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Staff Paper

Title:
**Motivation, Barriers and Incentives for the
Participation of Livestock Operations in MAEAP**

by:

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Motivation, Barriers and Incentives for the Participation of Livestock Operations in MAEAP

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Abstract

We survey Michigan livestock producers – gauging incentives and barriers for participating in Michigan's voluntary environmental program for livestock producers under the Michigan Agriculture Environmental Assurance Program (MAEAP) and through discussion groups sessions, explore the. Survey respondents include producers that have and have not participated in MAEAP

60 pages

Executive Summary

The Michigan Agriculture Environmental Assurance Program (MAEAP) is a voluntary environmental program initiated in 1999 by a coalition of state government agencies and agricultural, environmental and conservation groups in Michigan. The MAEAP is a broad voluntary environmental program (VEP) offering risk assessments and third party environmental verification to farms of all sizes and commodities in Michigan. As of April 2011, the program has had 10,000 attendees at education events and has 877 verified farms in three systems – Farmstead, Cropping and Livestock.

The initial impetus for the MAEAP came from the Governor’s Pollution Prevention Strategy for Michigan Agriculture 1998, which sought innovative approaches for participatory environmental compliance. Livestock farmers seeking MAEAP verification participate in education programs, develop a comprehensive nutrient management plan (CNMP) (or, only recently, a Livestock-A-Syst plan), and follow generally accepted agricultural and management practices (GAAMPS). MAEAP activities, including verification, are managed by officials at Michigan Department of Agriculture (MDA). The number of livestock farms receiving MAEAP certification in Michigan has grown to 255 by 2011.

Under an agreement reached in 2002, between the U.S. Environmental Protection Agency (EPA) and the Environmental Council of the States (ECOS), any Concentrated Animal Feeding Operation (CAFO) in Michigan that had not made a regulated discharge in the previous two years could decide to become MAEAP verified in lieu of a National Pollutant Discharge Elimination Permit (NPDES permit). With the conclusion of the ECOS Agreement in 2007, MAEAP verification in lieu of a permit is no longer an option available to Michigan livestock producers. Loss of this option eliminated a potential major motivator for participation and raised questions about the future of the MAEAP livestock program.

In order to study the motivations, barriers, and incentives for participation in the MAEAP program by Michigan livestock producers and help guide the future directions of the program with respect to other non-livestock production systems, researchers at Michigan State University conducted in-depth focus group discussions with officials from the Michigan Department of Agriculture (MDA) and Michigan Department of Environmental Quality (DEQ). In 2009, the researchers also surveyed a sample of 299 livestock producers in Michigan--including 64 MAEAP participants. The key insights gleaned from these focus group discussions and surveys are summarized below.

Key Insights from In-depth Focus Group Discussions

Economic theory identifies two major motivations for firms’ participation in voluntary environmental programs: ‘regulatory preemption’ and ‘signaling.’ Under a ‘*regulatory preemption*’ scenario’, firms engage in voluntary pollution reduction through VEPs when faced with potentially stringent future regulations. The VEP aims at reducing political pressures on regulatory agencies and legislators, thereby preempting future regulation. Under a ‘regulatory preemption’ scenario’, it is expected that those firms which are most likely to be affected by anticipated future stringent regulations will participate. Furthermore, the regulatory preemptive VEPs are designed to meet the minimum level of environmental performance that is considered adequate to reduce the possibility of more

stringent future regulations. Because of the preemptive nature of the VEPs, many believe that participants in preemptive VEPs tend to be those who currently have a high level of pollution.

Under a ‘*Signaling*’ scenario, firms which are already proactively engaged in environmentally responsible activities would like to send a signal about their environmental responsibility to regulators and/or environmentally conscious consumers. The goal is to differentiate themselves and to capture additional returns—either in the form of higher prices from consumers or in reduced regulatory costs. The signaling VEPs are designed so that participation in them is costly enough that it provides a ‘credible signal.’ In a properly designed signaling VEP, the firms that are environmentally responsible tend to participate and others will not (because participation is costly). Correspondingly, the consumers and regulators believe the participating firms are environmentally more responsible.

Our discussions with MDA and DEQ officials indicate that there may be differing views about what participation in MAEAP represents—in part because of its historic evolution. That is, DEQ officials appeared to view MAEAP using the ‘regulatory pre-emption’ lens because MAEAP certification was proposed ‘in lieu of CAFO permitting’ under the ECOS Agreement, and because the DEQ and environmental groups did not perceive themselves as effective/equal participants in setting performance expectations and monitoring processes for MAEAP certification. Further, DEQ officials felt constrained by regulatory requirements, especially after the termination of the ECOS Agreement. These regulatory requirements provide fairly ‘clear, bright line’ standards for environmental compliance. Because of these standards for CAFOs, the potential signaling from participation in MAEAP was limited since there was not a one to one relationship between the MAEAP requirements and these standards.

In contrast, MDA officials appeared to view MAEAP—throughout its history—using the ‘signaling’ lens. Therefore, MDA officials expected that MAEAP certified farms would be perceived and treated as ‘environmentally’ more responsible. These differing analytical viewpoints and beliefs lead to some interagency conflict and frustration regarding MAEAP, particularly during the period before and during the ECOS Agreement, particularly with regard to CAFOs.

Despite these past differences, officials from both agencies recognize the promise of VEPs, such as MAEAP, in managing and reducing environmental risks from agricultural operations and in providing opportunities for product differentiation in consumer markets. For example, DEQ officials recognize their agency’s technical and resource limitations in regulating widely dispersed agricultural operations, and view MAEAP verifications of small and medium sized livestock operations (which are excluded from permitting requirements unless they discharge pollutants) as credible signals of proactive environmental responsibility. MDA officials agree about this potential and feel that the loss of MAEAP in lieu of a permit sent conflicting signals to the regulated community and fear the loss may have damaged the program. They feel that many of the permitted farms may choose not to continue to participate unless other incentives are identified. However, they recognize the potential role MAEAP can play in signaling environmental responsibility to ‘green consumers’ and meeting ‘green procurement’ standards being set by large retailers.

Key Insights of the Surveys

Selected insights from the surveys of livestock farmers are listed below.

- About 80% of the surveyed livestock producers were aware of MAEAP, but surprisingly, only 72% of respondents who had actually participated in a MAEAP education event recognized it as a MAEAP sponsored event.
- A significant proportion (42%) of the general population of livestock farmers who were not MAEAP verified indicated that they had completed a CNMP. The desire to become environmentally sustainable was a major reason for becoming MAEAP verified, and 75% of respondents agreed that participation in MAEAP benefitted their farms.
- However, over 38% of respondents disagreed or strongly disagreed with the statements that MAEAP participation either reduced their insurance premiums or increased their property values. Similarly, only 9% of respondents agreed that MAEAP will enable farmers to receive higher prices.
- Respondents view MAEAP as effective in signaling higher environmental responsibility to MDA (87.5%) and other farmers (78.4%). However, only 59% of respondents felt that MAEAP signaled higher environmental responsibility to DEQ, and only 35.3% felt that MAEAP effectively signaled to the environmental activist community. Respondents were unsure if the MAEAP logo conveyed any meaningful information to the general community.
- Only 5% of farmers agreed with the statement that, “Livestock producers lack interest in environmental protection,” suggesting that lack of interest was not a major barrier to MAEAP adoption.
- Lack of open support by DEQ officials for MAEAP verified farms and loss of ability to use MAEAP verification in lieu of a DEQ permit were significant factors restraining producers from becoming MAEAP verified. Other constraining factors are innate in the MAEAP program, where, about 70% of respondents felt that MAEAP was ‘too demanding’ and nearly 60% felt that MAEAP did not fit well with every producer’s circumstances.
- More than 75% of respondents agreed that financial incentives, recognition by DEQ, access to technology, streamlining CNMP process and recognition by processing and retail industry would make MAEAP attractive. There was little support for making MAEAP mandatory or changing the administration of MAEAP to commodity groups.
- Most livestock producers felt that environmental regulations will expand to cover smaller producers within next 5-10 years.
- Only 45% of respondents felt that MAEAP was more effective in pollution control than DEQ permitting, but 64% felt that MAEAP was less costly to producers.

Livestock producers appear to have a demonstrated interest (e.g. significant voluntary CNMP adoption) in improving environmental management of their farms, despite lack of direct financial returns. However, the adoption of CNMPs may have been motivated by National Resource Conservation Service requirements to obtain cost share funds as much as by MAEAP. Our survey also indicated that a majority of producers perceive greater environmental regulatory pressures on smaller livestock producers in the near future, as

well as producers of all sizes experiencing increasing pressure from retailers and other bulk/institutional customers.

Guidelines for MAEAP redesign

Following are some guidelines for redesigning the future MAEAP program informed by findings under this research.

- Using ‘Regulatory pre-emption’ as the primary motivator for MAEAP is likely to be counterproductive in the long run because it will likely send the wrong signals to regulators, consumers, environmental groups and retailers relative to farmers’ environmental practices and attitudes. This ‘regulatory pre-emption’ direction can also have adverse effects if the MAEAP’s future objectives include establishing the MAEAP label as a signal of higher environmental responsibility.
- To make MAEAP verification an acceptable, credible signal of higher environmental stewardship, it is important to actively involve a broader set of stakeholders including regulators and environmental groups in setting the performance and monitoring standards.
- Because livestock farmers have demonstrated a willingness to invest in environmental management and perceive social and regulatory pressure to protect the environment, lack of farmer interest is not likely to be a barrier in expanding MAEAP. To be effective, the redesign of MAEAP has to take into consideration the heterogeneity among livestock farmers and build in more flexibility without compromising the credibility of the signal, or regulatory compliance requirements.
- A focus of MAEAP on small- and medium-sized farms that are not subject to regulatory permitting has great potential, because the value of signaling is likely to be higher and unambiguous for this group. The incremental value of the MAEAP signal to large farms, since they are already subject stringent permitting requirements, is probably lower.

Conclusion

Our research suggests that the MAEAP can play a positive role in improving and maintaining environmental performance from livestock operations of a variety of sizes and that this outcome can and has been recognized by the DEQ under certain circumstances. The study of the historical evolution of the MAEAP brings clarity as to how to improve MAEAP partnerships and to better recognize it for its historical and potential achievements with respect to the MAEAP objective of “being an innovative, proactive program that helps farms of all sizes and all commodities voluntarily prevent or minimize agricultural pollution risks.” The findings of this research are also relevant to other states that have VEPs, such as Wisconsin’s Green Tier Program, in designing and implementing VEPs.

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Overview and Introduction

Many non-agricultural firms engage in self-led, voluntary environmental programs (VEP). That is, firms voluntarily undertake environmental protection practices. Economic theory identifies two major motivations for firms' participation in voluntary environmental programs (VEPs): 'regulatory preemption' and 'signaling.' Firms following a '*regulatory preemption*' motivation may pursue a VEP to quell future regulations by reducing political pressures on regulatory agencies and legislators to expand environmental regulation. Regulatory preemptive VEPs are designed to meet or exceed the minimum level of environmental performance that is considered adequate to reduce the possibility of more stringent future regulations. Under a 'regulatory preemption' scenario', it is expected that those firms which are most likely to be affected by anticipated future stringent regulations will participate. Because of the preemptive nature of the VEPs, many believe that participants in preemptive VEPs tend to be those who currently have a high level of pollution.

Firms motivated to form a VEP as a '*signaling*' mechanism seek to send a signal about their relatively superior environmental responsibility to regulators and/or environmentally conscious consumers. Their goal is to differentiate themselves and to capture additional returns—either in the form of higher prices from consumers or in reduced regulatory costs. The signaling VEPs are designed so that participation in them is costly enough that it provides a 'credible signal.' In a properly designed signaling VEP, the firms that are environmentally more responsible tend to participate and others will not (because participation is costly). Correspondingly, the consumers and regulators believe the participating firms are environmentally more responsible.

The Michigan Agriculture Environmental Assurance Program (MAEAP) is a Michigan-based VEP focusing on agricultural production. MAEAP was established in 1999 by a coalition of state government, agricultural, environmental, and conservation groups as an outgrowth of the 1997 Pollution Prevention Strategy for Michigan Agriculture. This strategy sought innovative approaches for assisting farmers in reducing environmental risks of agricultural production. The strategy focused on the development of creative incentives and funding mechanisms to make participatory environmental compliance achievable for Michigan agricultural producers. At the time of its inception, Michigan did not issue National Pollution Discharge Elimination System (NPDES) permits to livestock producers, however, livestock producers wanted a system of assurance that their practices were not only environmentally sound, but also would signal to others that they were practicing good stewardship. As a voluntary, incentive-based mechanism for environmental compliance, MAEAP was seen as a solution that accomplished both objectives (Wilford, Janice 2005). The MAEAP component of this strategy was viewed as a preventive rather than remediation approach to agricultural pollution control and was initially advocated by the Michigan Department of Agriculture (MDA)¹ and the Michigan

¹ Under Executive Order No. 2011-2, the Michigan Department of Agriculture changed its name to the Michigan Department of Agriculture and Rural Development (MDARD) to reflect the additional mandates around economic development in rural regions.

Department of Environmental Quality (DEQ). MAEAP has undergone significant changes since its inception from being a resource for the industry to becoming an option in lieu of an NPDES permit.

Though MAEAP systems encompass many segments of agricultural production, this report focuses on the livestock systems and documents the outcomes of livestock producer surveys and focus group discussions of environmental issues around livestock production in Michigan. Surveys were distributed to producers that have participated in MAEAP Phase I education programs as well as to the general population of livestock producers to explore the barriers and motivations for participating in the MAEAP. Focus group discussions were targeted at understanding the political and administrative issues around regulation and the MAEAP, and included regulators from Michigan Department of Environmental Quality and the Michigan Department of Agriculture in separate sessions. The focus group discussions provide insights on policy aspects while producer surveys provide insights on how the industry views regulatory policy as well as voluntary compliance through MAEAP. This report starts with a discussion of the regulatory environment following the Federal Clean Water Act (CWA) of 1972. It is followed with an overview of the focus group discussions before discussing survey findings. It concludes with a summary and synthesis of the findings.

Historical Perspective

The history of agricultural pollution regulation in Michigan has influenced today's regulatory environment and perceptions of MAEAP. MAEAP was established in 1997 and designed as a flexible alternative to the National Pollution Discharge Elimination System (NPDES) of permitting regulated waste discharges. The program was broader than the NPDES system of permits by targeting all sizes and types of livestock operations rather than being limited to large operations. The NPDES was established with the Federal Clean Water Act (CWA) of 1972 and administered by the EPA. In essence, the CWA prohibits the discharge of any pollutant from a "point source" into national waters except as authorized under an NPDES permit, where point source is defined as any discernible, confined and discrete release of pollutants, including from concentrated animal feeding operations (CAFOs). Under the CWA, all CAFOs are considered to be point sources of pollution that require NPDES permits for any discharge or potential discharge, unless there exist no potential to discharge or there has been no regulated discharge within the prior five years, excluding agricultural stormwater discharges. Though CAFOs are considered point sources under the CWA, most agricultural producers are considered nonpoint sources, and therefore are exempt from NPDES permit requirements.

The Governor John Engler Administration, in framing the *1997 Pollution Prevention Strategy for Michigan Agriculture*, favored a voluntary approach to environmental monitoring of agriculture in Michigan.² Components of this voluntary approach included the Right to Farm legislation and stewardship practices specified in the Generally

² See <http://www.deq.state.mi.us/documents/deq-ead-p2-ag-agstrat98.pdf>, reviewed on May 31, 2011.

Accepted Agricultural and Management Practices (GAAMPs) and the approach was viewed by many as providing an appropriate balance of rigorous environmental protection and accommodation of producers' needs. Michigan also had legislation that established a zero discharge policy that was more restrictive than that required under the CWA. With the 1997 Pollution Prevention Strategy for Michigan Agriculture, and Michigan's restrictive zero discharge legislation, many viewed Michigan to be in good standing with CWA mandates.

Under the Engler plan, MAEAP focused on educating producers via Phase I educational workshops, on-site evaluations, development of site-specific management plans and incentives as means of reducing environmental risks. The plan also impacted regulation of livestock producers by strongly recommending that the Michigan Department of Agriculture (MDA) and the Department of Environmental Quality (DEQ) take into consideration producers' compliance with Generally Accepted Agricultural Management Practices (GAAMPs) as representing good faith efforts toward complying with environmental requirements before taking any regulatory or enforcement actions. In other words, the Engler plan considered that, the MAEAP and the NPDES permit system were different approaches for meeting the objectives of the CWA as well as state legislation; the NPDES permit system mainly took a regulatory approach for certain livestock operations, while MAEAP took a cooperative voluntary management approach.

While MAEAP was established by a consortium of stakeholders, key stakeholders have shifted since its inception. Much of the shift has occurred following the 2000 EPA review of the state's administration of CWA regulations, which concluded that the state's NPDES compliance and enforcement program was seriously lacking in several respects. The state was at risk of losing its delegated authority to administer state NPDES permits. In 2002, the state agreed to tighten NPDES oversight and issue permits to CAFOs. Under the state plan, any CAFO in Michigan that had not made a regulated discharge in the previous two years could select to become MAEAP verified in lieu of an NPDES permit, while all CAFOs and AFOs that had a regulated discharge were required to operate under a state-administered NPDES permit. Regardless of the system the CAFO chose to operate under, all were obligated to complete a Comprehensive Nutrient Management Plan (CNMP) that documented how livestock wastes were to be managed. This regulatory plan was developed under a Regulatory Innovation Agreement with the EPA and the Environmental Council of the States (ECOS), and has since been known as the ECOS Agreement. Under the ECOS Agreement, MAEAP took on a quasi-regulatory role rather than a strictly voluntary, cooperative effort and resource to reduce environmental risk of Michigan livestock production.

Although DEQ regulators and environmental groups initially endorsed the development and concept of MAEAP, they had mixed feelings about providing the ECOS option of MAEAP verification in lieu of a permit. Regulators and environmental groups suggested that the ECOS Agreement afforded those livestock producers that sought to hide environmental infractions a guise of compliance. Furthermore, opponents of the ECOS Agreement contended that MAEAP had weak provisions for de-verifying producers who failed to comply with their CNMP after becoming verified. These issues sparked

sometimes bitter conflicts between DEQ and MDA personnel, although such conflicts appear to have decreased since the conclusion of the ECOS Agreement on December 31, 2007.

