Project title:	Environmental Results Program Applied to Feedlots
Applicant agency:	Minnesota Pollution Control Agency
Project contact:	Kate Brigman Regional Environmental Division Minnesota Pollution Control Agency 1230 South Victory Drive Mankato, MN 56001 Voice 507-389-1775 Fax 507-389-5422 kate.brigman@pca.state.mn.us
Funding requested:	$130,306
Project period:	January 1, 2005 – December 31, 2006 (work begins before the anticipated award date of January 1, 2005)

Current situation and need

The MPCA has the responsibility to regulate the collection, transportation, storage, processing, and land application of animal manure for the prevention and abatement of water, air, and land pollution. As of August 2004, MPCA estimates that over 30,000 regulated animal feedlot and manure storage sites exist in Minnesota. Those sites regulated are feedlots over 10 animal units (AU) if within shoreland and over 50 AU if outside shoreland. Regulated storage areas store manure for 100 or more animal units. Minnesota also regulates the rate, location, and timing of manure application to soil. Current data shows that 11,460 feedlots are located within 1000 feet of surface water (an approximation of "within shoreland"). Beyond the issues present at the animal holding area or manure storage site, manure application activities have the potential to release nutrients into surface and ground water supplies. It is important to prevent the contaminants in manure from moving from the animal holding areas and manure storage areas as well as from land application areas.

In manure, the constituents most impacting water quality include phosphorus, nitrogen, biological oxygen demand, and disease-causing organisms (pathogens). Human health and the environment are put at risk from these water quality impact factors. The problems caused by the contaminants or the results of environmental contamination have different pathways of entry and source areas. Various types of gaseous compounds emanating from manure are an additional human health and environmental concern.

Watershed projects conducted through the Minnesota Clean Water Partnership Program have diagnosed water quality problems in 37 project sites throughout the state. Sixteen projects identified feedlots as significant contributors of contaminants to lakes and streams. While the statewide effects of contaminants from manure have not been completely separated from other sources of pollution, it is clear that surface water quality is being impacted from agricultural sources in general, which includes discharges and runoff from feedlots and manure application sites.

To address these issues, MPCA implemented its updated feedlot rules in October 2000, which included a requirement that owners register their feedlots and manure storage areas. Additionally, the MPCA focused its staff on inspection and compliance. Over 30,000 sites are now registered. Of the registered sites, approximately 600 are currently regulated through NPDES permits; an additional estimated 200 will require NPDES permits under EPA's new CAFO rules; the remaining sites are regulated through state rules and permits.

In addition to permitting and registration requirements, all livestock facilities required to have a permit, NPDES or state-issued, are required to have a comprehensive nutrient management plan. Review of plan record keeping is conducted as a portion of site inspections. State rules will require nutrient management plans for all livestock facilities greater than 300 AU by January 2006.

Problem statement

At existing rates of inspection, and given tight state and county budgets, the estimated time to reach all 30,000 state feedlots would exceed 10 years. In the meantime, MPCA and the citizens of Minnesota have an incomplete grasp of whether these feedlots comply with the state and federal rules. In addition, focusing only on the regulatory program ignores the possibility that non-regulatory tools could be effective in improving environmental performance and

bringing feedlots into compliance long before an inspection and formal compliance tools would discover issues of poor performance or noncompliance.

Project purpose

The MPCA proposes to test an Environmental Results Program approach for feedlots, with a special focus on preventive and whole-farm Best Management Practices and management systems.

The Environmental Results Program (ERP) has the potential to cost-effectively reduce environmental impacts in industry sectors comprised of large numbers of facilities that, on their own might have low impacts but taken together, may present a substantial cumulative environmental risk. Businesses targeted so far by ERP include gas stations, auto salvage yards, auto body and mechanical repair shops, dry cleaners, and printers. ERP can help environmental agencies identify previously unknown facilities, measure performance, increase regulatory efficiency, and help improve overall environmental performance. ERP is in part designed to help facilities that want to comply but don't understand their requirements. Evidence suggests that ERP can motivate operators to comprehensively review their environmental performance and take needed action to come into compliance and adopt best practices.

Self-certification, assistance in partnership with the Minnesota Milk Producers Association, and other ERP tools will help feedlots improve environmental performance and compliance in a more timely way, and without the typical level of MPCA and county effort. Partnership with the producer associations will aid development and distribution of the program. Statistical approaches will be used to help MPCA draw conclusions about compliance rates in various feedlot sectors and sized facilities, and will guide targeting of compliance assistance and inspections.

The project also aims to extend the basic water quality protection and land application management aspects of the feedlot rule to deal with odors, dusts, pests, ancillary and maintenance operations, related feed crop production, and many other aspects of operations, pushing toward a multi-media, "whole-farm" management system.

Project goals and objectives

Recognizing that the stakeholder process involved may alter them somewhat in the course of the project, goals and objectives for the project include:

GOAL 1: Understand and communicate the universe of state and federal feedlots in Minnesota and their compliance/performance vectors over time

OBJECTIVE 1: Maximize quality and completeness of MPCA's feedlot database

OBJECTIVE 2: Develop hard copy and electronic self-certification annual submittal system and integrate inspection data

GOAL 2: Maximize leverage through partnerships

OBJECTIVE 1: Strengthen producer (association) partnerships through project planning and implementation

OBJECTIVE 2: Develop partnerships such that performance improvement is lead by the producer associations.

GOAL 3: Test the ERP methodology in the field to determine effectiveness of self-certification process on this regulated sector.

OBJECTIVE 1: Determine baseline conditions

OBJECTIVE 2: Operate facility self-certification cycle

OBJECTIVE 3: Follow-up inspections/assessments with all baseline facilities to gauge effectiveness of process, program materials and services in attaining compliance and multi-media performance goals

OBJECTIVE 4: Explore these possible research questions:

- Does self-certification with Minnesota Milk Producers Association (MMPA) or state or county assistance yield equal, better, or earlier compliance results and better overall performance than that accomplished by dairies that do not undergo a self-certification process? What are the relative costs?

- Does self-certification without significant MMPA or state or county assistance yield equal, better, or earlier compliance results and better overall performance than that accomplished by dairies that do not undergo a self-certification process? What are the relative costs?
- Does self-certification with MMPA or state or county assistance yield equal, better, or earlier compliance results and better overall performance than that accomplished under the state interim permit or Open Lot Agreement programs? What are the relative costs?

