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Total Porosity	--	--	--	0.073	0.041	0.051	0.071	0.099	0.123	
Hydrocarbon Saturation	0.45	0.60	0.85	0.62	0.37	0.45	0.61	0.81	0.94	
Gas Compressibility "Z"	0.95	1.00	1.05	0.81	0.76	0.79	0.84	0.91	0.98	
Gas Formation Expansion Factor	--	--	--	129	20	56	126	188	212	
Gas Recovery Factor	0.35	0.55	0.70	0.53	0.30	0.37	0.51	0.71	0.86	

3. Yield Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01
Yield: Oil-in-Place (stm3/m3)	--	--	--	0	0	0	0	0	0
Yield: Recoverable Oil (stm3/m3)	--	--	--	0	0	0	0	0	0
Solution Gas-in-Place (sm3/m3)	--	--	--	0	0	0	0	0	0
Free Gas-in-Place (sm3/m3)	--	--	--	5.8	0.8	2.2	5.1	9.7	14.8
Adsorbed Gas-in-Place (sm3/m3)	--	--	--						
Yield: Gas-in-Place (sm3/m3)	--	--	--	5.8	0.8	2.2	5.1	9.7	14.8
Yield: Raw Recoverable Gas (sm3/m3)	--	--	--	3.1	0.4	1.0	2.6	5.3	8.7
Yield: Marketable Gas (sm3/m3)	--	--	--	2.7	0.3	0.9	2.3	4.7	7.6
Gas Liquids Yield (stm3/e6sm3)	20	30	50	33	15	20	31	48	65
Gas to BOE Conversion (Mscf/BOE)	--	6.00	--						
Surface Loss (Fuel gas, etc...)	--	10%	--						
Marketable Gas (Fraction of Raw)	--	--	--	0.87	0.82	0.85	0.88	0.89	0.89

4. Play Totals

	Risked Mean volumes			Volumes given Geological Success in Play					
				Mean	P99	P90	P50	P10	P01
In Place									
Oil (10 ⁶ stm ³)		0.0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.3		0.8	0.0	0.1	0.4	1.9	6.6
Total Liquids (10 ⁶ stm ³)		0.3		0.8	0.0	0.1	0.4	1.9	6.6
Total Liquids (MMstb)		2.2		5	0.1	0.4	2.3	11.9	41.5
Solution gas (10 ⁹ sm ³)		0.00		0	0	0	0	0	0
Free gas (10 ⁹ sm ³)		11		26	1	2	12	58	189
Total gas (10 ⁹ sm ³)		11		26	1	2	12	58	189
Total gas (Bscf)		378		909	23	86	429	2,047	6,714
MMBOE		65		157	4	15	74	353	1,160
Recoverable									
Oil (10 ⁶ stm ³)		0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.2		0	0	0	0	1	4
Total Liquids (10 ⁶ stm ³)		0.2		0	0.01	0.04	0.19	1.00	3.57
Total Liquids (MMstb)		1.2		3	0.1	0.2	1.2	6.3	22.5
Solution gas (10 ⁹ sm ³)		0		0	0	0	0	0	0
Non associated gas (10 ⁹ sm ³)		5.6		14	0	1	6	30	102
Total gas (10 ⁹ sm ³)		5.6		14	0.3	1.2	6.2	30.4	102.1
Marketable Gas (10 ⁹ sm ³)		4.9		12	0.3	1.1	5.4	26.5	88.7
Marketable Gas (Bscf)		174		420	10	37	193	941	3,149
MMBOE		30		73	2	6	33	163	547

Note for parameter estimates;
Calculations Require Low < Best < High



UNDISCOVERED RESOURCE ESTIMATE - CONVENTIONAL

Petrel Robertson Consulting Ltd.
Global Petroleum Consulting

Area/Region: Windsor - Kennetcook Basin Nova Scotia

Play Name: Glass sand (top of Horton Bluff Fm)

Play Type: Low porosity sands - stratigraphic traps

Estimator Name: PRCL team

Avg. Surface Temp. (°C):	15
Normal Pressure Gradient (kPa/m):	9.93
Temp. Gradient (°C/100 m.):	1.50
Raw Gas Gravity:	0.60

