

Report

Livestock Facility Siting Technical Expert Committee Recommendations

December 21, 2010

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State of Wisconsin
Jim Doyle, Governor

Department of Agriculture, Trade and Consumer Protection
Randy Romanski, Secretary

December 21, 2010

Randy Romanski, Secretary
Department of Agriculture, Trade and Consumer Protection
2811 Agriculture Drive
Madison, WI 53718

Dear Secretary Romanski:

As co-chairs of the Technical Expert Committee, we are pleased to present you with the committee's report, which satisfies the requirement in s. 93.90(2)(d), Stats. to secure expert advice as part of the review of the siting rule. This report's key feature is a series of technical recommendations to improve the standards in the siting rule (ATCP 51) for local approval of new and expanding livestock facilities. The report reflects the consensus of the committee and notes differences of opinion.

While our time together was short, this group of experts worked diligently to develop recommendations to complete their assignment. In responding to the assignment, the committee focused on the best available science, field experience and research, with a particular focus on developments since 2005 when the first technical committee finished its work. The committee also considered whether proposed changes are practicable and workable.

As a whole, the recommendations reflect an endorsement of the siting framework. Individual recommendations range in specificity for a number of reasons, including the complexity of the subject matter and the current state of research. Some recommendations suggest general guidance and point to factors that the department may wish to consider in revising the siting standards. Other recommendations are precise and detailed in the improvements they offer. Recognizing that technical questions invariably have policy dimensions, the committee nonetheless steered clear of significant policy questions such as the imposition of financial responsibility requirements.

In view of the narrow charge under which our committee operated, and the challenge in finding balance among competing considerations, the committee believed it was important to invite committee members as well as the general public to submit comments on the report. Comments will become part of the record, and useful in revising the rule.

The committee understands the importance of its recommendations to complete the four year review and improve the current rule, while recognizing that our recommendations must be vetted through the rule making process. Now that the agency has opened

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ATCP 51 for revision, it has moved to a new stage in the process which is governed by a different set of procedures and broader set of considerations. When considering our recommendations during the rule revision, DATCP must have a broader focus and specifically consider the recommendations in light of the economic and other factors listed in s. 93.90 (2) (b), Stats. For example, the department will need to consider how any suggested changes may burden the advancement of technologies such as anaerobic digesters that are paving the way toward a sustainable future of more profitable farms and cleaner energy.

DATCP may also need to address issues not covered by the technical review of the siting standards. As part of rulemaking, the agency may consider issues related to the local administration of the siting program such as the adequacy of fees and procedures for determining the completeness of applications. There are other issues such as groundwater quantity and protection of vulnerable karst areas that are appropriate subject matters for the legislature. As DATCP stakes out the territory for rule changes, we understand the need to work with stakeholders and the ATCP Board, all of which have shown an active interest in the scope of any proposed rule changes.

On behalf of the entire committee, we extend our appreciation for the opportunity to share our expertise, and we stand ready to contribute in the future.

Sincerely,


Richard Castelnovo, Co-chair


Ed Odgers, Co-chair

Executive Summary

The technical expert committee was convened as part of the Department of Agriculture Trade, and Consumer Protection's (DATCP) required four year review of the livestock facility siting standards under ch. ATCP 51 Wis. Admin Code (siting rule). DATCP appointed 16 members and three advisors to serve on the committee. Members with expertise in nutrient management, engineering, odor, setbacks and public health were divided into three subcommittees and given the task to answer assignment questions through a consensus process. The full committee met twice to review subcommittee recommendations and reach agreement on the final recommendations presented in this report.

The recommendations set forth below are arranged by the topic areas defined by the assignment questions: Engineering, Odor, Setbacks, and Nutrient Management; and a summary related to Compliance. Found within the main body of the report are supporting rationale to accompany the recommendations. The committee's assignment focused on technical issues; therefore recommendations are of a technical nature and do not include a broader set of issues related to implementation of the siting rule. The recommendations are the primary guidance and any perceived differences between the recommendation and rationale should be resolved in favor of the recommendation.