Interim permits, issued by counties and the MPCA, are essentially return-to-compliance schedules of 24-27 months for non-CAFO feedlots (larger than 300 AU) inspected and found to be out of compliance. Open Lot Agreements allow feedlots under 300 AU to attain 100% compliance by 2010.

This project will allow MPCA to explore whether an approach modeled upon the Environmental Results Program can help achieve these goals, while improving regulatory cost-effectiveness.

Geographic focus

Initially, MPCA intends to pilot the ERP approach in 2 dairy-rich counties along the Mississippi River: Stearns in central Minnesota and Winona in southeastern Minnesota. Depending on results, MPCA may then extend the experiment to dairies statewide or test the approach in other feedlot sectors such as swine or turkeys (or both).

Partners, Roles and Responsibilities

- Minnesota Milk Producers Association staff and members will assist in project design, in definition of compliance goals, in drafting the compliance/performance workbook and self-certification, in recruiting participants, and in deploying certifying technicians. If possible, MPCA will contract with MMPA to help cover the cost of on-farm technician assistance.
- Winona and Stearns County staff will assist in project design, in definition of compliance goals, in drafting the compliance/performance workbook and certification materials, in training of MMPA technicians, and in conducting baseline and verification inspections.
- MPCA has built its current workplan assuming a minimum of 150 participants: 50 undertaking baseline inspection, ERP certification, and post-certification inspection; 50 having already undertaken MMPA Five-Star certification and undergoing post-certification inspection as part of this project, and; 50 undergoing baseline and follow-up inspection concurrently with ERP inspections. More sites will be added if enough volunteers and resources are available.
- EPA will provide partial support for the project through an Innovations cooperative agreement, and assist in project design and review of data gathered and results reported.
- MPCA staff will lead project design, assist in definition of compliance goals, in drafting the compliance/performance workbook and certification materials, in training of MMPA technicians and county staff, and in conducting baseline and verification inspections. MPCA staff will work with external experts to determine appropriate sample sizes, and to collect and analyze metrics appropriately.
- MPCA Agency-wide Planning and Assistance staff will provide technical assistance and administration of the EPA cooperative agreement.

Stakeholder involvement

Throughout the project, MPCA will consult with the partners listed above as an advisory group. In the initial stages, this group will advise on compliance and performance goals for project participants, project design and the timing of tasks. Further on, the group will provide input on the content and presentation of workbooks, outreach, reporting forms, the electronic reporting interface, and ultimately the conclusions reached based on data generated by the pilot.

Beyond the participants, MPCA will seek opportunities for communication with the MN Department of Agriculture, Board of Soil and Water Resources (BWSR) and local Soil and Water Conservation Districts (SWCD), the MPCA's Citizens Board, commissioners in the participating counties, and Clean Water Partnership (CWP) citizens groups in the participating counties. Communication with these groups would occur at intervals: soon after initial project design is complete; after the initial round of inspections; after the certification phase; after the post-certification inspections and draft conclusions are complete, and; upon completion of the final project report when recommendations are made on future steps.

Bios

Project Manager – Kate Brigman

- MPCA water quality staff, feedlot compliance, enforcement and permitting four years;
- Lead CAFO staff for six south-central Minnesota counties;
- Feedlot program contact for a Supplemental Environmental Project (SEP) for ongoing enforcement with a NPDES water treatment facility at a Carver County creamery. Project is to apply MMPA Environmental Quality Assurance program to dairies supplying milk to the creamery;
- MPCA liaison to Minnesota Association of County Feedlot Officers annual conference agenda committee;
- County zoning administrator and delegated county feedlot officer in Waseca County for one year;
- Prior to Waseca County, was the local water planner for Le Sueur County for six and a half years where she was the lead program assistant for three Phase I and two Phase II Clean Water Partnership Projects and was the non-delegated county contact for livestock producers until the county became delegated.

Grant Champion/Lead Investigator – Bob Finley

- MPCA Southwest Region Manager;
- MPCA Feedlot Program Manager;
- For the previous 4 years, was the Director of the Water Resources Center at Minnesota State University, Mankato;
- Served for a number of years as the Executive Director of the Redwood-Cottonwood Rivers Control Area;
- Over the past 20 years, has managed dozens of research and implementation projects at the watershed and basin scale, most of which examined the relationship between agriculture and surface water quality in southern Minnesota;
- Considerable experience interpreting and managing water quality data along with experience in the design and application of surface water monitoring plans.

Project Consultant – Myrna Halbach

- Feedlot program manager for MPCA for 4.5 years (oversaw final rule development and implementation from October 1999) - in that time, 29,000 feedlots were registered and nearly 600 NPDES permits issued including the largest dairy in the state (~5000 head);
- Worked closely with Minnesota Milk Producers on a number of projects, including
  - Development of mapping tool to account for regulations, environmentally sensitive features, population, etc. in siting or expanding dairies;
  - Development of Five-Star whole farm audit program conducted by technicians, assisting in developing the concept, reviewing materials for accuracy and appropriateness, training technicians and reviewing achievements;
- Worked with MN Pork Producers on a similar third party audit program;
- Licensed, registered professional engineer (Civil Engineering - Environmental specialty) and biochemistry Major.

Project workplan

Applying ERP to feedlots presents unique challenges. MPCA and others spent considerable energy in the 1990s to enact revised rules regulating feedlots in Minnesota. Increased or different regulation was not popular for livestock, particularly smaller dairies, which were going out of business at an increasing rate. A rule or policy mandating a universal environmental protection and compliance certification program such as ERP under the program is viewed by MPCA as unworkable, at least until such a program is piloted successfully. Therefore, MPCA has proposed a voluntary ERP model for the feedlot pilot.

As MPCA staff have discussed the project plan with EPA and others in greater detail, it has become clear that using only volunteers in the pilot will have significant implications for project design. First and foremost, it will be impossible in advance of actually recruiting the volunteers to know how many will be available and of what types of dairies. Both the number and types of dairies volunteering will affect the extent to which the volunteer population reflects the variability in the overall population of dairies. Further, the fact that dairies will be volunteering to certify, rather than being randomly selected, represents a source of measurement bias that will make it difficult to definitively compare their performance to the control group and to extrapolate the results of this experiment to the rest of the population. As a result, MPCA will have to accept up-front uncertainty as to the scope of conclusions.

