**Supplementary File 1.**

Summary of the samples collected in the study area (See Fig. 3 for locations) with a short description of each pegmatite and the reason why some were not selected for geochronology. Abbreviations used: aln = allanite-(Ce); bt = biotite; grt = garnet; Kf = K-feldspar; ms = muscovite; ab= albite; qtz = quartz.

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| **Peg #** | **Pegmatite description** | **Sample description** | **Analyzed?** | **Reason** |
| **1** | 80 cm wide unzoned pegmatite. Slightly deformed, numerous Kf megacrysts and qtz pods. Rare grt, mt. No graphic texture. | Very coarse Kf-qtz assemblage with minor ab and bt from the center of the pegmatite. 3 kg. | Y |  |
| **2** | A few 20 cm wide pegmatites. Undeformed, crosscutting WR fabric. Mostly Kf, pl, qtz with minor bt and rare grt. One 10 cm Kf crystal exhibits graphic texture. | Two 20 cm-wide fragments of one dike. 1 kg. | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **3** | 50 cm wide pegmatite. Extremely deformed and perfectly aligned with WR fabric. Remnants of a quartz core, many masses of fine-grained Kf, likely recrystallized Kf megacryst during deformation. Lacks grt, bt/ms, and graphic texture. | Several masses of recrystallized Kf in massive qtz. No pl, no grt, no primary mica. 5 kg. | Y |  |
| **4** | 1 m wide unzoned pegmatite pinching out. Mostly Kf, pl, qtz with minor ms, bt and rare grt. Mm-scale graphic granite texture present in Kf megacrysts. A few WR inclusions. | Coarse Kf-qtz-pl-bt assemblage from center of pegmatite. Rare grt and ms. 5 kg. | Y |  |
| **5** | 5 m wide zoned pegmatite. Undeformed, crosscutting WR fabric. Well-developed qtz core with 50+ cm euhedral Kf megacrysts. Pl-qtz rich border zone. Abundant ms, bt, grt, Kf-qtz intergrowth (including graphic texture), pl-qtz intergrowth and dendritic quartz. Ep-qtz-act veinlets xcutting peg and intense hematization of Kf indicates later fluid event. | Coarse Kf-qtz-ab assemblage from the inner zone. Some garnets and a large mass of pl-qtz intergrowth. 5 kg. | Y |  |
| **6** | 5 m wide undeformed composite pegmatite. Left part of dike is a pegmatitic leucosome with mostly very coarse (<40 cm) ab with minor qtz, bt and abundant accessory blue apt. Right part is a zoned pegmatite with well-developed qtz core, Kf-rich inner zone and finer-grained border zoned with abundant accessory aln and rarer apt. | "P6(leuco)": left side mostly very coarse ab with minor qtz and bt, but abundant apt. 5 kg. | Y |  |
| "P6(Kf)": Right side coarse Kf-qtz-ab assemblage from inner zone with minor bt and accessory apatite and allanite. 5 kg. | Y |  |
| **7** | 3 m wide zoned pegmatite. Undeformed and crosscutting pl-rich leucosome in WR. Mostly Kf, pl, qtz with minor ms, bt and accessory grt. Minor qtz-ab intergrowth and graphic texture. | Coarse Kf-qtz-ms assemblage with minor ab from inner zone. Many garnets present. 5 kg. | Y |  |
| **8** | 3 m wide zoned pegmatite. Undeformed and crosscutting WR fabric. Well-developed qtz core. Mostly Kf, pl, qtz and ms with minor bt and grt. Presence of graphic granite, ms-qtz intergrowth, pl-qtz intergrowth, and graphic-like grt-qtz intergrowth. Kf has intense hematite alteration. | Coarse Kf-qtz assemblage with minor ms-qtz intergrowth and accessory grt from inner zone.  5 kg. | Y |  |
| **9E** | 4 m wide zoned pegmatite. Abundant Kf megacrysts with very well-developed graphic texture and qtz pods in a pl-rich (+ qtz, Kf, ms) matrix showing some deformation. Presence of grt and secondary bt. | Megacrystic Kf in coarse pl-qtz matrix with minor ms and bt. Some grt present. 5 kg. | (Y) |  |
