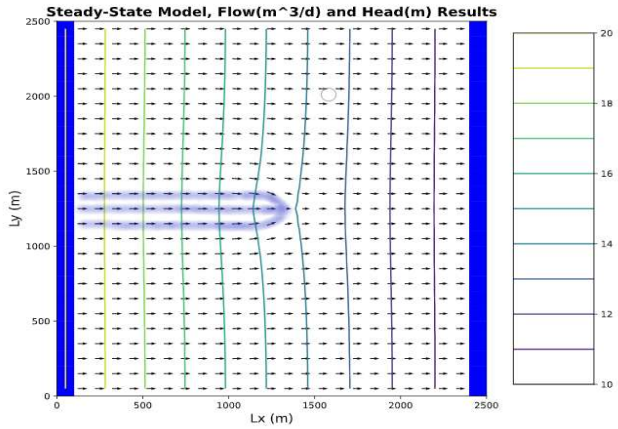
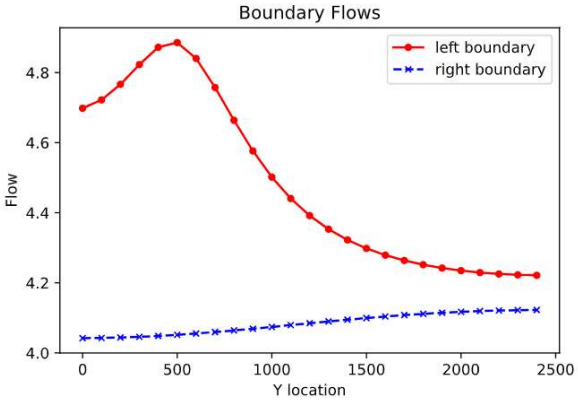
In this capture diagram, it seems to me that all of the flow highlighted in blue should be headed right into the well. It seems that the flow just upgradient seems to increase slightly. Maybe the area just next to the flow line is contributing to the center flow line



well moved to 5, 5

When this move occurred the symmetry of the system was no longer present so the contours no longer resembled circles



Changing the head values to be equal on both the left and right side, and then moving the well back to (12, 12) seems to have fixed this.

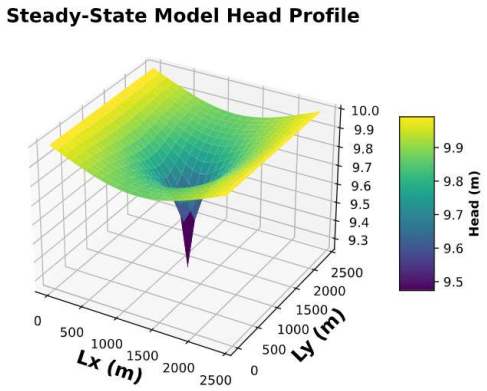
Initial Challenge responses

I believe that we are still modeling steady state conditions. After the system reaches steady state I'd expect that the flow in this model would be coming, ultimately, from the constant head boundaries. In order satisfy conservation of mass, the same volume of water must move through the areas that the areas further out supply. Because the area that the water moves through decreases as you get closer to the well, the velocity of that water needs to increase. I think that the hydraulic head decreases exponentially as it gets closer to the well because the associated increase in velocity causes head loss.

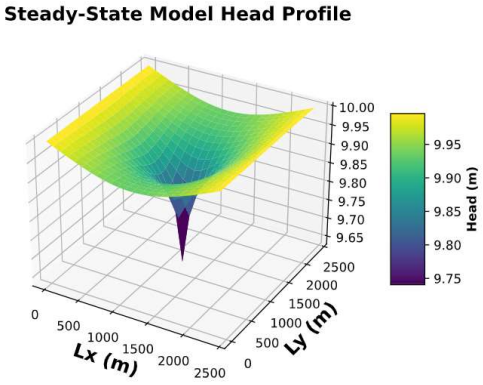
If the right head boundary represented a stream, that stream would have to be one of the sources of the water being pumped from the well. In many of these models I also had a constant head on the left side too. If the pump extracted sufficient amounts of water, the stream could conceivably dry up as a result of the pumping.

If we move the well to the center and increase the pumping rate, I expect to see the same profile for the cone of depression, and the magnitude of that cone increase with the pumping rate. At some point, the pumping should exceed what the system can handle and then I don't really know what would happen in a model.

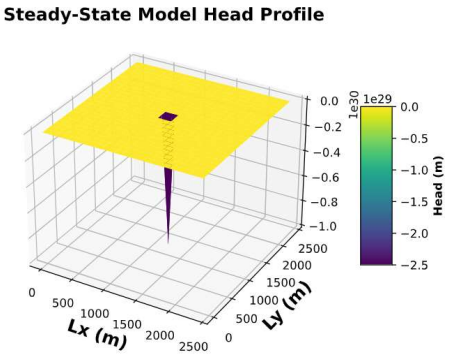
5 m^3/day



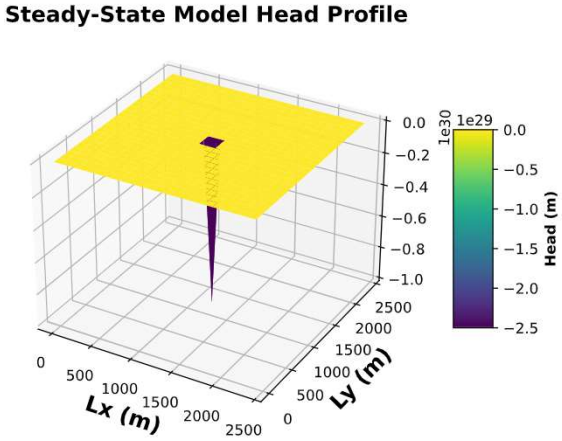
10 m^3/day

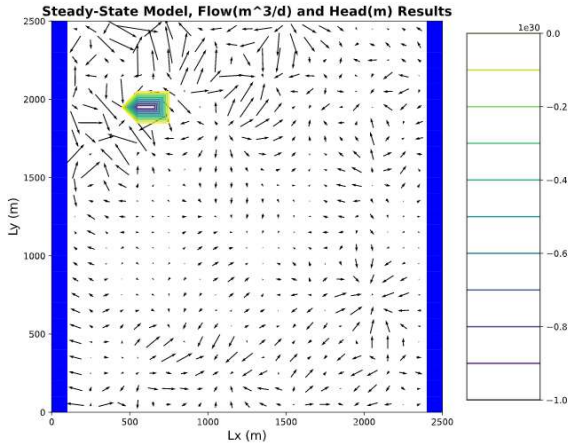


20 m^3/day



25 m^3/day





The model seems to have started to behave erratically after pumping around 20 m^3/day. My guess is that this is around the upper limit to what this system can supply. I think the constant head values and the depth of the model are probably what are limiting the amount that can be withdrawn.