

# Drill Core Library Activities in 2012

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## Introduction

The Nova Scotia Department of Natural Resources (DNR) Drill Core Library in Stellarton acquires and archives drill cores, well cuttings and other geological sample materials obtained from exploration, evaluation and development projects throughout Nova Scotia. The main intent is to facilitate further investigation and research of the province's geology and its geological resources, such as industrial and metallic minerals, energy resources such as oil, gas and coal, and infrastructure commodities such as aggregate resources. The sample materials are derived from various exploration and development projects conducted by the private sector, as well as from DNR field work and other government or academic sources. The DNR Core Library also acts as the repository for core and well cuttings obtained from drilling done under the jurisdiction of the Nova Scotia Department of Energy.

The Core Library's large collection of valuable drill core currently totals about 700 000 m from more than 7,700 holes drilled throughout the province. In addition, the archived materials include well-cuttings (predominantly from oil and gas drilling), rock slabs, geochemical samples (silt, till, soil, lake sediment and bio-geochemical materials) and large samples of various industrial mineral commodities such as limestone, barite and building stone. All core and cuttings (unless held confidential) are available for examination by interested parties and may be sampled subject to certain constraints and conditions. Many drill logs, geophysical logs, reports and maps, both published and unpublished, are also available for consultation.

All visitors are advised to make contact well in advance by phoning (902) 752-4842 or by e-mail to [oneillmj@gov.ns.ca](mailto:oneillmj@gov.ns.ca). Clients should note that safety policies require that they bring and wear work

boots at the facility when viewing sample materials. Safety glasses are provided for clients during their use of core splitters and saws. Clients are generally required to do their own layout and pickup of core boxes, which may involve some heavy lifting. The use of work gloves is recommended.

## Facilities and Services

The main Core Library facility is located centrally in Nova Scotia, 2 km off the Trans-Canada Highway (exit 23, Highway 104) at 105 - 109 Acheron Court in the Stellarton Industrial Park, Pictou County.

Five buildings occupy a total of 4000 m<sup>2</sup>, including 375 m<sup>2</sup> of laboratory space and 120 m<sup>2</sup> of office space. All five buildings are more than full, making it difficult to acquire core from new exploration work. A new storage building planned for construction during the latter part of 2012 was deferred to 2013 when it became apparent that the project could not be completed before freeze-up. An extra 230 m<sup>2</sup> of storage space provided since 2008 by the Nova Scotia Department of Energy is located 500 m from the main facility. Some additional core is stored in an older building in Debert, Colchester County, 75 km west of Stellarton. Free parking is available at all facilities.

Most core is stored in standard 1.5 m (5 ft.) long wooden boxes or trays with capacities of 4.6 - 7.6 m (15 to 25 feet) of core, depending on the core diameter. The majority of boxes weigh from 15 to 35 kg per box, although some are as much as 45 kg. Much of the drill core in storage was measured and marked in imperial units when drilled, so the boxes and depth markers are often labelled in feet rather than metres. Boxes of core are stored by strapping them onto custom-made wooden pallets - generally about 20 to 50 boxes per pallet - and the pallets are stacked vertically in rows. The storage areas have

only basic lighting and are unheated. Individual pallets are retrieved by forklift from storage as needed and are transferred by DNR staff to the core examination labs, where the core boxes may be laid out for viewing on benches, portable stands or the floor. A large paved yard may also serve as a core box layout area during good weather. The Core Library is equipped with a binocular microscope, a portable UV light, weigh scales, an SG balance, core-splitters and diamond saws, which are all available for use by clients. Clients are responsible for carrying out and documenting their own sampling, subject to the approval and guidance of Core Library staff. Analyses and other data generated from sampling must be forwarded by clients to Core Library staff within 60 days of sampling.

A small reference library area with tables, chairs and a microfiche reader/scanner/printer is available for clients and staff. The library collection includes a complete set of microfiche for older exploration assessment reports, open file reports and maps. The Mineral Resources Branch no longer microfilms any reports: all assessment reports received and released from confidential status have been electronically scanned and are now available free of charge as downloadable pdfs via NovaScan on the branch website. Paper copies of many reports, papers and maps published by the Mineral Resources Branch are also available for reference, together with a selection of GSC papers, memoirs, bulletins and maps. Unpublished information (logs, sections, maps, reports, analyses, etc.) is available at the Core Library for some drillholes.

A public broadband internet connection is not available at the Core Library: clients wishing to consult web-based reports and logs during core examination may prefer to download the required files prior to their visit, or staff can assist by downloading files to a client's portable USB storage device.

## **New Acquisitions in 2012**

Champlain Mineral Ventures Limited offered to donate all the drill core from exploration drilling carried out in 2002, 2003 and 2010 on its spodumene-bearing pegmatite at Brazil Lake,

Yarmouth County, and a selection of this core was transferred to the Core Library in October 2012. Much of the core from 2002 and 2003 (2125 m in 32 holes) had previously been selectively condensed and most of what remained (179.3 m from 18 holes) was accepted for the Core Library. Of the 2574 m drilled in 2010 (28 holes), 914 m from 25 of the holes, (including two complete holes) were selected for transfer to the Core Library. Most of the core is NQ size, with some HQ.

Core previously donated by Avalon Ventures Limited (now Avalon Rare Metals Incorporated) from the East Kemptville area, Yarmouth County, was also transferred to the Core Library in October (Fig. 1). A total of 768.8 m from seven holes drilled at Gardners Meadow Brook, Ikes Ridge and Second Bear Lake was selected for retention, out of a total of 2219 m in 12 NQ holes.