| **9W** | Continuation of peg 9E on west side of the highway. 5 m wide zoned pegmatite. Abundant Kf megacrysts with well-developed graphic texture and large qtz masses in a pl-rich (+ qtz, Kf, ms, bt) matrix with some deformation. Abundant accessory grt often at edge of Kf megacrysts. | Megacrystic Kf in coarse pl-qtz-bt matrix. Graphic texture in the Kf megacryst. 5 kg. | Y |  |
| **10** | 3 m wide zoned pegmatite. Minor deformation and some large-scale layering. Mostly Kf, qtz, ab with minor ms, bt and abundant accessory grt. Rare graphic texture. | Coarse Kf-qtz-ab assemblage with minor bt and 1+ cm grt from the inner zone. 3 kg. | N | Connected to peg 43 across the highway |
| **11** | 50 cm wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf, bt. Rare grt, ms. No graphic texture. | Coarse Kf-qtz-ab assemblage with minor bt and accessory grt. 3 kg. | N | Same than adjacent pegmatites 12, 41, 42 |
| **12** | 50 cm wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf, bt. Rare grt, ms. No graphic texture. | Coarse Kf-qtz-ab assemblage with minor bt and accessory grt. 3 kg. | Y |  |
| **13** | 2 m wide unzoned pegmatite. Undeformed, sub-horizontal, crosscutting WR fabric. Mostly pl, qtz, kf with minor bt, ms and accessory grt. Presence of graphic granite. | Coarse Kf-qtz-ab assemblage with minor bt and abundant <1 mm grt. 5 kg. | N | Connected to peg 38 across the highway |
| **14** | 50 cm wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf, bt with accessory grt, mt and aln. No graphic texture. | Coarse pl-qtz-Kf assemblage with minor bt. Rare mm-sized garnet and aln crystals. 3 kg. | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **15** | 2 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Coarse-grained but only a few Kf crystals above 5 cm. Mostly pl, qtz, Kf with minor bt. Very rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | Y |  |
| **16** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Coarsed-grained but only a few Kf crystals above 5 cm. Mostly pl, qtz, Kf with minor bt. Very rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | N | Same than adjacent pegmatites 15, 17, 30-36 |
| **17** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Coarsed-grained but only a few Kf crystals above 5 cm. Mostly pl, qtz, Kf with minor bt. Very rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | N | Same than adjacent pegmatites 15, 16, 30-36 |
| **18** | 50 cm wide pegmatite. Undeformed and crosscutting WR fabric. Mostly Kf, qtz, ab with minor ms, bt and abundant accessory grt. Presence of grt layers and graphic granite | Coarse Kf-qtz-ab with minor bt and abundant accessory grt. 5 kg. | Y |  |
| **19** | 3 m wide zoned pegmatite. Slightly deformed, but crossutting WR fabric. Mostly megacrystic (<1 m) Kf, qtz, ab and bt with minor ms. Rare graphic texture but several 30+ cm skeletal/dendritic qtz crystals. | Very coarse Kf-qtz assemblage with minor ab and bt from the inner zone. 5 kg. | Y |  |
| **20** | 30 cm wide unzoned pegmatite. Undeformed and crosscutting WR fabric. Mostly pl, qtz and Kf with minor bt. No graphic texture, no grt. Intense hematization of pl. | Not sampled | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **21** | 30 cm wide unzoned pegmatite. Undeformed and crosscutting WR fabric. Mostly pl, qtz and Kf with minor bt. No graphic texture, no grt. Intense hematization of pl. | Coarse Kf-qtz-ab assemblage and minor bt. 1 kg. | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **22** | 50 cm wide unzoned pegmatite. Undeformed and crosscutting WR fabric. Mostly Kf, ab and qtz with minor bt. No graphic texture, no grt. | Coarse Kf-qtz-ab assemblage and minor bt from center of the pegmatite. 3 kg. | (Y) |  |
| **23** | 30 cm wide unzoned pegmatite. Some deformation, but crosscutting WR fabric. Mostly Kf, qtz, pl. No graphic texture, no grt, no primary micas. | Coarse Kf-qtz-ab assemblage. No grt, no micas. 3 kg. | Y |  |