Following are some descriptors of dairies which MPCA has discussed as potentially-significant variables that may influence the environmental performance of dairies. To the extent possible, the control group will be matched to key characteristics of the volunteer group to better facilitate comparison. Note that only the first two or three will likely be

used to actually limit subsets of the sample or control group.

1. Size (under 300 animal units, 300-1000 A.U., and over 1000 A.U., or 714 head of dairy cows over 1000 pounds) – inclusion of the 1000+ A.U. group would help understand the status of dairies previously in the state program but now subject to federal CAFO regulations and NPDES permitting – this would include farmers with 714-1000 head of cows who were previously unpermitted;
2. Previous one-on-one contact (inspection or assistance) with MPCA, a county, or the MMPA;
3. County location;
4. Presence of an open lot (but not in an Open Lot Agreement);
5. Sites where no treatment structure exists to receive milkhouse waste;
6. Proximity to surface water (less than 1000 feet from a lake; less than 300 feet from a stream);
7. Presence of surface tile inlet(s) in fields receiving open lot runoff;
8. Existing certification to the MMPA Environmental Quality Assurance ("Five-Star") standard;
9. MMPA membership.

Under number 1 above, the MPCA has no intention of using the ERP process as a stand-in for issuing individual or general NPDES permits to those facilities required to apply for them under federal and state law. In addition, due to the voluntary nature of the pilot and the resulting small sample size, MPCA does not expect that self-certifications during the project period will serve as functional equivalents for inspections. That would require full implementation of a mandatory ERP program and further discussion with EPA.

Uncertainty about the final size of the volunteer pool will also mean that resource commitments and timelines can only be finalized after recruitment is complete. Therefore, this project workplan will be based on a goal of 50 participating volunteers and a control group of 50 non-participants, chosen as randomly as possible while also being selected to match the volunteer group's profile. Both groups would undergo baseline and follow-up inspections, but only the participants would have access to MMPA technician assistance and submit their certifications.

Another significant group will also be inspected by MPCA. So far, MMPA has successfully guided 50 dairies to "Five-Star" status, which means the dairies have been certified by the association as in compliance and as addressing a list of "whole-farm" performance issues beyond those regulated by MPCA. This group is entirely self-selected and very likely not representative. However, a post-certification inspection will yield useful data on the accuracy of their self-certifications. MPCA and stakeholders will make final decisions on the timing of such inspections later. It could be advantageous to inspect some of the Five-Star sites right away so that if there are compliance or performance gaps between MPCA and MMPA expectations of a Five-Star dairy, resolution of these gaps can be built into the pilot project.

The timeline for implementation is another challenge that will strongly influence the results measured and reported *within the project period*, particularly for smaller dairies with fewer resources. MPCA will attempt to leverage as much existing lake and stream monitoring effort and data as possible to draw conclusions about the impacts of improvement efforts by farmers, particularly where they are grouped or located in priority areas (like watersheds being actively studied for TMDL development). In addition, Board of Water and Soil Resources (BWSR) models and the Feedlot Evaluation (FLEval) model should allow MPCA to project impacts based on improvements completed within the project period, or planned but not completed within the project period. These models will be especially useful where open lots exist (as is the case in a majority of dairies). MPCA expects to rely on models rather than actual data to estimate environmental impacts, since it is unlikely that monitoring data can be linked to the control group.

We should also note that we cannot say with certainty at this point whether both Stearns and Winona counties will participate in the same functions. Stearns would be MPCA's first choice for recruiting the volunteer dairies because of the number of dairies (1240, over 3 times as many as the next largest dairy county) and because MMPA is officed there. Winona County would add geographic and demographic diversity. However, if having samples from 2 separate counties makes statistical analysis too difficult, then Winona or another county or counties could be the source of the control group. These decisions will have to await deeper discussion with stakeholders and a statistician.

Following are tasks, subtasks, timelines for completion, measures, and where applicable, deliverables and milestones.

Shaded areas occur prior to or after MPCA expenditure of cooperative agreement (CA) funds.

	Start	Finish	Deliverables	Milestones
1. Stakeholder Process	**Mon 8/9/04**	**Fri 12/29/06**		
(a) Establish internal stakeholder group to provide feedback on the project	Mon 8/9/04	Tue 8/31/04		
(b) Maintain external partner group	Wed 9/1/04	Wed 10/13/04	Meeting minutes, network	
(c) With external partner group, develop environmental business practice indicators (EBPIs), including shared compliance goals	Wed 9/1/04	Wed 10/13/04	Completed EBPIs	EBPIs needed for inspector checklist, trainings, database
(d) With external partner group, develop marketing strategy	Wed 9/1/04	Wed 10/13/04	Completed strategy	
(e) Determine if policy changes are necessary (e.g., self-audit protection or project-specific enforcement policy to act as incentive)	Th 10/14/04	Fri 12/31/04	Agreement on workable incentives	Incentives must be in place before program materials and marketing
(f) With external partner group, develop a plan for communicating with all relevant stakeholder groups	Mon 1/3/05	Fri 1/28/05	Completed communication plan	
(g) With external partner group, develop a plan for long-term measurement of environmental impacts of project results	Mon 2/7/05	Mon 12/18/06	Plan complete	Available for final report to EPA, state stakeholders
(h) With external partner group, develop data, draft conclusions, and reports to EPA and other stakeholders	Mon 1/3/05	Fri 12/29/06		
(i) Periodic check-in with Feedlot Management Team	Monthly			
(j) Communication with Governor's Livestock Task Force	Informal			

Stakeholder Process Measures:

1. Partners understand project goals – indicated by consensus and satisfaction coming out of external partner meetings.
2. Partners' willingness to market on MPCA's behalf – indicated by consensus and partners delivering the product and level of effort identified in marketing strategy.

