Drainfield to Surface Water Setback Distance Subcommittee
Teleconference Meeting Minutes
Wednesday, 04/21/2010, 10:00 am

Teleconference
Date: 2010-04-21
Start: 1010 hours

Attendance: Boise: AJ Maupin, PE; Bill Holder, PE; Joe Canning, PE
Pocatello: Allen Worst
Athol: George Miles, PE
Kimberley: Dr. Jim Ippolito, Ph.D. USDA
Idaho Falls: Nathan Taylor

Missing: John Corcoran (Realtor Association Representative); Brett Skidmore (Building Contractors Association Representative); Dick Martindale

Meeting called to order at 10:10 am.

Past Meeting minutes:

March 31, 2010 Minutes: Prior meeting minutes presented. Motion made to approve the minutes as presented, the motion was seconded and the minutes passed.

Surface Water Negotiated Rulemaking:

AJ notified the subcommittee that the Surface Water Group was entering into negotiated rulemaking to address the lack of surface water anti-degradation procedures. Currently, DEQ has an anti-degradation policy, also required by the Clean Water Act, but DEQ lacks procedures. AJ will keep the subcommittee informed on the progress of these negotiated rulemaking activities.

Vadose Zone Modeling:

Additional modeling results based upon the anticipated effluent quality being discharged to the drainfield of only 9 mg-P/L (9 ppm) were presented. Breakthrough was defined as when the effluent leaving the bottom of the vadose zone reached 50% of the influent concentration, or 4.5 mg-P/L (4.5 ppm). The models were run using various soils from around the state, and varying the thickness of the vadose zone. The vadose zone thickness beneath the trench varied from 1 foot to 4 feet in 1 foot increments. The soils modeled and the resulting drainfield lifetime are presented in the following table:

	Depth to Groundwater (ft)			
Soil Series	1	2	3	4
	Number of Years Before 50% of Amorphous Fe + Al Sites are Filled (1:1/2:1 sorption)			
Logan (silty; SE ID)	41 / 21	83 / 41	124 / 62	166 / 83
Declo (loamy; S ID)	10 / 5	21 / 11	32 / 16	42 / 21
Greenleaf (silty; SW ID)	67 / 34	134 / 67	201 / 101	268 / 134
Palouse (silty; N ID)	60 / 30	119 / 60	179 / 89	238 / 119
Santa (silty; N ID)	40 / 20	81 / 41	122 / 61	163 / 81
Threebear (loamy, N ID)	258 / 129	516 / 258	775 / 388	1033 / 517

The soils of southern Idaho are predominantly calcareous with a resulting high pH. These are the Logan, Declo and Greenleaf soils. Some concern with the results from the Declo soils was voiced because these soils have about ½ the amorphous metal (AL & Fe) phases as the Logan soils but the drainfield lifetimes are substantially less than those modeled in the Logan soils. The Excel spreadsheet results and the Mintec modeling results were both of the same order of magnitude so they appear to roughly agree.

These modeling results can be scaled up because the drainfield's size increases as the flows increase. Additionally, there was a strong consensus in past subcommittee meetings to pressure dose the drainfields to maximize the soil's ability to filter phosphorus and prevent point loading and saturated flows in the drainfield.

A question whether sandy soils had been considered was posed. Sandy soils had not been modeled for various reasons. The NRCS database does not provide the mineralogy of sandy soils. Also, there are difficulties linking

specific soils to depth to ground water. It was suggested that if phosphorus is the constituent of concern for the site, then during the site evaluation a soil mineralogy analysis should be required. The TGC should consider this additional requirement. The question of practicality and expense arose. These costs should be investigated and presented to the subcommittee.

It was recommended that we come back to these results at the next meeting after everyone has had time to review.

Saturated Flow Modeling:

A sensitivity analysis was performed on the variables identified in previous meetings. Those variables that proved to be the most important were:

- Saturated hydraulic conductivity (k)
- Effluent concentration
- Ground water gradient
- Background phosphorus concentration
- Surface water dilution flows
- Soil metal concentrations (Fe, Al, Ca)
- Soil loading rates
- Wastewater constituent concentration
- Distribution method (pressurized)

Variables that may impact but were not thoroughly evaluated included:

- Surface water type and
- TMDL

Variables that were determined to be of little influence were:

- Unsaturated hydraulic conductivity
- Soil bulk density
- Plasticity

The Variable list will be modified to reflect this and returned for discussion at next meeting.

The saturated flow modeling was completed using an hydraulic conductivity of 10 feet per day (fpd), a gradient of ½% (0.5%), a background aquifer phosphorus concentration of 0.01 mg-P/L (0.01 ppm) and a variable phosphorus loading from 2 to 20 mg-P/L (2-20 ppm). The model was run to simulate 20 years of discharge to the drainfield. These modeling states helped identify the impact/importance of each of the variables.

Why a duration of 20 years was used was posed. This is the expected useable life of a drainfield which has led the NP Study program to recommend modeling for this duration to evaluate impacts at the point of compliance.

Another question about whether surface water impacts were evaluated at the 300 foot distance arose. Yes, the model was run using continuity equation with surface water dilution providing a volume of 25% of stream flow. The stream dilution contribution was the most influential variable and the existence of a TMDL (Total Maximum Daily Load) in the receiving water will be critical.

Evaluation of lakes and reservoirs were difficult due to lack of information on how to proceed. The variables were not rated with respect to modeling of lakes and reservoirs.

Some members mentioned that they were finding it difficult understanding the entire situation, variables and their interaction. We may wish to discuss further at next meeting. Some members felt that they have a better understanding of what is going on now.

The variable listing will be modified for this next meeting's discussion.

Next Meeting Schedule:

The next meeting is scheduled for Wednesday, 12 May 2010, from 10:00 am MDT (9:00 am PDT) to 12:00 pm MDT (11:00 am PDT). This meeting date and time was subsequently changed to Friday, 14 May 2010, from 9:00 am MDT (8:00 PDT) to 11:00 am MDT (10:00 am PDT).

Meeting Topic:

- Discuss the vadose zone modeling modifications proposed in this meeting.
- Discuss the impact of changing the input to the saturated flow modeling to 4.5 mg-P/L. Discuss variables and their impact on modeling.
- Discuss acceptable technologies for sequestering phosphorus in the effluent stream and possible impacts to surface water setbacks.

Meeting adjourned at 11:45 am.