Nunavut Assessment Drill Database (Version 2.)

Northwest Territories and Nunavut Chamber of Mines, March 2019

Introduction

The Nunavut Assessment Drill Database version 2 (NADD 2.0) represents further progress in compiling drill hole data from mineral assessment reports filed in Nunavut into an interactive form that is readily displayed and searchable in an geographic browser such as Google Earth. The core products are a spreadsheet compilation and an interactive KML file containing information on 2701 drill holes reported in 810 assessment reports filed with Crown-Indigenous Relations and Northern Affairs Canada (C-IRNAC) and its predecessor agencies from the years 1999 to 2015, and now within the public domain. In addition to new data gathered from 1105 drillholes in 412 reports, NADD Version 2.0 includes upgraded reporting on the 1596 holes that were included in version 1.

The database significantly enhances accessibility and utility of information already in the public domain. Drill logs contain a wealth of information, not only from the detailed geological descriptions in them, but also from the results of various tests and analyses performed on drill core or drill chips.

The Nunavut Assessment Drill Database is expected to be useful in public awareness, community engagement, land use planning, and in mineral exploration.

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Limitations and Disclaimer

Compilation and production of this dataset is fully reliant on the original assessment reports, and there is no practical means of verifying the data in those sources. All reasonable efforts were made to ensure accurate transcribing of data and operations on it, but for any work beyond viewing and selecting areas of interest, reference must be made back to the original source documents, which are in the public domain and available for download from the Nunavut Geoscience "Gateway" portal at http://nugeo.ca/gateway/browseA.php or from physical libraries of C-IRNAC.

Methodology

Assessment reports were generally viewed as PDF files either via download from NUMIN (http://nugeo.ca/pages/en/numin.html) or directly from the offices of Indigenous and Northern Affairs Canada offices in Iqaluit. Some reports contain digital data in spreadsheet of database extract form. Text and tables in the reports were systematically reviewed for drill hole information and a spreadsheet was compiled by entering data for the following fields for each hole:

- Hole ID – The project operator's drillhole name or identification number.
- Drill Type – Either Core or RC (chip.)
- Hole Size – Either in industry-standard code, or hole diameter in numerical units, if reported.
- Assessment Report – The unique numerical report identifier assigned by C-IRNAC for each report submitted.
- Year Drilled and Year Reported – the years in which work was completed, and in which it was filed for assessment credit.
- Reporting Operator – The mineral claim holder, or their agent, who completed the work or filed it for assessment credit on their behalf.
- Projection – The original geographic location system used in reporting; most commonly Universal Transverse Mercator coordinates, but sometimes Latitude and Longitude.
- Easting and Northing – The numerical data for UTM coordinates.
- Elevation (m) – Height (in metres) of the drill collar above normal sea level. This is not routinely reported for many drill programs, and has not been entered into the compilation in a fully systematic way at present. The field is included to make the dataset more fully compatible with typical X-Y-Z spatial databases.
- Location Method – The means by which drill holes were sited on the ground (either before or after completion,) if reported.

- Azimuth, Reference Azimuth, Inclination and Length – These are the basic parameters compiled from drill summary tables or from log sheets. Reference Azimuth is commonly not stated in the report, or may be given as True North, UTM grid north, or Local grid (specified or not specified.) Azimuth and Inclination ("Dip") are the initial orientations at the drill collar. Hole Length has been converted from feet to metres where necessary.
- Geology Log, Geotechnical Log – These are input as 'Yes' or 'No' fields identifying whether that information is in the assessment report.
- Samples / Analyses – This field was previously populated with a simple 'Yes / No' option. It is now filed with more detailed information on samples extracted for testing and analysis:
  - Assay/Analysis for single element or a select suite of elements
  - Analysis for a broad geochemical suite of elements
  - Micro- or Macro-diamonds
  - Mineralogical analysis (e.g. Kimberlite or Metals indicators)
  - Petrography
  - Spectroscopy
  - Sample record only, with no analytical results
  - No sample intervals recorded

  The detailed information now available in this field will allow, with some additional standardization, NADD to evolve to a standard database that is searchable and sortable by types of analyses performed.

- Geophysical or Physical Property testing – downhole logs, or *in situ* tests of core; common examples include magnetic susceptibility, scintillometer testing, or downhole radiometrics.
- Commodity or commodities – the main minerals or materials sought during the reported exploration efforts.

Additional data fields were assigned or calculated:

- Latitude and Longitude – Universal geographic locators were calculated for each drillhole by importing point data to the Geographic Information System program QGIS (https://www.qgis.org/en/site/) in batches according to the coordinate system in which they were originally reported, followed by export in Latitude and Longitude coordinates using the WGS84 Datum. The conventions of negative values for West Longitude and positive values for North Latitude are employed.
  For drillholes that were not reported or mapped in UTM coordinates, Latitude and Longitude were determined directly from the best available location information provided in assessment reports.

