Quarterly Report 12 - Covering the second quarter of calendar 2008 (April through June)

I. PHASE 1 PROGRESS

Ongoing tasks for Phase 1 (evaluation of third-party assessments) include:

- Working with MMPA's Environmental Quality Assurance program coordinator on further refinement of EQA tools, and extending them to cattle operations.

II. PHASE 2 PROGRESS

Following is a summary of progress on Phase 2 (the self-assessment pilot) deliverables.

1. Completed MinnFARM feedlot runoff model calculations for all but 5 of the 60 Phase II volunteer and control farms with open lots (7 farms ended up having no open lots or their lot runoff flows to containment). The MinnFARM work took longer than anticipated as project staff waited for the MinnFARM model to be updated and some farms required multiple model runs. The 55 farms presented 86 open lots or groups of open lots since many farms have multiple open lots or discharge points. The MinnFARM model allows the user to assess each discharge point separately when runoff flows in different directions on the same farm. MinnFARM results are presented in table form on page 2.

   There are five main inputs to MinnFARM: 1) Lot size (a primary factor influencing run-off volume), 2) Buffer (or vegetative treatment area) size and type, 3) Soil type (even though most are hydrologic B group), 4) Stocking density of lot, 5) Area 2 contributions (clean water that flows through the lot). The projected loadings are based on county-by-county averages for annual precipitation including all events up to those experienced every 25 years. This means that rain events up to about 5 inches in 24 hours are anticipated in the model, with the possible result that intermittently-flowing waterways can transport pollutants to permanent surface water features every year. Outputs of MinnFARM are annual loadings of chemical oxygen demand (COD), nitrogen, fecal coliform, phosphorus, and biochemical oxygen demand (BOD5) in pounds (with the exception of fecal coliform which is in CFUs – colony-forming units) *after* any and all treatment. MinnFARM numbers are *not* what is leaving the lot prior to treatment.

   The basic caveats for the MinnFARM analysis follow. First, project staff are using MinnFARM results in a new way: to analyze group performance. At this point we don't know how well MinnFARM can be applied in this way. Second, the results represent discharges from open lots after any available treatment, regardless of whether those pollutants are ultimately reaching and impacting surface water. Thus, MinnFARM values are not the final indicator of compliance. Project staff will be reviewing maps and aerial photos of project farms to determine proximity (including for intermittent transport) to priority surface water (e.g., lakes and protected wetlands). This layer of information will help prioritize farms for correction of any noncompliance issues. Third, for some as-yet unexplained reason, MinnFARM runs on some lots generated a zero value for fecal coliform, even when those runs produced significant levels of other pollutants associated with manure. Project staff are pursuing this issue with the model's developer.

   The approach we are exploring in this project is to use MinnFARM to calculate a baseline potential for loading, even if that loading only occurs under extraordinary circumstances. When corrections are made, a second model run inputting the new conditions will give a sense of the numeric reduction of potential loading or need for further treatment. In a way, this is a "beyond-compliance" approach in that reducing potential loadings is protective under even the most extraordinary circumstances. In contrast, the feedlot program uses MinnFARM to help judge compliance with standards in the event of discharge to public waters and to help prioritize cost-share allocations. For these applications, the program uses only the MinnFARM BOD5 result and to its phosphorus value when the discharge more-or-less directly flows to a lake. The other MinnFARM parameters are not yet regulated nor considered a concern.

   For 17% (3 of 18) of the volunteer farms and 24% (9 of 37) of the controls modeled, MinnFARM calculated at least one BOD5 discharge exceeding standards. Interestingly, while volunteers' herd sizes exceeded those of controls by some 36%, per-farm discharges for volunteers exceeded those of controls by 60% or greater on average. Further analysis will be necessary to exclude the influence of small numbers of outlying (very high or very low-discharging) farms and determine the statistical significance of any remaining differences. Also, more analysis will be necessary to see if there are any correlations between discharge levels or rates and farm size or geographic location (county or region of state).

   The MinnFARM exceedance results *suggest* noncompliance and priority for correction but as was mentioned earlier, this is not the final word on compliance. To illustrate this, only 2 of the 3 volunteers and 3 of the 9 controls modeled as exceeding were initially assessed as having discharge to surface water and/or inadequate vegetative treatment, and 3 other volunteers and 11 other controls for whom MinnFARM did *not* model BOD5 exceedance *were* assessed as having inadequate treatment. For now the message is that MinnFARM numbers represent potential discharge only and are not yet linked to actual discharge or compliance status.

