

**Table 4: Summary of petroleum exploration plays in Northern Yukon Fold Belt of the Mackenzie Corridor**

Play Name	Territory/State	Play type	Reservoir	Source	Gas/Oil	Seal	Trap style	Discoveries/shows	Exploration risks	Oil reserves (10 <sup>6</sup> m <sup>3</sup> ) (in-place)	Gas reserves (10 <sup>6</sup> m <sup>3</sup> ) (in-place)	Oil resource (10 <sup>6</sup> m <sup>3</sup> ) (in-place) (mean)	Gas resource (10 <sup>6</sup> m <sup>3</sup> ) (in-place) (mean)	Number of fields	Author	Methodology	Comments on resource volumes	
A. Eagle Plains Basin																		
1) Lower Paleozoic carbonate structural	Yukon Territory	Conceptual	Bouvette & Ogilvie limestones & dolostones	Road River shales, Ogilvie organic-rich carbonates, Canol shales	Gas	Road River & Canol shales	anticlinal structural culminations	1 gas flow in DST, Ogilvie Formation in S. Tuttle N-05 well traces of gas in 4 other wells	Adequate reservoir, timing, closure				12698	6	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk		
2) Lower Paleozoic carbonate stratigraphic	Yukon Territory	Conceptual	Bouvette & Ogilvie limestones & dolostones	Road River shales, Ogilvie organic-rich carbonates, Canol shales	Gas	Road River & Canol shales	basinward and updip facies changes, carbonate to shale facies transitions	none	Adequate reservoir, timing, closure				4334	20	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk	Ogilvie carbonates only	
3) Tuttle sandstone stratigraphic	Yukon Territory	Established-immature (gas) Conceptual (oil)	Tuttle sandstones	Canol and Ford Lake shales	Gas; oil	Ford Lake shales (both lateral and top seal)	subcrop edge pinchouts, intraformational stratigraphic pinchouts, updip facies changes	2 gas pools; Birch B-34, Chance L-08 2 gas flows in DST, Whitestone N-26, Ridge F-48 wells traces of gas in 2 other wells	Presence of closure, adequate reservoir			138	11	9147	5 (oil); 18 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk	
4) Hart Creek sandstones and carbonates structural	Yukon Territory	Established-immature	Hart Creek limestones & sandstones	Ford Lake shales, Blackie shales & carbonates	Gas; oil	Blackie & Jungle Creek shales	Laramide anticlinal folds, drag folds on thrust faults, normal faulted anticlines, structural/stratigraphic traps beneath sub-Cretaceous unconformity	3 oil pools; 2 in Chance L-08 well, Chance G-08 4 gas pools; 3 in Chance L-08 well, Birch B-34 1 oil recovery in DST, Chance L-08 traces of gas in 2 wells	Adequate reservoir, timing, closure	1.5	1373	12.2	3344	5 (oil); 6 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk		
5) Hart Creek sandstones and carbonates stratigraphic	Yukon Territory	Established-immature	Hart Creek limestones & sandstones	Ford Lake shales, Blackie shales & carbonates	Gas; oil	Blackie & Jungle Creek shales, intraformational shales	updip facies changes, unconformity subcrop	2 oil pools, Chance J-19 (w/condensate), Chance L-08 (Canoe River mbr) 2 gas pools, Chance J-19, Chance L-08 (Canoe River mbr) 1 oil recovery in DST, W. Parkin D-51 3 gas flows in DST, 2 in East Chance C-18 well, E. Porcupine I-13 traces of oil and condensate in 2 wells traces of gas in 2 wells	Adequate reservoir, closure, seal, charge	1.5 0.3	1373 55	1.4 12.5	3932 48287	5 (oil); 11 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk	Chance sandstone member only	
6) Ettrain carbonate stratigraphic	Yukon Territory	Conceptual	Ettrain limestones	Blackie shales and carbonates	Gas	Cretaceous shales	unconformity subcrop	1 gas flow in DST, East Chance C-18	Adequate reservoir, charge, seal				715		National Energy Board (2000b)	@Risk	Not analyzed by Osadetz et al., <i>in press</i>	