| **24** | 2 m wide unzoned pegmatite. Deformed, but crosscutting WR fabric. Mostly Kf, qtz, pl. Kf is locally recrystallized. Abundant 1+ cm mt with 1-2 mm grt coronas. Rare graphic texture, no primary micas, no primary grt. Evidence of partial melting within the pegmatite. | Coarse Kf-qtz-ab with minor mt from center of pegmatite. 5 kg. | Y |  |
| **25** | 30 cm wide unzoned pegmatite. Deformed and align parallel to WR fabric. Mostly Kf and qtz with minor pl. No graphic texture, no grt, no primary micas. | Coarse Kf-qtz assemblage. No pl, no grt, no primary micas. 2 kg. | Y |  |
| **26** | 30 cm wide unzoned pegmatite. Undeformed and crosscutting WR fabric. Mostly pl, qtz and Kf with minor bt. No graphic texture, rare grt. | Coarse pl-qtz-Kf assemblage with minor bt. 3 kg. | Y |  |
| **27** | 30 cm wide unzoned pegmatite. Undeformed and crosscutting WR fabric. Mostly pl, qtz and Kf with minor bt. No graphic texture, rare grt. | Coarse pl-qtz-Kf assemblage with minor bt. 3 kg. | Y |  |
| **28** | 50 cm wide unzoned pegmatite. Undeformed and crosscutting WR fabric. Mostly qtz, Kf and ab with minor bt. No graphic texture, no grt. | Coarse Kf-qtz-pl-bt assemblage. 1 kg. | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **29** | 4 m wide zoned pegmatite. Undeformed and crosscutting WR fabric. 3 m wide quartz core with 30+ cm euhedral ab megacrysts on each side. No graphic texture or grt, only a couple of Kf crystals observed. Intense metasomatism, including many dissolution cavities, hematization of pl, secondary fine-grained ms and several metamict + metasomatized unidentifiable RM phases. | 2 samples: 1) a large chunk of qtz from the core and 2) megacrystic ab with cm-sized altered RM phases. Total of about 4 kg. | Y |  |
| **30** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | N | Same than adjacent pegmatites 15-17, 31-36 |
| **31** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | N | Same than adjacent pegmatites 15-17, 30, 32-36 |
| **32** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 4 kg. | Y |  |
| **33** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | N | Same than adjacent pegmatites 15-17, 30-32, 34-36 |
| **34** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 3 kg. | N | Same than adjacent pegmatites 15-17, 30-33, 35, 36 |
| **35** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 3 kg. | N | Same than adjacent pegmatites 15-17, 30-34, 36 |
| **36** | 1 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare grt, no graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 3 kg. | N | Same than adjacent pegmatites 15-17, 30-35 |
| **37** | 50 cm wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor ms and bt. Rare grt and graphic texture. Only quartzite-hosted pegmatite and feldspars are less hematized than in other pegmatites. | Coarse pl-qtz-Kf assemblage with minor bt and accessory grt. 5 kg. | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **38** | 3 m wide zoned pegmatite. Undeformed, subhorizontal and crosscutting WR fabric. Some qtz masses towards the middle of the pegmatite and pl-rich border zones. Mostly Kf, pl, qtz with minor ms, bt and accessory grt. Presence of graphic texture, including pl-qtz graphic intergrowth in the border zone. | Coarse Kf-qtz-ab assemblage with minor bt and accessory grt from inner zone. Kf exhibits graphic texture. 5 kg. | Y |  |
| **39** | 30 cm wide unzoned pegmatite. Deformed and align parallel to WR fabric. Mostly Kf and qtz with minor pl. No graphic texture, no grt, no primary micas. | Coarse Kf-qtz assemblage. No pl, no grt, no primary micas. 2 kg. | Y |  |
| **40** | 2 m wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt. Rare garnet. Locally abundant graphic texture, including some pl-qtz graphic intergrowth at the edges of the pegmatite. | Coarse pl-qtz-Kf assemblage with minor bt from center of pegmatite. 5 kg. | N | Likely connected to pegmatite 38 |
