November 28, 2022

Mrs. Carrier and St-Pierre

Dear Réjean and Yves

The following is a brief description of our observations, and conclusions reached, during the visit by Jim Walker and Dustin Dahn (DNRED Geological Surveys) to the Pozzolan Dalhousie core shed in Dalhousie on Nov. 23, 2022. The following is based on our very quick assessment of two drill cores, 3-1 and 8-1 combined with lithogeochemical data provided by Mr. Réjean Carrier. The following summary of observations is by no means exhaustive and is based on a very cursory assessment made on only two cores and on geochemical data provided to us. As such, the following should be considered as reconnaissance only and should not be relied upon for economic assessment, mining plan etc. Should such detailed work be required a professional geologist (PGeo) should be engaged to conduct detailed core logging (and additional geochemical sampling) of several cores to make a detailed stratigraphic assessment and to better constrain the distribution of those units in the subsurface.

The regional geology in the area (see DNRED Map Plate MP 2013-16 (1:50 K scale) or Map Plate MP 2012-53 (1:20 K scale). A modified portion of this area which with the location of the two cores examined, I attach as a separate file). Overall that area is underlain by a north younging sequence that strikes east-northeast and dips approx. 35-50^{o} to the north. This is consistent with observations made on the cores examined where the angle between the drill core (drilled at a dip of 45^{o} toward 170^{o}), and primary layering are at approximately 90^{o} to one another.

The rocks intersected by drilling can be broadly divided into two packages that are all included in the Val D ‘Amour Formation (of the Early Devonian Dalhousie Group, DNRED Map Plate (MP 2013-16). These are an upper (northern unit) of andesite separated from a lower (southern unit) dominated by mafic volcanic and subordinate calcareous sedimentary rocks. These two units are in fault contact according to regional mapping (see attached map).

The upper part of the southernmost drill core investigated (DDH 3-1), intersected a sequence of interlayered green to grey to reddish grey massive to locally amygdaloidal andesite flows, and crystal lithic tuff **(Figs. 1 and 2).** This agrees with regional mapping which recognizes an andesite in the area of the quarry, that extend east as far as Inch Aran lighthouse and west to Campbellton.

In drill core 3-1, interflow units are common and appear to be primarily of auto-brecciated andesite consisting of oxidized (red) fragments of massive to highly amygdaloidal andesite **(Figs 2 and 3**). However, true iInterflow clastic sedimentary rocks appear to be absent suggesting limited time between eruptive events and /or subaerial deposition, the later explanation is supported by highly oxidized interflow units.

The andesite unit (Val D’amour Formation) is in gradational contact down hole into an “upper conglomerate”. The Upper conglomerate is a matrix- to clast-supported, mafic to intermediate (?) volcanic clast dominant, pebble- to cobble conglomerate **(Fig. 4).** This unit appears to be a near source (proximal) deposit formed in a shallow water to emergent setting. The upper conglomerate gives way down section into more andesitic or basaltic (?) lava flows and then into a lower Conglomerate unit **(Fig. 5)** that is texturally similar to the upper conglomerate.

The lower conglomerate is gradational (over a narrow interval) down hole into a sequence calcareous sedimentary rocks locally consisting of nodular limestone, and locally containing fossil debris (**Figs. 6 through 9).** Similar sedimentary rocks are interbedded with mafic volcanic rocks on the coast south of Bon Ami rocks to the east. There is a good chance that the rocks on the coast correlate directly with the mafic volcanic and sedimentary rocks at the bottom (below 250 m) of drill hole 3-1. The apparently gradational relationship between the andesite package and the mafic volcanic sedimentary package in drill core 3-1 suggests that the interpreted regional fault separating the two is not real.

A quick review of core from DDH 8-1 suggest similar rock types with similar relative positions to those recognized in core 3-1. The unit of interest (andesite) may contain a bit more crystal lithic tuff (**Fig. 11)** than encountered in core 3-1 but this is just an impression and not quantitative.

Fig 1. Massive green andesite (two runs on left) gradational down hole into red (oxidized), amygdaloidal andesite clast, interflow unit (run on right).

Fig. 2 Colour variation pink to green in massive andesite flows.

Fig. 3. Andesitic interflow fragmental unit (bottom run); on top of a massive to slightly amygdaloidal andesite flow (top run).

Fig. 4. Heterolithic (basalt /andesite) pebble- to cobble-conglomerate (DDH 3-1; 103-125 m), interbedded with andesitic flows/tuffs. Note rounded volcanic clasts (VC)

Fig. 5. Green-grey andesite (GA) transitional down hole into volcanic clast (VC) sedimentary unit.

Fig.6 Amygdaloidal basalt flow (ABF) and clast (ABC) (two runs on left); interlayered with and passing down hole into fossiliferous/calcareous clastic sedimentary rocks and interlayered nodular limestone (NL) (run on right).

