

Weekly Status Report – Niles Guo Oct 22, 2017

This week's activity:

1. Transcribed the rough outline of the paper outline onto word format and uploaded onto Asana. This will make future collaboration easier.
2. Had an extremely productive meeting with Tim to go over how we want to tackle the validation task using his research. We first worked through the different decision variables, parameters, and constraints in his model. Then we extended it to think about who the decision makers are, and from there we identified the submodules that we want to have for this CADS model (See next section below). I'm going to summarize the raw information and try to create both a process flow and a submodule flow to visualize what each decision makers are responsible for, and how the variables are interconnected.

Brainstorming Results:

Decision Variables:

Fracking Schedule (binary)

Freshwater and waste water piping (binary)

Water Transported (Continuous)

Via truck

Via pipeline

To disposal

To reuse

To central storage

Fixed inputs:

Gas Production

Water demand

Waste water production

Locations

Cost parameters

Constraints

TDS limit

of Fracking crew

Policy scenarios (location limitation, traffic limitation etc)

Pipe size

Different Decision Makers:

Waste Water Treatment Expert:

- Technology used

- Scalability, cost, and TDS limit
- Disposal options and rates
- Reuse opportunities and value

Fresh Water Expert:

- Water availability
 - o Where?
 - o When?
 - o How much to transport?
- Discharge threshold

Transportation Expert:

- Pipeline
 - o Cost, feasibility, size
- Trucks
 - o Cost, feasibility, type of truck

Well-pad operator:

- Water demand, waste water production, quality of water
- Gas production, # of stages, lifespan
- Waste water storage
- Freshwater impoundment

Senior Management:

- Well location
- Scheduling
- Number of fracking crews

(?) Regulatory:

- Possible reuse of waste water
- Discharge requirements
- Rates of disposal
- Rates of trucking
- Connection constraints

Issues/Agenda for next meeting

1. I want to walk through the brainstorming session I had with Tim, focusing especially on the decision makers and their responsibilities. I'm hoping to have a few of the process flow diagrams ready by the time we have our meeting, so I want to walk through that as well, so that we can think about both what variables each decision maker is responsible for, and how they interact with each other.

2. If we have time, I also would love to hear your feedback on the paper outline as well.

Next week's activity:

1. Incorporate the feedback for both the validation model and the summary paper based on our meeting on Monday.