The committee provides the following responses to the questions considered during its technical review:

Engineering: manure storage and runoff management

1. The requirements for evaluating existing manure storage structures should be refined to promote consistent and accurate conclusions, clarify inspection requirements for specific liner types, avoid duplication and supply better documentation. Inspection of waste transfer systems must be required.
2. NRCS BERT (Barnyard Evaluation Rating Tool) model should be considered as the new tool for evaluating animal lot runoff.
3. New and altered feed storage should be designed according to the NRCS Standard 629 Waste Treatment for commonly stored feed stuffs. Evaluation of existing feed storage facilities should begin at 500 animal units, and must include a process to evaluate whether leachate and runoff controls are necessary. Standard 629 should also be referenced for systems designed to treat process wastewater such as milking center waste.
4. The existing process to evaluate how new technologies fit into current design standards is adequate. A separate system within ATCP 51 is not necessary.
5. Addressing cost of waste storage facility closure is complex and site specific. Generally cost and risk increase with structure size, however a wide range of technical and non-technical factors influence project scope and final cost.

Odor management

1. The odor standard must continue to be based on accurate odor predictions.

2. Odor generation numbers for three of 24 existing odor sources should be modified: 1) Dairy free stall housing utilizing a flush system is currently underestimated, 2) the standard should differentiate high rise and belt drive poultry layer housing types, and 3) waste storage facility size, not storage time, should be used to calculate odor.
3. Create two new odor generation numbers: 1) sheep/goat housing and 2) sand/manure solids separation systems.
4. Change 11 of the current reduction factors assigned to the 24 odor control practices: increase one, decrease six, redefine three, and eliminate one. The rest are accurate.
5. Create two new odor control practices: 1) immediate return of flush water and 2) poultry litter dryer belt systems.
6. The 2,500 foot exemption to the odor standard should be eliminated.
7. All permitted facilities should be required to develop training and environmental incident response management plans that include strengthened requirements to better reflect odor control. DATCP should develop an example plan which producers can tailor to their facility. Management points awarded in the odor model must be reduced.

Setbacks

Among other options for managing the offsite impacts of larger livestock operations, DATCP should evaluate augmenting the current road and property line setbacks by requiring separation distance between livestock structures and neighboring occupied residences and high use buildings.

Nutrient management

1. DATCP should attempt to harmonize the nutrient management requirements in ATCP 50, ATCP 51 and NR 151, and coordinate changes to the RUSLE2 model.
2. The current approach is workable because it recognizes the ability for local governments to request supporting documentation. To improve the credibility of nutrient management plans, applications should more clearly define ownership of the acreage for land spreading, locations of sensitive features, alternative manure disposal methods and applications of other nutrient sources such as organic by-products.
3. Develop a mechanism, possibly by restoring Section V.A.2.b(2) of the 590 Standard, to allow for local restriction of nutrient applications on frozen and snow covered ground in “areas delineated in a conservation plan as contributing nutrients to direct conduits to groundwater or surface water as a result of runoff.” Such a provision should only be used when the permitting authority is responsible for developing the conservation plan at no expense to the farmer. An oversight and appeals mechanism should be developed in the rule to ensure that local spreading restrictions are appropriate or are in response to a documented event such as field runoff.

Compliance

There needs to be better documentation of facility compliance with practices and other requirements approved in a siting permit. Expanding the checklist concept beyond nutrient management to include all the standards is a reasonable approach that can accommodate producer self certification and review by the permitting authority. DATCP

should provide guidance and training to local authorities on compliance monitoring, responding to changes at permitted facilities, and collecting implementation data.

Expert Committee Process

Background and Chronology

The technical expert committee was convened as part of the Department of Agriculture Trade, and Consumer Protection's (DATCP) four year review of the livestock facility siting standards under ch. ATCP 51 Wis. Admin Code (siting rule), which became effective in May 2006. Under sec. 93.90, Stats. (siting law), the DATCP Secretary must appoint a committee of experts to advise DATCP on the review of standards in ATCP 51.

Early in the process of reviewing the siting rule, DATCP committed to a technical expert committee that would retain the scientific and technical focus of the original technical panel that created the siting standards. The membership reflected the composition of experts originally convened with certain additions.

DATCP began defining the committee's scope of review with the four year evaluation report on implementation of the livestock facility siting rule (April 2010) presented to the Board of Agriculture, Trade and Consumer Protection (ATCP Board). (Available at http://www.datcp.state.wi.us/arm/agriculture/land-water/livestock_siting/reports.jsp) The report pointed to the appropriate areas for the agency's rule review and identified certain policy and other issues beyond the scope of the rule review.

