

Northeast Thelon Compilation Report to Baker Lake, Chesterfield Inlet and Rankin Inlet

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Geomapping for Energy and Minerals Program (GEM), Geological Survey of Canada (GSC)

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Strategy: Compile knowledge, fill gaps by new geoscience surveys, and build new maps for all or parts of 56D-E, 66A, B, C, F, G & H; to help stakeholders make decisions on mineral resource development. 8 Inuit Owned Subsurface Land areas are covered by these studies and NTI is a partner.

2009, July 3 to August 30 activities:

- A field trip July 3-17 using helicopter from Baker Lake involved 3 GSC + 6 university + 9 industry + 1 DIAND geologists, transferred knowledge and decided research priorities.
- An airborne geophysical survey from July 15 to August 30 based in Baker Lake with no other touch downs filled data gaps between existing data sets shared by an 8-company consortium.

2010, July 3 to September 4 field activities:

- Main field work by 17 researchers from GSC and 5 universities: Carleton (Ottawa), McMaster (Hamilton), New Brunswick (Fredericton), Queens (Kingston), and Regina.
- A series of 2-3 person fly camps (a few tents) lasted 3 to 10 days in 7 different localities.
- >2000 field stations for gravity, magnetism, mineralogy, structure and geochemistry.
- We gave Posters and Power Points at communities, Nunavut Mining Symposium, and the Geological Association of Canada annual meeting in May (free GSC Open Files 6949, 6950 and 6962, papers by Tschirhart et al. and Peterson et al.
- Jefferson met Hamlet Officials, HTOs & schools in Baker L., Chesterfield & Rankin inlets.
- 5 fuel caches were set out and 8 fly camps of 2-6 people were removed with no trace.

2011, June 29 to August 14 activities:

- 14 researchers from GSC and 4 universities: U of Ottawa, McMaster Hamilton, New Brunswick and Regina completed final field work & prepared reports & maps to disseminate knowledge.
- We flew out of Baker Lake. 5 fly camps focused work by 2-8 people for 2-6 days each.
- We added >2000 field stations (like 2010); tested and expanded 3-D geoscience hypotheses.
- We removed fly camps with no trace and started selling and removing fuel caches.

April 2012 to March 2013: final fiscal year for project:

- Workshop in St. John's National meeting: 65 total, 30 Industry including NTI.
- July-August 2012 field work by Fayek (U of Manitoba) & White (UNB) on research agreement sponsored by GEM-NSERC-AREVA on faults and uranium. Jefferson worked with Fayek and White, completed NE Thelon field work, helped Operation GEM and removed remaining fuel.
- Workshops at Baker Lake, Rankin and Chesterfield Inlets are planned for late November 2012.

Scientific Results:

Many layers of 2.7-2.0 billion year old (Ga) volcanic, sedimentary and granitoid rocks were folded and refolded >4 times, fractured in many directions, covered and injected by more layers many times e.g. 1.83, 1.75, 1.67, 1.54, 1.4 and 1.1 Ga. Uranium was deposited under the Thelon sandstone by hot salty water ~1.6 BY. We have mapped key rock units for uranium, gold and silver, and annually transferred a full spatial geodatabase to the Kivalliq Inuit Association.