	Start	Finish	Deliverables	Milestones
2. EPA cooperative agreement	**Thu 6/17/04**	**Mon 2/28/05**		
(a) Attend Chicago meeting for SIG winners	Thu 6/17/04	Fri 6/18/04		
(b) Develop detailed ERP Gantt chart	Tue 7/6/04	Mon 8/16/04	MS Project workplan	
(c) Develop a detailed ERP implementation strategy	Tue 7/20/04	Mon 8/16/04		Needed for CA proposal
(d) Revise EPA CA proposal	Mon 6/21/04	Mon 8/16/04		
(e) Develop EPA performance measurements	Mon 6/21/04	Fri 7/16/04		Needed for CA proposal
(f) Develop EPA Quality Assurance Project Plan Framework	Mon 7/19/04	Fri 7/30/04	Draft 8/3/04	
(g) Internal stakeholder and EPA review process	Wed 8/4/04	Thu 8/12/04	Draft 8/3/04	
(h) Finalize proposal narrative	Fri 8/13/04	Tue 8/17/04		2 wks approval at MPCA
(i) Submit final proposal to EPA	Tue 8/31/04	Tue 8/31/04	Target 8/31/04	To execute CA by 12/31
(j) EPA review and approval of CA proposal	Tue 8/17/04	Mon 10/11/04		
(k) EPA delivers money to MPCA	Mon 12/1/04	Wed 12/31/04		Assume 12/31/04
(l) Revise full project workplan	Mon 1/3/05	Mon 1/31/05		Finalize partner roles
(m) Finalize full project workplan	Tue 2/1/05	Mon 2/28/05	Final workplan	Goals for end use of ERP tool set, guiding statistical methodology (if feasible)

EPA Cooperative Agreement Measures:

1. Completed at MPCA by 8/31/04
2. Executed by EPA by 12/31/04
3. Final project workplan by 2/28/05

	Start	Finish	Deliverables	Milestones
3. Contract(s) for support	**Wed 9/1/04**	**Mon 1/3/05**		
(a) MPCA develops RFP and/or sole source as needed	Wed 9/1/04	Wed 10/13/04		Stakeholder input
(b) Contractor(s) develops workplan and qualifications	Mon 10/18/04	Fri 11/12/04		
(c) MPCA awards contract(s) for entire project period	Mon 11/15/04	Mon 1/3/05	Contract paperwork	Awaits EPA execution

Contract for Support Measures:

1. On-time execution (1/3/05)

	Start	Finish	Deliverables	Milestones
4. Facility ERP database	**Wed 9/1/04**	**Mon 6/20/05**		
(a) Define facility universe characteristics	Wed 9/1/04	Thu 9/30/04		
(b) Develop quality assurance procedures for development of facility universe	Wed 9/1/04	Thu 9/30/04		
(c) Identify facilities from various sources	Wed 9/1/04	Wed 10/13/04	Full facility set for participating counties	All EBPIs and facility datapoints known before developing database
(d) Develop data entry points (to accommodate ALL project data, not just inspections) within existing feedlot database in Delta system	Thu 10/14/04	Mon 2/21/05	Delta feedlot database adapted	
(e) Draft certification and notification form content	Mon 1/3/05	Fri 2/11/05		
(f) Revise forms and conduct further internal review	Mon 2/14/05	Fri 3/18/05	Paper forms complete	Adaptable to web interface
(g) Input facility data into database	Tue 2/22/05	Mon 2/28/05		
(h) Quality Assurance for Facility Universe	Tue 3/1/05	Mon 3/28/05	QA/QC	QAPP (and staff) in place
(i) Finalize facility universe	Mon 3/28/05	Mon 3/28/05	Facility universe data entry	Universe data available for sample generation
(j) Develop a procedure for handling inspection/cert data collection/entry	Tue 3/8/05	Mon 3/21/05		Program staff trained
(k) Draft the database screens for inspection/certification inputs	Tue 3/22/05	Mon 5/2/05		
(l) Internal review of database screens	Tue 5/3/05	Mon 5/9/05		Use data from Five-Star dry run inspections (7a)
(m) Internally test database	Tue 6/7/05	Mon 6/13/05		
(n) Finalize database for inputs	Tue 6/14/05	Mon 6/20/05	Final screens set	
(o) Program statistical reporting functions into the database, if possible	Tue 6/21/05	Mon 7/18/05		Report functions developed or easily provided by substitute function (i.e. download electronically to existing statistical package like Minitab)
(p) Develop the database screens for outputs	Tue 7/5/05	Mon 7/25/05	Final database	Ready for use

Facility ERP Database Measures:

1. Universe of dairies well-documented statewide and in participating counties – indicated by number of dairies missed and later located by CFOs or MPCA staff.
2. MPCA users able to input, use, analyze – indicated by training post-test, longer-term satisfaction, and documented error rate.

NOTE: This task may be delayed depending on MPCA priority-setting.	Start	Finish	Deliverables	Milestones
5. Electronic interchange	**Mon 9/6/04**	**Fri 7/28/06**		
(a) Negotiate with Information Systems to get into queue for Web interface development	Mon 9/6/04	Mon 2/28/05		Decision on feasibility of continuing EI development
(b) Agree on division of labor between counties on data entry	Mon 1/31/05	Fri 3/18/05	Memorandum of Agreement	
(c) Draft Web interface for certifications and notifications (as needed)	Tue 3/22/05	Fri 12/30/05		
(d) External review of interface for certification & notification forms	Tue 1/3/06	Fri 2/24/06		User workshop
(e) Revise and beta test Web interface	Mon 2/27/06	Fri 5/5/06		User beta test
(f) Prepare near final database, including integrated input/web interfaces	Mon 5/8/06	Fri 6/2/06		
(g) Finalize Web interface and database links	Mon 6/5/06	Fri 7/28/06	Web interface/firewall	

Electronic Interchange Measures:

1. Replicate stormwater interchange at lower cost – time to completion versus stormwater or other web exchange projects (from time-tracking records)
2. Dairies able and willing to use EDI – (short-term) evaluations from user workshop/beta test, (long-term) electronic versus paper submittals
3. Decreased paper use and cost of handling – based on average sheets/envelopes/mailing and mailing costs

	Start	Finish	Deliverables	Milestones
6. Statistical design/sampling	**Wed 9/1/04**	**Fri 6/20/05**		
(a) Locate (and retain if necessary) statistical expertise	Wed 9/1/04	Fri 10/15/04	Contract, if needed	Optimize Cadmus' time with assistance by MPCA staff proficient in statistical analysis
(b) Generate 2 to 3 scenarios based on different responses by participants	Mon 1/3/05	Fri 4/1/05		Be prepared for recruiting results, when known
(c) Draft the statistical methodology	Mon 4/4/05	Fri 4/29/05	Draft methodology	
(d) Internal and external review of statistical methodology (includes EPA review and comment)	Mon 5/2/05	Fri 5/27/05		Coordinate with stakeholders, EBPI, and workplan development
(e) Finalize statistical methodology	Mon 5/30/05	Mon 6/6/05	Final methodology	Volunteer pool completion required before method finalized
(f) Amend and secure final approval of QAPP	Tue 6/7/05	Tue 6/14/05	Final QAPP	QAPP final before sampling begins
(g) Generate sample from volunteer participants, and sample for control group	Wed 6/15/05	Mon 6/20/05	Complete samples	Samples ready for data entry when database development allows

Statistical Design/Sampling Measures:

1. Study design maximizes insights into research questions (see Objective #4 under Goal 3), within policy and resource constraints.
2. Feasibility overlay – representative samples can be processed without drawing significantly on program staff not already assigned to the project.