1. Risk Component

Risk Factors	Play risk
1. Source Rock	0.95
2. Charge	0.90
3. Migration	0.90
4. Reservoir Rock	0.75
5. Trap/Closure	0.80
6. Seal/Containment	0.70
Probability of Geological Success (P_g)	0.32

2. Hydrocarbon Volume Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01	NOTES
Reservoir Depth (mTVD)	50	660	2,350	1,140	199	522	1,113	1,797	2,175	
Reservoir overpressuring (x hydrostatic)	1.0	1.0	1.1	1.01	0.94	0.97	1.01	1.04	1.07	
Reservoir Pressure (kPa)	--	--	--	11	2	5	11	18	22	
Reservoir Temperature (°C)	--	--	--	32	18	23	32	42	48	
H ₂ S Content	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ Content	0.01	0.03	0.05	0.03	0.01	0.01	0.03	0.05	0.09	
Total Play Area (sqkm)	1,253	1,392	1,531	1,392	1,181	1,260	1,388	1,529	1,630	
Tested Play Area (sqkm)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Untested Play Area (sqkm)	--	--	--	1,392	1,181	1,260	1,388	1,529	1,630	
Fraction of Untested Play Filled										
Developable Fraction of Total Play										
Potential O&G Area (sqkm)	--	--	--	40.4	5.5	10.8	30.1	84.0	161.8	
Fraction of PV Oil Bearing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Oil Area (sqkm)	--	--	--	0.000	0.000	0.000	0.000	0.000	0.000	
Potential Gas Area (sqkm)	--	--	--	40.4	5.5	10.8	30.1	84.0	161.8	
Average Net Pay (m)	4	6	7	6	4	4	6	7	9	
Matrix Porosity	0.05	0.07	0.10	0.073	0.041	0.051	0.071	0.099	0.123	
Natural Fracture Porosity	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Total Porosity	--	--	--	0.073	0.041	0.051	0.071	0.099	0.123	
Hydrocarbon Saturation	0.45	0.60	0.85	0.62	0.37	0.45	0.61	0.81	0.94	
Gas Compressibility "Z"	0.95	1.00	1.05	0.81	0.76	0.79	0.84	0.91	0.98	
Gas Formation Expansion Factor	--	--	--	131	21	57	128	189	212	
Gas Recovery Factor	0.35	0.55	0.70	0.53	0.30	0.37	0.51	0.71	0.86	

3. Yield Component

	Low	Best	High	Mean	P99	P90	P50	P10	P01
Yield: Oil-in-Place (stm3/m3)	--	--	--	0	0	0	0	0	0
Yield: Recoverable Oil (stm3/m3)	--	--	--	0	0	0	0	0	0
Solution Gas-in-Place (sm3/m3)	--	--	--	0	0	0	0	0	0
Free Gas-in-Place (sm3/m3)	--	--	--	5.9	0.8	2.2	5.2	9.7	14.4
Adsorbed Gas-in-Place (sm3/m3)	--	--	--						
Yield: Gas-in-Place (sm3/m3)	--	--	--	5.9	0.8	2.2	5.2	9.7	14.4
Yield: Raw Recoverable Gas (sm3/m3)	--	--	--	3.1	0.4	1.1	2.7	5.4	8.7
Yield: Marketable Gas (sm3/m3)	--	--	--	2.7	0.3	0.9	2.3	4.7	7.6
Gas Liquids Yield (stm3/e6sm3)	20	30	50	33	15	20	31	48	65
Gas to BOE Conversion (Mscf/BOE)	--	6.00	--						
Surface Loss (Fuel gas, etc...)	--	10%	--						
Marketable Gas (Fraction of Raw)	--	--	--	0.87	0.82	0.85	0.88	0.89	0.89

