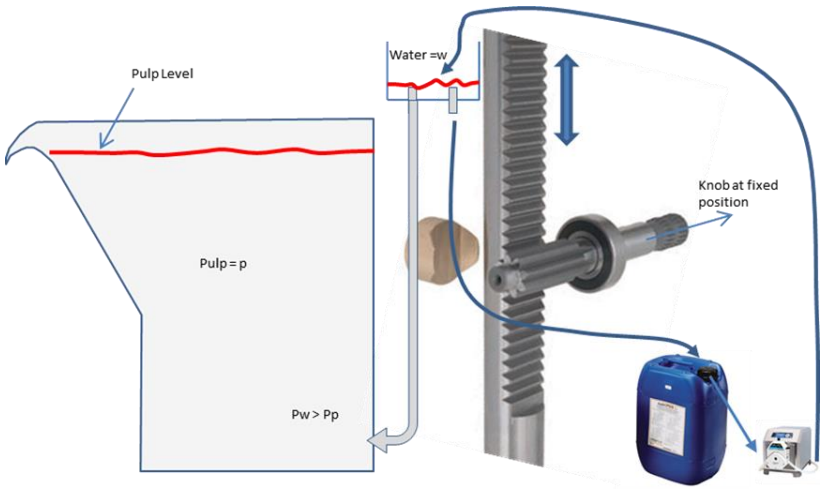
There are a few other considerations you need to look at when you are looking at froth height vs concentrate grade and screen analysis. Frank gave you some the measurement of grade gradient which would be applicable for continuous reactor. For the lab, you can do the same test but need to refresh the feed after level sampling. In all, there are other considerations:

1. Getting a correct level. When we (At Aminpro) want very accurate level control in the lab, we have a unique setup consisting of a water reservoir located above the cell that receives water from a main stock tank placed on the floor. The reservoir has two outlets at the same elevation: one connected to the bottom of the flotation cell and one to overflow to a water stock tank. If we ensure that the water pumped from the main stock tank to the reservoir keeps water flowing back to the stock tank, the loops is then automated. The reservoir is attached to a manual gear level positioner such that we can set its level at a desired position. As the density of the pulp is higher than that of water, the reservoir o/f pipes will always be higher than the cell. The difference can be calculated in your spare time. Then you need to adjust for air holdup…another gem to account for (hint: check the level with air and without air and estimate air holdup).



2. Changes in Froth Recovery (*Fr*): when you change the froth bed height, you are indeed changing the froth recovery and therefore the overall cell recovery from the following, where R_{flot} is the flotation recovery and *Rc* is the lab collection zone recovery Rc = (1 – exp(-kt)). Rmax. You can determine froth recovery by doing a few froth bed heights and extrapolating to zero height.

$$R_{flot} = {Rc.Rf}\Big/{(Rc.Rf \quad + \quad 1 - Rc)}$$

3. Entrainment Recovery of solids (*Re*): various degrees of entrainment (D.E. = Re/Rw) come into play when you change the froth bed. For one you tend to entrain more water (higher water recovery (*Rw*) when the bed is shallow, and with it more solids. The changes in the degree of

entrainment (D.E.) are huge and well defined for industrial processes when you change air and froth depth. It closes the calculation of total cell recovery with the following expression:

$$R_{tot} = \left[R_{flot} + \left(1 - R_{flot}\right)\right] Re$$

Now you have the full picture….but yes, leave items 2 and 3 out and follow Frank's notes.