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Miscellaneous Release—Data 383

Results of the 2014–2017 Drilling Programs on the Niagara Peninsula: Graphic Logs, Descriptions and Analytical Data

by A.K. Burt

This publication can be downloaded from

http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD383

This release contains an explanatory report, graphic logs, sediment descriptions, interpretations, analytical data, a subsurface database and photographs resulting from 99 continuously cored boreholes drilled as part of the Niagara Peninsula three-dimensional (3-D) sediment mapping project. The data are organized into 6 folders:

- Analytical Data
- GIS Files
- Graphic Logs
- Photographs
- Reference Maps
- Subsurface Database

Analytical Data

This folder contains 5 Microsoft® Excel® for Office 365 (.xlsx) workbook files, an image (.jpg) of AMS C¹⁴ dating lab notes and a portable document format (.pdf) file of the 2015 Geo Labs brochure, which describes the analytical methods used at the Ontario Geological Survey Geoscience Laboratories. The workbook files contain the results of laboratory carbonate, grain size, and radiocarbon analysis as well as field pebble lithology counts and unconfined compressive strength test results.

Carbonate.xlsx: Chittick analysis was undertaken on diamicton and fine-textured glaciolacustrine samples. The results of all analyses, including quality-control duplicate samples and standards, have been integrated into a

single datasheet (Complete Dataset). Duplicate samples are noted by the letters DUP in the lab ID number. The percent of calcite and dolomite, the total percent of carbonate and the ratio of calcite to dolomite are the key data fields. Quality-control duplicate samples and standards are also presented in a separate datasheet (*QA QC Data*) and select quality-control data are shown graphically. *Chittick Unit* worksheet compares percent calcite and percent dolomite results for the standard CTK-2 by chittick apparatus used to perform the analysis (i.e., there are 4 chittick setups in service at the Geoscience Labs). *Dups Calcite* compares the percent calcite results for each duplicate pair. *Dups Dolomite* compares the percent dolomite results for each duplicate pair.

Grain Size.xlsx: Grain size analysis was undertaken on diamicton and stratified sediment samples. The results of all grain size analyses, including quality-control duplicate samples and standards, have been integrated into a single data worksheet (Grain Size Data). Duplicate samples are noted by the letters DUP in the sample Lab ID number. The quality-control duplicate samples and standards are also presented in a separate datasheet (*QA QC Data*). Select quality-control data is shown graphically in the other worksheets. *Standards Silt and Clay* compares percent clay and percent silt results for the standard reference material used. *Dups Fine to Very Fine Sand* compares the percent fine to very fine sand results for each duplicate pair, *Dups Silt* compares the percent silt and *Dups Clay* compares the percent of clay.

Pebble Counts.xlsx: Pebble lithologies were determined visually in the field under different light conditions by the project geologist and field assistants with variable levels of experience as well as a geological assistant in a lab. Furthermore, many of the pebbles were fine to very fine gravel (less than 1 cm). It is recommended that the data be used to explore trends.

Unconfined compressive strength.xlsx: A pocket penetrometer was used to determine the unconfined compressive strength of sediments at 5 cm increments perpendicular to cleaned core. Readings were not taken from sections of core sampled for micromorphology. A value of 0 indicates unsuitable sediments (for example stony diamicton, wet silt or sand) or disturbed intervals. A value of 5 indicates intervals that were not possible to penetrate. There are many sources of error, such as pebbles or voids below the core surface and the speed at which readings were taken, and it is recommended that the data be used to explore trends in stiffness. Note that not all cores and not all intervals were tested.

Radiocarbon.xlsx: Accelerator mass spectrometry (AMS) ^{14}C radiocarbon analysis was performed at the André E. Lalonde AMS Laboratory at the University of Ottawa on organic material obtained from stratified sediment samples.

GIS Files

This folder contains a fully attributed shapefile of borehole locations and 2 layer files which may be used to code the boreholes according to Conservation Authority or presence or absence of monitoring wells.

Graphic Borehole Logs

This folder contains graphic logs for each of the 99 boreholes, provided in portable network graphic (.png) format. With the exception of borehole BH94-NP-2016, the graphic logs are designed to be printed in landscape mode on standard letter paper. Borehole BH94-NP-2016 was much deeper than the other holes and printing in portrait mode on tabloid paper (11 by 17 inches) is recommended.

Photographs

This folder contains 3 subfolders labeled “Core”, “Pebble Counts” and “Radiocarbon Samples”.

Core: This folder contains 99 subfolders, one for each borehole, labeled according to the borehole number. Each borehole subfolder contains subfolders with images (*.jpg*) of wet and, in some cases, dry core, an image (*.jpg*) of the complete core, and an image of the drill site (*.jpg*). The core images are named according to the borehole name and depth. The top of the core is always on the left side of the image.

Pebble Counts: This folder contains 99 subfolders, one for each borehole, labeled according to the borehole number. Each borehole subfolder contains one or more images of the pebbles separated by lithology and colour. The file names refer to the sample number. Sample depths may be found in the *Pebble Counts (.xlsx)* workbook within the *Analytical Data* folder.

Radiocarbon Samples: This folder contains images of the fragments submitted for radiocarbon dating. The file names refer to the sample number. Sample depths and the analytical results may be found in the *Radiocarbon (.xlsx)* workbook within the *Analytical Data* folder.

Reference Maps

This folder contains high-resolution versions (*.tif*) of the maps shown in the introductory section of the explanatory notes.

Subsurface Database

This folder contains a workbook with borehole locations, monitoring well data, summary and detailed lithological units, summary descriptions and interpretations, hydrostratigraphic units, aquifer class, oxidation and drilling method and recovery in separate worksheets.

Borehole Location: This worksheet contains location information for each borehole.

Monitoring Well: This worksheet contains location information for monitoring wells installed within and adjacent to OGS boreholes. The information was obtained at the time of drilling, from water well records, Niagara Peninsula Conservation Authority and the City of Hamilton.

Summary Lithology: This worksheet contains simplified geologic information used to generate a graphic log. The first unit in each borehole has been coloured blue.

Detailed Lithology: This worksheet contains detailed geologic information. Bedrock formations were identified from core or photographs by Derek Armstrong (OGS), Frank Brunton (OGS) and Shuo Sun (Oil, Gas & Salt Resources Library). The first unit in each borehole has been coloured blue.

Description and Interpretation: This worksheet contains a simplified description and general interpretation of sediment packages. The first unit in each borehole has been coloured blue.

Hydrostratigraphic Unit: This worksheet contains depth intervals of the hydrostratigraphic units described previously. The first unit in each borehole has been coloured blue.

Aquifer Class: This worksheet contains depth intervals of surface or buried sediment aquifers / potential aquifers, aquitards (confining layers) and bedrock. Aquifer / potential aquifer units are coloured yellow.

Oxidation: This worksheet contains depths of oxidized and reduced sediments and bedrock. The first interval in each borehole has been coloured blue.

Drilling Method and Recovery: This worksheet contains information on drilling methods and material recovered in each run. The first interval in each borehole has been coloured blue.