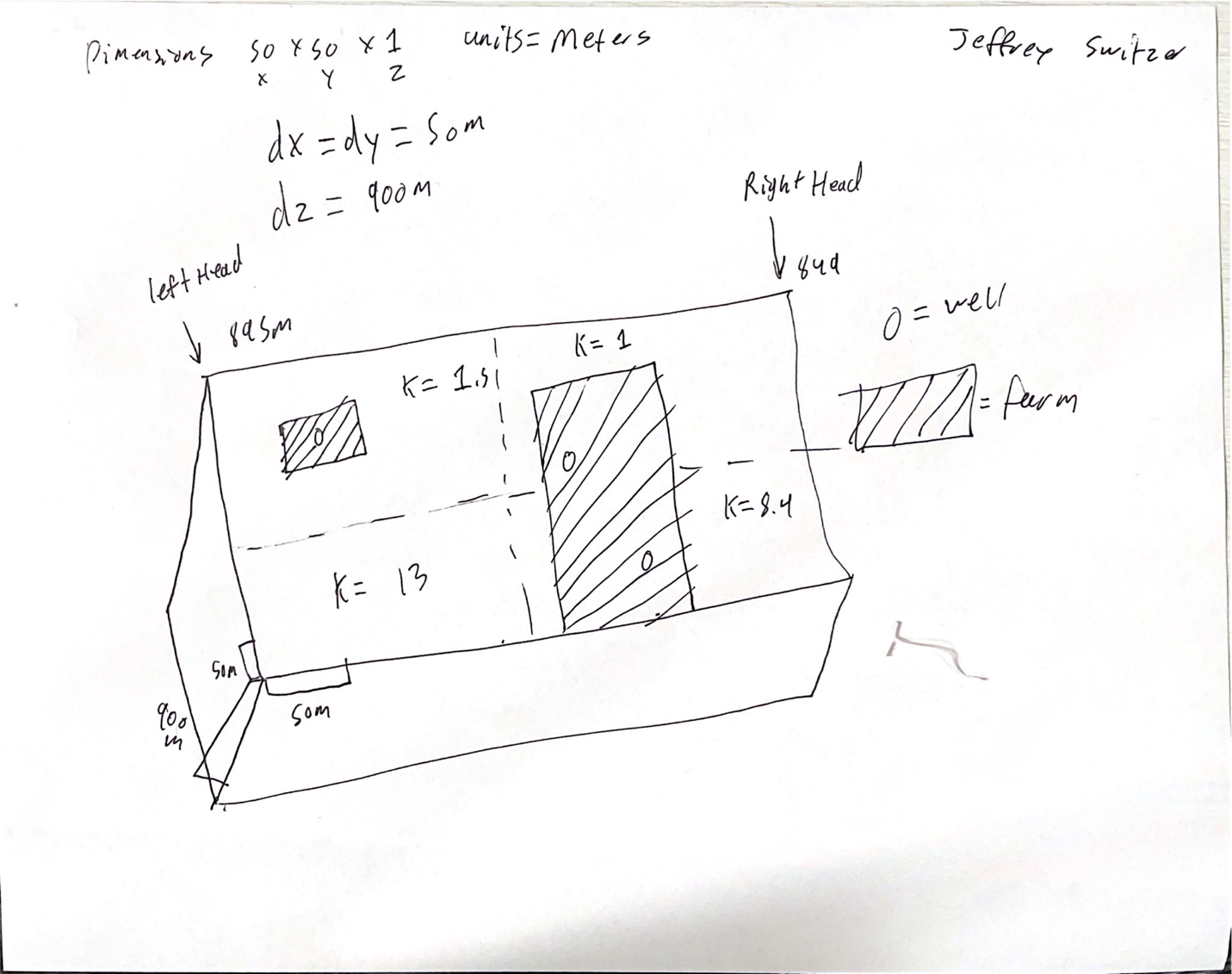
“HW\_7\_Disscusion\_questions\_Switzer”

(All images and information are based off of justin’s project information”



1. The grid resolution is set to 50 by 50 to get a finer resolution than our last few models due to the 350m by 350m far so it fits neatly into its grids rather than having have a grid empty but counting all of it with a 100m resolution.

Values for the pumping rates were calculated by multiplying the irrigation needs for cotton and alfalfa by the area of the farms with a 421 m^3 pumping rate for the wildcat farm and a 12409m pumping rate split over two wells on the acme farm. ET rates were a giving value to us.

The boundary conditions are assumed to be constant head with 895m on the right and 849m on the left.

Some assumptions that are made are that there are constant heads to the left and right of the system, ET is not different on the farms than in the surrounding land, k values are constant per quadrant of the map and don’t gradually change, there is no recharge over the farm land and the farms are not wasting any water.

The three scenarios that I will be simulating if the well is as farm from each other as possible, if both are in the high k section, and if wildcat farm were to get well right s in the high k zone Infront of the ACME farm.

1. Due to my code not working I will be more conceptual that graphical in my analysis

If the ACME farms were to place their wells as far apart from each other as possible one well will be in the low k and one in the high k and the cone of depressions will not be in as close a proximate to each other but it will drop the head to below the 20 m catch distance of the wildcat well. If the wells are placed near each other the cone of depression would be so big that they would no longer be able to intake water. And with the last one the wildcat farm would be able to take water and still have get its necessary water while letting other water get to the ACME farms wells.

The most likely scenario is that the wells are far apart and the wildcat well will not have any water.

The best case scenario is the well being away from the Wildcat farm but that is not very likely while the worst case of the two wells being on the ACME farm being far a way and the Wildcat well drying up.

Glossary questions

1. What does it mean to be simulating saturated flow vs variably saturated flow? What are the advantages and disadvantages of each? Why is it much harder to solve for unsaturated flow? Integrate the concept of a linear versus a nonlinear model into your answer.

Saturated flow is when the entire column or head has water flowing through it while variable flow changes the head value but only has flow that is saturated through it. advantages to saturated flow is that it is very simple but not a accurate while variable is more accurate but harder to solve. It is harder to solve for unsaturated as it is a different equation that you have to solve for that has significantly more variables.

1. What is meant by an internal source/sink for ground water flow and how is it different than a boundary condition? Give an example.

The source or sink for ground water flow means from which boundary has water coming from it while sinks remove it from the system and they are different from bounaryies as they create or destoy water from the system rather than keep a constant head at a boundary and calc the flow.

1. What is meant by ‘forecast uncertainty’ in the context of a groundwater model? What are the sources of this uncertainty? What is required for a prediction to be as robust as possible?

Forecast uncertainties are variable we don’t know exactly in ground water flow models some come from k values over an area the ET of certain plants over an area and the resolution at which these calculations are done to change them. A prediction to be robust must be able to work with in a range of values and show what would happen without breaking