Through communications with the ATCP Board and the public, DATCP defined its vision for the committee's work. The committee was responsible for evaluating the siting standards to ensure the standards provide for responsible growth while correctly balancing community interests. Specifically, the committee considered the following standards in light of the latest research, field experience and other factors:

- Livestock structures and their location on the property, which included structural and manure storage setbacks from property lines and roads.
- Odor and air emissions, which included an assessment of odor credits for control technologies and manure handling practices.
- Nutrient management, which included identifying documentation required within a nutrient management plan.
- Waste storage facilities, which included evaluation of existing facilities.
- Runoff management, which included the consideration of federal standards for controlling leachate and runoff from stored feed.

Consistent with the limited technical focus of the committee, DATCP identified areas outside the scope of the committee's review, including social acceptance of large livestock farms, animal husbandry practices, and regulatory areas within the purview of DNR or other agencies.

In June 2010, DATCP appointed 16 members and 3 advisors to serve on the committee (A membership list organized by subcommittee assignments is on page 11). Drawn from both the public and private sectors, the experts were selected because they possessed expertise necessary to provide advice regarding permitting of livestock operations, air emissions, odor, land use planning, nutrient management, public health, runoff

management, and agricultural engineering. In the area of odor management, the committee drew on the knowledge and experience of members who have nationally recognized expertise in this area. This is the first time that this level of expertise has been officially involved in the advisory process for setting siting standards.

To ensure a transparent and public process related to the committee's deliberations, DATCP committed to the following:

- Publicly notice and conduct each meeting according to the open meetings law
- Prepare staff notes for each meeting
- Maintain a website to share critical documents and information, such as the committee assignment, meeting agendas, and staff notes for each committee meeting: http://www.datcp.state.wi.us/arm/agriculture/land-water/livestock_siting/technical_expert_committee.jsp

At its first meeting on July 21, 2010, the full committee received a detailed assignment with specific questions regarding the siting standards. The assignment questions are set forth in full in the recommendations section of this report. Committee members and advisors were assigned to the following three subcommittees based on their expertise 1) nutrient management, 2) engineering, and 3) odor. Each subcommittee was given responsibility for addressing relevant questions in the assignment, and identifying how they would complete their work, including scheduling the appropriate number of meetings. Ultimately subcommittee recommendations were reviewed and vetted by the full technical committee for inclusion into this report.

The subcommittees meetings were held as follows:

- Engineering subcommittee - August 31 in Appleton, September 14 and October 12 in Madison.
- Nutrient Management subcommittee - September 8, September 29 and October 13 in Madison.
- Odor subcommittee - August 24, September 14, September 30 and October 26 in Madison.
- Odor and Engineering subcommittees jointly met to discuss setbacks on September 14 and October 19 in Madison.

The full committee reconvened on November 11 and December 16 to review and finalize the recommendations submitted by the three subcommittees.

In October, prior to the final two committee meetings, DATCP initiated the rule making process by publishing a scope statement to revise standards and procedures in the siting rule for local approval of new or expanding livestock facilities. The scope statement specifically provided that DATCP would consider the recommendations of this committee in revising ATCP 51. The scope statement was unanimously approved by the Board of Agriculture, Trade and Consumer Protection on October 27, 2010.

Review Scope and Criteria

The required review of the siting rule has multiple purposes:

- Maintain a viable rule by responding to new information
- Balance responsible industry growth with community interests
- Ensure that the siting standards keep pace with and reflect changes in the size, technology, and complexity of livestock operations
- Update the siting standards to incorporate important changes in statewide technical standards
- Respond to local experiences with permitted and non-permitted farms
- Improve implementation of the siting rule through refinements to procedures

These purposes were reflected in the questions posed to the committee in its assignment. There are assignment questions that focus on the impacts of facility size, Natural Resources Conservation Service (NRCS) updates to technical standards, developments in research and new technologies, and implementation experiences including monitoring for compliance.

In addressing their assignment, committee members followed an objective and science-based approach consistent with their background and expertise. Deliberations focused on research, field studies, knowledge and experience of the nationally-recognized experts, and other credible sources of information related to water quality, odor and other impacts of livestock facilities. Also considered were changes in technical standards developed by NRCS and others. The group evaluated this information based on soundness of the methods used, validation using peer review, and other criteria to assess reliability.

The committee's evaluation was informed to a degree by conditions and issues related to farms granted local siting permits in the last four years. However, the committee was limited in its capacity to evaluate this information. First, the information did not fit within accepted scientific approaches used for evaluation. Second, the lack of data reported to DATCP concerning performance of permitted farms makes it difficult to interpret how the standards are working on the ground. The committee took a cautious approach to evaluation. Where there was uncertainty, the committee considered options to retain the status quo or make adjustments in the standard to reflect the lack of clarity in science supporting the standard.