	Start	Finish	Deliverables	Milestones
7. Inspector checklist	**Wed 9/1/04**	**Fri 4/29/05**		
(a) Identify state inspectors	Wed 9/1/04	Fri 9/24/04		
(b) Identify county inspectors	Mon 9/27/04	Fri 10/22/04		
(c) Draft environmental business practice indicators (EBPIs), inspector checklist (includes red-flag decision tree)	Tue 11/9/04	Mon 12/20/04		EBPIs and compliance goals drafted with stakeholders
(d) Internal review cycle for EBPIs, inspector checklist	Tue 12/21/04	Mon 1/10/05		
(e) Revise EBPIs, inspector checklist	Tue 1/11/05	Mon 1/24/05		
(f) External review of EBPIs	Tue 1/25/05	Mon 2/14/05		Stakeholder support before next step.
(g) Revise EBPIs, inspector checklist	Tue 2/15/05	Mon 2/28/05		
(h) Finalize EBPIs	Tue 3/1/05	Mon 3/21/05	Final EBPIs, including compliance goals	EBPIs must be finalized before inspector checklists – stakeholder support before "dry run"
(i) Dry run checklist with 5 "Five-Star" dairies, 5 "regular" facilities	Tue 3/22/05	Mon 4/4/05		This initial data informs checklist, database development, and other areas of the project
(j) Finalize inspector checklist	Tue 4/5/05	Fri 4/29/05	Checklist with EBPIs and project metrics integrated	

Inspector Checklist Measures:

1. Combines multiple programs and issues in maximum half-day visit – results of dry runs
2. Inspectors & technicians accept the checklist – attitudinal survey following completion
3. Checklist helps communicate project issues to dairies – survey of dry run dairies

	Start	Finish	Deliverables	Milestones
8. ERP outreach/participation	**Mon 10/18/04**	**Fri 4/29/05**		
(a) Draft any flexibility incentives agreed to during stakeholder process	Mon 10/18/04	Fri 12/31/04		
(b) Finalize flexibility incentives (if any)	Mon 1/3/05	Fri 2/25/05	Policies approved, final	Policies stated in outreach
(c) Prepare preliminary brochure for distribution to potential volunteers	Mon 2/28/05	Fri 3/4/05		
(d) Internal review of brochure	Mon 3/7/05	Mon 3/7/05		
(e) Revise brochure based upon internal feedback	Tue 3/8/05	Tue 3/8/05		
(f) External review of brochure	Wed 3/9/05	Wed 3/9/05		Customer-tested
(g) Develop final ERP brochure	Thu 3/10/05	Wed 3/23/05		
(h) Print final ERP brochure	Thu 3/24/05	Thu 3/24/05	Final brochures printed	
(i) Mailings and co-presentations with MMPA; MPCA web site notice	Mon 3/28/05	Fri 4/1/05	1,600-piece mailing and 2 presentations per county	
(j) Review progress and follow up as necessary	Mon 4/4/05	Fri 4/29/05		Reach 50 volunteers

ERP Outreach Measures:

1. Number of mailings (minus number of returns)
2. Web site hits

3. Requests for further information (either MPCA or MMPA)
4. Number of brochures and information requests managed by Dept of Ag Dairy inspectors
5. Sign-ups
6. MMPA membership increased

	Start	Finish	Deliverables	Milestones
9. Training inspectors	**Tue 6/21/05**	**Tue 7/12/05**		
(a) Basic project awareness training for MPCA, county feedlot staff, Dept of Agriculture dairy inspectors, and MMPA technicians	Tue 3/1/05	Mon 3/21/05	Basic awareness of project up to EBPIs (7h)	Complete before recruitment (8i)
(b) Prepare inspector training for all pilot project inspectors and technicians	Tue 6/21/05	Mon 7/4/05	Inspector training for purposes of completing pilot project	
(c) Dry run of inspector training for all pilot project inspectors and technicians	Tue 7/5/05	Tue 7/5/05		
(d) Revise the inspector training for all pilot project inspectors and technicians	Wed 7/6/05	Fri 7/8/05		
(e) Deliver training for all inspectors and technicians (each county)	Mon 7/11/05	Tue 7/12/05	2-3 trainings completed	Technicians co-trained so they're aware of inspection protocol

Training Inspectors Measures:

1. Number of county and MPCA staff, MMPA technicians trained
2. Hours in development - timetracking records
3. Inspector satisfaction – training evaluations
4. MMPA techs work effectively with dairies – MPCA survey calls to dairies
5. MPCA, county inspectors' effectiveness in working with dairies – MPCA (third-party) calls to dairies
6. MMPA technician performance (complete checklists, operator satisfaction) – MPCA survey calls to dairies
7. High-quality data collection (longer-term) – accuracy of certifications, data reported

	Start	Finish	Deliverables	Milestones
10. Baseline inspections and analysis (includes most data entry)	**Wed 7/13/05**	**Tue 11/15/05**		
(a) Inspections and ongoing data entry	Wed 7/13/05	Mon 10/3/05		
(b) Initial inspector debriefing (one week into inspections)	Tue 7/19/05	Tue 7/19/05		
(c) Data entry wrap up and quality assurance	Tue 10/4/05	Mon 10/17/05	X inspections complete	Complete before harvest
(d) Final inspection debriefing	Tue 10/18/05	Tue 10/18/05		
(e) Post-baseline follow-up and analysis	Tue 10/18/05	Tue 11/15/05		
(f) Follow up on non-compliant facilities.	Tue 10/18/05	Tue 11/15/05	Complete baseline data set	
(g) Analysis of baseline inspection data.	Tue 10/18/05	Tue 11/15/05	Completed analysis of compliance and performance levels	Initial conclusions on reliability of sample