With the conclusion of the ECOS Agreement, MAEAP verification in lieu of a permit is no longer an option available to livestock producers. The loss of this particular compliance-push motivation for MAEAP participation raises some important policy issues for the future of the livestock portion of MAEAP. Understanding the motivations of Michigan livestock producers for participating in voluntary environmental programs (VEP) will contribute to understanding how MAEAP can be improved within Michigan and how VEP programs in other states can effectively address regulatory compliance needs. Furthermore, as small and medium sized producers have and continue to participate in the MAEAP, even though they are mostly exempt from the NPDES permit system, their motivations for participating in MAEAP will likely differ from those of larger producers. MAEAP provides valuable educational seminars and outreach about agri-environmental stewardship practices. But the absence of the ECOS Agreement incentive to becoming MAEAP verified posits new challenges for program administrators.

Motivation for Participating in Voluntary Environmental Programs

Understanding what motivates small, medium and large producers to participate in MAEAP, what services they value and how they benefit from participation is critical for developing MAEAP into a VEP that meets industry needs. This research is directed at that need. In addition to anticipating MAEAP participation, this research also has broader implications for national and international environmental regulatory programs, as firms are increasingly participating in VEP programs sponsored by governments (Khanna, M., P. Koss, C. Jones, and D. Ervin 2007). VEP programs are appealing because they serve multiple interests, including government, industry, and environmental groups, and provide flexible means of reaching desired environmental goals. Effective VEPs have the potential to reduce compliance and regulatory costs and meeting environmental performance standards with greater efficiency (Potoski, M. and A. Prakash 2004). Despite the conclusion of the ECOS Agreement, MAEAP, as a VEP, provides opportunities for the animal agriculture community and regulators to work together to reduce the risk to Michigan's surface waters.

Ideally, effective VEPs provide more amicable and efficient environmental outcomes when compared with more adversarial approaches because VEPs promote cooperation between firms and regulators that can result in win-win outcomes. This situation contrasts with potentially lose-lose conflicts between regulatory enforcement and firms under strict regulatory approaches. However, it is important to note that if VEPs are perceived to serve some interests at the expense of others, their usefulness as an effective regulatory tool will be compromised (Levy, D. 1997). Their effectiveness depends on how stakeholders perceive compliance enforcement relations between regulators and producers.

Whether compliance enforcement follows a cooperative or an adversarial approach depends on how regulators enforce compliance and how producers respond to them (Scholz, John T. 1991). Assuming that the producers wish to avoid regulation and strict compliance, and assuming the opposite is the case for regulators, then both parties have short-term interests to behave opportunistically and impose an adversarial relationship. Yet a cooperative voluntary approach can potentially provide superior long-term outcomes. The setting is a classic example of an economic game as discussed in economic literature—where the actions of one party have implications for the actions of another. In the “game” context, both parties act strategically to signal their intent in hopes that the other will adopt the preferred response. Within the current context, producers can signal to regulators their intent to comply with environmental regulations by participating in voluntary compliance programs in anticipation that regulators will respond cooperatively. Similarly, regulators may signal to producers their intent to strictly enforce regulation with substantial fines for infractions in anticipation that producers will refrain from evading compliance. The signals are the key instruments in implementing strategies.

Interviews and Focus Group Discussions

Interviews and focus group discussions were carried out with key policy makers to discover environmental and agricultural policy issues around livestock production. Two sets of interviews and two focus group discussions were carried out with regulators and MAEAP administrators. The first interview was with Steve Chester on April 1, 2010, who stepped down as the Director of the Michigan Department of Environmental Quality (DEQ) on January 4, 2010. A second interview on May 27, 2010 was with Mindy Koch and Frank Ruswick, the Resource Management and Stewardship Deputy Directors of Department of Natural Resources and the Environment (DNRE),³ respectively. Discovery from these three interviews are included in this report. In addition, these interviews contributed to the final design of the instrument for the two focus group discussions. Copies of the focus group instruments are included as Appendix B and Appendix C of this report. Focus group discussions were carried out on May 28, 2010 with eight DEQ interviewees in one group and four Michigan Department of Agriculture (MDA) interviewees in the second. DNRE is the agency charged with implementing the federal and state water quality protection legislation in Michigan, and was recently formed by merging the DEQ and the Department of Natural Resources (DNR). It has since split back into the original two agencies in March 2011. MDA has regulatory oversight of Right to Farm legislation and GAAMPs and is the agency which is partnering in and implementing MAEAP. Other MAEAP partners were not interviewed.

The next section presents interview and focus group discussions on the regulatory environment that ensued after the ECOS Agreement. The final section broadly discusses the adequacy of existing environmental management and challenges to regulating animal

³ At the time of the interviews, DEQ was operating under the combined agency The Department of Natural Resources and Environmental, which merged the Department of Natural Resources and the Department of Environmental Quality on January 1, 2010. The two agencies have since separated again into two distinct agencies under Executive Order 2011-1.

agriculture in Michigan as perceived by the interviewees. The subsequent two sections present the focus groups' discussions around the role and future of MAEAP and the perceptions of VEPs in general. The last two sections discuss topics where all parties generally agreed and challenges facing environmental regulation of animal agriculture in Michigan. The Focus Group Discussion section concludes with implications for the role of voluntary programs in Michigan and specifically the future of MAEAP.

Lingering Tensions from the ECOS Agreement

Focus group discussions revealed that the use of MAEAP in lieu of a permit has been a dominant and lingering source of tension across DEQ, MDA and MAEAP members, despite the termination of the ECOS Agreement in 2007. Trust issues that lingered following tensions from the ECOS Agreement was seen as the primary problem by all in the focus group participants and the three individuals interviewed separately. Substantial focus group topics centered on how actions and attitudes under the ECOS Agreement undermined the other agency and produced inter-agency trust issues between 2002 and 2007—the period during which the ECOS Agreement was in place. The underlying cause of these perceived reactions differed between the two agencies.

DEQ staff perceived that the ECOS Agreement was forced on an unwilling DEQ, without DEQ involvement. They expressed that they would have preferred to regulate all CAFOs and operations that had discharges under the CWA within the NPDES permit system. They also questioned the motives of CAFOs that selected to become MAEAP verified in lieu of operating under a DEQ permit—viewing them with a 'regulatory pre-emption' lens of choosing the option with least cost. That is, they perceived those choosing the MAEAP option as those producers that were most likely not operating within NPDES standards. The DEQ interviewees contrasted this motivation with their perception that those who chose to become verified prior to the ECOS option were more likely to be driven by an innate desire to be excellent stewards.

In addition, DEQ regulators felt that that MAEAP did not set the environmental standards bar high enough relative to a NPDES permit for CAFOs, and that MAEAP provided inadequate and weak oversight of MAEAP verified farms. They suggested that the MAEAP option allowed producers to operate outside of the NPDES permit system and undermined the regulations set forth under the CWA. A particular concern was that the CNMP required to become MAEAP verified was viewed as a planning document; that if followed could move the livestock facility towards being compliant with water quality regulations. But completing the written CNMP, does not assure that the producer will implement the CNMP. The CNMP was contrasted by the DEQ interviewees to the Livestock*A*Syst documentation of sound practices which requires certain practices to be followed before the document is completed. Producers seeking MAEAP verification or renewal of verification under a Livestock*A*Syst are only awarded verification status when environmental risks are mitigated, not when recognized. In addition, while the DEQ interviewees applauded the efforts that producers undertook to become MAEAP verified, the fact that there is not a stated and enforced means of de-verifying a MAEAP-verified farm (including removing the farm's sign indicating that the farm was MAEAP

verified) was thought to degrade the value of the MAEAP logo as an indicator of a good faith, stewardship effort.

MDA personnel expressed concerns that strict mandates to eliminate risks posed a barrier to producers who would be willing to eliminate environmental risks if allowed to progressively implement improvements. They posit that most producers have an innate desire and incentive to eliminate risk, and providing the education and incentive for them to meet guidelines is equally effective in meeting environmental standards without incurring prohibitive costs. In addition, those MAEAP-verified producers who do not progress to meet the CNMP at the end of three years, will have their MAEAP standing revoked, and that the agency stands ready to take action before the three-year required re-verification for flagrant abuse. They noted, however, that while a MAEAP-verified farm could lose its verification, the MAEAP sign could not be revoked and removed, as it was the property of the farm. Farms that do lose their MAEAP standing are strongly encouraged to correct their situation or remove the sign.

The focus group discussions suggest that the ECOS Agreement colored how the DEQ interviewees viewed MAEAP and how the MDA viewed the DEQ. The DEQ interviewees saw MAEAP as a vehicle that could allow agriculture to avoid CWA regulations. Because of this perception, MAEAP was viewed as a political tool and devalued as a legitimate good faith effort. In part, because of this history, DEQ concerns about the true motives of those supporting MAEAP appear to be lingering to this day. In contrast, MDA viewed the DEQ as not appreciating the pollution prevention efforts of livestock producers, nor understanding the challenges faced by them in becoming better stewards. As a result, the ECOS Agreement produced a wedge between the two agencies with the potential of degrading cooperation between the two agencies.

However, all participants agree that conflict-laden regulatory discussions around CAFO facilities have subsided considerably, and that most people in the agencies and the agricultural community appear to have accepted the current regulatory environment. Thus, DEQ, MDA, and producers have been able to establish the existing *modus operandi* in meeting state and federal discharge regulatory obligations despite the erosion of trust between the two agencies. At the time of this writing, MAEAP is entering into a new era of collaborative partnership. Public Act 2, 2011 (PA-2) was signed into law, establishing MAEAP into law with new provisions. Public Acts 1 and 2 established the Environmental Assurance Advisory Council (EAAC) in place of the Groundwater Advisory Council. The EAAC is made up of the directors of MDA, DEQ, Michigan State University Extension (MSUE), and AgBioResearch, along with representatives from the USDA Farm Services Agency and Natural resources Conservation Services, from conservation districts and non-governmental environmental and conservation organizations, industry and others, as appointed by the director. The EAAC, along with other tasks, sets MAEAP standards and protocols for verification and revocation of verification.

The new era will bring new collaborations and challenges, and lessons learned from MAEAP's 11-year history are equally applicable to MAEAP in the new era. As

discussions with past stakeholders show, all stakeholders must share in the challenges of meeting Michigan objectives around livestock systems and their threats to environmental quality. This new era comes about as stakeholder tensions are easing and agencies rebuild trust following the conclusion of the ECOS Agreement.

Role of MAEAP

Many concerns and issues about MAEAP were identified in the focus group discussions. For example, many producers and proponents of MAEAP described MAEAP as a voluntary program of self-compliance that, if followed, is equivalent to obtaining and maintaining the terms of a NPDES permit. However, DEQ interviewees took issue with the concept of NPDES equivalency and went further to assert that compliance is imposed. Thus, it is not surprising that DEQ interviewees believe that compliance with regulation is not voluntary under any circumstance. They further assert that a discharge is illegal regardless of whether a facility is or is not verified.

DEQ interviewees want MDA and MAEAP to sharpen and maintain the distinctions between regulation (i.e., the domain of the DEQ) and voluntary activities (i.e., the domain by which MDA and MAEAP have authority). In particular, they felt that MAEAP should not be viewed as setting the standard for regulation, nor should MAEAP operate under the guise of a regulator. They viewed MDA efforts as appropriately focused on the well-being of the farmer and farming community. In essence, MDA and MAEAP are perceived by DEQ interviewees as advocates for producers, and as such MAEAP is recommending only those changes in farming systems that are viewed as acceptable to farmers. DEQ interviewees also sensed that the MAEAP administration struggles with balancing simplicity, which facilitates verification, and flexibility, which facilitates producers' needs. Flexible standards, though beneficial to the producer, reduce the distinction between effective and ineffective compliance with legal requirements. The DEQ interviewees believed that producers should be able to discern what the minimum requirement for each level of environmental performance is, and they perceive flexible requirements as muddying that distinction. More so, they view flexible standards established under MAEAP as awkward and unclear – producing less guidance for farmers while adding unneeded costs.

MDA interviewees believed that MAEAP standards closely followed standards required under the NPDES, and in some cases, exceeded those under the NPDES. Consistent with the *Pollution Prevention Strategy and Implementation Plan for Michigan Agriculture*, MDA interviewees would like MAEAP verification to be perceived by DEQ as a signal of good faith efforts by the producer to reduce environmental risks. MDA interviewees tended to view the DEQ staff as unsophisticated regulators of the farming community about which they have little understanding. That is, DEQ regulators were perceived to be uninformed about modern farming practices and issues around farming, such as producer's inability to protect against extreme weather events. The perception was that DEQ did not have the time, mandate, staff, or entree that MDA staff had for building the relationships with those in the agricultural community. They argued that farmers had to have environmental management options that make sense for their situation and that

farmers need to be assured that the environmental management changes they make under MAEAP are recognized as good faith stewardship efforts by the DEQ. At the minimum, MDA staff felt that they should be consulted before enforcement actions were carried out against a MAEAP participating farmer.

In addition, the focus group participants from the MDA, expressed concern that DEQ regulatory action had not been consistent. They argued that enforcement actions should reflect some underlying sequence of events or producer intent that reflected negligence or clearly discernable infractions on the part of the livestock producer. They pointed to examples of what they perceived as inconsistent application of enforcement actions which blurred the distinction between permissible and non-permissible livestock production practices. Rather than applying strict compliance enforcement inconsistently, they saw flexible standards that allow producers to seek optimal solutions to risk as a means of encouraging producers to be in compliance or even exceed compliance standards.

When we asked interviewees if DEQ was more likely to audit (inspect) MAEAP-verified livestock operations for their environmental performance, two distinct perceptions arose. DEQ interviewees said that they were less likely to scrutinize a MAEAP-verified farm unless there was a complaint of an illegal discharge. DEQ interviewees noted that they generally operate under the assumption that if a farm is MAEAP-verified, then it has an environmental management system in place and is therefore more likely to be up to standard. DEQ administrators went so far as to suggest that it is not worthwhile to focus attention on MAEAP-verified establishments, as those farmers have already indicated a willingness to invest in stewardship practices and that it is not in their best interest to spend time and resources on establishments less likely to be out of compliance. To this extent, the hurdle of completing verification signaled a producer's willingness to control discharge. In contrast, MDA interviewees suggested that under the ECOS Agreement, MAEAP-verified farms appeared to be targeted by DEQ and environmental groups for compliance infractions, and that such attention became a disincentive for producers to participate in MAEAP. However, DEQ interviewees acknowledged that MAEAP-verified farms might have been subject to greater scrutiny towards the end of the ECOS option and that such an outcome was to be expected since there was need to gather data on the efficacy of the MAEAP option under the ECOS Agreement.

In sum, there exist differing views about what participation in MAEAP represents—in part because of its historic evolution. DEQ officials appeared to view MAEAP using the 'regulatory pre-emption' lens because MAEAP certification was proposed 'in lieu of CAFO permitting' under the ECOS Agreement and because the DEQ and environmental groups did not perceive themselves as effective/equal participants in setting performance expectations and monitoring processes for MAEAP certification. However, DEQ interviewees laud the efforts of producers completing MAEAP verification; though they acknowledge questioning the motives of those that chose MAEAP in lieu of a permit. Because they view MAEAP standards are not consistent with those under the NPDES permit, DEQ officials viewed participation in MAEAP with a '*regulatory preemption*' lens, where producers undertook MAEAP verification to skirt existing regulation. On the

other hand, MDA officials appeared to view MAEAP within the ‘*signaling*’ lens – even during the ECOS Agreement. Therefore, MDA officials expected that MAEAP certified farms would be perceived and treated as more responsible environmentally. These differing analytical viewpoints and beliefs lead to some interagency conflict and frustration regarding MAEAP, particularly during the period before and during the ECOS Agreement, and particularly with regard to CAFOs.

Role of Voluntary Programs in Michigan Livestock Production

Despite concerns about MAEAP, DEQ interviewees saw real opportunities for VEPs. They pointed to the success of the Michigan Environmental Response Program which is a voluntary program designed for the Michigan dry cleaning industry. The DEQ interviewees viewed voluntary compliance as most essential when there were non-point sources of pollution or when effective regulation was hindered by too many small entities. Under these situations, it becomes prohibitively expensive for the DEQ to monitor all sources of pollution. Such voluntary programs were thought to be most effective when peers monitored each other’s practices and outcomes, and the social threat of peer criticism and reporting was a strong motivator for producers in pursuing stewardship.

The DEQ is confident that voluntary agriculture-environmental programs can work in Michigan. DEQ interviewees provided two examples. When the DEQ gathered farmers and hunt clubs to discuss solutions to Michigan's TB problem, regulators left the identification of a solution to them. The hunt club asked for regulations on their industry, while farmers sought to build common practices for controlling TB. Both groups revealed willingness to pursue a common good. In another example, the Berrien County agriculture community was willing to self-coordinate to solve aquaculture issues in the absence of regulation. DEQ interviewees see voluntary environmental programs as an important component to meeting Michigan's environmental goals.

However, DEQ interviewees felt that they should take an active role in any agricultural VEP, and that they were not fairly represented in the MAEAP governance structure. Although DEQ was initially represented on the MAEAP governing board, most DEQ representatives have become inactive due to a perception of being ineffectual on the board. To facilitate communication and accordance, the DEQ interviewees noted that they would like to be represented in MAEAP governance in such a manner that if they expressed concerns with the MAEAP process and procedure, the administration of MAEAP would give these concerns appropriate respect and consideration. DEQ interviewees suggested that, with earnest cooperation with MDA, MAEAP could be an important component of Michigan's effort to meet CWA mandates. It is clear, however, that the DEQ is not likely to view MAEAP verification in its current form as a replacement for a permit. Instead, they view MAEAP as a tool for farms to reduce their environmental risks.

All interviewees (DEQ and MDA) recognized MAEAP’s potential contribution toward meeting state environmental goals. However, losing the option of MAEAP certification

in lieu of a NPDES permit was perceived, at least by the MDA interviewees, as eroding a key motivator for livestock producers to become MAEAP verified. However, they recognized that other motivations exist, and expressed a need to better understand these motivators, and align the MAEAP accordingly to ensure more livestock producers become MAEAP verified. DEQ interviewees also expressed that MAEAP and VEPs in general have a prominent role in working with small and medium producers—those not subject to CAFO permitting—in raising the levels of environmental performance of smaller producers to those required of CAFOs. As MAEAP is also an educational forum, they see it as instrumental in curtailing most environmental quality violations that occur because of lapses in management or lack of knowledge about risks.