While the primary focus was on objective, science-based information, the committee also considered whether proposed changes to the standards are:

- Protective of public health or safety
- Practical and workable
- Cost-effective
- Designed to promote the growth and viability of animal agriculture in this state
- Designed to balance the economic viability of farm operations with protecting natural resources and other community interests
- Usable by officials of political subdivisions

The siting law specifically provides that these factors should be considered in proposing standards.

Even though some technical questions invariably touch on larger issues involving livestock agriculture, the committee steered clear of tackling any significant policy questions, including the removal of the rule's prohibition against imposing financial responsibility requirements as a condition of permit.

Deliberative Process and Public Participation

The committee followed ground rules intended to create an environment conducive to the free exchange of information and thoughtful deliberation on technical issues. While the public was welcome to attend committee meetings to listen, public participation in the committee process was restricted as done in 2004 when the original technical expert panel developed the siting standards. This structure recognizes that there will be other occasions for the public to comment and share their ideas. Opportunities for public involvement include ATCP Board meetings when the committee's recommendations are presented, and any rulemaking related to the committee's recommendations.

Decision-Making

The committee utilized a consensus process to develop their recommendations. Using this process members were asked to reach a common agreement regarding recommendations, the committee did not make decisions by counting votes. In finalizing the recommendations from the subcommittees, the full committee was expected to show appropriate deference to the work of each subcommittee, and was responsible for ensuring the internal consistency of the recommendations.

As its goal, the consensus process is designed to enable members to find a common ground of understanding and agreement regarding recommendations. In certain cases, recommendations were accepted without changes from the subcommittee. Because of the short turnaround time for the committee to complete its work, the committee did not have the opportunity to fully resolve every difference of opinion among members. In recognition of this and other constraints, The committee believed it was important to specifically provide a separate opportunity for committee members, as well as the general public, to comment on this report.

Livestock Siting Technical Expert Committee 2010

Members Listed by Subcommittee Structure

Committee Co-Chairs

- **Richard Castelnuovo.** Agricultural Resource Management DATCP. Madison WI
- **Ed Odgers.** Agricultural Resource Management DATCP. Madison WI

Engineering Subcommittee

- **Ed Odgers.** DATCP
- **Brian Holmes.** Professor, Biological Systems Engineering Department, UW-Madison, UWEX appointment. Madison, WI
- **John M. Roach.** General Manager, Roach & Associates. Seymour, WI
- **Tom Bauman.** Agricultural Runoff Management Coordinator, Bureau of Watershed Management, Department of Natural Resources. Madison, WI
- **Richard Wagner.** Co-owner of Quantum Dairy. Weyauwega, WI.
- **Staff Support: Dennis Presser.** Agricultural Resource Management DATCP. Madison, WI
- **Advisor: John Ramsden.** State Conservation Engineer, Natural Resources Conservation Service. Madison, WI

Odor Subcommittee

- **Jerry Halverson.** Department Director, Manitowoc County Soil and Water Conservation Department. Manitowoc, WI
- **Charles M. McGinley.** Technical Director, St. Croix Sensory Inc. Lake Elmo, MN
- **Dean Perlick.** Manager, Planning & Economic Development, Dodge County. Juneau WI
- **Jeffrey Voltz.** Wisconsin Dept. of Natural Resources, Cooperative Environmental Assistance Program. Madison, WI
- **Robert L. Thiboldeaux.** Toxicologist, Wisconsin Bureau of Environmental and Occupational Health, Department of Health and Family Services. Madison, WI
- **Steve Struss.** Agricultural Resource Management DATCP, Madison, WI
- **Staff Support: Mike Murray.** Agricultural Resource Management DATCP, Madison, WI
- **Advisor: Larry Jacobson.** Professor and Extension Engineer, University of Minnesota, Department of Bioproducts and Biosystems Engineering. Minneapolis, MN

Nutrient Management Subcommittee

- **Dave Buss.** Private Sector Nutrient Management Consultant, NuSOLUTIONS Agronomy LLC. Waterloo, WI
- **Patricia Cicero.** Resource Management Specialist, Jefferson County Land and Water Conservation Department. Jefferson, WI
- **Jeff Endres.** Farmer, Chair of Transfer of Development Rights Committee, and member of the Plan Commission, Town of Springfield, Dane County, WI

