

Failure of the Master Matrix: Industrial Livestock Operations Still Harming Air, Water, and Communities

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Executive Summary

Iowans are concerned about our air and water quality, especially with regard to industrial livestock operations. Policy makers created the Master Matrix in 2002 to help protect our air and water from these operations. The matrix is a list of questions used to assess the potential impacts of a proposed confinement on air, water, and nearby communities. The matrix questions could help mitigate or eliminate air and water quality impacts of proposed confinements.

New data from the Department of Natural Resources (DNR) highlights that in practice, over the last five years, the matrix has not helped to solve our water and air quality problems. The passing score, set at 50%, is far too easy to obtain—only a few of the 272 applications submitted have failed to obtain this score. Most applicants skip the questions and do not adopt the practices that were intended to protect our air, water, and nearby communities. For example, no applicant has agreed to construct an emergency containment area to contain manure spills that would help prevent fish kills.

We need to change Iowa's policies to better protect air and water quality by: 1) requiring applicants to answer all questions on the Matrix and allowing the DNR to strengthen it; 2) increase separation distances between livestock operations and manure spreading and our waterways and communities; 3) require most proposed livestock operations to undergo this review; 4) give county governments authority to decide where livestock operations are located.

Iowans created the Master Matrix to protect our interests

Industrial livestock operations can adversely impact water quality, air quality, and the quality of life in nearby communities in a number of well-documented ways. The U.S. Environmental Protection Agency reports that agricultural practices and intensive livestock operations are leading causes of Iowa's impaired or threatened rivers, streams, lakes, and wetlands.¹ Water pollutants include phosphorous and nitrogen, ammonia, pathogens, antibiotics, pesticides, and hormones.² Air pollutants include ammonia, hydrogen sulfide, carbon dioxide, particles that can include microorganisms, and strong odors.³ Overall this water and air pollution degrades our state's environment and quality of life.

¹ U.S. EPA, *2002 National Assessment Database*, at <http://www.epa.gov/waters/305b/index.html> (last accessed Feb. 15, 2007).

² U.S. EPA, *Potential Environmental Impacts of Animal Feeding Operations*, at <http://www.epa.gov/agriculture/ag101/impacts.html> (accessed Feb. 15, 2006).

³ Iowa State University and the University of Iowa Study Group, *Iowa Concentrated Animal Feeding Operations Air Quality Study: Final Report*, Feb. 2002; Peter S. Thorne et al, *Health*

Iowans are concerned about the environmental impacts of the livestock industry, particularly from the industrial livestock confinements also known as concentrated animal feeding operations (CAFO) and factory farms. According to a recent poll by the Sustainable Natural Resource Funding Advisory Committee, Iowans identified water pollution generally as their top environmental concern and pollution from livestock confinements as their second top environmental concern.⁴

The state has preempted local officials from adopting policies to protect air and water quality in their communities from industrial livestock pollution. Instead, Iowa has attempted to protect air and water quality from industrial livestock pollution solely through statewide laws and regulations. A key component of existing regulations is the Master Matrix, which is a series of questions intended for applicants to disclose and improve their planned environmental, worker and construction practices. The matrix was created through state legislation in 2002.⁵

The Department of Natural Resources and county supervisors use the Master Matrix to evaluate the proposed site of a confinement feeding operation that would include over 1000 animal units (equivalent of 2,500 hogs).⁶ The 44 questions on the matrix examine some of the potential environmental and community impacts of the proposed livestock confinements. Obtaining a satisfactory score on the matrix is an important step to obtaining a construction permit to build a facility in the 87 counties that have chosen to use the matrix system.⁷

The matrix questions were intended to ensure that proposed livestock confinements do not pose problems with regard to the water quality of nearby rivers, streams and lakes, air quality, or the quality of life in nearby communities. In addition, the points awarded for answering the questions can create requirements and incentives for the applicant to adopt practices that protect air and water quality.

The past five years show it's time for a change

Effects of Airborne Exposures from Concentrated Animal Feeding Operations, Environmental Health Perspectives (2006).