	Otter Tail	Pine	Kanabec	Carlton							
VOLUNTEERS	(11)	(3)	(2)	(2)						All (18)	Per farm
Total COD	4382	295	540	437						5654	314.1111
Total Nitrogen	220	15	30	23						288	16
Total Fecal	1.53E+15	7.72E+13	0	8.81E+13						1.69E+15	9.41E+13
Total Phosphorus	67	4	9	7						87	4.833333
Total BOD5	988.187	65	120	97						1270.187	70.56594
All AU in project	2564.96	318.3	395.5	217						3495.76	
MinnFARM AU	1663.66	270.3	395.5	217						2546.46	
Ave AU per farm	151.24	90.1	197.75	108.5						141.47	
BOD5 Exceeded	2		1							3	16.7%
PER FARM (VOLS)											
Total COD	398.3636	98.33333	270	218.5							
Total Nitrogen	20	5	15	11.5							
Total Fecal	1.39E+14	2.57E+13	0	4.41E+13							
Total Phosphorus	6.090909	1.333333	4.5	3.5							
Total BOD5	89.83518	21.66667	60	48.5							
	Otter Tail	Pine	Kanabec	Carlton	Olmsted	Wabasha	Redwood	Lyon	Chippewa		
CONTROLS	(11)	(5)	(1)	(2)	(10)	(8)	Soon	Soon	Soon	All (37)	Per farm
Total COD	2777	474	610	39	1524	1775				7199	194.57
Total Nitrogen	143	26	33	2	79	95				378	10.216
Total Fecal	4.69E+14	2.82E+13	3.3859E+14	8.52E+12	3.05E+14	4.98E+14				2E+15	4E+13
Total Phosphorus	35	7	10	0	22	28				102	2.7568
Total BOD5	617	105	135	8	338	416				1619	43.757
All AU in project	1529.5	629.7	126	96.6	682.5	972.7	526	100.2	81.4	4744.6	
MinnFARM AU	1337.4	629.7	126	96.6	682.5	972.7				3844.9	
Ave AU per farm	121.58	125.94	126	48.45	68.25	121.59				103.92	
BOD5 Exceeded	3	1	1		3	2				10	27%
PER FARM (CON)											
Total COD	252.4545	94.8	610	19.5	152.4	221.875					
Total Nitrogen	13	5.2	33	1	7.9	11.875					
Total Fecal	4.27E+13	5.64E+12	3.3859E+14	4.26E+12	3.05E+13	6.22E+13					
Total Phosphorus	3.181818	1.4	10	0	2.2	3.5					
Total BOD5	56.09091	21	135	4	33.8	52					
VOLS+CONTROLS										All (55)	
Total COD	3863	769	1150	476						12853	
Total Nitrogen	185	41	63	25						666	
Total Fecal	4.93E+14	1.05E+14	3.39E+14	9.66E+13						3.34E+15	
Total Phosphorus	102	11	19	7						189	
Total BOD5	1605.187	170	255	105						2889.187	
BOD5 Exceeded	5/22=23%	1/8=13%	2/3=67%	0%	3/10=30%	2/8=25%				13/55=24%	
V+C PER FARM											Per farm (55)
Total COD	325.40909	96.125	383.3333	119							233.690909
Total Nitrogen	16.5	5.125	21	6.25							12.1090909
Total Fecal	9.088E+13	1.32E+13	1.13E+14	2.42E+13							6.0683E+13
Total Phosphorus	4.6363636	1.375	6.333333	1.75							3.43636364
Total BOD5	72.963045	21.25	85	26.25							52.5306727

II. PHASE 2 PROGRESS continued

2. Mailed out the Self-Assessment Workbooks and Response Forms to all who completed them last year plus those who initially volunteered but did not ultimately submit the Response Form last year (39 total);
3. Have received 14 completed Response Forms (compared to 23 last year – will investigate the causes for non-returns);
4. Within the reporting period, project staff completed 8 inspections (will be completing remaining inspections July through September). Of course, 2008 inspection data will be analyzed in much greater detail in months to come, but in general, farmers exhibit greater understanding of performance and compliance issues. Some have undertaken basic corrections (e.g., removing burn barrels) and others are beginning to move on easier lot and manure management corrections. However, many are clearly not acting on information mailed to them following the baseline round of inspections in 2007;
5. Secured EPA supplemental funds and internal agreements necessary to continue the primary FERP inspector in that role through September;
6. Continued internal discussion of permanent implementation.

III. LEVEL OF EXPENDITURES

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