Fig 7. Calcareous sedimentary rocks (bottom two runs) interlayered with grit (top run). Note, graded grit beds (GB) with erosional lower contact clearly illustrating tops/younging direction up hole.

Fig 8. Calcareous sedimentary rocks (grey to black), with subordinate white nodular limestone (NL), and locally containing beds with fossil debris (FB).

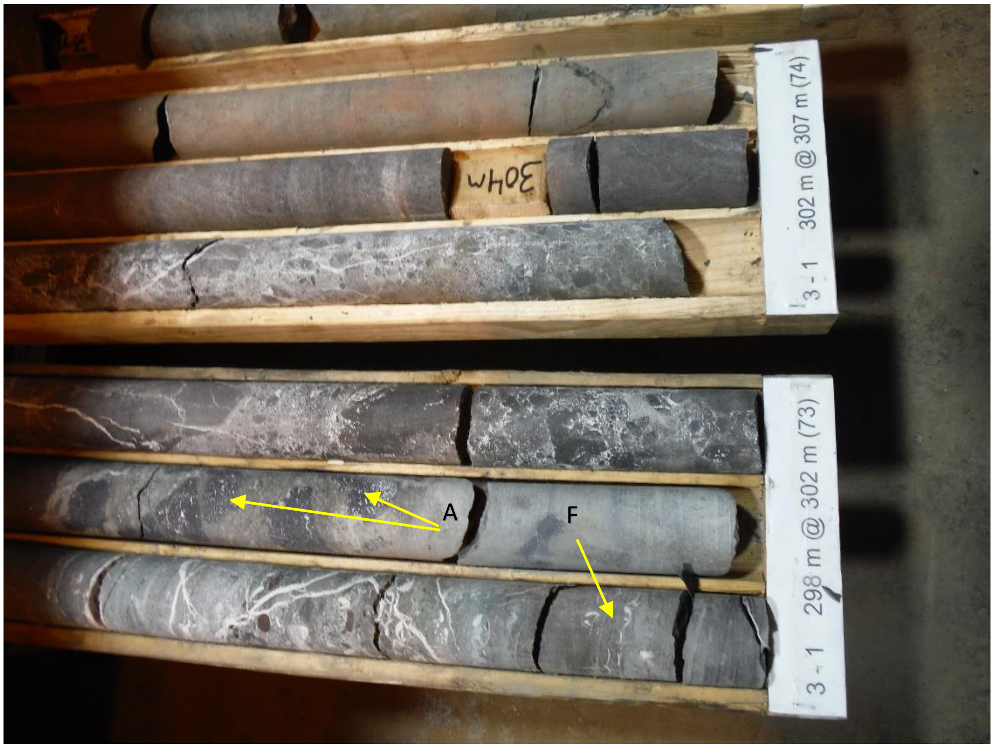

Fig 9. Mafic volcaniclastic rock dominated by amygdaloidal basalt clasts (A), and interlayered calcareous, locally fossiliferous (F) sedimentary rocks (DDH 3-1, @ 298-307 m)

Lithogeochemistry

Using the lithogeochemical data provided by Réjean Carrier. The limited data set (major element oxides only) precludes an exhaustive assessment of the rock types sampled. Likewise, the data set supplied is quite limited in terms of the number and distribution of samples and clearly does not reflect the stratigraphic complexity recognized during our cursory examination of cores from DDHs 3-1 and 8-1. None the less, the total alkalis versus Si discrimination diagram (Fig 10.) does afford an opportunity to use geochemistry to check observations made on core from hole 3-1. (Fig 10A). Two populations are clearly outlined on Fig 10A; data from the upper part of the core (marked by diamond symbols) clusters near the intersection of the Andesite-trachyandesite-basaltic andesite fields. This is consistent with regional mapping which places these rocks in an andesite dominant unit of the Val D ’Amour Formation. The second population coms from samples collected below a depth the 250 m in the core and clearly reflects a more mafic (lower Na_2O+K_2O and lower SiO_2) content relative to the andesite. This is consistent with regional mapping which recognizes a mixed mafic volcanic sedimentary unit that underlies the andesite and is exposed to the south of the are of drilling. Review of all Geochem data Fig 10b shows that most of the samples collected plot in the andesite and trachyandesite fields with only a few samples trending to more mafic compositions.