Topics where MDA and DEQ Interviewees were in Agreement

Despite lingering tensions between the MDA and DEQ there was agreement among interviewees on several issues. All participants (DEQ and MDA) indicated that there was no question that agricultural production impacted environmental quality regardless of the size of operations. But the discussions did not address the question whether large producers were better or worse at managing an equal amount of waste as opposed to many smaller producers or whether chronic or acute discharges caused more pollution damage.

Furthermore, there exists a consensus that the current system of environmental regulation and monitoring of livestock production is working, though all agreed that some aspects of regulation needed further attention. Generally, all interviewees agreed that the majority of the animal agriculture community practiced pollution prevention and that both peer and regulatory constraints worked to minimize the risk of pollution-generating runoff from livestock facilities. All interviewees also recognized that there were “bad actors” (e.g. inappropriate farming practices) that created water quality/ pollution problems, and that agriculture remained a major source of risk for water quality/pollution problems in the state.

From a regulation effectiveness perspective, both DEQ and MDA interviewees recognized that DEQ was neither well suited nor had the policing authority and budgets for monitoring all livestock producers’ practices and environmental outcomes. The DEQ has regulatory oversight of only the largest livestock producers. Alternatively, the MDA interacts with all sizes of operations on an ongoing basis, providing a substantial opportunity for promoting efforts to reduce environmental risks. Because both agencies viewed the potential for discharge of both small and large producers to be equal threats to water quality, they recognized the need for workable approaches toward preventing or controlling animal agriculture discharges of smaller producers.

Interviewees from both agencies also recognized MAEAP’s contribution and potential contribution toward reducing the risk of discharge from smaller, non CAFO producers. As both agencies do not foresee existing regulation expanding to require NPDES permits for smaller livestock producers, they recognized the importance of MAEAP in improving the environmental performance of such producers. They recognize the strength of

rapport between producers and MDA personnel in providing technical pollution prevention assistance and motivation to effectively influence the environmental risk management of livestock producers.

There was also agreement from both agencies' personnel that retailers such as Wal-Mart or meat processors were not going to have much influence on environmental practices of livestock producers in the near future, unless these practices corresponded directly with food safety concerns. More so, the more direct the channel from producer to consumer, the more influence wholesalers and retailers have on stewardship practices. But, indirect channels from producer to consumers mitigate consumer influence on industry practices. So far, such industry practice requirements have largely been applied to vegetable and fruit production, but have not been widely directed at animal agriculture where direct connections of farmers with end consumers were limited.

In conclusion, both agencies see MAEAP as an integral part of the solution for environmental risks of livestock production. Inherent challenges in regulating multiple pollution sources from large and small producers with limited budgets and policing authority frustrates DEQ regulators who seek to minimize environmental threats. Alternatively, the MDA has built up rapport with livestock producers and has a more open audience to practices that minimize environmental risks. In effect, both agencies see environmental risk mitigation efforts enhanced with collaboration.

Ongoing and Future Challenges to Regulating Animal Agriculture

We asked all interviewees to discuss their perceptions of the challenges in improving the environmental performance of livestock production. Many such challenges have been discussed in the previous section; including discord between agencies and perceived inconsistency of regulatory efforts. Other challenges were mentioned during our interviews. One challenge is developing a *shared and accurate knowledge base*. For example, DEQ participants stressed that the agriculture community demonstrated confusion about what GAAMPs covered – some producers erroneously inferred that their compliance with GAAMPs meant they were compliant with Michigan environmental regulations. But, as the DEQ interviewees noted, Michigan's environmental regulation go beyond GAAMPs and a farm that operates within GAAMPs guidelines could still be in violation of Michigan's environmental laws. Additionally, Michigan's animal agriculture producers relied heavily on the Natural Resources Conservation Service (NRCS) Manure Storage Facility Standards (313) and Nutrient Management Standards (590). The NRCS standards are regional guidelines for sound practices and are not equal to Michigan regulatory standards. Hence, the DEQ interviewees believed that the MAEAP and NRCS industry guidelines, though valuable tools toward meeting laudable environmental and production farming practices, were not enough to assure that producers would be protected from the legal risks of environmental discharge.

The DEQ interviewees would also like to see NRCS guidelines be less technical and more operational from a regulatory standpoint. That is, they saw NRCS guidelines as inflexible and less than amenable to state regulatory guidelines. They also expressed the

desire for more collaboration with MDA toward addressing these issues and educating producers. However, reduced trust between the agencies following the ECOS Agreement has hindered the agencies' ability to fully recognize efforts to address the most significant obstacles to collaboration. This lack of trust has also impeded DEQ efforts to directly communicate and work with the agricultural community toward common goals. With greater collaboration, it is envisioned that both agencies will be better able to work with livestock producers toward win-win opportunities for reducing environmental risk.

Interview Conclusions

Several topical areas were illuminated during the two interviews and two focus group discussions. A key element among these were the ongoing relationship between DEQ and MDA; a relationship that has important implications on how the agricultural community and the regulatory community work together to solve Michigan's agricultural, environmental issues.

Foremost, history matters. There has been an uneasy relationship between the agricultural community and the regulators with respect to agro-environmental issues. In the case of MAEAP, these tensions were inflamed by the perceptions around the ECOS Agreement. As regulators felt they hadn't contributed to the concept underlying the ECOS Agreement and, as a result, generally did not support the imposition of the ECOS option, it became a source of friction that eroded trust between the two agencies. One interviewee noted that the ECOS Agreement provided a lesson on how not to implement policy, and that successful policy implementation required involvement and participation of all affected agencies and staff.

True collaboration will require a rebuilding of trust between the agencies and avoiding situations where MAEAP is perceived by the DEQ as being used as a political vehicle that undermines the role of regulations as well as the DEQ. One possibility is for both agencies to jointly assess how much does MAEAP verification actually reduce environmental risks over space and time and whether there are policy or management steps that can be taken to further reduce such risks.

Second, there is lack of clarity as to who are the stakeholders and influential leaders in MAEAP. At the time of the interviews, it is not currently clear whether participating farmers (e.g. large CAFOs or AFOs) the agricultural community's leadership (e.g. MI Farm Bureau), or MDA that leads MAEAP. Other stakeholders such as the DEQ, and environmental organizations and community groups appear to have withdrawn or feel sidelined. This lack of clarity has the potential to hinder the creation of trust between the agencies and reduce livestock producers' motivation for participating in MAEAP.

If collaboration restores trust, MAEAP verification can potentially be viewed as a consistent signal of environmental stewardship from participating farmers to the DEQ regulators, which in turn can lower the cost of regulatory oversight while increasing the amount of environmental stewardship achieved. This restoration of trust might require that MAEAP carefully avoid any assertions that MAEAP verification or planning documents imply regulatory compliance.

A potentially more arduous factor that may hinder further collaboration is the differing priorities/ policy mandates of the two agencies. The DEQ is tied to enforcing existing state and federal legislation for reducing environmental impacts of producers, whereas the MDA is tied to traditional role of building and maintaining its relationships with farmers while in pursuit of improved agricultural-environmental outcomes. Understanding and respecting the different perspectives and working within these constraints may prove a key to successful collaboration.

Finally, MAEAP has an important and non-controversial role to play in improving the environmental performance of small and medium farms that are not covered by the permit requirements and this potential is recognized by both agencies. A redesigned MAEAP program can also facilitate future efforts in ‘green marketing and green certification’ of livestock products.

Surveys of Producers

The prior section elucidates policy-makers’ perceptions of environmental risks of livestock production and MAEAP’s role in mitigating risks. This section relies on mail surveys of Michigan livestock producers to gain an industry perspective of MAEAP, state regulation and environmental risks of livestock production. Similar surveys were mailed to two population groups. The first survey was sent to a sample of the general population of animal agriculture producers. The Michigan Field Office of the National Agricultural Statistics Service (Michigan NASS) provided the sample for this survey. The second survey was sent to animal agriculture producers who had previously attended a MAEAP, Phase I educational event. The second survey sample was based on the sign-up sheets that each Phase I event attendee had been asked to complete. The Michigan Farm Bureau assisted in identifying livestock producers from these lists, although some livestock producers may have been overlooked.

The surveys were designed to gauge the perceptions of producers on topics that included regulations, regulatory enforcement, regulation and environmental risk, and MAEAP. In particular, the survey questions were aimed to address the following research questions.

- What is the awareness about MAEAP among different types of MI-livestock producers?
- Among those familiar, what fraction of producers participate in MAEAP education programs and what are their motivations in participating?
- Among those who participated in the education program, what fraction followed all the steps in the MAEAP certification (such as CNMP, Planning, verification etc.)? What are the drivers of such decisions?
- What are the producer perceptions about the effectiveness and benefits of MAEAP participation, in terms of communicating with various stakeholders and regulators?
- What are the drivers of decisions not-to-participate in MAEAP after attending the initial training program?
- What modifications in the program design may improve MAEAP participation?

The survey instrument was adopted from Abdulkadri *et al.* (Abdulkadri, Abdul, Steve Miller, Sandra Batie, and Satish Joshi 2009), who developed a survey instrument for MAEAP-verified producers from focus group discussions of Michigan livestock producers on April 7, 2008. The instrument was modified to better anticipate the responses of livestock producers who had neither completed verification nor participated in any MAEAP-sponsored events. The revised instrument was reviewed by multiple livestock educators from Michigan State University Extension and MDA personnel. As the instrument was essentially a replication of a prior survey, no pre-test of the instrument was undertaken. A copy of the survey instrument is included as Appendix A in this report.

Survey Samples and Respondent Characteristics

The survey instrument was distributed to two different populations of Michigan livestock producers. The first survey was distributed to a sample of Michigan population of livestock producers, stratified along commodities and herd size as self-reported in the 2007 Agriculture Census. It was delivered via First-Class mail on February 2, 2010. Eleven days later, a postcard reminder was sent, and a second copy of the survey was sent to those producers who had not responded at the end of two weeks from the initial mailing. A total of 1,040 surveys were mailed; fifteen were returned as undeliverable by the U.S. Postal Service and 36 were returned by the recipient, indicating that they no longer raised livestock or had since left farming. A total of 288 valid surveys were received from the NASS sample, or just over 29 percent. This sample will be referred to as the general population throughout the remainder of this report. The second survey was sent on June 2, 2010 to individuals that had attended at least one MAEAP-sponsored educational event within the past three years. Postcard reminders were sent 14 days later, and second reminder surveys were sent to all individuals 21 days later. Due to cost considerations, this survey was sent via Nonprofit Enhanced Carrier Route, Standard Mail rate class through the U.S. Postal Service. Under this postal class, non-deliverable mailings are not returned to sender.⁴ Hence, it was not possible to track how many surveys were not delivered. A total of 385 people had attended at least one Phase I education event in the past three years. These participant addresses were compared to the general population survey to filter out duplicate addresses. One hundred and fifteen were filtered out as duplicates of the general population sample or agri-business service providers. This sorting left 270 in the population of MAEAP participants. Of these, eight respondents returned surveys indicating they no longer raised livestock or had left farming. A total of 64 surveys were received from the sample of Phase I education session attendees, or just under 24 percent. This sample will be referred to as “MAEAP Participants’ Survey” throughout the remainder of this report.

⁴ Nonprofit Enhanced Carrier Route Standard Mail mailings first correct incorrect addresses where possible and remove those addresses that are deemed undeliverable through USPS CASS-Certified filters before actually incurring postage expense. While the CASS-Certified mailings minimizes the possibility that the survey will be non-deliverable, mailings sent via Nonprofit mail rates do not return envelopes that are not delivered, nor does it forward the mail in the case that the recipient changes addresses.

Several tabulations of the responses received are provided in the following paragraphs. In most cases, tabulations are provided separately for both samples—MAEAP participants and general population—in addition to aggregate tabulations that pool both samples. In the following paragraphs, where the sample is not specified, the reader should interpret the statistics as from the pooled sample from both surveys.

Respondents from both samples were asked to provide key information about their livestock operations. Table 1 presents the total number of respondents from each sample that indicated possessing each respective livestock species. Respondents may indicate having more than one livestock species. As seen in the table, survey respondents most commonly selected dairy (35.2%) and beef (46.9%) cows as present on their farm. Hog producers (29.5%) make up a large component as well, but are not as representative of the MAEAP-educational event attendees (9.4%). Other livestock groups include poultry and turkeys (15.6%), sheep and goats (11.4%), horses (13.1%) and others (2.0%).

Table 1: Survey Responses by Commodity Type

Survey		Dairy Cows	Beef Cows and Other	Hogs	Poultry & Turkeys	Sheep & Goats	Horses	Other
MAEAP Phase I Population	Possess	32 (50)	30 (46.9)	6 (9.4)	7 (10.9)	7 (10.9)	8 (12.5)	1 (1.6)
	Do not Possess	32 (50)	34 (53.1)	58 (90.6)	57 (89.1)	57 (89.1)	56 (87.5)	63 (98.4)
General Livestock Population	Possess	92 (31.9)	135 (46.9)	98 (34)	48 (16.7)	33 (11.5)	38 (13.2)	6 (2.1)
	Do not Possess	196 (68.1)	153 (53.1)	190 (66)	240 (83.3)	255 (88.5)	250 (86.8)	282 (97.9)
Total of Both Populations	Possess	124 (35.2)	165 (46.9)	104 (29.5)	55 (15.6)	40 (11.4)	46 (13.1)	7 (2)
	Do not Possess	228 (64.8)	187 (53.1)	248 (70.5)	297 (84.4)	312 (88.6)	306 (86.9)	345 (98)
Total Responses		352	352	352	352	352	352	352

Numbers in parentheses are percent of surveyed.

Species groups are tabulated by size of operations in Table 2. This table shows the percent of responses in each size of operation category of those indicating possessing each respective livestock species. The responses in Table 2 suggest that MAEAP participants tend to be smaller dairy, cattle and poultry operators. For example, only 12.5 percent of the sample of the 32⁵ MAEAP-educational event attendees with dairy operations indicated having herds of 500 or more, compared to 47.8 percent of the general population of livestock producers. Alternatively, 66.7 percent of MAEAP participants raising hogs indicated in excess of 500 head, compared to 48 percent for the general population of hog producers. However, it should be noted that only six MAEAP educational event attendees make up the MAEAP participant sample of hog producers.

⁵ As shown in Table I.1

Table 2: Commodity Type by Size of Operations by Survey (percent responses)

Dairy Cows by Size Group				Beef and Other Cows by Size Group			
	MAEAP Participants	General Population	Total		MAEAP Participants	General Population	Total
1-49	15.6	9.8	11.3	1-49	43.3	51.9	50.3
50-499	71.9	42.4	50.0	50-499	53.3	37.0	40.0
500-899	9.4	23.9	20.2	500-899	0.0	5.2	4.2
900+	3.1	23.9	18.5	900+	3.3	5.9	5.5
Total	100	100	100	Total	100	100	100

Hogs by Size Group				Poultry/layers & meat/Turkeys by Size Group			
	MAEAP Participants	General Population	Total		MAEAP Participants	General Population	Total
1-49	33.3	25.5	26.0	1-99	71.4	52.1	54.5
50-499	0.0	26.5	25.0	100-499	28.6	29.2	29.1
500-999	0.0	10.2	9.6	500-999	0.0	2.1	1.8
1000+	66.7	37.8	39.4	1000+	0.0	16.7	14.5
Total	100	100	100	Total	100	100	100

Sheep/Goats by Size Group				Horses by Size Group			
	MAEAP Participants	General Population	Total		MAEAP Participants	General Population	Total
1-49	71.4	60.6	62.5	1-9	100	100	100
50-249	14.3	24.2	22.5	10+	0	0	0
250-899	14.3	9.1	10.0	Total	100	100	100
900+	0.0	6.1	5.0				
Total	100	100	100				

Additional questions about operations were asked of respondents. Only 8.3 percent of MAEAP participants in the sample indicated that they operate as a CAFO compared to nearly 22 percent from the general population. We further asked respondents to indicate the total number of acres owned or leased by their operations. The results are shown in Table 3. As an alternative to the number of livestock head, Table 3 indicates that MAEAP participants tended to have more acreage than the general population, with 82 percent rather than 68 percent (of the non-omitted responses of 340) indicating 250 or more acres. We further asked respondents to indicate whether they felt they would continue to raise livestock in the future. Those results are shown in Table 4. Of those responding from both samples, 283 of the 345 respondents, or about 82 percent, indicated they plan to continue to raise livestock in 10 years. Those producers that indicated they were likely to not continue livestock operations in 10 years were asked to provide a reason. Of those that selected “other” as their reason (52.2%), most all wrote in “Retire” for their reason. Of those not selecting other, plans to transfer ownership were the most common response (23.2%), followed by plan to sell for agricultural uses (14.5%) and plan to sell for non-agricultural uses (10.1%).

Table 3: Responses by number of acres

Acres	MAEAP Participants		General Population		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
1-49	3	2.4	23	8.0	26	7.4
50-99	10	8.1	16	5.6	16	4.5
100-249	8	6.5	50	17.4	60	17
250-499	22	17.9	41	14.2	49	13.9
500-999	16	13.0	55	19.1	77	21.9
1000+	59	48.0	94	32.6	110	31.3
Omitted	5	4.1	9	3.1	14	4
Total	123	100	288	100	352	100

Table 4: Plan to continue farming in next 10 years

	MAEAP Participants	General Population	Total
Yes (Counts)	50	233	283
No (Counts)	11	51	62
Plan to sell for ag use (%)	16.7	13.7	14.5
Plan to sell for non-ag use (%)	11.1	9.8	10.1
Plan to transfer ownership (%)	22.2	23.5	23.2
Other (%)	50.0	52.9	52.2

We finally asked respondents to indicate in which NRCS programs they participate. Respondents were allowed to select more than one. Nearly 50 percent of respondents from both samples participate in at least one NRCS program as shown in Table 5. Environmental Quality Incentives Program (EQIP, 31.8%) is the most commonly selected NRCS program, followed by Conservation Reserve Program (CRP, 20.5%). Grassland (GRP, 3.4%) and Wetland Reserve (WRP, 5.7%), Programs and Wildlife Habitat Incentives Program (WHIP, 3.7%) were least likely to be selected across both samples.