Baseline Inspections Measures:

1. Time investment relative to standard dairy inspections – from timetracking records, relative to historical average for this type of dairy
2. Inspectors able (not able) to cover material projected in checklist – inspector records
3. Response of operators during inspectors – qualitative, from inspector records

4. Number of operators requesting assistance from MMPA technicians during inspections – inspector records
5. Compliance rates – inspector records
6. BMPs in place – inspector records
7. Number of enforcement actions required (after any amnesty period) – longer term
8. Percentage of facilities that reregister every year – long term

	Start	Finish	Deliverables	Milestones
11. Assistance	**Tue 12/21/04**	**Wed 4/19/06**		
(a) Draft outline/sample section for compliance assistance workbook	Tue 12/21/04	Mon 1/10/05		Feedback from baseline inspections integrated
(b) Internal review of workbook sample	Tue 1/11/05	Mon 1/24/05		
(c) Revise workbook sample	Tue 1/25/05	Mon 2/7/05		
(d) External review of compliance assistance workbook sample.	Tue 2/15/05	Mon 3/7/05		MMPA feedback
(e) Debriefing on results of external review	Tue 3/8/05	Mon 3/14/05		
(f) Develop Complete Draft of Workbook and Forms, and cover letter	Tue 3/15/05	Mon 5/9/05	Draft package	
(g) Internal review of all certification materials	Tue 5/10/05	Mon 6/6/05		
(h) Revise all certification materials based upon internal feedback	Tue 6/7/05	Mon 7/4/05		
(i) External review of all certification materials	Tue 7/5/05	Mon 7/11/05		MMPA and dairy feedback
(j) Finalize facility forms	Tue 7/12/05	Mon 7/25/05		
(k) Finalize cover letter	Tue 7/12/05	Mon 7/18/05		
(l) Finalize workbook	Tue 7/26/05	Mon 8/22/05		
(m) Finalize the entire certification package	Mon 8/22/05	Mon 8/22/05	Near-final package	
(n) Schedule facility workshops	Tue 7/12/05	Mon 7/18/05		
(o) Draft facility workshops, including participant evaluation forms	Tue 8/23/05	Mon 9/5/05		
(p) Internal review of facility workshops	Tue 9/6/05	Mon 9/12/05		
(q) Revise facility workshops	Tue 9/13/05	Mon 9/19/05		
(r) Technician assistance on-farm	Tue 10/4/05	Tue 3/7/06		Effort and roles as designed with stakeholders
(s) Dry run of workshops (includes external review)	Tue 10/4/05	Fri 10/7/05	2 dry runs?	MMPA and dairy participation
(t) Finalize facility workshops (and package) based upon dry run	Mon 10/10/05	Fri 10/21/05	Final package and workshop syllabus	
(u) Deliver facility workshops	Tue 11/1/05	Fri 11/11/05	2 workshops completed	Workshops timed to balance inspections, harvest, cert. deadline
(v) Analyze participant evaluations of workshops	Mon 11/14/05	Fri 11/18/05		

Assistance Measures:

1. Workshop attendance – operators in attendance
2. Workbooks distributed
3. Technician requests and deliveries – MMPA records
4. Number of facilities assisted vs. self-certified – MMPA records
5. Accuracy of self-certification vs. technician-assisted – longer-term, involves data from post-certification inspections (requires flags in database)
6. Number (percentage) of facilities claiming to have used assistance materials, but did not certify – MPCA survey of those not completing certification, others.

	Start	Finish	Deliverables	Milestones
12. Certification	**Tue 8/23/05**	**Wed 5/17/06**		
(a) Print certification packages	Tue 8/23/05	Mon 9/5/05	Certification mailing	
(b) Prepare certification packages for mail and mail them	Tue 9/6/05	Mon 10/17/05		Mailed to coincide with end of baseline inspections
(c) Feedlots fill out compliance certification forms (set deadline)	Tue 10/18/05	Tue 3/7/06		Set deadline with stakeholder input
(d) Certification deadline	Tue 3/7/06	Tue 3/7/06		
(e) Technician assistance (same as 11r)	Tue 10/4/05	Tue 3/7/06	On-farm assistance	Effort and roles as designed with stakeholders
(f) Data entry for self-certification forms (if not submitted on line).	Tue 3/7/06	Tue 3/28/06		
(g) Initial analysis of self-certification data	Tue 3/28/06	Tue 4/18/06		
(h) Follow-up with non-responders?? NOTE: This is tentative	Tue 4/18/06	Wed 4/19/06		
(i) Follow-up with red flag, other facilities (including RTC's) Tentative	Tue 4/18/06	Wed 4/19/06		RTC forms completed
(j) Final analysis of self-certification data	Wed 4/19/06	Wed 5/3/06	Analysis complete	
(k) Internal presentations and feedback on self-certification data results	Wed 5/3/06	Wed 5/17/06		Communication and understanding among inspectors – consensus on conclusions

Measures:

1. Time spent in managing data electronically vs. what it would have been had the entire process been manual – from time-tracking records, based on data submittals similar to certifications.
2. Number (percentage) of baseline operations completing certification
3. Number of return to compliance submittals
4. Number reporting compliance vs. non-compliance
5. Overall accuracy of certification forms – (longer-term) waits for post-certification inspector records
6. Return to compliance forms submitted and RTC plans implemented – requires post-certification or other inspection records

	Start	Finish	Deliverables	Milestones
13. Post-certification inspections	**Wed 5/3/06**	**Mon 10/16/06**		
(a) Revisit statistical methodology	Wed 5/3/06	Wed 5/24/06	Final methodology (revised)	QAPP would determine if adjustments are made within the project or later
(b) Preparation for inspector training	Wed 5/24/06	Wed 5/31/06		
(c) Generate inspection list	Wed 5/31/06	Thu 6/1/06		
(d) Inspector training/debriefing	Thu 6/1/06	Fri 6/2/06		Inspector protocol/ checklist modified (if necessary to improve data collection and if possible without skewing earlier data)