- **Dennis Frame.** Co-Director, University of Wisconsin Discovery Farms Program. Pigeon Falls, WI
- **Carrie A.M. Laboski.** Associate Professor, Soils Science Department, UW-Madison, Dept. of Soil Science. Madison, WI
- **Pat Murphy.** State Resource Conservationist, Natural Resources Conservation Service. Madison, WI
- **Jim VandenBrook.** Agricultural Resource Management DATCP. Madison, WI
- **Staff Support: Sue Porter.** Agricultural Resource Management DATCP. Madison, WI
- **Advisor: Andrew Craig.** Nutrient Management Specialist, DNR. Madison, WI

Recommendations and Supporting Findings Livestock Siting Technical Expert Committee

The committee provides the following responses to the questions posed in the assignment prepared by DATCP. These responses, nearly all of which include recommendations, are the product of meetings held by three subcommittees from August to October 2010. Staff notes from those meetings were compiled and formatted to prepare draft recommendations for review by the full committee. The full committee began its review of the draft recommendations on November 11, 2010 and used a consensus process to reach agreement on the final recommendations at its last meeting on December 16, 2010.

The committee's recommendations are arranged by the four topic areas defined in the assignment: Engineering, Odor, Setbacks, and Nutrient Management. At the beginning of each topic area, the report provides references to the applicable sections of the siting rule, including the application worksheets contained in Appendix A of the siting rule. Within the four topic areas, the recommendations are organized according to the questions identified in the assignment. Recommendations related to compliance are included within three topic areas. While recommendations are accompanied by supporting rationale, the recommendations should be considered the primary guidance, and any perceived differences between the recommendation and rationale should be resolved in favor of the recommendation.

To improve technical requirements of the siting standards in the livestock facility siting rule, the committee provides the following answers to the questions presented in their assignment. In addition, the committee makes an overall recommendation supporting research in developing new technologies and standards for siting livestock facilities, with a specific request that funding be targeted toward odor measurement, including monitoring of odor from separation buildings and field studies to verify the laboratory research on odor. Better collection of implementation and other information can supplement the recommendations in this report.

Engineering Recommendations

Rule References: ATCP 51.18, ATCP 51.20, Appendix A, Worksheets 4 & 5

***Objective:** Are adjustments needed to the requirements for facility design, construction and operation in ATCP 51.18 and 51.20 pertaining to waste storage facilities, manure transfer systems, animal lots, feed storage leachate controls and runoff management based on current research and field experience?*

Engineering Question 1: *How can Worksheets 4 and 5 (Appendix A, 390-33 to 390-35) be improved to ensure that applicants evaluate and document the conditions of existing structures and practices including manure stacks, short and long term manure storage, animal lots and feed storage leachate controls, manure transfer systems?
(Recommendations for this question are provided under questions 2, 3 and 4).*

Engineering Question 2: *Should the method for evaluating manure storage required in Worksheet 4 (Appendix A, 390-33) be modified based on the CNMP and other evaluation approaches?*

Recommendation for Question 1 and 2: Worksheet 4 is fundamentally sound but lacks specificity and should be refined to assist the evaluator to draw consistent and accurate conclusions and to provide documentation. The following refinements are recommended:

- The worksheet should require the following information to be submitted:
 - Storage facility identifier such as unit name or number
 - Description of the type of facility (tank, pit, above or below ground etc.)
 - Liner type (selected from tables 1 thru 5 in NRCS Standard 313, Waste Storage Facility)
 - Dimensions and volume
 - Any existing designs and as-built documentation
 - Date the facility was constructed
 - Date of inspection
 - Level of manure at inspection
- The evaluation should include the waste transfer system.
- The condition of facilities with liner types more prone to damage (compacted clay, geomembrane, geosynthetic) should be evaluated by visually inspecting the liner when the facility is empty or as near empty as practical (typically within two feet from the lowest point). The department shall consider options to provide flexibility for completing a satisfactory inspection that facilitates timely completion of a permit application.
- A safety fence should be required for existing waste facilities to continue in use, as is the case for all new storage facilities.
- Duplication should be avoided. Equivalent components of other evaluation tools, such as the NRCS Comprehensive Nutrient Management Plan (CNMP) and DNR Wisconsin Pollution Discharge Elimination System (WPDES) permits for animal feeding operations, should be accepted as inputs to Worksheet 4.

