Version 2016_1.

THIN AND THICK SECTION MAKING REQUESTS:

PROCEDURES FOR STAFF and STUDENTS.

The submission process:

1. Planning your submission
2. Cutting your rocks
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Planning your submission:

- Plan your sample submission well ahead of time; samples are processed in the order received. If the job is urgent you have the option of asking the technicians if they want to work after hours at extra cost to you; an additional R80 per thin/thick section and R100 per fluid inclusion wafer.
- The sample preparation lab can make 25mm diameter round polished blocks (epoxy plugs) and polished or covered thin sections sized 26 x 46mm. (The height of the epoxy plugs will be standardized by the technicians at 12mm or less; **exactly** 22mm is another option if you need it for some reason)
- A maximum of 23 samples may be submitted at a given time. If you wish to submit more than 23 samples, the other samples will go into another batch that will fall behind the next person in the queue. This is to ensure that everybody gets a chance to get sections made and have something to work with while the other samples are being made. (Note that the technicians work with batches of about 10; thus the 23 will be released, upon completion, in 2 batches).
- It is a requisite that you group your samples that are alike; it makes the sectioning process more efficient for both you and the technicians, and minimizes cross contamination (e.g., BIFS together in one session; carbonatites together in another session, etc.).

For example, BIF and Mn-rich rocks have to be processed together and separately from other rock types because they contain very fine-grained material that pollutes the water used during cutting and grinding. The water has to be changed in the machines after cutting and grinding these rock types to prevent cross-contamination with other samples. This is time-consuming but necessary. These samples also have to be cut down using the slow saw rather than the Discoplan due to their hard and brittle characteristics. These types of samples will always take a little longer to process (BIF and Mn-rich rocks).

- Electron microprobe work requires a high quality polish as a **prerequisite** for the technique. Discuss the potential for **vastly** different polish quality between minerals with Andrea. If there are potential cases, and if you intend to do **electron microprobe** work on all those minerals, then you should have duplicate sections made of the same rock, but each duplicate optimized for specific minerals. Give those samples unique ID's.
- Know your samples: Are any of the minerals in your rocks water sensitive? Heat sensitive? Light sensitive? Hardnesses. Etc.

<u>Cutting your rocks:</u>

- **Students** must cut their own samples down to size. This is to avoid any confusion about what the student actually wants to sample and analyse. A wooden template block is available in the saw room to help you mark it out on your sample. If you cannot get the dimensions cut exactly, don't worry, the technicians can refine within a **few millimetres**.

  Staff may request (via Andrea) that the technicians cut their personal samples.

- After planning your work, and clearing the details with your advisor, arrange a time to meet with the Chief Technical Officer (Andrea) to be trained on the rock saw. Email her a.king@ru.ac.za or go see her in her office (18).
- A safety induction on the correct use of the rock-cutting equipment will be given and an induction form must be signed afterwards.

- Rock cutting can only be done in normal office hours when the technicians and the chief technical officer are present (7:30am-1pm and 2pm-5pm). This is a safety precaution and ensures that someone is always available to assist you while rock cutting.
- For epoxy plugs, the maximum size a piece of rock can be is 22mm diameter. For thin sections, the maximum size that a piece of rock can be is 23 x 38 mm. For both the thick and thin sections make sure your sample thickness is a minimum of 1 cm, just in case the section has to be re-made. Maximum of 1.5cm.
- Samples must be clearly labelled with a unique sample ID. Numbers like 1 or 2 or 3 etc. will not be accepted. Either create a sample ID with your initials or borehole ID or locality ID e.g. JB01-1. The sample ID must be clearly written on the back of the sample. Eight characters should be the max. **Make sure your sample numbers are unique, or else we may lose track of some during the sectioning process.**
- Double check that sample ID's are not duplicated and the sample ID on the sample matches what is written on the sample submission form.

Filling out the form:

- Partially completed forms will not be accepted. This form can be found on the RU website under "Geology" and under "Analytical facilities". http://www.ru.ac.za/geology/geology/analyticalfacilities/
- The sample ID's on the form must match those written on the samples.
- Make sure to use the correct code for polished thin-section; covered thin-section; polished block (epoxy plug); or fluid inclusion wafer. (See codes on form).
- The rock type is very important to fill in, because different rocks need to be set, ground, and polished differently.
    - Hard or soft.
    - Brittle or ductile.
    - Friable.
    - Coarse grained.

- Flag the most important minerals you are interested in, in case it happens that the sectioning lab needs to make sacrifices in polishing quality between minerals. For example:
  If your sample contains minerals of different hardness it may be difficult to get a very good polish on all the minerals in the sample. If you have soft sulphides in a rock like a norite (feldspar and pyroxene) the sulphides will polish a lot quicker than the felsic minerals. The sulphides can easily be over-polished leaving pits and be picked out of the sample, while trying to get a good polish on the felsic minerals. If the sulphides are the important minerals for analysis, then the lab will aim to get the best polish on the sulphides rather than on the matrix minerals.

- The remarks column is only for special instructions like 'sample must be 50 microns thick rather than 30 microns' or 'very friable – impregnate' or 'polish only' or 'no resin impregnation'. It is not for general instructions or rock types.

Submission.

- Samples must be given to the Chief Technical Officer (Andrea) for submission. They **must not** go directly to the lab technicians. A requisition form must be completed **by computer** and emailed (not hand delivered) to a.king@ru.ac.za **before** the samples are physically handed in.

Collection.

- All communication should go through Andrea; **do not** work directly through the technicians yourself. This is to avoid miscommunication issues.
- Samples will be released in batches of about 10.
- You will be emailed when your sections have been made and the quality has been checked by Andrea. After receiving the email you may come collect it. The polish must be checked by either Andrea or the academic supervisor as the quality of the polish is critical for SEM-EDS or electron microprobe analysis.
- All samples and jobs must be signed in and signed out. **No one may take a sample without signing for it first**.

- Please make sure to ask for your offcuts in case you want more sections made or want to use that sample for some other type of analysis. The offcuts should be handed to you on completion but check if you have been given all of them. Sometimes there is no material left over after the sections was made.
- Sometimes a sample may need to be re-made and you will receive it a little later than the rest of the samples in a batch. It must still be signed for. All sample submissions must go through Andrea and not go straight to the technicians. This is to ensure that there is a record of what samples were submitted, digitally and physically.