(e) Inspections and ongoing data entry	Fri 6/2/06	Fri 9/1/06		QAPP would determine if starting one month earlier than baselines is OK (i.e., does not introduce substantial seasonal bias)
(f) Initial inspector debriefing (one week into inspections)	Fri 6/9/06	Mon 6/12/06		
(g) Data entry wrap up and quality assurance	Fri 9/1/06	Fri 9/15/06		
(h) Final inspection debriefing	Fri 9/15/06	Mon 9/18/06	X post-cert inspections	
(i) Post-certification follow-up and analysis	Mon 9/18/06	Mon 10/16/06		
(j) Follow up on non-compliant facilities.	Mon 9/18/06	Mon 10/16/06	Enforcement actions	
(k) Analysis of post-certification inspections [predecessor OK?]	Mon 9/18/06	Mon 10/16/06	Analysis completed	

Measures:

1. Number of inspections completed vs. number needed for sample
2. Time elapsed to complete all planned inspections
3. Time/cost per post-cert inspection vs. standard and vs. baseline – timetracking records
4. Accuracy of self-certifications – baseline and post-cert inspector records
5. Consideration of (progress on) whole farm issues – inspection records and longer-term MPCA followup
6. Number (percentage) of farmers adopting recommended NM practices – inspection records and longer-term MPCA followup
7. Performance of certifying facilities vs. others – longer-term (site visits)
8. (Increased) use of soil testing and other site assessment tools – longer-term (site visits)
9. Use of P2 and BMPs reported – annual reports
10. Number (percentage) of farmers with approved manure management plans – followup submittals, inspections?
11. Estimated pollutant reductions based on FLEval and BWSR models

	Start	Finish	Deliverables	Milestones
14. Reporting	**Thu 12/2/04**	**Fri 12/29/06**		
(a) Revise and Submit QAPP for EPA	Thu 12/2/04	Wed 12/22/04		
(b) Get QAPP Approval from EPA	Thu 12/23/04	Wed 2/16/05		
(c) Quarterly Report 1, Year 1	Mon 12/20/04	Fri 12/31/04	Quarterly report, web site, mail to ALL stakeholders	
(d) Quarterly Report 2, Year 1	Fri 3/18/05	Thu 3/31/05	Quarterly report, web site post, mail to ALL	
(e) Quarterly Report 3, Year 1	Fri 6/17/05	Thu 6/30/05	Quarterly report, web site post, mail to ALL	
(f) Annual Report 1 (Year 1)	Mon 9/12/05	Fri 9/30/05	Annual report, web site post	Raw data from baselines being tabulated
(g) Present at MN Association of County Feedlot Officers conference	Mon 10/3/05	Fri 10/28/05		
(h) Meeting offered for all stakeholders, including non-participants	Mon 10/3/05	Fri 10/28/05		
(i) Informational item for MPCA Citizens Board	Thu 10/6/05	Tue 10/25/05		
(j) Quarterly Report 1, Year 2	Mon 12/19/05	Fri 12/30/05	Quarterly report, web site post, mail to ALL stakeholders	First round inspection data available
(k) Quarterly Report 2, Year 2	Mon 3/20/06	Fri 3/31/06	Quarterly report, web site post, mail to ALL	Raw data from early certifications

(l) Quarterly Report 3, Year 2	Mon 6/19/06	Fri 6/30/06	Quarterly report, web site post, mail to ALL	
(m) Review of program results	Mon 9/18/06	Fri 10/27/06		
(n) Present at MN Association of County Feedlot Officers conference	Mon 10/2/06	Fri 10/27/06		
(o) Meeting offered for all stakeholders, including non-participants	Mon 11/6/06	Fri 11/24/06		
(p) Informational item for MPCA Citizens Board	Thu 11/30/06	Tue 12/19/06	Potential program changes by rule or legislative action	
(q) Prepare and submit final report to EPA	Mon 10/30/06	Fri 12/29/06	Final report, web site post	All data
(r) Distribution to other states – conference calls, presentations, web page	Mon 1/3/05	Fri 12/29/06		

Measures:

1. Reports delivered on time
2. Interest from other states – program staff phone logs
3. Interest from other MPCA program managers – program records (staff training)
4. Interest from other livestock sectors
5. Adaptation by other states (long term) – EPA records
6. Adaptation by other MPCA programs (long term) – MPCA records

15. Long-term measurement

MPCA has discussed long-term measurement of project impacts. The costs and difficulties of such efforts are well-known. Nevertheless, MPCA commits to continue exploration of feasible means of measuring the project's environmental impacts within the project period, with the goal of producing a plan for long-term measurement, which can be feasibly implemented, either within or after the project period. Some of the possible tools or approaches that MPCA will consider in establishing its long-term results measurement plan are:

- Report form for 50 participants to insert in existing annual report or submit separately on which they indicate progress towards BMPs and needed corrections;
- Phone survey of 20-50 participants - product: list of BMPs implemented, compliance correction;
- On-farm survey (not an inspection) of 20-50 participants - product: list of BMPs implemented, compliance correction, information to complete FLEval;
- Follow-up inspections of a sample or of all 50 participants after 2 years (or other meaningful interval), looking at all or most of the vectors in the baseline and post-cert inspections – product: same as #2 but direct verification plus credit for a formal inspection;
- Work with state and local water monitoring staff to determine if existing sampling sites can be used to draw reliable conclusions about project impacts on water quality parameters;
- Work with state and local water monitoring staff to determine if in the project timeline the partners could set up any new sampling sites, particularly in priority TMDL watersheds or if a number of participants are conveniently clustered. If so, then project staff could work with monitoring experts to determine proper site setup for data collection. Other sources of support for the monitoring or for the participating site's implementation would be necessary in order to pursue this option.

Possible measures:

1. Changes in surface water ambient conditions
2. Diversions of pollutant runoff based on modeling
3. Activity measures (e.g. structures receiving milkhouse wastes, open lots addressed and how, surface tile inlets closed, etc.)
4. Environmental gains not directly associated with feedlot management, such as solid waste, chemical storage, habit restoration, etc.

Compliance with program requirements

This experiment relates to EPA's Environmental Innovation Strategy in several ways. First, it borrows from ERP experiences in other states (supported by EPA) as well as innovative approaches to animal agriculture environmental improvement being used in other states and in Minnesota, in partnership with producer associations and various rural governmental and non-governmental organizations. Second, the project deals with a priority environmental issue for Minnesota and EPA: restoring the environmental quality of impaired surface water and preventing future impairments. Third, the project demonstrates a focus on results by improving water quality using new environmental tools (self-certifications, farm management systems, and statistical assessment of sub-sector performance) and partnerships to obtain water quality protection sooner than could be obtained with conventional regulatory tools and current resources.