Rationale: The subcommittee discussed the need to refine the ATCP 51 worksheet to narrow the interpretation necessary to characterize an existing storage. For example, the subcommittee felt that the worksheet should include additional guidance to conclude that a facility is in "...good condition and repair..." Additional guidance will ensure that engineers have better information to render professional judgments and provide greater assurances to regulators that quality technical evaluations were completed. The lack of specificity could result in widely varying results and competitive pressures on engineers and practitioners conducting evaluations. The rule should strike a balance between the judgment of the professional and the verification required. The subcommittee acknowledged that the facilities and the methods necessary for evaluating their condition will be unique and inevitably will rely on the judgment and professionalism of the evaluator. Nonetheless, the subcommittee felt there are criteria that universally apply. One is that liner types more prone to damage (compacted clay, geomembrane, geosynthetic) cannot be credibly evaluated without visually

inspecting a significant portion of the liner surface and, consequently, need to be inspected when the facility is as empty as practical, or within two feet of the bottom. The evaluation process used for Comprehensive Nutrient Management Plans may offer guidance in this and other areas. The subcommittee explored if and how the permitting process could move ahead despite an inconclusive storage evaluation, because of a delay in documenting the facility's liner or conducting a soils investigation. Though problematic, local administration may consider conditional permits.

Engineering Question 3: *In light of new models for evaluating animal lot runoff, should the BARNY model be replaced, e.g. BERT (Barnyard Evaluation Rating Tool)?*

Recommendation for Question 3: The NRCS BERT model should be considered as a replacement for the outdated BARNY if BERT can be modified or amended to confirm laminar (sheet) flow across the buffer. Whichever model is used, applicants should be required to provide a printout of the model inputs and outputs so that permit reviewers can better assess the application. If the BARNY model remains the tool, there should be additional guidance for its use.

Rationale: The BERT model has the advantage of being more precise, flexible, and actively supported by NRCS. Both BERT and BARNY are based on the 1982 ARS feedlot formulas and produced similar outcomes for most scenarios but for some examples BERT will produce vastly different results depending on the entry input chosen for "sheet-flow" across the buffer. Unlike BARNY, the BERT model is not responsive to the width of the buffer area that the user inputs. Rather, it relies on answering if runoff contacts the buffer in "sheet flow" (laminar conditions). The subcommittee concluded that for the purposes of the siting rule, BERT would need to be augmented with directions on how to make this determination, preferably within the model itself as a subroutine in the spreadsheet using standard hydraulic determinations. Consequently, the final recommendation of the subcommittee is to replace the outdated BARNY model, but only at such time that the BERT model can be modified into a stand-alone tool suitable for the users of the Siting worksheets. The subcommittee suggested that DATCP work with NRCS to determine if these changes can be made. If this can be accomplished within the timetable of any ATCP 51 revision, the group recommends that BERT be adopted. Alternately, BARNY will need to be retained until a suitable replacement is adopted.

Engineering Question 4: *Given the changes in the requirements for the feed storage leachate control, including NRCS Standard 629, should the standards in Worksheets 5 (Appendix A, 390-34-35) be updated? What feed storage structures should be subject to the requirements for leachate and runoff control? Should the requirements vary depending on the size of the structure, whether the structure is new or existing, or the type of feed stored?*

Recommendation for Question 4: The rule should cite NRCS Standard 629 Waste Treatment for all new and substantially altered feed storage facilities. Feed storage requirements should apply to all of the commonly stored feeds, consistent with NRCS

Standard 629, not just feed over 70 percent moisture (cannery, brewers and distillers byproduct feeds). Requirements for existing feed storage (Worksheet 5, Feed Storage, 2. (b)) should use 500 AU as the threshold of application instead of the current “one acre,” and DATCP should assess how this change will impact smaller producers. An evaluation or risk assessment tool for existing facilities, similar to manure storage and feedlots, should be developed to grandfather existing systems that are adequately protective. Grandfathering adequate existing facilities will avoid unnecessary upgrades and provide an adequate level of environmental protection.