4. Play Totals

	Risked Mean volumes			Volumes given Geological Success in Play					
	Low	Best	High	Mean	P99	P90	P50	P10	P01
In Place									
Oil (10 ⁶ stm ³)		0.0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.0		0.0	0.0	0.0	0.0	0.1	0.3
Total Liquids (10 ⁶ stm ³)		0.0		0.0	0.0	0.0	0.0	0.1	0.3
Total Liquids (MMstb)		0.1		0	0.0	0.0	0.2	0.6	1.6
Solution gas (10 ⁹ sm ³)		0.00		0	0	0	0	0	0
Free gas (10 ⁹ sm ³)		0		1	0	0	1	3	7
Total gas (10 ⁹ sm ³)		0		1	0	0	1	3	7
Total gas (Bscf)		16		48	2	8	30	103	259
MMBOE		3		8	0	1	5	18	45
Recoverable									
Oil (10 ⁶ stm ³)		0		0	0	0	0	0	0
Condensate & NGL (10 ⁶ stm ³)		0.0		0	0	0	0	0	0
Total Liquids (10 ⁶ stm ³)		0.0		0	0.00	0.00	0.01	0.05	0.14
Total Liquids (MMstb)		0.0		0	0.0	0.0	0.1	0.3	0.9
Solution gas (10 ⁹ sm ³)		0		0	0	0	0	0	0
Non associated gas (10 ⁹ sm ³)		0.2		1	0	0	0	2	4
Total gas (10 ⁹ sm ³)		0.2		1	0.0	0.1	0.4	1.6	3.9
Marketable Gas (10 ⁹ sm ³)		0.2		1	0.0	0.1	0.4	1.4	3.5
Marketable Gas (Bscf)		7		22	1	3	13	48	123
MMBOE		1		4	0	1	2	8	21

Note for parameter estimates;
Calculations Require Low < Best < High

Play Risk	Risk	Risked Liquids volume e6stm3	OIP+CIIP given success			Risked Gas Volume e9sm3	GIIP given success			Risked Gas Volume Bscf	GIIP given success		
			P90	P50	P10		P90	P50	P10		P90	P50	P10
			e6stm3	e6stm3	e6stm3		e9sm3	e9sm3	e9sm3		Bscf	Bscf	Bscf
Horton Bluff Shale	1.00	8.89	1.62	5.57	18.55	781.4	190.9	551.6	1,556.0	27,734	6,777	19,579	55,229
Lower Horton Bluff Sandstone	1.00	1.03	0.13	0.53	2.20	51.6	7.5	29.2	107.3	1,831	266	1,036	3,810
Upper Windsor Group – clastics and carbonate	0.07	0.00	0.01	0.03	0.14	0.1	0.3	1.1	4.2	5	9	38	150
Macumber Fm (Gays River equiv.) – basal Windsor	0.42	0.07	0.02	0.08	0.40	2.2	0.5	2.6	12.2	78	18	91	435
Upper Horton Cheverie Fm	0.42	0.35	0.07	0.37	1.90	10.6	2.4	12.1	57.7	378	86	429	2,047
Glass sand (top of Horton Bluff Fm)	0.32	0.01	0.01	0.03	0.10	0.4	0.2	0.9	2.9	16	8	30	103

Play Risk	Risk	Risked Liquids volume e6stm3	OIP+CIIP given success			Risked Gas Volume e9sm3	GIIP given success			Risked Gas Volume Bscf	GIIP given success		
			P90	P50	P10		P90	P50	P10		P90	P50	P10
			e6stm3	e6stm3	e6stm3		e9sm3	e9sm3	e9sm3		Bscf	Bscf	Bscf
Horton Bluff Shale	1.00	1.33	0.17	0.70	2.90	101.7	16.4	60.4	219.6	3,608	581	2,143	7,794
Lower Horton Bluff Sandstone	1.00	0.31	0.03	0.15	0.65	13.4	1.7	7.0	28.5	476	59	248	1,011
Upper Windsor Group – clastics and carbonate	0.07	0.00	0.00	0.02	0.07	0.1	0.1	0.5	1.9	2	4	17	69
Macumber Fm (Gays River equiv.) – basal Windsor	0.42	0.04	0.01	0.04	0.21	1.0	0.2	1.1	5.7	36	8	41	201
Upper Horton Cheverie Fm	0.42	0.18	0.04	0.19	1.00	4.9	1.1	5.4	26.5	174	37	193	941
Glass sand (top of Horton Bluff Fm)	0.32	0.01	0.00	0.01	0.05	0.2	0.1	0.4	1.4	7	3	13	48