1. The proposed project demonstrates an innovation used in other states and supported by EPA (ERP), but applies it in an experimental sense to a sector where it has not yet been deployed. As such, MPCA will be researching the applicability of ERP in this new area, gathering data on metrics for environmental improvement, compliance, and resource efficiency, applying this learning to other feedlot and (eventually) economic sectors, and disseminating the results of the experiment via web and reports to citizens, state and national agencies, and NGOs.

2. The focus of the project proposal is on techniques for preventing surface and ground water contamination at the source. However, to the extent a "whole farm" or integrated management approach can be expressed in the program materials and promoted in the field by staff and partners, this project will be multi-media. MPCA expects to leverage environmental management systems (EMS)-like approaches (including auditing) already being used by producers or promoted by their associations.

3. Target priority environmental issues – Measures will look at producers moved to environmental improvement sooner than expected with existing alternatives, and encouraged improvement in impacts and farm management systems beyond the primary (and priority) area of water quality protection. To the extent that the project develops as an alternative or supplement to the existing interim permitting process (the existing state permitting minimum for non-CAFOs), the project will constitute an innovation in permitting that the feedlot program will be able to integrate and carry forward.

4. Likely improvement in results from project implementation -
   - Differ from current methods – MPCA expects that participating feedlots will self-audit for compliance and adopt environmental improvement techniques for more areas of the farmstead sooner than under a conventional inspection program. In addition, the producer association should be motivated to promote the ERP program more effectively than MPCA can on its own.
   - Build on "lessons learned" – Clearly, MPCA is adopting a process used and evolved successfully in other states. We also will be building on the work of producer associations and public/private pilots in Minnesota and other farm states, leveraging quality assurance programs, Farm Bill audit incentives, and EMS/auditing-based approaches promoted by producer associations.
   - Quantifiable environmental improvements – self-corrections for compliance, feed and supplement BMPs, soil-tested nutrients levels, nutrient management plans, energy use reduced, water conserved, amounts composted, riparian buffers installed, drain tile inlets capped, etc. These measures will be developed further in the first phases of the project.
   - Improved administrative efficiency – MPCA and delegated counties fully expect to have their existing level of effort leveraged (at least by a factor of two, although this research will verify this assumption) by producer associations and participating producers in the course of the project. The resource savings would escalate as the pilot is extended to other feedlot sectors.
   - Costs and efficiency improvements for producers – On a quicker basis than otherwise possible, participating producers should realize energy and water use cost reductions, soil loss, nutrient supplement reductions for animals and feed crops, and so on, and the net present value of completing compliance and environmental improvements sooner as opposed to in the future.

5. Measuring improvement and accountability

- Information on the project will be made available through reports, web pages, conferences, and trainings. All project participant performance data will be available to surrounding communities via the web page and local distribution.
- Timeline for achievable results –MPCA plans to begin work in August 2004, with baseline inspections complete in October 2005. Follow-up inspections, results analysis, and plans for extension to other sectors would be complete by December 2006.
- Goals for environmental improvement – Mentioned in QAPP in more detail.
- Indicators of environmental improvement – Mentioned elsewhere in more detail, although final measures will depend on the result of stakeholder discussions and what aspects of operations participating producers will agree to measure.
- Baseline measurements – Stakeholder discussions will set compliance and performance goals; subsequent inspections will measure status against those compliance and performance goals and practices. Baseline inspections will be complete in October 2005.
- Plan, timeline, and commitment for project evaluation – Agreed-upon goals and measures will receive baseline and follow-up data by fall 2006, at which point final analysis of the project will take place, draft conclusions discussed with stakeholders including EPA, and final results distributed by December 2006.
- Results expected within one to three years and how measured – Mentioned elsewhere in more detail.
- Long-term results (three years plus) – These are difficult to project at this point, but if the results of the experiment warrant expansion into other feedlot sectors, than similar results could be expected based on species-specific goals and measures, and the size and readiness of those other sectors.

6. Transferring Innovation
   - MPCA will use its feedlot database to assimilate all data gathered as a result of the project, will demonstrate that database to interested jurisdictions, and will make performance and project data available through public distribution.
   - MPCA expects eventual widespread participation with the ERP approach, across feedlot sectors. Also, we believe other farm states with numerous animal agriculture operations will find the experience useful.
   - The feedlot ERP project will fundamentally change how MPCA and counties approach feedlot compliance, and more importantly, identification and targeting of resources towards under-performing sectors or locations. Feedlot ERP can be deployed to support priority TMDLs, as well. Finally, MPCA expects that this initial use of ERP within the agency and the state will diffuse to other sectors in manufacturing and commerce.
   - MPCA (on behalf of participating counties) will commit to provide consultation and mentoring to other States wishing to adopt a feedlot ERP approach.

Budget Summary

	EPA Innovations	State Leverage Funds	Total Project Costs
Personnel	62,640 [1]	50,112 [2]	112,752
Fringe (0.26 of personnel)	16,286	13,029	29,315
Contractual	25,000 [3]		25,000
Travel	4,004 [4]	2,465 [5]	6,469
Equipment			
Supplies		5,006 [7]	5,006
Other			
Total Direct	107,930	70,612	178,542
Indirect (0.2835 of salary & fringe)	22,376	17,900	40,276
TOTAL	130,306	88,512	218,818

1. Projected to be 1.25 FTE total over 2-year project period (1.25 FTE Feedlot staff). Calculated using $24 average rate/hour times 1,305 hours/year times 2 years.
2. Projected to be 1 FTE total over 2-year project period (0.9 FTE Feedlot staff, 0.10 OSRM support). Calculated using $24 average rate/hour times 1,044 hours/year times 2 years.
3. Pass-through to producer association(s) to assist in recruiting participants, creating workbooks and trainings, providing on-farm assistance, and supporting completion of generating certifications.
4. MPCA out-of-state travel or other states traveling to Minnesota to gather and distribute information related to the project: assumes four 2-day trips outside MN or two 2-day trips plus an event hosted by MPCA ($2,000).
5. Supplies: printing and mailing marketing materials, workbooks, and workshop invitations.