Four boxes of Cretaceous core drilled in the 1990s by Kaoclay Resources Incorporated and by Joe Richman were transferred from the Founders Square office to the Core Library in January 2012.

Although the drill core contributed in 2012 met provincial standards, drill core donated to the Core Library is often in poor condition due to neglect and poor stewardship. Regulations under the *Mineral Resources Act* state that drill core must be retained in standard core boxes at the drill site or at a core storage facility and that precautions must be taken to secure the drill core against weather and vandalism. The boxes should be identified with weatherproof labels that indicate the drillhole number, core interval represented, and the date and name of the company for which the drill core was obtained.

## **2012 Client Activity**

Clients traditionally include private sector geologists and prospectors working in the mineral exploration sector, or in the oil and gas sector, as well as geologists with the Geological Survey of Canada, DNR (Mineral Resources Branch) and the Nova Scotia Department of Energy. University students, research staff, consultants, architects and engineers also make use of the facilities.



**Figure 1.** Loading donated drill core from the East Kemptville area in Yarmouth County.

Total client activity for the year was 155 person days (for use of core, cuttings or other samples), while approximately 50 other visitors used the facilities for various reasons, including access to information and equipment. This represents a moderate level of activity within a normal range (Table 1). These figures do not include off-site activity, where core or cuttings were loaned out.

### Drill Core Database

The department’s Drill Core Database provides basic information on all drill core held at the Core Library facilities, including operational data such as storage location and number of boxes per hole. Linkages to the Drillholes Database (see next section) provide the key to more detailed information about each hole, with links and references to logs, maps and reports.

The Drill Core database can be searched by single or multiple fields: for example by place name,

**Table 1.** Client activity at the Core Library in recent years.

Year	Lab activities: person days	Other visitors: person days
2007	193	58
2008	209	61
2009	72	48
2010	225	55
2011	110	36
2012	155	50

company name, hole number, map sheet or year. The database is updated continually and at the end of December 2012 it contained records for approximately 7,720 holes having core or cuttings in the Core Library. The working version is still based on Advanced Revelation database software, using OpenInsight for Windows for querying and data entry. An online version of the Drill Core Database based on Microsoft SQL continues to be

tested and updated by Core Library staff, but has not yet been made available for public access. Queries should be directed to the Core Library geologists for all drill core information and core data searches.

## Drillholes Database

At the start of 2012 the department's Drillholes Database contained records for 24,092 surface drillholes. In 2012, 787 new records from three sources were added, bringing the total number at the end of 2012 to 24,879 drillholes. (1) Records of 474 new holes reported in assessment reports submitted to DNR between mid-2009 and mid-2010 were added as their confidential status expired. (2) Records of 111 Vibracore sediment-sampling holes drilled in Cobequid Bay and the Avon River in 1997 and 1998 were added after their locations were determined by geo-referencing. (3) Records of 202 auger, percussion and reverse-circulation holes were added from historical reports. The new data from these three projects bring the database more up-to-date and complete, although an indeterminate amount of older historic data still remains to be captured. Also, data from recent assessment reports are only added when the reports are removed from confidential status, meaning that most data are at least two years old before being added to the database.

Existing records for 2138 drillholes were updated with better collar locations. The lack of geographic co-ordinates in many older assessment reports, where drillhole collars were referenced only to a local grid, resulted in inaccurate or missing data in the database. Using the GIS software ArcMap, maps from these reports were scanned and geo-referenced to determine the required co-ordinates for collar locations. A total of 1759 collar locations for holes entered prior to 2000 were corrected using this method. Also, 136 collar locations were corrected by using improved data received directly from clients or other contacts. The remaining 243 drillholes that were updated had either new or corrected collar data added to the record from various other sources.

Over the course of about 100 years, ending in 1996, the Government of Nova Scotia operated a

diamond-drilling division, which drilled 8,048 holes, either as a contactor to the mining and other industries or for its own purposes. While much of this information is already included in the Drillholes Database, there is a need to capture information for holes that have not yet been included. To this end a spreadsheet is being populated with existing data from the Drillholes Database and from DNR's annual published reports *Drilling Logs of Government Core Drills* to identify what data remain to be found or updated.

Many other drillholes are still not recorded in the database, but they will be added as relevant information is obtained. Information sources include a variety of published and unpublished reports, maps and files, including old annual reports of the Nova Scotia government and the Geological Survey of Canada, as well as various open file reports and even some assessment reports that were previously overlooked. Drilling on mine leases is not reported to the department; old mine records are generally the only source for these data.

Due to a major effort over the last few years, most assessment reports are now available online as downloadable pdfs through NovaScan. This makes geo-referencing historic drilling easier as large maps are now available as single images to bring into ArcMap, from which accurate UTM co-ordinates can be determined. With the new and updated records recently added to the database, there are still 254 holes in the Core Library's collection of archived core for which data are not yet available in the Drillholes Database or for which a match has not yet been identified. This represents only 4% of the holes for which core is available in the Core Library. This number will diminish as records are found or as "orphan" core is discarded as having insufficient value for retention.

An online version of the Drillholes Database, based on Microsoft SQL, continued to be tested and updated by Core Library staff and by GIS staff in the Halifax office. The new version will be available for public access when the updates are complete. Queries should be directed to Mick O'Neill at the Core Library for all drillhole information and data searches.