| **41** | 50 cm wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf, bt. Rare grt, ms. No graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 3 kg. | N | Same than adjacent pegmatites 11, 12, 42 |
| **42** | 50 cm wide unzoned pegmatite. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf, bt. Rare grt, ms. No graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 3 kg. | N | Same than adjacent pegmatites 11, 12, 41 |
| **43** | 4 m wide zoned pegmatite. Minor deformation and large scale layering suggesting two separate melt injection. Outer zone: abundant ms, megacrystic Kf, accessory grt and graphic texture. Inner zone: rich in ab and bt; no graphic texture, no grt, no ms. Many high aspect-ratio crystals perpendicular to the peg-WR contact. | 2 samples: 1) coarse pl-qtz-kf-bt assemblage from inner zone. 2) megacrystic Kf with qtz, minor pl, ms and accessory grt. Total of about 5 kg. | Y |  |
| **44** | 5 m wide zoned pegmatite. Well-developed qtz core (locally up to 2 m) with many megacrystic (< 1m) Kf megacrysts. Abundant ms, graphic texture and accessory grt, often concentrated at the edge of Kf megacrysts. Presence of graphic-like grt-qtz intergrowth as well as ms-qtz intergrowth. | Coarse Kf and qtz assemblage with minor pl, ms and accessory grt.  5 kg. | N | Likely connected to pegmatites 9E, 9W, 46 |
| **45** | 3 m wide zoned pegmatite. Mostly Kf, qtz, ab with minor ms, bt and accessory grt. Presence of graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 5 kg. | Y |  |
| **46** | 4 m wide zoned pegmatite. Mostly Kf, qtz, ab with minor ms, bt and accessory grt. Presence of graphic texture. | Coarse pl-qtz-Kf assemblage and minor bt. 3 kg. | N | Likely connected to pegmatites 9E, 9W, 44 |
| **47** | 3 m wide pegmatite. Extremely deformed and perfectly aligned with WR fabric. Remnants of a quartz core, many masses of fine-grained Kf, likely recrystallized Kf megacryst during deformation. No grt or micas, no graphic texture. | Several masses of recrystallized Kf in massive qtz. No pl, no grt, no primary mica. 5 kg. | Y |  |
| **48** | 80 cm wide zoned pegmatite. Undeformed and crosscutting WR fabric. Only peg intruding the Estaire pluton. Large, well-developed qtz core with 20+ cm Kf and ab megacrysts in the border zones | Megacrystic Kf in qtz with accessory ms. No pl, no grt. | Y |  |
| **49** | 1 m wide unzoned pegmatite. Slightly deformed and crosscutting WR fabric. Mostly Kf, pl, qtz with. No grt or primary micas, no graphic texture. | Coarse pl-qtz-Kf assemblage with minor bt from center of pegmatite. 5 kg. | Y |  |
| **50** | A few <50 cm wide pegmatites. Undeformed, crosscutting WR fabric. Mostly pl, qtz, Kf with minor bt and rare grt. No graphic texture. | One 10 cm-wide fragment of one dike. 1 kg. | N | Very similar to pegmatites 11-18, 26-27, 30-36, 41-42. |
| **51** | 1 m wide unzoned pegmatite. Deformed, crosscutting WR fabric. Mostly qtz, pl, Kf. No grt or primary micas, no graphic texture. | Coarse Kf-qtz assemblage with minor pl. No grt, no primary micas. 5 kg. | Y |  |
| **52** | Two 1 m wide unzoned pegmatites branching from each other. Undeformed, crosscutting WR fabric. Mostly Kf, pl, qtz, bt. Very rare grt, no graphic texture. Many WR inclusions, some pristine (angular), some deformed. | Coarse pl-qtz-Kf-bt assemblage from center of pegmatite. 5 kg. | Y |  |
| **53** | 2 m wide unzoned pegmatite. Very deformed and aligned sub-parallel to WR fabric. Remnant of well-developed qtz core. Many recrystallized Kf masses. No primary micas or grt, no graphic texture. | Coarse Kf-qtz assemblage with minor pl. No grt, no primary micas. 5 kg. | Y |  |