Table 5: NRCS Programs Enrolled

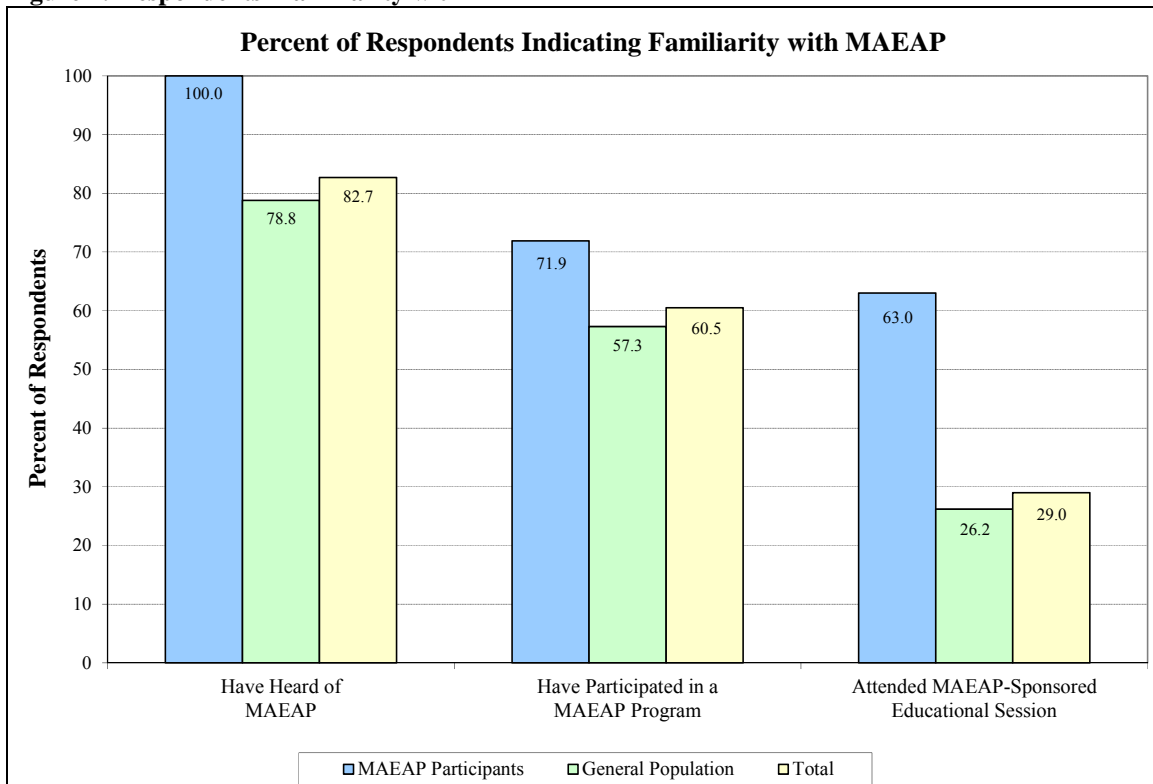
NRCS Program	MAEAP Participants		General Population		Total	
	Count	Percent	Count	Percent	Count	Percent
Conservation Reserve Program (CRP)	15	23.4	57	19.8	72	20.5
Conservation Reserve Enhancement Program (CREP)	3	4.7	32	11.1	35	9.9
Conservation Security Program (CSP)	5	7.8	23	8	28	8
Environmental Quality Incentives Program (EQIP)	23	35.9	89	30.9	112	31.8
Grassland Reserve Program (GRP)	1	1.6	11	3.8	12	3.4
Wetlands Reserve Program (WRP)	3	4.7	17	5.9	20	5.7
Wildlife Habitat Incentives Program (WHIP)	1	1.6	12	4.2	13	3.7
At Least One Program	30	46.9	136	47.2	166	47.2

Familiarity with MAEAP

As shown in Figure 1, most respondents of both samples indicated familiarity with MAEAP. Just over 80 percent of general population report being familiar with MAEAP, and, not surprisingly, 100 percent of the MAEAP participants indicated they have heard of MAEAP. Nearly 60 percent of the general population indicated participating in a MAEAP program in the last three years, but only 72 percent of those that have participated in MAEAP-sponsored educational events recognized participating in such an

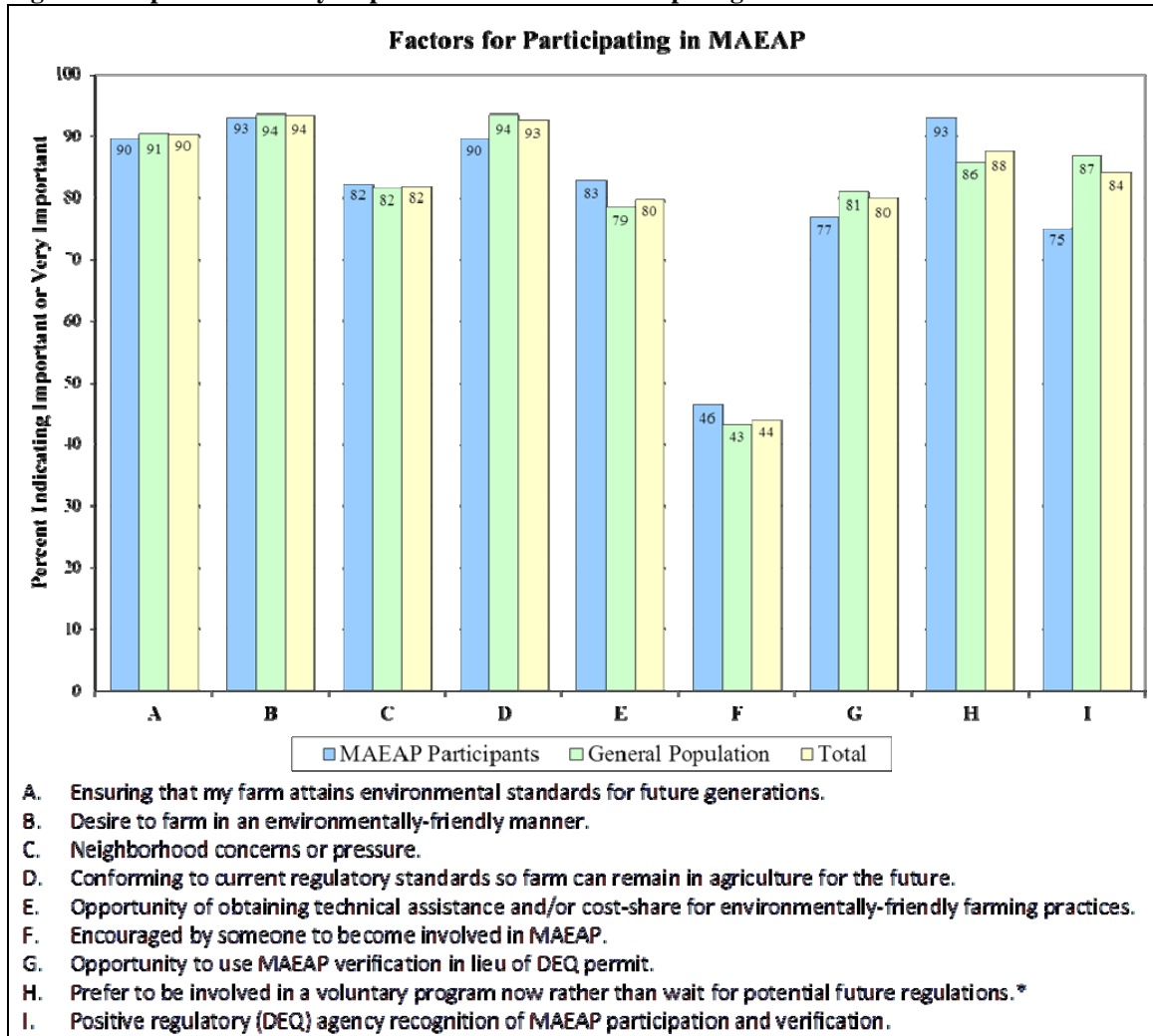
event. Finally, when asked if they participated in a MAEAP-sponsored educational session, only 26 percent of the general livestock producer sample indicated doing so while 63 percent of those that have attended a MAEAP Phase I educational session recalled it or recognized it as being a MAEAP-sponsored event. As the MAEAP participants sample was drawn from those that have attended a MAEAP-sponsored educational session in the last three year, and therefore a MAEAP program, we should expect MAEAP participants to all select “Yes” to all three of these questions. The fact that less than a 100 percent recognized their participation in a MAEAP program and their attendance of a MAEAP-sponsored educational session suggests a general failure to recognize MAEAP as the sponsor of such educational events.

Figure 1: Respondents' Familiarity with MAEAP



Just 125 of the respondents over both surveys indicated they have attended a MAEAP-sponsored educational event in the last three years. These individuals were further asked to rank several factors that led to their participation. Several factors were offered as choices, including environmental, regulatory, and community factors. Additionally, respondents were encouraged to write in other factors. Figure 2 shows the percent of respondents that indicated each selected factor was either “important” or “very important” in their decision to participate in a MAEAP-sponsored educational event. As is evident in the responses, producers considered most factors as contributing to their decision to participate in MAEAP. However, someone else’s encouragement to participate in MAEAP was not perceived to be an important factor in their decision. When comparing responses across the two samples, none of the responses indicated a significant difference in factors for participating in MAEAP.

Figure 2: Important or Very Important Factors for Participating in MAEAP

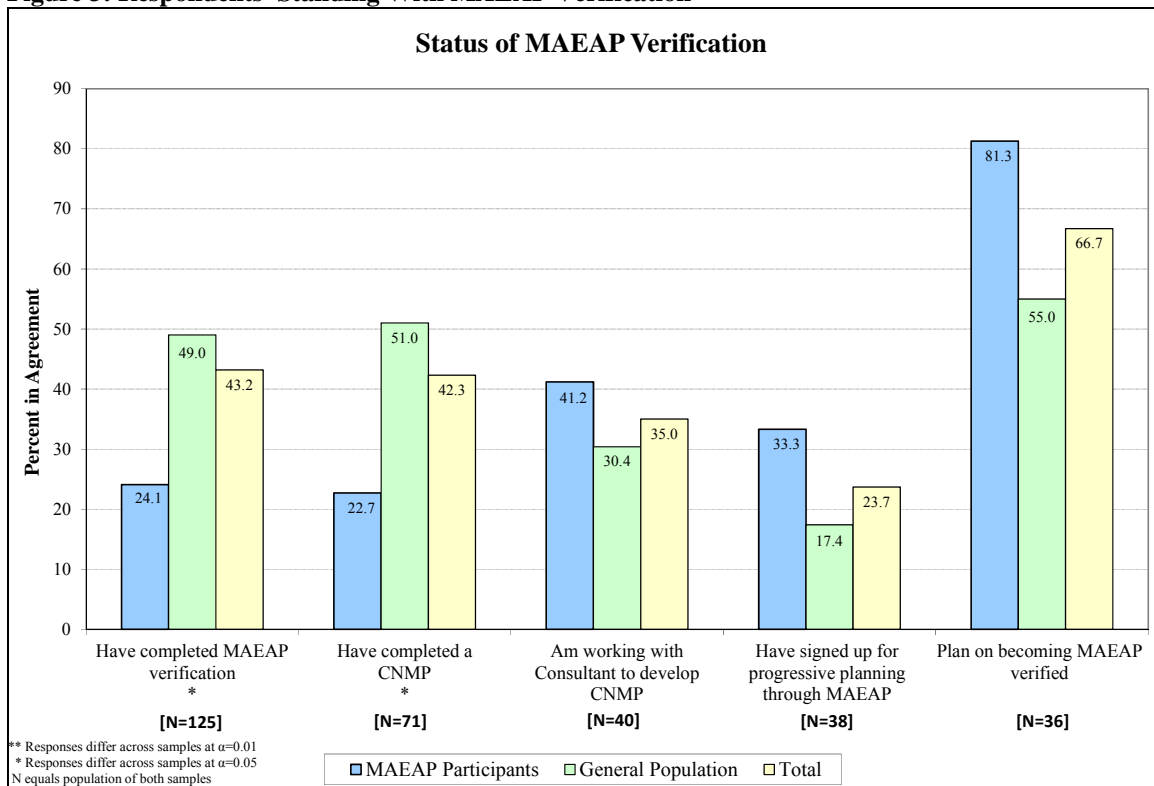


Those producers that indicated they had attended a MAEAP-sponsored educational session were also asked to indicate their intentions and status toward becoming MAEAP verified. Figure 3 shows responses to five questions regarding producers’ plans concerning MAEAP verification. Individuals were first asked if they have completed MAEAP verification. Approximately 43 percent of 125 respondents that indicated attending a MAEAP-sponsored educational event also indicated they had completed verification. There exist a statistically significant difference between responses of the MAEAP participant and general population samples; approximately 49 percent of the general population respondents indicated completion of verification compared to 24 percent of MAEAP program attendees.⁶ Those producers that indicated they had not completed verification were then asked if they have completed a CNMP. Only about 28 percent of sample of MAEAP program participants indicated completing a CNMP, while 51 percent of those from the general livestock producing population did. The difference

⁶ No effort was undertaken to control for non-response bias. Hence, it is possible to conceive that those from the general population that have engaged in the MAEAP process were more likely to complete the survey.

between the two samples is significant. In the pooled sample, 42.3 percent (or 30) of the 71 respondents that were not MAEAP verified had completed a CNMP. The 41 respondents from both samples that indicated they had not completed a CNMP were then requested to address three additional questions. About 35 percent of the remaining population (of the pooled sample) indicated that they were currently working with a consultant to develop a CNMP; 23.7 percent indicated that they had signed up for progressive planning through MAEAP; and nearly 67 percent indicated plans to become MAEAP verified. Responses to these three questions were not significantly different between the two samples.

Figure 3: Respondents' Standing With MAEAP Verification



Individuals that indicated they had attended a MAEAP-sponsored educational event or indicated participation in the MAEAP program were asked to explain what motivated their involvement. This was an open question where most individuals indicated a desire to become environmentally sustainable as the right thing to do. Other responses included desire to reach compliance voluntarily, pursuit of technological and/or financial incentives to reach compliance, stave off DEQ regulations and becoming proactive on environmental issues.

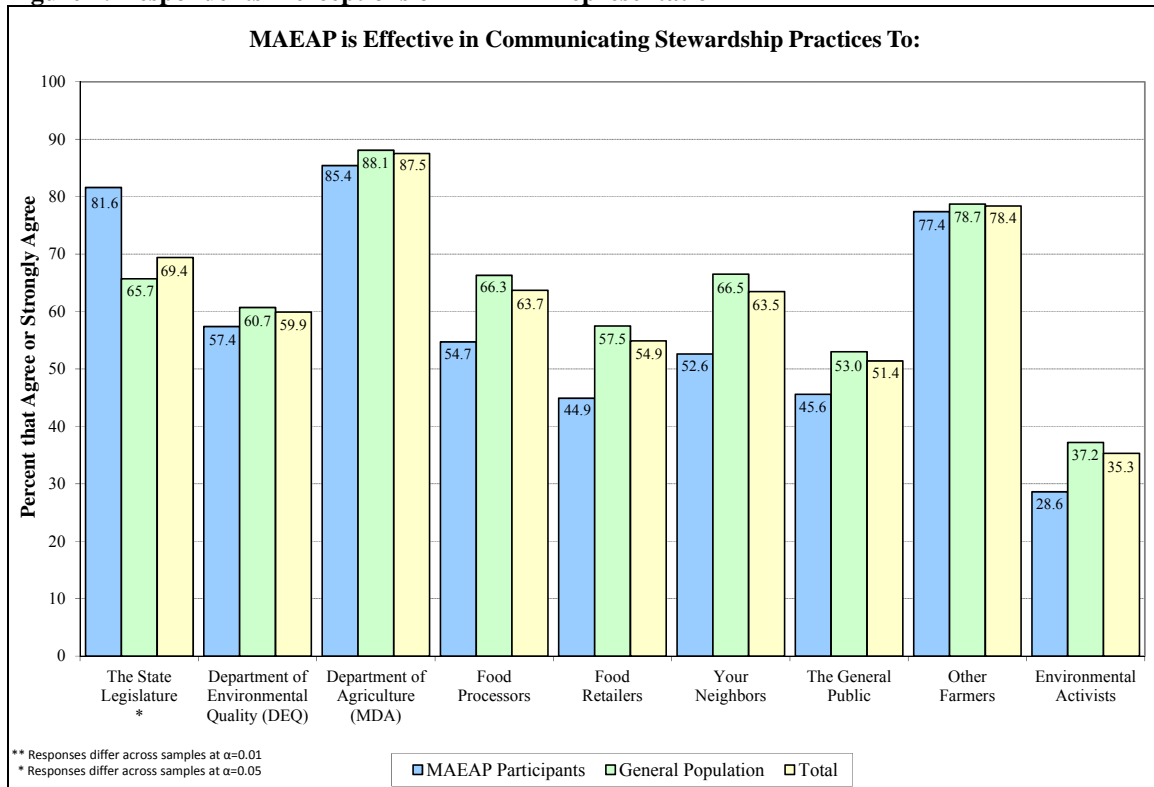
Effectiveness of MAEAP

We asked respondents to share their perceptions of the effectiveness of MAEAP. Ten questions were asked with multiple components. The findings are reported in the accompanying graphs and tables and discussed within the text below. Only those

producers that indicated they were familiar with MAEAP were asked to complete this section of the survey.