7) Jungle Creek sandstone structural	Yukon Territory	Established-immature	Jungle Creek sandstones	Blackie shales and carbonates (?)	Gas; oil	Cretaceous shales	Laramide anticlinal folds	1 gas pool, Blackie M-59 1 gas flow, Blackie M-59 traces of oil and gas in 1 well	Adequate closure, reservoir, charge		660	16.7	2042	4 (oil); 5 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk		
8) Jungle Creek sandstone stratigraphic	Yukon Territory	Conceptual	Jungle Creek sandstones	Blackie shales and carbonates (?)	Gas	Cretaceous shales	unconformity subcrop, updip facies changes	1 gas recovery in DST, S. Chance D-63 1 gas flow in DST, E. Porcupine I-13 trace of gas in 1 well	Adequate seal		660	0.12	1491	16	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk	Not analyzed by NEB (2000)	
9) Cretaceous sandstones structural	Yukon Territory	Established-immature (gas) Conceptual (oil)	Fishing Branch sandstones, basal sandstone unit in Whitestone River Fm	Whitestone River shales for gas, deeper sources for oil	Gas; oil	interbedded & overlying shales	Laramide anticlinal folds	1 gas pool, Chance G-08 1 gas flow in DST, W. Parkin C-33 trace of gas in 1 well	Adequate reservoir, closure, charge		150	10.7	6538	6 (oil); 16 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk		
10) Cretaceous sandstones stratigraphic	Yukon Territory	Conceptual	Fishing Branch & Porcupine River sandstones, ss unit in Mount Goodenough Fm	Whitestone River shales for gas, deeper sources for oil	Gas; oil	interbedded & overlying shales	intraformational porosity pinchouts, turbiditic shelf-edge deltas, submarine fans, deltaic and fluvial channels	1 gas flow in DST, W. Parkin D-54 traces of gas in 4 wells	Adequate reservoir, closure, charge			6.4	3354	7 (oil); 16 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions @Risk	Combination of two gas plays Fishing Branch sandstone Triangle Zone structural Not analyzed by NEB (2000)	
Total endowment – Eagle Plains Basin										1.8	2376	69.4	171469	32 (oil); 114 (gas)	Osadetz et al., <i>in press</i> (a)	Petrimex-volumetric probability distributions		
B. Kandik Basin																		
1) Tertiary/Upper Cretaceous nonmarine	Yukon Territory, Alaska	Conceptual	Monster sandstones & conglomerates	Glenn shales, interbedded coal seams (biogenic gas)	Gas; oil	Road River, Ford	faulted anticlines, normal and reverse fault traps, lateral stratigraphic pinchouts	none	Adequate timing, seal, closure			35	8012	30 (oil); 30 (gas)	Hannigan et al., 1999	Petrimex-volumetric probability distributions		
2) Mesozoic marine structural	Yukon Territory, Alaska	Conceptual	Martin Creek & Kathul sandstones	Glenn shales	Gas; oil	Mount Goodenough & McGuire shales	anticlines, overthrust traps, unconformity subcrops	none	Adequate seal, closure, reservoir				11899	8	Hannigan et al., 1999	Petrimex-volumetric probability distributions	Oil play not analyzed – expected to be in Alaska only	
3) Paleozoic marine structural	Yukon Territory, Alaska	Conceptual	Jones Ridge, Ogilvie, Hart River, Ettrain & Takhandit carbonates, Jungle Creek sandstones	Road River, Canol, Ford Lake & Glenn shales	Gas; oil	Adams & Biederman argillites, Road River, Ford Lake & Glenn shales	anticlines, drag folds on thrust faults, duplex structures, unconformity subcrops	20 oil-staining and bitumen occurrences in outcrops	Adequate reservoir, closure, timing			23	19647	3 (oil); 10 (gas)	Hannigan et al., 1999	Petrimex-volumetric probability distributions		
Total endowment – Kandik Basin												*59	*39825	33 (oil); 48 (gas)	Hannigan et al., 1999	Petrimex-volumetric probability distributions		
C. Bonnet Plume Basin																		
1) Lower Paleozoic carbonate/shale facies transition	Yukon Territory	Conceptual	Bouvette & Ogilvie limestones & dolostones	Road River and Canol shales	Gas	Road River & Canol shales	basinward and updip facies changes, carbonate to shale facies transitions	none	Adequate reservoir, seal				20383	6	Hannigan, 2000	Petrimex-volumetric probability distributions		