⁴ Sustainable Natural Resource Funding Advisory Committee, *Sustainable Natural Resource Funding Study: Preliminary Report*, Jan. 2007

<http://www.iowadnr.com/sustainablefunding/index.html> (last accessed Feb. 15, 2007).

⁵ See Iowa Code Chp. 459, Animal Agriculture Compliance Act.

⁶ A copy of the Master Matrix document is available at <http://www.iowadnr.com/afo/matrix.html> (last accessed Feb. 15, 2007).

⁷ Of Iowa's 99 counties, 87 have adopted the necessary resolution to review permits using the master matrix questions. Twelve counties have opted out and do not use the matrix to review the counties. See *Status of Construction Evaluation Resolutions by County*, Feb. 7, 2007, <http://www.iowadnr.com/afo/matrix.html> (last accessed Feb. 13, 2007).

New data from the Iowa Department of Natural Resources, released in January 2007, shows the patterns of use for the matrix since it was adopted in 2002.⁸ Based on our analysis of this information, the matrix permit process is failing to assess the impact to the air and water quality and the quality of life in surrounding communities. In particular, most applicants do not answer the questions or adopt the practices that would mitigate the negative impacts of proposed confinements. The failure of the matrix is reflected in the continued water quality problems that Iowa faces and in the lack of community support for new proposed confinements.

Applicants can obtain a passing score too easily: of the 272 matrix applications submitted to the DNR since 2002, only 5 have received a failing score. Most applicants answer just enough questions to obtain a satisfactory score, which is often as few as 16 questions out of the total 44 questions in the application.

This analysis confirms the direct experiences of the county supervisors who initially assess the scores of matrix applications. According to a February 2007 survey by the Iowa State Association of Counties (ISAC), a majority of supervisors are dissatisfied with the matrix. Among the key reasons, supervisors stated that passing scores are too easy to obtain and that most applicants do not answer all of the questions.

The Matrix is leaving the questions of Iowans unanswered

The 44 questions in the matrix create a total of 880 possible points in an application. However, applicants can obtain a satisfactory score with only 440 points – a 50% score. Questions are not equally weighted. Some award 100 points – nearly 25% of the overall score – while others only award five or ten points.

Applicants need not provide answers to all questions, but just enough to obtain the passing score. Applicants can obtain points on each question, but points cannot be deducted in any part of the application. It is technically feasible to obtain the required 440 points with answers to as few as 13 questions. Often citizens and local officials see other questions as more significant to their community and to local environmental issues.

Based on our analysis of new DNR data, many applicants obtain the passing score by answering the same 16 questions and only these questions. Most applicants do not answer the questions or adopt the many practices that would help protect air and water quality. Given this new information, the matrix is failing to protect air quality, water quality, and community interests as originally intended in 2002.

98% of applicants are skipping 7 critical questions and requirements that offer the strong protection to communities and nearby streams and rivers

Based on the DNR data, 5 or fewer applicants, or 2% or less of applicants, scored points by agreeing to do the following:

⁸ Based on information obtained from the Iowa Department of Natural Resources on the use of the matrix since 2002.

- Build an emergency containment area in the manure storage area (Question 13)
- Install air filters on confinement buildings (Question 14)
- Aerate manure lagoons to reduce odors (Question 18)
- Adopt an environmental management system (Question 42)
- Demonstrate the support of the surrounding community, in writing (Question 36)
- Allow for monitoring of groundwater on the site (Question 44)
- Adopt a more comprehensive and strict nutrient management system (Question 43)

These seven practices could help to mitigate the impact that industrial livestock facilities pose to water, air, and nearby communities.

Surprises: According to DNR data, not a single applicant has agreed to build an emergency containment area, which can help eliminate fish kills by containing manure spills.

Benefits of Good Practices: Air filters can help reduce odors and the associated pollutants ammonia and hydrogen sulfide. Groundwater monitoring can detect whether the confinement poses an actual threat to important groundwater resources. Obtaining the written support of the surrounding community shows that the neighbors do not see the confinement as a threat to their quality of life.

As this information indicates, however, operators are not using any of these practices to protect air and water quality.