Respondents familiar with MAEAP were asked to indicate their levels of agreement with the statement that “MAEAP verification communicates that producers are responsible environmental stewards” to various stakeholder groups. Figure 4 presents the percent of respondents that selected either “Agree” or “Strongly Agree” for each respective stakeholder group. Two stakeholder groups clearly stand out—“MDA” (87.5% of both samples) and “other farmers” (78.4%). The relatively lower results across other groups suggest that respondents anticipate lower recognition of MAEAP outside of the agriculture community. Of the non-agriculture groups, “State Legislatures” (69.4%) are perceived as recognizing MAEAP verification as an indicator of stewardship practices. Relative to MDA, respondents perceive that the DEQ is less likely to recognize MAEAP verification as an indication of stewardship practice (59.9%). Most Michigan livestock producers perceive that MAEAP verification sends a positive message to the nine groups shown in Figure 4. That is, fifty percent or more indicated that they “agree” or “strongly agree” that MAEAP verification sends a positive signal of environmental stewardship. However, respondents were less certain if environmental activists viewed MAEAP verification favorably, with only 35.3 percent indicating agreement or strong agreement that environmental activists view MAEAP verification as effectively communicating

Figure 4: Respondents' Perceptions of MAEAP Representation



stewardship practices. ANOVA⁷ tests of equality of means between the two samples indicated that MAEAP Phase I educational session attendees were statistically more likely to perceive a positive response from state legislators for becoming MAEAP verified than the general livestock producing population. Statistically, there are no significant differences across the two samples for the other eight stakeholder groups.

An additional question was asked as to respondents' beliefs regarding whether MAEAP verification communicates to regulators that the livestock producer is practicing environmental stewardship. Respondents were asked to select along a continuum from zero—extremely weak belief, to 100—an extremely strong belief in the message. Selections from the combined sample are shown in Figure 5 and support the finding in Figure 4. Responses along the 100-point continuum are provided via histogram in Figure 5. The average response in the pooled sample was 60.55 (± 2.77), which compares favorably with the second column of Figure 4.

Figure 5: Effectiveness of MAEAP in Conveying Stewardship Behavior to DEQ

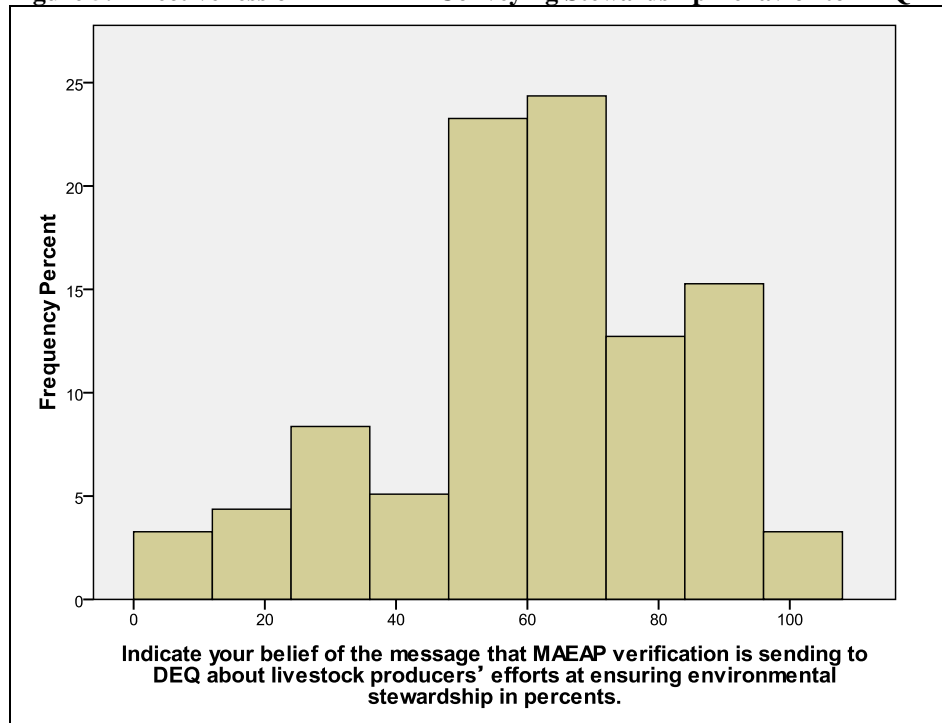


Table combines responses from MAEAP participant and general livestock population samples

The next series of 22 questions asked respondents about their perceptions as to how MAEAP verification impacts or may impact their operations. Individuals were instructed to rate their level of agreement on a five-point Likert scale, from 1=“strongly disagree” to 5=“strongly agree.” The results are presented in tabular format in Table 6, which combines both samples (general population and MAEAP participants). Each entry shows the percent of respondents that selected the respective level of agreement for each

⁷ Analysis of Variance (ANOVA) is a statistical approach for comparing means across multiple response, or treatments. It uses an F statistical distribution, based on the ratio of variances between the total samples and the treatment samples, to test the probability that means between responses are equal.

statement. Bolded entries denote the modes or the responses that were most commonly selected. As shown in Table 6, the most common selections across all 22 questions tend to be “Neutral” and “Agree.” Additionally, a composite score was calculated for each statement as the average response using the Likert scale that denotes a value of one for “Strongly Disagree” to five for “Strongly Agree.” Possible scores range from one to five, though most scores were around three. Scores between 2.5 and 3.5 are considered neutral, while scores between 3.5 to 4.5 generally denote agreement with the statement. Using these scores, respondents indicate agreement with eight of the 22 statements.

Table 6: Producers' Perceptions of MAEAP

Statement	Percent of Respondents					Mean Score (1-5)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
DEQ is less likely to audit operations that are MAEAP-verified.	3.8	23.3	37.7	30.5	4.7	3.1
Due to my participation in MAEAP, I can better manage my farm for environmental and regulatory matters.	2.0	6.0	31.7	48.6	11.6	3.6
Due to my participation in MAEAP, I have made changes to my livestock operation that protect the environment.	2.5	10.2	27.5	43.9	16.0	3.6
Farmers of MAEAP-verified farms are more likely to practice environmental stewardship.	1.8	9.6	13.9	52.0	22.8	3.8
I am comfortable with Michigan Dept. of Ag visiting my farm.	2.8	6.3	21.8	52.1	16.9	3.7
I am not concerned that MAEAP verification will draw additional unwanted attention/scrutiny to my farm operation.	4.1	18.7	34.1	36.3	6.7	3.2
Insurance premiums are lower for MAEAP verified farms.	4.4	25.7	43.2	21.8	4.9	3.0
MAEAP participants are better able to differentiate or brand their products in the marketplace.	2.8	26.7	40.6	26.3	3.6	3.0
MAEAP participants are more prepared for any future regulatory changes.	1.5	7.0	24.6	57.0	9.9	3.7
MAEAP provides farmers with the resources to be responsive to changes in the market for livestock products dictated by environmental concerns.	2.0	7.2	34.7	46.6	9.6	3.6
MAEAP verification helps in obtaining farm loans.	3.6	21.4	43.6	29.1	2.3	3.1
MAEAP verification reduces farm liability in the event of an environmental accident.	4.3	16.4	21.9	45.7	11.7	3.4
Participating in MAEAP will add benefits to farms.	1.1	6.1	18.2	55.7	18.9	3.9
Participation in MAEAP will likely increase the value of my property if it should ever be sold.	8.9	29.4	38.3	21.0	2.4	2.8
The existence of MAEAP may help preempt future regulation of livestock producers.	2.3	16.4	25.6	46.6	9.2	3.4
The MAEAP logo is well recognized in my community.	5.7	26.1	36.8	28.4	3.1	3.0
The MAEAP program is not likely to cease within the next 5 years.	2.8	13.8	35.9	41.5	6.0	3.3
The MAEAP verification sign lends credibility to farms.	1.8	9.5	24.8	53.6	10.2	3.6
The regulatory (DEQ) personnel view MAEAP-verified farms favorably.	4.1	10.6	32.5	44.3	8.5	3.4
There exist sufficient financial incentives for my farm beyond cost share to become (or continue to be) MAEAP-verified.	5.6	24.7	42.0	23.4	4.3	3.0
There exists sufficient cost-share opportunities for farms to become (or continue to be) MAEAP-verified.	3.5	23.2	36.4	32.9	3.9	3.1
The benefits of MAEAP participation will likely exceed the costs for farms.	3.1	15.0	35.8	33.8	12.3	3.4

Table combines responses from MAEAP participant and general livestock population samples

Evident in Table 6 is that respondents from both samples perceive MAEAP verification as being beneficial to their operations, with nearly 75 percent agreeing or strongly agreeing with the statement, “Participating in MAEAP will add benefits to farms.” They also indicate that they recognize the environmental attributes of becoming MAEAP verified; where once again, approximately 75 percent of respondents either agreed or strongly agreed with the statement, “Farmers of MAEAP-verified farms are more likely to practice environmental stewardship.” However, respondents were less optimistic about MAEAP verification increasing the value of their property or creating savings in insurance premiums, as over 38 percent selected either strongly disagree or disagree to the statement, “Participation in MAEAP will likely increase the value of my property if it should ever be sold,” and 30 percent for the statement, “Insurance premiums are lower for MAEAP verified farms.” Additionally, respondents indicated a general need for more cost-share opportunities and financial incentives for becoming MAEAP verified with 27 and 30 percent selecting strongly disagree and disagree to the statements, “There exists sufficient cost-share opportunities for farms to become (or continue to be) MAEAP-verified,” and “There exist sufficient financial incentives for my farm beyond cost share to become (or continue to be) MAEAP-verified,” respectively. On a final note on the outcomes, respondents showed uncertainty as to their communities’ recognition of the MAEAP logo, where responses are equally distributed across disagreement, neutrality and agreement that the MAEAP logo is well recognized in their community.

While Table 6 highlights livestock producers’ perceptions around MAEAP, it is revealing to explore if common features, or constructs, arise from this set of questions. Table 7 provides groupings of individual statements across both samples based on common statistical references across statements. Both samples (General population and MAEAP participants) are included in Table 7. Factor analysis provides a means by which researchers gauge commonality of responses across multiple survey questions. Such constructs are often used to test the validity of multiple responses across themes. Using a VARIMAX rotation factor analysis, four themes arise.⁸ Themes along a component column are exposed when the factor loadings (entries in each cell) exceed 0.60. Factor loadings that exceed this minimum threshold are lumped together and bolded. Then the same is done for the next column until no other columns exhibit significant factor loadings.

The first theme relates to how MAEAP impacts farm management. Table 7 shows the component questions sorted by each construct. Column 1 shows that questions related to *farm management and farm performance* share common responses. However, one statement, “I am comfortable with Michigan Dept. of Ag visiting my farm” seems misplaced in this construct. In addition, one may notice that statements 20 and 22 in Table 7 are closely related to this theme, but both did not get included in this category (1-6 of Table 7). That is because their factor loadings failed to meet the minimum threshold of 0.60.

⁸ Factor analysis with VARIMAX rotation is a statistical approach to identify commonality among many questions. In simplest terms it identifies high correlations among responses that indicate associations, or common correlations. Themes are inferred by the grouping of questions with factor scores greater than .60.

Table 7: Factor Analysis of Producers' Perceptions of MAEAP

	Statement	Factor				Mean Score
		1	2	3	4	
1	Due to my participation in MAEAP, I can better manage my farm for environmental and regulatory matters.	0.744	0.111	0.269	0.342	3.62
2	Participating in MAEAP will add benefits to farms.	0.728	0.282	0.326	0.065	3.85
3	Farmers of MAEAP-verified farms are more likely to practice environmental stewardship.	0.695	0.117	0.400	0.056	3.84
4	Due to my participation in MAEAP, I have made changes to my livestock operation that protect the environment.	0.665	-0.063	0.189	0.450	3.61
5	MAEAP participants are more prepared for any future regulatory changes.	0.646	0.453	0.105	0.001	3.67
6	I am comfortable with Michigan Dept. of Ag visiting my farm.	0.639	0.025	-0.043	0.222	3.74
7	The regulatory (DEQ) personnel view MAEAP-verified farms favorably.	0.111	0.763	0.198	0.138	3.43
8	DEQ is less likely to audit operations that are MAEAP-verified.	-0.084	0.679	0.168	0.282	3.09
9	MAEAP verification reduces farm liability in the event of an environmental accident.	0.264	0.639	0.258	-0.021	3.44
10	The MAEAP program is not likely to cease within the next 5 years.	0.277	0.612	0.114	0.146	3.34
11	Insurance premiums are lower for MAEAP verified farms.	0.183	0.113	0.752	0.088	2.97
12	Participation in MAEAP will likely increase the value of my property if it should ever be sold.	0.214	0.225	0.702	0.371	2.79
13	MAEAP participants are better able to differentiate or brand their products in the marketplace.	0.197	0.426	0.642	0.008	3.01
14	MAEAP verification helps in obtaining farm loans.	0.163	0.441	0.632	0.141	3.05
15	There exists sufficient cost-share opportunities for farms to become (or continue to be) MAEAP-verified.	0.169	0.231	0.157	0.811	3.11
16	There exist sufficient financial incentives for my farm beyond cost share to become (or continue to be) MAEAP-verified.	0.275	0.249	0.145	0.767	2.96
17	The MAEAP logo is well recognized in my community.	0.380	0.376	0.077	0.350	2.97
18	I am not concerned that MAEAP verification will draw additional unwanted attention/scrutiny to my farm operation.	0.340	0.289	0.143	0.228	3.23
19	The existence of MAEAP may help preempt future regulation of livestock producers.	0.160	0.548	0.303	0.203	3.44
20	The benefits of MAEAP participation will likely exceed the costs for farms.	0.440	0.173	0.429	0.183	3.37
21	The MAEAP verification sign lends credibility to farms.	0.590	0.519	0.137	0.176	3.61
22	MAEAP provides farmers with the resources to be responsive to changes in the market for livestock products dictated by environmental concerns.	0.560	0.324	0.337	-0.052	3.55

Table combines responses from MAEAP participant and general livestock population samples
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

The second theme relates to the *regulatory and liability exposure of farm operators*. Here, the respondents tended to group responses across questions around regulatory issues together. While question 10 seems to be misplaced in this group, as it relates to

the expected longevity of the MAEAP program, its inclusion suggests that respondents tended to associate program longevity to the overall regulatory environment of livestock producers. Like the first theme, several questions relating to this theme scored high but were excluded because the factor loadings did not meet the minimum score. They include questions 5 and 19 in Table 7. Question 5 pertains to how MAEAP prepares farms for future regulatory changes, but factor analysis shows that respondents were more likely to associate this question with the first theme. Question 19 pertains to how MAEAP preempts possible future regulation. This question scored high and probably belongs to this construct, but did not exceed our threshold of 60 to be included. Two other questions have high scores under this theme, but did not get included; questions 13 and 21. These two questions relate to how producers view MAEAP as a means to differentiate themselves from non-MAEAP verified farms.

The final two themes center on MAEAP's contribution to the *financial health of the farm* and *resources available for producers to become verified or maintain verification*. The third column shows a commonality across multiple statements, suggesting consistency in perceptions of how verification impacts the cost of insurance, ability to obtain financing, and property values (column 3 of Table 7). Additionally, respondents tended to relate the two questions on cost-share opportunities and incentives for becoming MAEAP verified – suggesting where one scored high for a respondent, the other likely did as well.

The findings in Table 7 demonstrates a measured level of confidence that the survey questions on perceptions of MAEAP verification are consistent and can be replicated with similar results. The constructs do not suggest favorable or unfavorable responses for themes, but when considered against the average rankings from Table 6 provides evidence to the robustness of the responses.

The survey next asked respondents to consider reasons that may hinder producers from becoming MAEAP verified. Respondents were asked to rate several statements on a five-point Likert scale with one indicating “strong disagreement” and five indicating “strong agreement.” Several reasons were suggested and respondents were asked to provide their own reason in case they considered issues not provided on the survey. Table 8 provides percent breakdowns of the responses from both samples, and provides the overall mean score between one and five. Entries that are bolded are modes, or the most commonly selected responses. Only statistics from both samples (general population and MAEAP participants) are shown in Table 8. However, t-tests of equality⁹ of means were conducted. Those tests suggested the two populations did not differ on their responses except for one reason described below.

As shown in Table 8, livestock producers disagreed with the notion that lack of interest in protecting the environment is a reason holding producers back from becoming MAEAP verified. Only about 5 percent of the respondents indicated they agreed or strongly agreed with the statement, “Livestock producers generally lack interest in environmental protection.” Instead, respondents suggested that the loss of the ability to use MAEAP verification in lieu of a DEQ permit (3.7) and the lack of open support by DEQ regulators

⁹ independent sample T-test of common means with assumption of in-equal means with alpha = 0.05

for MAEAP-verified farms (3.6) were significant issues restraining producers from becoming MAEAP verified. Additionally, producers appear to perceive that MAEAP does not fit every producer’s circumstances with 59.4 percent of respondents selecting “agree” or “strongly agree” with the statement “MAEAP does not fit every producer’s circumstances, nor does everyone value it for their farm.” Finally, the responses suggest that producers perceive MAEAP to be confusing (3.1) and costly (3.5), as well as that MAEAP verification poses excessive “hassles.” However, it is interesting to note responses did not significantly differ between the two samples except for the statement, “MAEAP is confusing and it is hard for livestock producers to fully understand the process.” On this statement, about 49 percent of the responses from the Phase I educational session attendees agreed or strongly agreed with this statement compared to 36 percent for the general livestock producer sample.