2) Upper Cretaceous-Tertiary clastic	Yukon Territory	Conceptual	Bonnet Plume conglomerates & sandstones	Road River & Canol shales (thermogenic), interlayered shales & coals (biogenic)	Gas	Road River, Ford	Laramide-related anticlinal culminations and block fault traps, lateral stratigraphic pinchouts	none	Adequate timing, seal				1732	6	Hannigan, 2000	Petrimex-volumetric probability distributions		
3) Upper Cretaceous clastic subthrust	Yukon Territory	Conceptual	Bonnet Plume conglomerates & sandstones	Road River and Canol shales, interlayered shales and coals	Gas	overthrust sheets & interbedded sandstones	fold and fault closures beneath overthrust sheets	sporadic bitumen occurrences	Adequate timing, closure				549	2	Hannigan, 2000	Petrimex-volumetric probability distributions		
4) Cambrian lillyd carbonate structural	Yukon Territory	Speculative	lillyd limestones	Road River shales	Gas	Road River shales	fault block traps, curvilinear anticlines	none	Adequate porosity, overmaturity						Hannigan, 2000	Insufficient information for assessment		
5) Cambrian Slats Creek clastics structural	Yukon Territory	Speculative	Slats Creek sandstones & conglomerates	Road River shales	Gas	Road River shales	fault block traps, curvilinear anticlines	none	Adequate porosity, overmaturity						Hannigan, 2000	Insufficient information for assessment		
6) Bonnet Plume coal bed methane	Yukon Territory	Speculative	Bonnet Plume coals	Bonnet Plume coals	Gas	N/A	N/A	none	rank of coals						Hannigan, 2000	Insufficient information for assessment		
Total endowment – Bonnet Plume Basin													*28799	14	Hannigan, 2000	Petrimex-volumetric probability distributions		
D. Old Crow Basin																		
1) Kekiktuk conglomerate	Yukon Territory, Alaska	Conceptual	Kekiktuk conglomerates	Kayak marine shales, subcropping Road River & Imperial shales	Gas	Kayak shales	anticlinal culminations, fault-related traps, unconformity subcrops, lateral stratigraphic pinchouts	none	Adequate reservoir, closure				11956	5	Hannigan, 2001b	Petrimex-volumetric probability distributions		
2) Upper Paleozoic carbonate	Yukon Territory, Alaska	Conceptual	Lisburne Group carbonates	Kayak & Mesozoic shales	Gas	Mesozoic shales	fault-related traps, diagenetic pinchouts, unconformity subcrops, anticline up-dip pinchouts	none	Adequate reservoir, closure, timing				19439	5	Hannigan, 2001b	Petrimex-volumetric probability distributions		
3) Mesozoic clastic	Yukon Territory	Conceptual	Mount Goodenough & Sharp Mountain sandstones & conglomerates	Jurassic & Upper Cretaceous shales	Gas	Jurassic & Upper Cretaceous shales	fault-related traps, unconformity subcrops, up-dip pinchouts	none	Adequate reservoir, closure, timing				1160	1	Hannigan, 2001b	Petrimex-volumetric probability distributions		
Total endowment – Old Crow Basin													*33485	11	Hannigan, 2001b	Petrimex-volumetric probability distributions		
E. Western Peel Plateau																		
1) Upper Paleozoic clastics	Yukon Territory	Conceptual	Imperial & Tuttle sandstones	carbonaceous material in Imperial; Canol shale; Road River shales	Gas	thick shales within the Imperial Fm	thrust sheet antiforms, fault-related traps	gas-cut mud in DST of 1 well	Adequate reservoir, seal, timing, source				105	5	Osadetz et al., <i>in press</i> (b)	Petrimex-volumetric probability distributions		
2) Cambrian-Devonian	Yukon Territory	Speculative	lillyd limestones, Slats Creek sandstones	Road River shales (?)	Gas	Road River shales	thrust sheet antiforms, fault-related traps	none	Adequate reservoir, source, preservation						Osadetz et al., <i>in press</i> (b)	Insufficient information for assessment		
Total endowment – Western Peel Plateau													105		Osadetz et al., <i>in press</i> (b)	Petrimex-volumetric probability distributions		

\* The total resources are not arithmetically-derived, but summed using statistical techniques