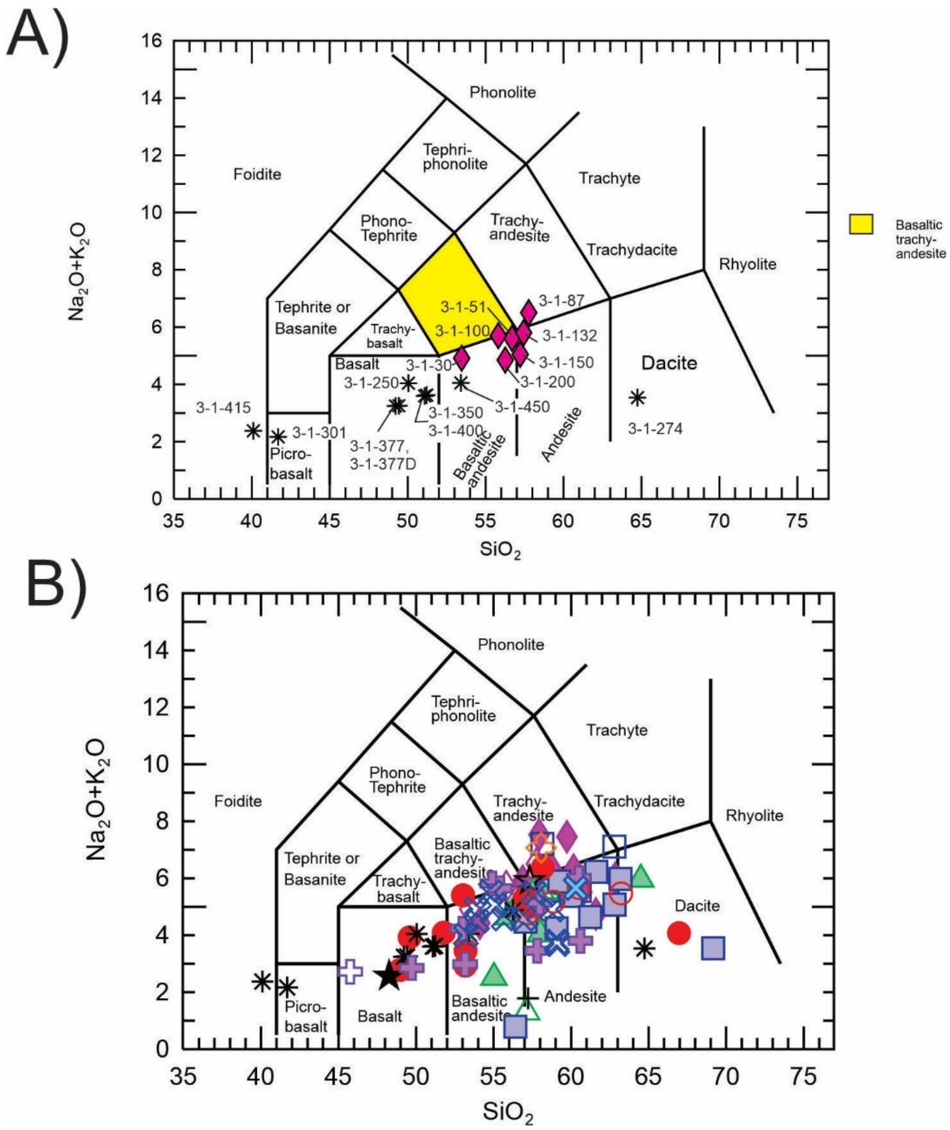

Fig 10. Total Alkalis versus Si rock type discrimination diagram using lithogeochemical data from the Dalhousie Pozzolan projected provide by Réjean Carrier. **A)** only data from DDH 3-1, Diamond symbols are from andesite unit in upper part of core, whereas samples marked by asterisk are from the lower part of the core and reflect basalt and minor dacite (sedimentary? chemistry), and **B)** all data; with the exception of the data from hole DDH 3-1 which has two symbols (see A above) all samples from a given core are marked by the same symbol.

Quick log; Drill core 3-1:

From (m)	To (m)	Description
0	255	Andesitic flow and interflow brecciation of various colours (maroon and grey are most common). Many flows are pophyritic and amygdaloidal. *Small sample taken at 46m*
103	>125*	Fragmental, rounded clastic unit. Clasts are heterolithic, pebble to cobble size.
>125	255	Andesitic flow and interflow fragmental rocks grading down hole into heterolithic pebble- to cobble- conglomerate
255	302	Calcareous sedimentary rocks
302	320	Basalt, dark colour with abundant calcite filled amygdule.
320	336	Limestone, basalt clasts, graded bedding (right way up) and shell fragments.
336	460 (EOH)	Basalt, dark colour with abundant calcite filled amygdule.

Fig. 11 Maroon to green-grey crystal lithic tuff (andesite) from drill core 8-1 at 195-199m m.

Quick core log Drill hole 8-1

From (m)	To (m)	Description
0	197	Andesitic flow and interflow fragmental rocks.
197	203	Maroon crystal lithic tuff
203	304	Andesitic flow and interflow fragmental rocks.
304	355	Fragmental, rounded clastic unit. Clasts are heterolithic, pebble to cobble size.
355	444	Maroon to grey andesite
444	451	Calcareous sedimentary rocks
451	469	Basalt, dark colour with abundant calcite filled amygdule.
469	496 (EOH)	Limestone