Table 8: Perceived Barriers to Becoming MAEAP Verified

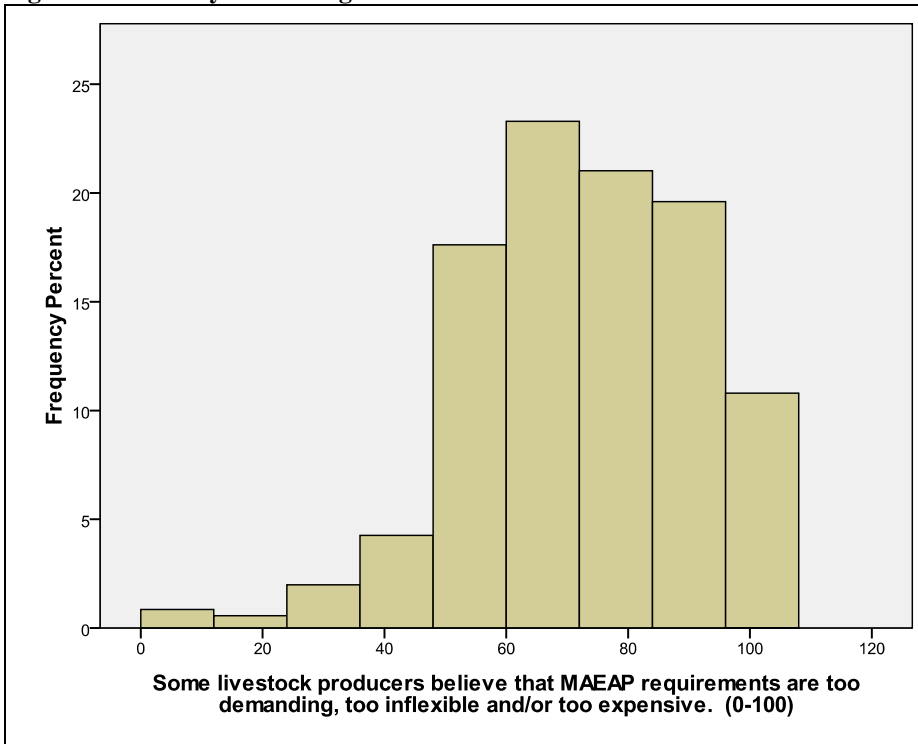
Statement	Percent of Respondents					Mean Score (1-5)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
MAEAP is confusing and it is hard for livestock producers to fully understand the process.	1.9	27.9	31.7	33.2	5.3	3.1
Livestock producers generally lack interest in environmental protection.	30.8	56.6	7.0	3.8	1.7	1.9
Livestock producers are discouraged by the loss of the ability to use MAEAP verification in lieu of DEQ permit for CAFOs.	1.3	7.5	30.5	40.7	19.9	3.7
Livestock producers encounter too much hassle or "red tape" in their effort to become MAEAP-verified.	1.2	13.6	34.2	41.6	9.3	3.4
Adequate technical assistance is lacking for livestock producers participating in MAEAP.	2.6	29.7	34.9	27.2	5.6	3.0
The costs of on-farm changes necessary for livestock operations to become MAEAP-verified are too high.	2.0	17.5	27.0	38.9	14.7	3.5
The size of many livestock operations is too small to justify investment in MAEAP verification.	4.2	28.9	21.7	33.8	11.4	3.2
Developing a CNMP occupies too much of producers time.	3.5	23.4	24.6	37.5	10.9	3.3
MAEAP does not fit every producer's circumstance, nor does everyone value it for their farm.	2.3	15.9	22.3	47.7	11.7	3.5
MAEAP is not openly supported by regulatory (DEQ) agencies.	2.3	9.7	27.8	41.7	18.5	3.6

Table combines responses from MAEAP participant and general livestock population samples

Generally, respondents perceived MAEAP requirements to be too demanding in terms of costs and flexibility. We asked respondents to further express their perceptions of how demanding were MAEAP verification. Individuals were instructed to mark their response along a continuum from “Not demanding” to “Too demanding.” Their selection was recorded on a scale from zero to one hundred, respectively. As shown in Figure 6, the responses are skewed to the right – being more demanding. With a score of 50 indicating “Just Right,” the average response was 70.3 indicating a general agreement that MAEAP verification is too demanding of livestock producers. The mode, or most common response range, includes the average response. Additionally, tests of equality of the means between the two populations failed to find differences in the responses between the general livestock production and MAEAP program participant populations.¹⁰

¹⁰ Independent sample T-tests with $\alpha=0.10$.

Figure 6: Difficulty in Meeting MAEAP Standards



Graph combines responses from MAEAP participant and general livestock population samples

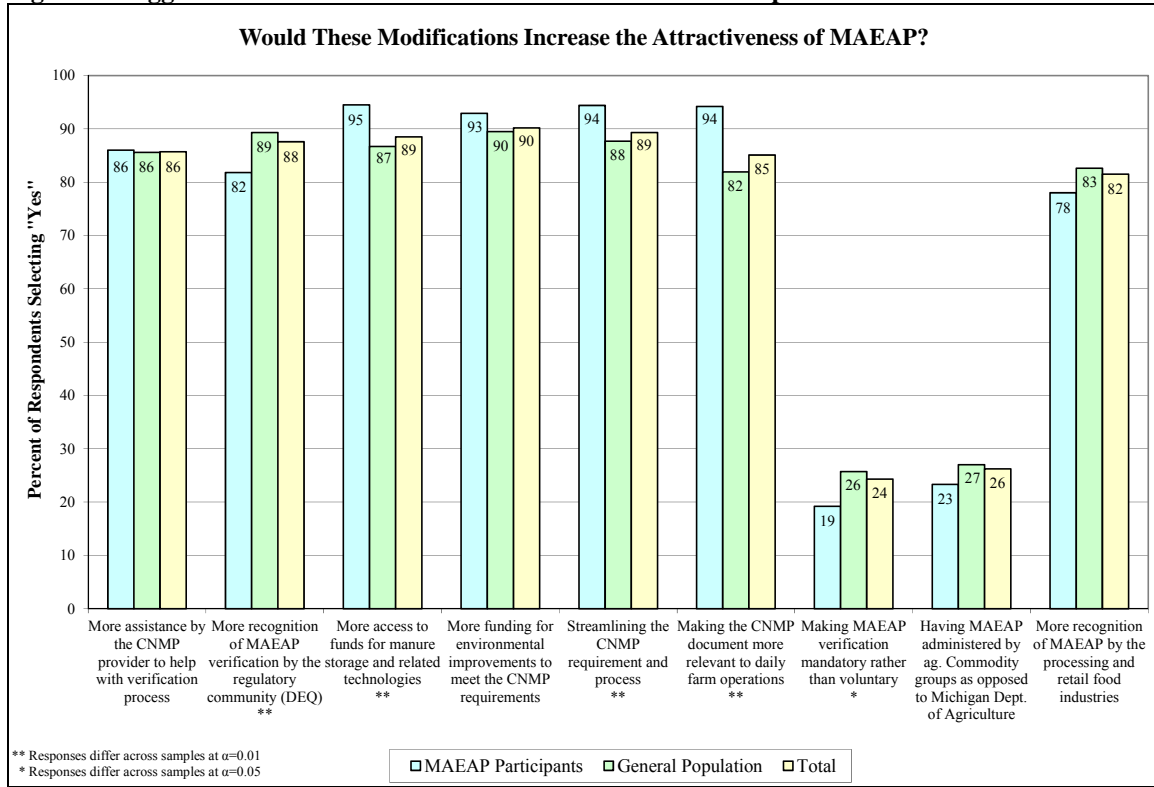
To better understand barriers to adopting MAEAP verification, respondents were also asked to rate several changes that might increase producers’ willingness to pursue MAEAP verification. Figure 7, summarizes the responses of the pooled sample as the percent of respondents that indicated that respective changes would increase producer’s willingness to pursue MAEAP verification. Mean responses of each sample were compared, where five of the nine suggested changes were found to differ significantly between the sample of MAEAP program participants and the general population of livestock producers. Those are indicated with a * for significant differences at a five percent level and ** for significance at the one percent level.¹¹ Those responses that tested significant at the one percent level suggest greater confidence that the populations differ in their responses than for those at the five percent level. However, both suggest strong evidence that the two populations differ in their perspectives, though the differences are not systematic across all questions.

Seven of the nine suggested changes are generally perceived to increase participation in MAEAP. These responses can be categorized as greater technical and financial assistance in becoming MAEAP verified, making the CNMP process more streamlined and relevant to farm operations, and greater recognition of MAEAP verification by processors and retailers. The two suggested changes that respondents discounted include making MAEAP mandatory, and having MAEAP administered by commodity groups rather than the MDA. The response to the mandatory requirement may reflect resistance

¹¹ * < 5% chance of not being equal: ** <1% change of not being equal

to greater regulatory mandates. The response to the commodity group administration may reflect a greater perception of objectivity from MDA personnel.

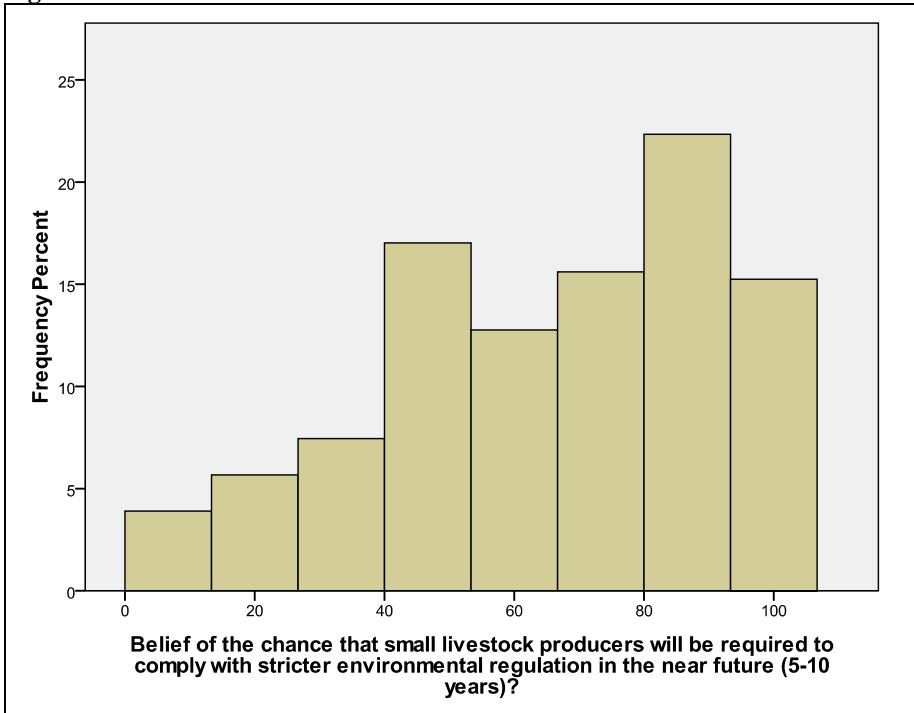
Figure 7: Suggested Modifications to MAEAP for Increased Participation



We further asked respondents to indicate their belief that environmental regulations would expand to smaller producers. Generally, respondents foresee a 65 percent chance that small producers will be required to comply with stricter environmental regulation within the next 10 years. The distribution is largely skewed to the right as shown in the histogram of responses in Figure 8. While the general perception is that there is a greater than 50 percent chance of new regulations governing smaller producers, the most commonly selected range of probability (mode) is between 80 and 90 percent.

To better understand producers’ perceptions of MAEAP effectiveness vis-à-vis the DEQ permit system, we asked respondents to indicate if MAEAP was less, equally or more effective at preventing pollution and if MAEAP was less, equally or more costly to for compliance. Responses are cross-tabulated in Table 9. The last row and column of the table show the distribution of the responses of each question as percent of total responses. The row totals indicate that 45 percent of both sample responses perceive MAEAP verification is more effective at pollution control than the DEQ permit system, while the column totals show that 64 percent of respondents perceive that MAEAP is less costly to producers than the DEQ permit system. Clearly most producers indicate MAEAP as a preferred means of meeting regulatory goals from both cost and effectiveness perspectives.

Figure 8: Beliefs that Current Laws will encroach on Smaller Producers



Graph combines responses from MAEAP participant and general livestock population samples

The inner cells of Table 9 shows the percent of respondents that selected the respective combination of responses to MAEAP’s relative effectiveness at pollution prevention and relative cost to the DEQ permit system. The results show for every response to effectiveness at pollution prevention (Rows), respondents unambiguously perceived MAEAP to be more cost effective. However, the opposite cannot be said. While respondents that viewed MAEAP as more costly than a DEQ permit and those that viewed it as less costly, perceive MAEAP to be more effective than DEQ in preventing pollution, those that did perceive a difference in cost favored that MAEAP is neither more or less effective than the DEQ permit. However, of those that viewed relative costs as equal, more suggested that MAEAP is more effective than the DEQ permit than less.

Table 9: Matrix of Producers' Responses - Effectiveness in Costs versus Effectiveness in Pollution Prevention

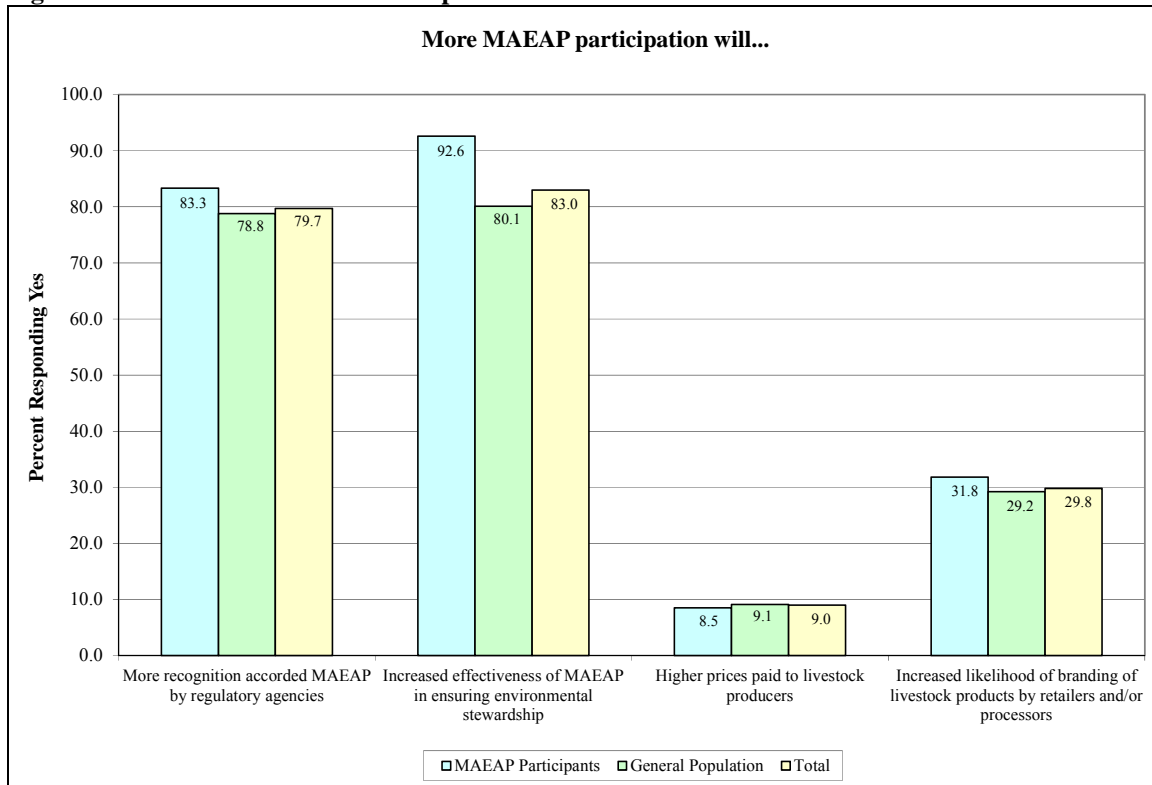
		MAEAP effectiveness: Cost of implementation			Row Total
		MAEAP is more costly than the DEQ permit	MAEAP costs the same as the DEQ permit	MAEAP is less costly than the DEQ permit	
		Percent of Total	Percent of Total	Percent of Total	
MAEAP effectiveness: Pollution prevention	MAEAP is less effective than the DEQ permit	3.2%	4.2%	14.7%	22%
	MAEAP is the same as the DEQ permit	3.2%	9.5%	20.0%	33%
	MAEAP is more effective than the DEQ permit	8.4%	7.4%	29.5%	45%
Column Total		15%	21%	64%	100%

Table combines responses from MAEAP participant and general livestock population samples

The implication is that respondents do not necessarily view MAEAP effectiveness as unambiguously superior to the DEQ permit system, though they view it as less expensive to implement.

Because the effectiveness of a program is often tied to how widely the program is adopted, we asked respondents to consider what may happen if more producers sought MAEAP verification. Figure 9 shows the percent of respondents that indicated a belief that change along four categories will occur if more producers became MAEAP verified. Generally, respondents perceive that more MAEAP-verified producers will likely lead to greater recognition of MAEAP by regulators (79.7%) and greater effectiveness of the MAEAP program (83.0%). However, they generally do not perceive that greater participation will lead to price increases of Michigan livestock products 9.0%, or that MAEAP would be a means of branding products as environmentally safe within the marketplace (29.8%). ANOVA tests were conducted to determine if there exist differences in the responses between the two samples, which indicated that responses from the two samples were not significantly different.¹²

Figure 9: Direction of MAEAP Participation



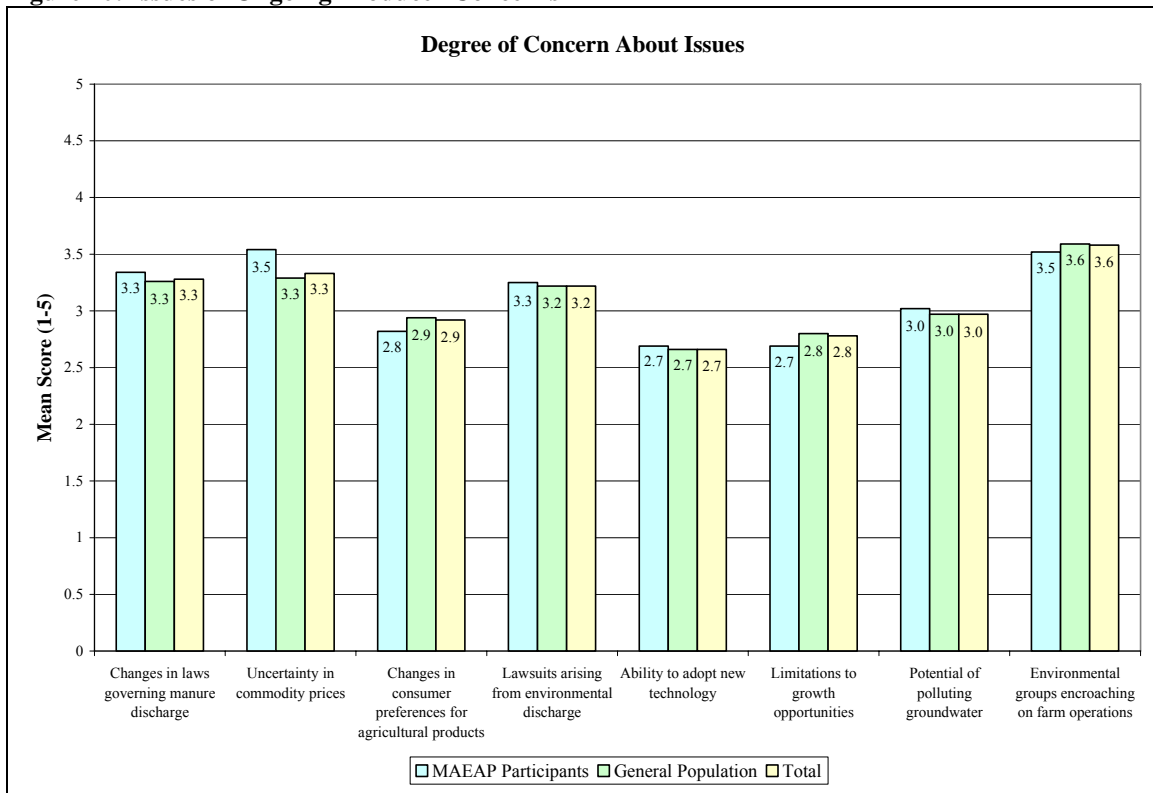
¹² Alpha = 0.05.