80% of applicants are skipping 10 additional questions that would further ensure protection of air, water and workers

Based on the DNR data, fewer than 50 applicants have scored points by agreeing to do the following:

- Conduct air quality modeling (Question 11)
- File a worker safety plan (Question 37)
- Build the confinement nearest to the applicants own home (Question 22)
- Demonstrate the added economic value of the proposal (Question 39)
- Allow the public to view the manure management plan (Question 38)
- Adopt a plan to handle emergencies (Question 40)
- Adopt a plan to handle the closure of the facility (Question 41)
- Enhancements to manure stockpile or composting facilities (Question 16)
- Base manure application to the phosphorous needs of a two-year crop rotation (Question 27)
- Only apply manure to land that is separated from all water sources by approved buffer strips (Question 28)

These 10 practices could help mitigate impacts that the proposed industrial livestock facility pose to water, air, and nearby communities.

Surprises: According to DNR data, 86% of applicants build the confinement closer to another residence, not their own. Notably, only 39 applicants claimed the Homestead Tax Exemption under Question 22, which can only be claimed if the applicant's residence is closest to the proposed confinement.

Benefits of Good Practices: Limiting manure application to phosphorous needs helps to reduce the over-application of manure, which causes chronic water pollution problems from nutrient runoff. Applying manure to land that is surrounded by buffer strips also protects nearby waterways. Plans to handle emergency situations or the closure of a facility can also help reduce acute water problems, such as fish kills from spills and leaks.

Over 90% of applicants rely on the same 8 easiest questions to avoid protecting the community, air and water quality

While 20% of applicants do not score points on the same 17 questions as referenced above, 90% of applicants do pick up points on the same popular 8 questions:

- Add to the distance separating the facility from certain areas (certain waterways, public areas, hospital, (Questions 2, 3, 6, 8, 10)
- Show no past environmental or worker protection violations, even if the applicant is new and has no history at all (Question 20)
- Use a formed manure storage structure (concrete or similar materials, covered or uncovered) (Question 17)
- Providing an area for trucks to turn around (Question 19)
- Keeping the facility under 3,000 animal units (Question 24)

Surprises: The points awarded in these areas reveal some additional problems with the matrix and current industrial livestock regulation in Iowa. Applicants who are new and have no history at all can still obtain the 30 points for not having a history of worker or environmental violations. Formed manure storage structures are the industry standard for new construction, but applicants still receive 30 points for using them.

Conclusion and Policy Recommendations

These patterns of use in the past five years with the Master Matrix highlight the failure of the matrix to adequately protect our air, water, and communities. While the matrix permit application could offer a valuable tool for evaluating proposed sites and encouraging operators to protect air and water quality, the tool is too full of loopholes to be effective. In addition, the data points to some overall policy shortcomings with the environmental regulation of livestock facilities in Iowa.

The matrix offers a broad variety of questions that relate to meeting the interests of Iowans to ensure responsible livestock production. It is challenging to put all of the interests of Iowans into one consistent application through state regulation, as priority issues of importance vary per community. The matrix could be improved to be an effective tool if it can be changed to represent the lessons learned over the past five years. Additional state policies could provide a

better framework for meeting the interests of Iowans. However, state level policy alone will never be fit the unique characteristics of every community nor the needs for every livestock producer.

To improve the water and air quality and community health, Environment Iowa Research and Policy Center recommends the following changes in policy:

- ✓ Increase the separation distance between new confinements and streams, rivers and lakes, and specific places, including schools, hospitals, residences and churches. Increase separation distances between areas where manure can be spread and these same areas
- ✓ Give the DNR the authority to strengthen the matrix so that it fully accounts for air, water, and quality of life impacts. Applicants must answer every question. The DNR should have the authority to create a more balanced application, such as deducting points on certain questions.
- ✓ Require more proposed confinements to undergo review with the matrix.
- ✓ Give counties more decision-making authority over where new confinements are located. For example, give county supervisors the power to adopt a local ordinance that would provide additional protections for water quality, air quality, and the welfare of the entire community.