- NTS Mapsheet and Region of Nunavut – Areal domains determined by the geographic position of drill collars. NTS Mapsheet is the Canadian National Topographic System (http://www.nrcan.gc.ca/earth-sciences/geography/topographic-information/maps/9765) 1:50,000 map which contains the drill collar.

- Serial ID - A unique identifier assigned to each drill hole during the compilation process.

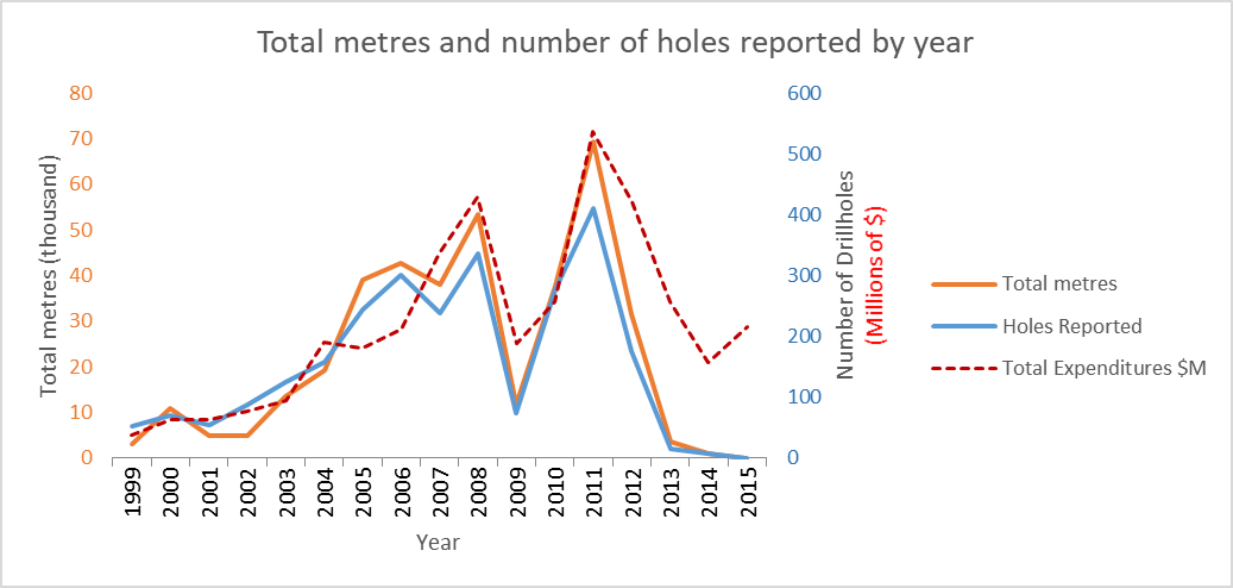
Products

The principle data product is a spreadsheet file in Microsoft Excel® format, "NADD version02.xls", and a slightly simplified comma-separated file, "NADD version02.csv". The main interactive product is a single electronic file in KML ("keyhole markup") (https://developers.google.com/kml/documentation/) format, "NADD 2.0.kml"which will open in a browser such as Google Earth, allowing panning, zooming, and selection in order to view the compiled and calculated drill data. Selection in the browser of any individual drill hole location will show the data in a flyout display.

In the packaged file folder, these KML, XLS, and CSV files are each stored in read-only format. In case the files become altered accidentally, duplicate files are in a Backup folder.

Initial Analysis

Drilling expenditures filed for tenure assessment credits might have some value as a measure of the activity in the mineral exploration industry. The number of holes and the total meterage drilled in any one year are subsets of the total exploration effort, and filing this work in assessment reports represents the intent of project operators to continue their exploration:



The charts above track the number of holes drilled (and total meterage) as recorded in Nunavut assessment reports since 1999 and captured in the drill database. After approximately 2014, drilling is not fully reported, as assessment reports containing that information may not yet be completely filed, reviewed, and placed in the public domain.

Incorporating the assessment drillhole data with tracking of mineral exploration and development by Natural Resources Canada (http://sead.nrcan.gc.ca/expl-expl/prelim-eng.aspx) and by the NWT-Nunavut Chamber of Mines (http://www.miningnorth.com/chamber-news/101522 and links on that page show that drilling reported for mineral tenure retention is actually a reasonable proxy for overall industry expenditures.

Potential Future Work

The developers of this follow-up phase database compilation recommend both expansion of the current dataset and creation of other similar products.

Instead of a simple spreadsheet, the fundamental compilation could be shifted to a more elaborate database structure, although benefits of this need to be weighed against possible loss of ease of use by the intended audiences. In a future phase of compilation, more compete records of drilling activity might be achieved by accessing data from land use reports in addition to mineral tenure assessment reports.

A related potential product to increase the use and accessibility of public domain information from assessment reports in public awareness, community engagement, land use planning, and mineral exploration would be an browse-able file containing information from *all* Nunavut assessment reports, not only those with drilling. Such a compilation could utilize the pre-existing report metadata in the NUMIN online libraries, and present it in a geo-searchable application.