Issues Confronting Livestock Producers

The next section of the survey sought producers' perceptions of issues confronting the livestock production industry. These questions relate to concerns about the regulatory environment and markets. Two multi-part questions were asked.

The first set of questions asked respondents to indicate their level of concern among multiple issues. Figure 10 provides the mean values of respondents' selections along a five-point Likert scale, with one being "Not Concerned" and five indicating, "Very Concerned." Possible scores range from one to five, though most scores are near three. Scores below 2.5 indicate less concern, while those above 2.5 indicate some level of concern. Although no issue had a mean score below 2.5, the mean scores of three issues were close to this low-value cut-off. They include perceptions of changes in consumer preferences (2.9%), ability to adopt new technologies (2.7%), and limitations to growth opportunities (2.8%). Alternatively, concern about environmental groups encroaching on farm operations (3.6%) is relatively high compared to other categories. Additional categories show higher levels of concern, namely concern about lawsuits arising from environmental discharges (3.2%), uncertainty in commodity prices (3.3%), and changes in laws governing manure management (3.3%), as key threats to operations.

Figure 10: Issues of Ongoing Producer Concerns



Factor analysis was used to isolate common constructs from the pooled sample responses shown in Figure 10. As described above, this method allows for the grouping of similar characteristics of responses over multiple observations. Two constructs were isolated as

shown in Table 10. The first construct centers on concerns that we label as the *market environment*. The second centers on the *legal or regulatory environment* of livestock production. Component scores that exceed 0.60 are considered contributing significantly to each construct. However, one issue (Potential of polluting groundwater) does not appear to move in conjunction with the two identified constructs. This question does not take on the flavor of either market or legal environments.

In addition, we asked respondents to indicate their level of agreement to statements relevant to issues affecting livestock producers. Respondents were asked to respond on a five-point Likert scale their level of agreement to multiple statements, with one indicating “strong disagreement” and five indicating “strong agreement.” Figure 11 provides mean, respondent scores from one to five. In general, respondents from both samples indicated similar responses with no statistical differences between MAEAP participants and the general population samples. Mean scores above 2.5 indicate agreement, while those below 2.5 indicate disagreement with the underlying statement. Overall, the scores are around 2.5, although there appears to be strong agreement that producers have good relations with their neighbors (3.4). The lowest mean response – indicating disagreement – is producers’ perception that regulators are fair (2.2). In sum, Figure 11 shows that there is a particular concern among livestock producers about the regulatory environment, but producers do not necessarily perceive neighbors as a risk.

Table 10: Factor Analysis of Ongoing Issues

Issue	Factor		Mean Score (1-5)
	Market Environment	Legal Environment	
Ability to adopt new technology	0.79	0.19	2.7
Limitations to growth opportunities	0.71	0.33	2.8
Changes in consumer preferences for agricultural products	0.70	0.22	2.9
Uncertainty in commodity prices	0.68	0.06	3.3
Lawsuits arising from environmental discharge	0.23	0.81	3.2
Environmental groups encroaching on farm operations	0.15	0.80	3.6
Changes in laws governing manure discharge	0.26	0.74	3.3
Potential of polluting groundwater	0.55	0.29	3.0

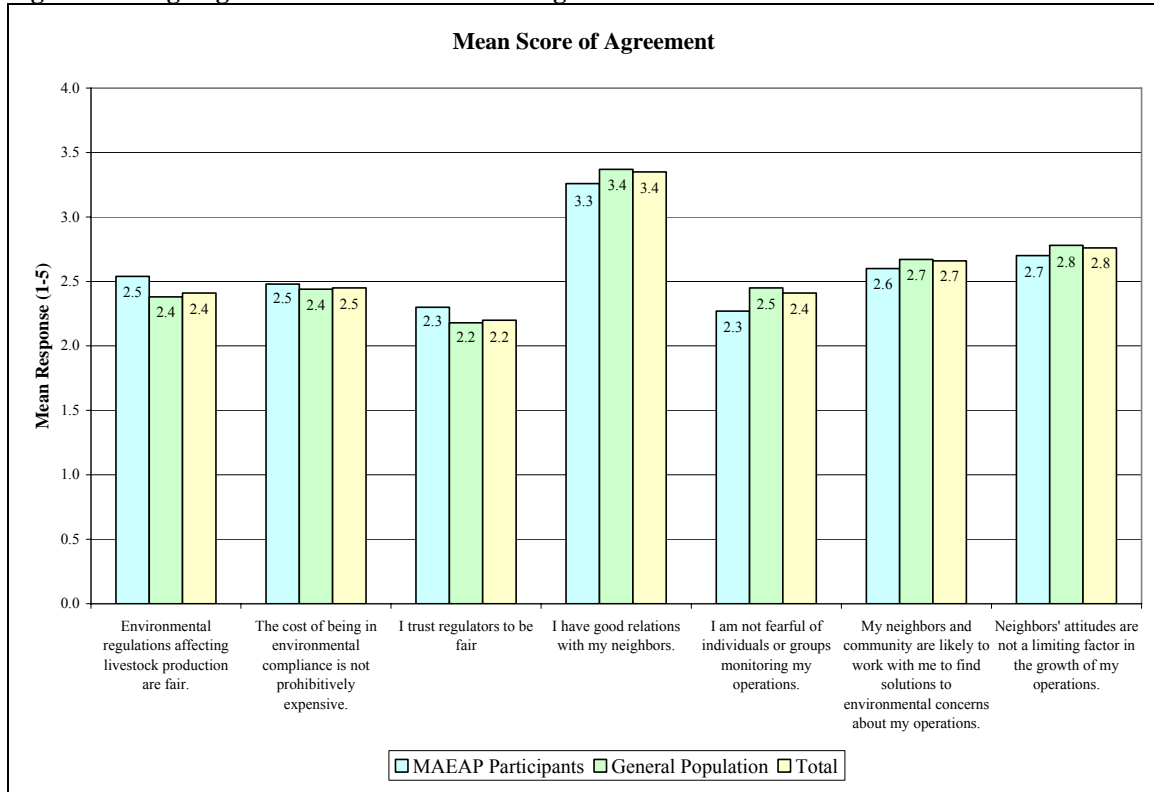
*Table combines responses from MAEAP participant and general livestock population samples
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.*

Conclusions from the Surveys of Producers

With surveys of two samples of Michigan livestock producers – MAEAP, Phase I educational session attendees and the general population of livestock producers, we sought to better understand livestock producers’ perceptions about environmental regulatory environment and compliance. Specifically, responses around six areas were specified in the introduction. The surveys and the populations by which samples were

drawn help us better understand producers' perceptions of MAEAP and the regulatory environment producers operate.

Figure 11: Ongoing Environmental Issues Facing Livestock Producers



More specifically, the survey responses across both samples suggest that producer awareness of MAEAP is high. Nearly 83 percent of all respondents indicating having knowledge of MAEAP. Of those that are familiar with MAEAP approximately 43 percent of those surveyed indicated they have completed MAEAP verification. The percentage of those that were sampled from the rosters of MAEAP, Phase I educational events were significantly lower than that from the general livestock producing sample. However, they also tended to be smaller operations. Of those that have not become MAEAP verified, about 42 percent have completed a CNMP, while about 20 percent are working with a consultant to develop a CNMP, while slightly less indicate having signed up for Progressive Planning through MAEAP.

When asked what motivated their decision to participate in MAEAP, those that had participated indicated innate desires to be environmental stewards, to meet regulatory standards, and to add value to their operations. Responses also suggest that several factors may hinder participation in MAEAP, including the loss of the ability to use MAEAP verification in lieu of a DEQ permit, lack of DEQ recognition of MAEAP, high cost of becoming MAEAP verified, and rigidity in the MAEAP standards that may not fit the operations of those seeking verification. When asked what would increase the participation in MAEAP, respondents suggested, that funding for meeting verification standards, streamlining the CNMP process, and greater recognition from DEQ regulators

would enhance producers' participation. Additionally, livestock producers' perceptions about how demanding MAEAP requirements are tend to lean toward being too inflexible or too expensive when implementing. These findings highlight that financial and implementation constraints posit real challenges for producers seeking MAEAP verification.

Sampled producers also perceive MAEAP to be more effective at curtailing agricultural pollution than the DEQ permitting process and less costly to implement. The findings suggest that typical Michigan livestock producers favor a voluntary compliance program.

Overall Project Conclusions

Our discussions with MDA and DEQ officials indicate that there may be differing views about what participation in MAEAP represents—in part because of its historic evolution. That is, DEQ officials appeared to view MAEAP using the 'regulatory pre-emption' lens because MAEAP certification was proposed 'in lieu of CAFO permitting' under the ECOS Agreement. On the other hand, MDA officials appeared to view MAEAP—throughout its history—using the 'signaling' lens; i.e. MAEAP certified farms were perceived and treated as 'environmentally' more responsible. These differing analytical viewpoints and beliefs lead to some interagency conflict and frustration regarding MAEAP, particularly during the period before and during the ECOS Agreement, and particularly with regard to CAFOs.

Despite these past differences, officials from both agencies recognize the promise of VEPs, such as MAEAP, in managing and reducing environmental risks from agricultural operations and in providing opportunities for product differentiation in consumer markets. For example, DEQ officials recognize their agency's technical and resource limitations in regulating widely dispersed agricultural operations, and view MAEAP certifications of small and medium sized livestock operations (which are excluded from permitting requirements unless they discharge pollutants) as credible signals of proactive environmental responsibility. MDA officials agree about this potential and feel that the loss of MAEAP in lieu of a permit sent conflicting signals to the regulated community and damaged the program, but also feel many of the permitted farms may choose not to continue to participate unless other incentives are provided. MDA officials also recognize the potential role MAEAP can play in signaling environmental responsibility to 'green consumers' and meeting 'green procurement' standards being set by large retailers.

Results from producer surveys indicate that farmers are well aware of MAEAP and are proactive about environmental stewardship. The desire to become environmentally sustainable was a major reason for becoming MAEAP verified. While 75% of respondents agreed that participation in MAEAP benefitted their farms, but most did not feel these benefits resulted in either reduced premiums or higher land values. Lack of open support by DEQ officials for MAEAP verified farms and loss of ability to use MAEAP verification in lieu of a DEQ permit were perceived to be significant factors restraining producers from becoming MAEAP verified. Other constraining factors are

innate in the MAEAP program, where, about 70% of respondents felt that MAEAP was ‘too demanding’ and nearly 60% felt that MAEAP did not fit well with every producer’s circumstances.

- Following are some guidelines for redesigning the future MAEAP program based on the research findings.
- Using ‘Regulatory pre-emption’ as the primary motivator for MAEAP is likely to be counterproductive in the long run because it will likely send the wrong signals to regulators, consumers, environmental groups and retailers relative to farmers’ environmental practices and attitudes. This ‘regulatory pre-emption’ direction can also have adverse effects if the MAEAP’s future objectives include establishing the MAEAP label as a signal of higher environmental responsibility.
- To make MAEAP verification an acceptable, credible signal of higher environmental stewardship, it is important to actively involve a broader set of stakeholders including regulators and environmental groups in setting the performance and monitoring standards.
- Because livestock farmers have demonstrated a willingness to invest in environmental management and perceive social and regulatory pressure to protect the environment, lack of farmer interest is not likely to be a barrier in expanding MAEAP. To be effective, the redesign of MAEAP has to take into consideration the heterogeneity among livestock farmers and build in more flexibility without compromising the credibility of the signal, or regulatory compliance requirements.
- A focus of MAEAP on small- and medium-sized farms that are not subject to regulatory permitting has great potential, because the value of signaling is likely to be higher and unambiguous for this group. The incremental value of the MAEAP signal to large farms, since they are already subject stringent permitting requirements, is probably lower.

Our research suggests that the MAEAP can play a positive role in improving and maintaining environmental performance of livestock operations of a variety of sizes and that this outcome can and has been recognized by the DEQ under certain circumstances. The study of the historical evolution of the MAEAP brings clarity as to how to improve MAEAP partnerships and to better recognize it for its historical and potential achievements with respect to the MAEAP objective of “being an innovative, proactive program that helps farms of all sizes and all commodities voluntarily prevent or minimize agricultural pollution risks.” The findings of this research are also relevant to other states that have VEPs, such as the Wisconsin’s Green Tier Program in designing and implementing VEPs.

Appendix A: Survey



Michigan Agriculture Environmental Assurance Program (MAEAP)

Survey of Livestock Producers

April 14, 2010

Center for Economic Analysis

Department of Agricultural, Food and Resource Economics

Michigan State University

East Lansing, MI 48824

Office: (517) 355-2153

Fax: (517) 432-1800

Environmental compliance and the desire to be environmental stewards can be important factors to all Michigan livestock producers. The Michigan Agriculture Environmental Assurance Program (MAEAP) is a voluntary and non-regulatory program for Michigan livestock producers. Your opinion on Michigan environmental regulations, environmental concerns and MAEAP is important to us. Regardless of the size of your operation, or your participation in MAEAP, your opinions are important in helping us convey industry needs to policy makers. Please respond so that this program, founded by many agricultural partnering organizations, can better serve you and your neighbors in the future. All responses will be kept confidential and no individual will be identified from this survey.

MICHIGAN STATE
UNIVERSITY



About MAEAP:

MAEAP provides a voluntary structure under which Michigan farmers can be assured they are effectively following all applicable Right to Farm Generally Accepted Agricultural and Management Practices (GAAMPs) and are working to comply with state and federal environmental laws specific to each system of the program.

The steps for MAEAP verification are:

- Attend Educational meeting
- Complete Progressive Planning and/or develop a Comprehensive Nutrient Management Plan (CNMP)
- Address environmental risks and apply for MAEAP verification

You can find more information about MAEAP at this web site: <http://www.maeap.org/>

How to complete this survey

1. If your operation is divided into multiple unique enterprise units where each individual unit requires a separate MAEAP verification and/or Comprehensive Nutrient Management Plan, we ask that you consider your largest enterprise when completing the questions below.
2. Select the answer that is most appropriate. There are no right or wrong answers.
3. Make all responses dark using ink or pencil, and complete as shown in the examples below.



4. Survey questions are written on the front and back of each sheet. Be sure to turn each sheet over to answer those questions on the back.
5. Feel free to write any comments or explanations on this survey.

Example Question

1. First, we'd like you to tell us how much you agree or disagree with the following statements.

A. Citizens' views should be included when designing programs that could affect their health.

Strongly Disagree
Disagree
Neither agree or disagree
Agree
Strongly agree

① ② ③ ④

Example Question

2. To what extent does public opinion influence local governance?

① ② ③ ④
None A little Some A fair Amount A great deal

Thank you for participating in this survey. The survey starts on the next page.

II. We would like to know about your level of participation in MAEAP. Please respond to the following statements as they apply to you:

4. I am through the entire MAEAP process, my farm has been verified by an on-farm visit and I am eligible to place a MAEAP sign at my farmstead.
 - ① Yes **Skip to Question 9**
 - ② No **Continue with Question 5**
5. I have completed a Comprehensive Nutrient Management Plan (CNMP) and the plan provider and I have signed it.
 - ① Yes **Skip to Question 9**
 - ② No **Continue with Question 6**
6. I am working with a consultant to develop a CNMP. ① Yes ② No
7. I have signed up for Progressive Planning through MAEAP. ① Yes ② No
8. I plan on completing MAEAP verification for my farm. ① Yes ② No
9. Irrespective of the stage of MAEAP at which you are, what influenced your decision to participate or not participate in MAEAP?

-

III. Now, we would like to know what you think about the effectiveness of MAEAP and the costs and benefits of participation:

10. Please indicate your level of agreement with the following: MAEAP is effective in communicating that MAEAP-verified livestock producers are responsible stewards of the environment to:

	① Strongly disagree	② Disagree	③ Neutral	④ Agree	⑤ Strongly agree	⑥ Don't Know
A. The state legislature	①	②	③	④	⑤	⑥
B. The Department of Environmental Quality (DEQ)	①	②	③	④	⑤	⑥
C. The Department of Agriculture (MDA)	①	②	③	④	⑤	⑥
D. Food processors	①	②	③	④	⑤	⑥
E. Food retailers	①	②	③	④	⑤	⑥
F. Your neighbors	①	②	③	④	⑤	⑥
G. The general public	①	②	③	④	⑤	⑥
H. Other farmers	①	②	③	④	⑤	⑥
I. Environmental activists	①	②	③	④	⑤	⑥

Comments: _____

11. Regardless of your level of involvement in MAEAP, Please indicate your level of agreement with the following statements.

