

Table 3: Summary of petroleum exploration plays in the Northern Foreland Belt of the Mackenzie Corridor

Play Name	Province/Territory	Play type	Reservoir	Source	Gas/Oil	Seal	Trap style	Discoveries/shows	Exploration risks	Oil reserve (10 <sup>6</sup> m <sup>3</sup> ) (in-place)	Gas reserves (10 <sup>6</sup> m <sup>3</sup> ) (in-place)	Total Gas resource (10 <sup>6</sup> m <sup>3</sup> ) (in-place) (mean)	Number of fields	Author	Methodology	Comments on resource volumes
A. Mackenzie Plain/Franklin Mountains																
1) Proterozoic sediments	Northwest Territories	Conceptual	potentially carbonate & sandstone units in Dismal Lakes Group & Mackenzie Mountains Supergroup	Dismal Lakes shales; black shales in Little Dal Group	gas; oil possible	regional top seal unknown; lateral seal may be shales of Little Dal Group	faulted anticlines; platformal buildups; anticlines; thrust faults; normal faults; onlap against structural highs; sub-Cambrian angular unconformity traps	none	Adequate reservoir, source and seal							
2) Cambrian clastics	Northwest Territories	Conceptual	Mount Clark sandstones; lower Mount Cap dolomitic siltstones, sandstones and dolomites	algal-rich shales in Mount Cap; possible Proterozoic sediment source for gas	gas; oil possible	Mount Cap shales; Saline River salts; faults seals possible	flower structures; roll-over anticlines in grabens affected by extensional reactivation of Proterozoic faults; stratigraphic pinchouts & onlap against basement highs; lateral facies pinchouts	none	Adequate reservoir; adequate source; communication with source							
3) Lower Paleozoic platform	Northwest Territories	Conceptual	Mount Kindie, Franklin Mountain & Whittaker carbonates; Little Doctor member sandstones	Road River shales; overlying Middle Devonian or Cretaceous shales	gas; oil	Bear Rock anhydrites; tight Mount Kindie dolomites; Devonian & Cretaceous shales	structural drapes over Saline River salt solution features; structural drape over basement highs; stratigraphic pinchouts; sub-Cretaceous angular unconformity trap	1 oil flow in DST; East Mackay B-45	Adequate reservoir; timing and seal; suitable source rock							
4) Amica/Landry platform	Northwest Territories	Established-immature	Amica, Landry, & Bear Rock carbonates	interbedded algal laminites; Funeral & Headless shales; Lower Chinchaga evaporites; Road River, Canol, Slater River shales	sour gas; oil	tight Landry carbonates; Lower Chinchaga evaporites; Headless shales; argillaceous limestones in Hume Formation	diagenetic post-depositional leaching; sedimentary and hydrothermal dolomitization; possible minor buildups on platform; updip porosity pinchouts; fault-bounded closures; folds associated with underlying salt tectonics; overthrust anticlines; faulted anticlines; fault closures	1 condensate/light oil & gas discovery; Summit Creek B-44	Adequate reservoir; isolation from source, top seal; adequate timing, closure							
5) Lonely Bay/Nahanni/Hume platform	Northwest Territories	Conceptual	Lonely Bay & Nahanni dolomites Hume limestones	Horn River & Muskwa shales; Bluefish member & Canol shales	sour gas; oil	Horn River shales; Upper Chinchaga evaporites; tight Lonely Bay/Nahanni/Hume limestones; Hare Indian & Canol shales	secondary fracture dolomitization; minor buildups on platform; thrust sheets antiforms to the west; shelf edge reefs; pinnacle reef buildups; patch reefs or subtle facies changes in platforms	none	Adequate reservoir							
6) Kee Scarp reefs (including Ramparts platform)	Northwest Territories	Established-immature (oil) Established-immature (solution gas) Conceptual-(non-associated gas)	Kee Scarp & Ramparts limestones	Canol shale; Bluefish mbr shale	oil; gas	Canol shale	isolated reefs; low relief shoals on Ramparts platform	1 oil pool at Norman Wells, containing solution gas	Adequate seal in proximity to outcrop; uneven porosity development; biodegradation of oil	100	6230					
7) Upper Devonian Imperial clastics	Northwest Territories	Conceptual	Imperial sandstones; Jungle Ridge mbr limestones	carbonaceous material in Imperial; Canol shale; Cretaceous shales; Road River shales	gas; oil possible	thick shales within the Imperial Fm	stratigraphic traps in turbidites and shorefaces; possible traps are submarine fans; incised channels on slopes	none	Adequate charge, reservoir, seal, timing, closure							
8) Cretaceous sandstones	Northwest Territories	Conceptual	Sans Sault & Little Bear sandstones	Slater River & Arctic Red shales	gas; oil	interbedded Cretaceous shales	stratigraphic valley-fill and channel-fill sands; shallow marine sandstone pinchouts; entrapments against topography of sub-Cretaceous unconformity	1 gas discovery (DST tests only); Stewart D-57	Adequate reservoir; breaching of top seal							
B. Liard Basin																
1) Laramide - Manetoe	Northwest Territories; Yukon Territory; British Columbia	Established-immature	Manetoe hydrothermal dolostones	Besa River shales	gas	Besa River shales	faulted anticlines; stratigraphic pinchouts in undeformed vertical Manetoe masses	8 gas fields; 7 in NWT/Yukon: Beaver River, Kotaneelie, Pointed Mountain, Liard K-29, Liard P-66A, La Biche, Bovie Lake J-72	Adequate reservoir, closure		70696	132024	100	Osadetz et al., 2003	Petrimex-volumetric probability distributions	
												147046	128			Petrimex-discovery process
												73630	39			
2) Laramide structural (excluding Manetoe)	Northwest Territories; Yukon Territory; British Columbia	Established-immature	highly fractured Besa River shales; Fielt & Prophet limestones, Mattson & Chinkah sandstones, Fantasque cherts	Besa River, Exshaw, Toad-Grayling & Garbutt shales	gas, oil in Cretaceous strata	Besa River, Exshaw, & Toad-Grayling shales; tight Mattson sandstones, Fantasque cherts	faulted anticlines; stratigraphic pinchouts, channel sandstones, estuarine valley-fill sandstones	5 gas fields; 2 in NWT; Liard F-36, Southeast Liard N-01	Adequate reservoir, adequate timing		2993	23298 118050	115 327	Drummond, 2004 Osadetz et al., 2000	@Risk Petrimex-discovery process	Northwest Territories only Carboniferous strata only
3) Pre-Laramide Bovie structural	Northwest Territories; British Columbia	Established-immature	Devonian carbonates, Mattson sandstones, Fantasque cherts, Chinkah sandstones	Besa River, Exshaw & Garbutt shales	gas, oil in Cretaceous strata	Besa River, Horn River and Banff shales, lateral fault seals	updip reverse fault traps, rollover anticlines, structural drape over growth faults	3 gas fields in British Columbia	Adequate timing, charge		12130	10608	34	Drummond, 2004	@Risk	Northwest Territories only
C. Mackenzie Mountains																
1) Plateau Overthrust	Northwest Territories	Conceptual	Paleozoic carbonates	Road River, Hare Indian, Canol & Imperial-equivalent shales	gas	Proterozoic sediments in hangingwall of thrust	fold and fault closures	none	Adequate source, timing			1150	22	Drummond, 2004	@Risk	Deh Cho area only
Total endowment – Foreland Belt										100	92049	276854				