	Strongly disagree ①	Disagree ②	Neutral ③	Agree ④	Strongly agree ⑤	I don't know/N/A ⑥
A. Participating in MAEAP will add benefits to farms.	①	②	③	④	⑤	⑥
B. The benefits of MAEAP participation will likely exceed the costs for farms.	①	②	③	④	⑤	⑥
C. Farmers of MAEAP-verified farms are more likely to practice environmental stewardship.	①	②	③	④	⑤	⑥
D. MAEAP provides farmers with the resources to be responsive to changes in the market for livestock products dictated by environmental concerns.	①	②	③	④	⑤	⑥
E. MAEAP participants are better able to differentiate or brand their products in the marketplace.	①	②	③	④	⑤	⑥
F. The regulatory (DEQ) personnel view MAEAP-verified farms favorably.	①	②	③	④	⑤	⑥
G. DEQ is less likely to audit operations that are MAEAP-verified.	①	②	③	④	⑤	⑥
H. I am comfortable with Michigan Dept. of Ag visiting my farm.	①	②	③	④	⑤	⑥
I. MAEAP verification reduces farm liability in the event of an environmental accident.	①	②	③	④	⑤	⑥
J. The MAEAP logo is well recognized in my community.	①	②	③	④	⑤	⑥
K. The MAEAP verification sign lends credibility to farms.	①	②	③	④	⑤	⑥
L. The existence of MAEAP may help preempt future regulation of livestock producers.	①	②	③	④	⑤	⑥
M. MAEAP participants are more prepared for any future regulatory changes.	①	②	③	④	⑤	⑥
N. There exists sufficient cost-share opportunities for farms to become (or continue to be) MAEAP-verified.	①	②	③	④	⑤	⑥
O. There exist sufficient financial incentives for my farm beyond cost share to become (or continue to be) MAEAP-verified.	①	②	③	④	⑤	⑥
P. Participation in MAEAP will likely increase the value of my property if it should ever be sold.	①	②	③	④	⑤	⑥
Q. MAEAP verification helps in obtaining farm loans.	①	②	③	④	⑤	⑥
R. Insurance premiums are lower for MAEAP verified farms.	①	②	③	④	⑤	⑥
S. I am not concerned that MAEAP verification will draw additional unwanted attention/scrutiny to my farm operation.	①	②	③	④	⑤	⑥
T. Due to my participation in MAEAP, I have made changes to my livestock operation that protect the environment.	①	②	③	④	⑤	⑥
U. Due to my participation in MAEAP, I can better manage my farm for environmental and regulatory matters.	①	②	③	④	⑤	⑥
V. The MAEAP program is not likely to cease within the next 5 years.	①	②	③	④	⑤	⑥
W. I would be willing to participate more (or renew my verification) if I was offered a reduction in property tax of at least _____ percent. (Please enter minimum tax reduction acceptable to you.)						

12. In this question, we are attempting to understand what may cause Michigan livestock producers to not participate in MAEAP. Please indicate your level of agreement with the following statements concerning potential barriers to MAEAP participation for livestock producers.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	I don't know/NA
A. MAEAP is confusing and it is hard for livestock producers to fully understand the process.	①	②	③	④	⑤	⑥
B. Livestock producers generally lack interest in environmental protection.	①	②	③	④	⑤	⑥
C. Livestock producers are discouraged by the loss of the ability to use MAEAP verification in lieu of DEQ permit for CAFOs.	①	②	③	④	⑤	⑥
D. Livestock producers encounter too much hassle or "red tape" in their effort to become MAEAP-verified.	①	②	③	④	⑤	⑥
E. Adequate technical assistance is lacking for livestock producers participating in MAEAP.	①	②	③	④	⑤	⑥
F. The costs of on-farm changes necessary for livestock operations to become MAEAP-verified are too high.	①	②	③	④	⑤	⑥
G. The size of many livestock operations is too small to justify investment in MAEAP verification.	①	②	③	④	⑤	⑥
H. Developing a CNMP occupies too much of producers' time.	①	②	③	④	⑤	⑥
I. MAEAP does not fit every producer's circumstance, nor does everyone value it for their farm.	①	②	③	④	⑤	⑥
J. MAEAP is not openly supported by regulatory (DEQ) agencies.	①	②	③	④	⑤	⑥

13. Are there other additional barriers to participation or other reasons not to participate? Yes No

a. If Yes, please list or explain them:

14. Some livestock producers believe that MAEAP requirements are too demanding, too inflexible and/or too expensive. Others argue the opposite. Please take a moment to provide your opinion by indicating your belief below. (Please mark an X on the line below at a point corresponding to your belief).



15. What modifications to MAEAP do you think will encourage more livestock producers to participate in MAEAP or continue on to become verified?

	Yes	No	Don't Know
A. More assistance by the CNMP provider to help with verification process.	①	②	③
B. More recognition of MAEAP verification by the regulatory community (DEQ).	①	②	③
C. More access to funds for manure storage and related technologies.	①	②	③
D. More funding for environmental improvements to meet the CNMP requirements.	①	②	③
E. Streamlining the CNMP requirement and process.	①	②	③
F. Making the CNMP document more relevant to daily farm operations.	①	②	③
G. Making MAEAP verification mandatory rather than voluntary.	①	②	③
H. Having MAEAP administered by ag. Commodity groups as opposed to Michigan Dept. of Agriculture.	①	②	③
I. More recognition of MAEAP by the processing and retail food industries.	①	②	③

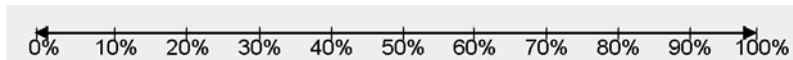
J. Other (Please list): _____

16. Regardless of the size of your farm, or whether you have a CAFO permit, we would like to know your opinion on how MAEAP verification compares with the Department of Environmental Quality (DEQ) permit for CAFOs with respect (A) to pollution prevention outcomes and (B) to the cost of implementation.

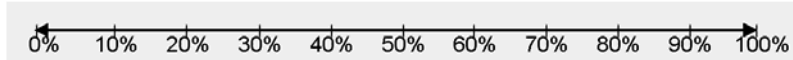
	MAEAP is less effective than the DEQ permit	MAEAP is the same as the DEQ permit	MAEAP is more effective than the DEQ permit	Don't Know
A. Pollution prevention	①	②	③	④
B. Cost of implementation	①	②	③	④

Comments: _____

17. On a scale of 0% (impossible) to 100% (certain), please indicate your belief of the chance that small livestock producers will be required to comply with stricter environmental regulation in the near future (5-10 years)? (Place an X on the line below at a point corresponding to your belief).



18. On a scale of 0% (extremely weak) to 100% (extremely strong), please indicate your belief of the message that MAEAP verification is sending to DEQ about livestock producers' efforts at ensuring environmental stewardship. (Place an X on the line below at a point corresponding to your belief).



19. Do you think that having more livestock producers participate in MAEAP will result in:
- | | Yes | No | Don't Know |
|---|-----|----|------------|
| A. More recognition accorded MAEAP by regulatory agencies? | ① | ② | ③ |
| B. Increased effectiveness of MAEAP in ensuring environmental stewardship? | ① | ② | ③ |
| C. Higher prices paid to livestock producers? | ① | ② | ③ |
| D. Increased likelihood of branding of livestock products by retailers and/or processors? | ① | ② | ③ |

IV. We would like to know your views about contemporary issues confronting livestock producers

20. Please indicate your degree of concern about the following factors

	Not Concerned	Slightly Concerned	Somewhat Concerned	Very Concerned
a. Changes in laws governing manure discharge	①	②	③	④
b. Uncertainty in commodity prices	①	②	③	④
c. Changes in consumer preferences for agricultural products	①	②	③	④
d. Lawsuits arising from environmental discharge	①	②	③	④
e. Ability to adopt new technology	①	②	③	④
f. Limitations to growth opportunities	①	②	③	④
g. Potential of polluting groundwater	①	②	③	④
h. Environmental groups encroaching on farm operations	①	②	③	④

21. Please indicate your degree of agreement on the following statements.

	Strongly Disagree	Disagree	Agree	Strongly agree
a. Environmental regulations affecting livestock production are fair.	①	②	③	④
b. The cost of being in environmental compliance is not prohibitively expensive.	①	②	③	④
c. I trust regulators to be fair	①	②	③	④
d. I have good relations with my neighbors.	①	②	③	④
e. I am not fearful of individuals or groups monitoring my operations.	①	②	③	④
f. My neighbors and community are likely to work with me to find solutions to environmental concerns about my operations.	①	②	③	④
g. Neighbors' attitudes are not a limiting factor in the growth of my operations.	①	②	③	④

V. Now, we would like to know about your livestock operations:

22. What is the number of head of animals on your farm today? (If you operate multiple unique enterprises, please add up all enterprises.)

Livestock Type	No. of Mature Animals Today
① Dairy cows (mature and milking)	No. _____
② Beef cows, and other cattle	No. _____
③ Hogs (number of sows and or finishers)	No. _____
④ Poultry/layers & meat/Turkeys	No. _____
⑤ Sheep/Goats	No. _____
⑥ Horses	No. _____
⑦ Other: _____	No. _____

23. Is it probable that you will be raising livestock in 10 years on your current property?

① Yes

② No **Please complete 24 directly below**

24 If you selected No, is this because:

① you plan to sell your farm for agricultural use?

② you plan to sell your farm for non-agricultural use?

③ you plan to transfer ownership to a relative or relatives?

④ Other: _____

25. Do you currently operate under the Michigan Department of Environmental Quality (DEQ) permit for a Concentrated Animal Feeding Operation (CAFO)? ① Yes
② No

VI. Now, we would like to know more about your farm:

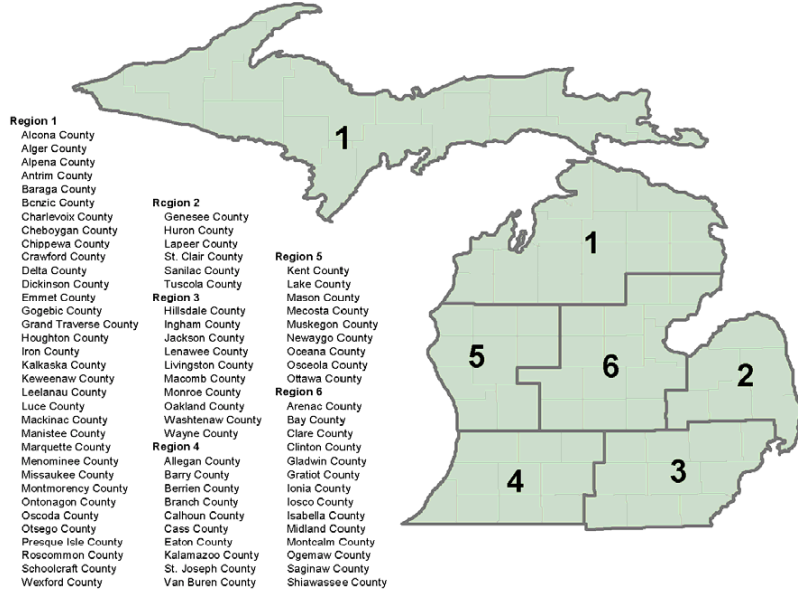
26. How many acres do you operate (both owned and rented)? _____ acres

27. Which, if any, of following Natural Resources Conservation Service (NRCS) environmental programs do you participate in? (Please select all that apply)

NRCS Programs

- ① Conservation Reserve Program (CRP)
- ② Conservation Reserve Enhancement Program (CREP)
- ③ Conservation Security Program (CSP)
- ④ Environmental Quality Incentives Program (EQIP)
- ⑤ Grassland Reserve Program (GRP)
- ⑥ Wetlands Reserve Program (WRP)
- ⑦ Wildlife Habitat Incentives Program (WHIP)

28. The map of Michigan is shown below. Please circle the number on the map corresponding to the region where your farm is located.



Please feel free to add additional comments here:

Thank you for participating in this survey. The results of the survey will be available by June 15, 2010. To learn about the results, please visit the following web site: <http://cea.msu.edu/>.

Appendix B: DEQ Focus Group Instrument

SAMPLE Questions to ask DNRE Personnel about Voluntary Programs and MAEAP

Sample questions about Agricultural Pollution Prevention and Control with specific attention to animal agriculture

I. Size of Problem: Relationship of Agricultural Practices to Environmental Quality

1. How serious a problem do you think pollution from animal agriculture is in Michigan? Is there a difference between the types of pollution issues presented by animal agriculture versus other types of agriculture? Do the issues vary with the size of the animal operation? If so, how?

II. Adequacy of Existing Regulations and Information: Providing Authorization

2. What is the current agency strategy and program(s) for addressing animal agricultural pollution issues? What current legislation and regulations apply?
3. What are your opinions of the effectiveness of the existing legislation/regulation and the enforcement of same in addressing these issues?
4. How high a priority should animal agricultural pollution issues be given within DNRE? Within MDA? What are the unique challenges in identifying and prioritizing these pollution issues and potential remedies?
5. In what direction do you foresee changes in regulations and laws governing animal agriculture (nationally and in Michigan) going in the near to medium term? Why? On a scale of 0 to 100, what is your estimate of the chance that small livestock producers will have more environmental regulation in the next 5 to 10 years?

III. Agency Activities: Evaluating Performance

6. How well do you think the animal agriculture regulated community meets the pollution prevention/control requirements? The “nonregulated livestock community”? How do we know?
7. How does the DNRE monitor animal operations performance after the operation has come to the attention of the agency?
8. Does the DNRE partner with others such as the MDA on evaluating livestock agriculture environmental performance?

IV. Agency Activities: Enforcing Responsibilities or Requirements

9. What are your opinions of the effectiveness of the existing enforcement of regulations and requirements relating to animal agriculture?
10. What are the circumstances or factors that would cause DNRE to take an enforcement response? Do the operations against which DNRE have taken enforcement responses share any characteristics? If so, what are they?

11. How does a farm come to the attention of the DNRE?. That is, how does the DNRE know if a farm is in compliance with federal and state pollution regulations ?
12. How does the agency enforce permits or other requirements of animal operations? How consistent do you think the agency has been in these regulatory activities?

V. Role of Voluntary Regulations

13. Whether one is thinking of agricultural source pollution issues or non-agricultural ones, do you see a role for voluntary programs for improving environmental performance? If so, can you point to examples that you think are exemplary or ones that do not seem to accomplish the objectives of pollution prevention and control? What are the characteristics of each of these types?
14. Are such voluntary programs substitutes for regulatory programs or complementary to them? Under what circumstances, if any, are voluntary actions more effective and or less costly than regulation in preventing and controlling pollution? Would there need to be strong compliance enforcement in place in order for voluntary programs to be effective?

VI. Role of MAEAP

15. What are your opinions about the Michigan Agricultural Environmental Assurance Program (MAEAP)? Can MAEAP be relied on to provide adequate performance from animal agriculture participants? Do you think there is a difference among MAEAP verified farms in environmental performance? If so, what are the differences ? What are the factors or circumstances that may cause them to differ?
16. What is the role of MAEAP vis- a- vis regulatory programs? Do you think the current leadership of MAEAP share the same views as to these roles? If not, does the difference influence your motivation to assist in MAEAP?
17. Do you think that farmers of MAEAP verified farms are better positioned to come into compliance with any foreseeable new environmental regulations?
18. Do you think that your agency is more or less likely to audit (inspect) operations for environmental performance if they are MAEAP-verified? Overall, how favorably or unfavorably do you view MAEAP verified farms? What about the agency as a whole?

Appendix C: MDA Focus Group Instrument

Sample Questions to ask MDA Agency Personnel about Voluntary Programs and MAEAP

Questions about Agricultural Pollution Prevention and Control with specific attention to animal agriculture

I. Size of Problem: Relationship of Agricultural Practices to Environmental Quality

1. How serious a problem do you think pollution from animal agriculture is in Michigan? Is there a difference between the types of pollution issues presented by animal agriculture versus other types of agriculture? Do the issues vary with the size of the animal operation? If so, how?

II. Adequacy of Existing Regulations and Information

2. What is the current MDA and DNRE agency strategy and program(s) for addressing animal agricultural pollution issues? What current legislation and regulations apply?
3. What are your opinions of the effectiveness of the existing legislation/regulation and the enforcement of same in addressing these issues?
4. How high a priority should animal agricultural pollution issues be given within MDA? Within DNRE? What are the unique challenges in identifying and prioritizing these pollution issues and potential remedies?
5. In what direction do you foresee changes in regulations and laws governing animal agriculture (nationally and in Michigan) going in the near to medium term? Why? On a scale of 0 to 100, what is your estimate of the chance that small livestock producers will have more environmental regulation in the next 5 to 10 years?

III. Agency Activities: Evaluating Performance

6. How well do you think the animal agriculture regulated community meets the pollution prevention/control requirements? The "non-regulated livestock community"? How do we know?
7. What is your perspective, on how well the DNRE monitors animal operations performance after the operation has come to the attention of the agency? Does DNRE involve MDA?

IV. Agency Activities: Enforcing Responsibilities or Requirements

8. What are your opinions of the effectiveness of the existing enforcement of regulations and requirements relating to animal agriculture?
9. What are the circumstances or factors that would cause DNRE to take an enforcement response? Do the operations against which there have been enforcement responses share any characteristics? If so, what are they?

10. How does a farm come to the attention of the DNRE?. That is, how does the DNRE know if a farm is in compliance with federal and state pollution regulations?
11. How does the agency enforce permits or other requirements of animal operations? How consistent do you think the agency has been in these regulatory activities?

V. *Role of Voluntary Regulations*

12. Whether one is thinking of agricultural source pollution issues *or non-agricultural ones*, what role do you see for voluntary programs for improving environmental performance? Can you point to examples that you think are exemplary or ones that do not seem to accomplish the objectives of pollution prevention and control? What are the characteristics of each of these types?
13. Are such voluntary programs substitutes for regulatory programs or complementary to them? Under what circumstances, if any, are voluntary actions more effective and or less costly than regulation in preventing and controlling pollution? ? Would there need to be strong compliance enforcement in place in order for voluntary programs to be effective?

VI. *Role of MAEAP*

14. What are your opinions about the Michigan Agricultural Environmental Assurance Program (MAEAP)? Can MAEAP be relied on to provide adequate performance from animal agriculture participants? Do you think there is a difference among MAEAP verified farms in environmental performance versus non-MAEAP livestock operations? If so, what are the differences? What are the factors or circumstances that may cause them to differ?
15. What is the role of MAEAP vis- a- vis regulatory programs? Do you think the current leadership of MAEAP shares the same views as to these roles? If not, does the difference influence your motivation to assist in MAEAP?
16. Do you think that farmers of MAEAP verified farms are better positioned to come into compliance with any foreseeable new environmental regulations?
17. Do you think the DNRE is more or less likely to audit (inspect) operations for environmental performance if they are MAEAP-verified?

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