Rationale: Feed storage leachate and runoff control was an emerging environmental issue when ATCP 51 was written. The current requirements are now outdated, having been adopted before development of the technical standards for feed storage leachate and runoff control. NRCS Standard 629 has since been adopted and is now being updated by a Standards Oversight Council (SOC) team. The 629 standard for feed storage reflects the best available knowledge regarding design and construction requirements, and DATCP should consider future changes to the standard. Likewise, CAFOs are required to address feed storage leachate and runoff control and have been upgrading their facilities to control contamination. The recommendations are made in light of these developments. The exemption for feed with less 70 percent moisture is not consistent with the technical standards, does not cover feed storage that is likely to generate pollutants on most farms, and does not prepare farming operations for their transition to WPDES permits. An animal unit threshold is a better approach for defining facilities required to meet requirements for existing storage. Adequately performing, existing feed systems should be grandfathered. An evaluation (risk assessment) tool for existing facilities, similar to manure storage and feedlots, needs to be developed.

Engineering Question 5: *What technical standards such as NRCS Standard 313 should be applied to the design, construction and operation of the following components of a manure management system: compost pads, digesters, digester substrate storage, manure residual storage, sand settling lanes, water treatment processes (e.g. ISS). Should ATCP 51 include a process for establishing engineering requirements for new manure handling technologies similar to the process used by DATCP to approve new odor control practices?*

Recommendation for Question 5: ATCP 51 need not include a unique process. Many new technologies will fit within the scope of existing standards. The Department should make an interpretation as to the applicable existing standards. Optionally, the Department should seek the assistance of the SOC for making interpretations and for initiating any standard revision or development that may be needed. In response to the listed practices in question 5, the Committee recommends the following technical standards apply:

- Compost pads – NRCS Standard 313 or NR 500, Wis Admin Code based on materials composted and size.
- Anaerobic digesters – NRCS Standard 313 for the digester vessel.
- Digester substrate storage – NRCS Standard 313 or NR Industrial waste rules such as NR 213, Wis Admin Code, based on types and amounts stored.
- Manure residual storage – NRCS Standard 313.

- Sand settling lanes – NRCS Standard 634 Manure Transfer.
- Waste treatment processes – Specific to system components; NRCS Standards 313 or 634 for most.

Rationale: When new technologies such as sand channels are first adopted, there may be uncertainty as to which standards apply. In some cases standards may not exist to adequately guide the design or implementation of a best management practice. The subcommittee felt that most new technologies will fit into existing standards but at the onset it may require an interpretation by DATCP technical staff to guide program implementation until standards or rules are revised. The subcommittee recommends that the Department seek the assistance of the SOC for making controversial interpretations and for initiating any technical standard revision or development that may be needed. The subcommittee concurred that the existing mechanisms to assign, revise and develop technical standards for technologies related to manure storage, feedlot runoff, and feed storage are adequate and that a unique process in ATCP 51 is not necessary.

Engineering Question 6: *What should be included in a checklist to determine compliance as part of a monitoring program, including the facilities and practices that must be inspected, frequency of inspections, and method of conducting and reporting inspections?*

Recommendation for Question 6: The subcommittee provides the following general recommendations for developing and implementing a checklist for monitoring purposes. Compliance requirements should be consistent with available staff resources, both time and expertise. Consideration should be given to a combination of self-certification with periodic review by an administering authority. Checklists need to be specific to either the producer, if self certifying, or regulatory authority, if a compliance review. Checklists should be practice specific and include a monitoring or inspection schedule for that practice. Duplication should be avoided and existing compliance assurance measures (CAFOs) should suffice for most compliance objectives. DATCP should provide guidance and training to local authorities on compliance monitoring and how to respond to changes at permitted facilities, and should work with these authorities to collect accurate information concerning the implementation of the siting law and the performance of permitted farms, including their record of compliance.

Rationale: The subcommittee endorses the concept of a checklist but did not have time to develop specific checklist recommendations. Compliance monitoring is important to ensure continued management of practices and to assist in evaluation of the functional condition of practices. The subcommittee's general recommendations are intended to provide guidance to ensure that checklists are effective tools for compliance monitoring.

Engineering Question 7: *Is there a need to address discharge of process wastewater? What practice requirements, if any, should be required?*

Recommendation for Question 7: Yes, Worksheet 5, Runoff Management should include a provision for controlling milking center wastewater, and require that applicants meet NRCS Standard 629 Waste Treatment to achieve compliance.

Rationale: Most dairy farms with manure storage comply with this performance standard. For those farms that do not have manure storage, this requirement is needed to address a significant runoff issue not previously considered by the siting rule. Since the siting standards were first issued, NRCS has developed a technical standard (NRCS 629) to specifically deal with this runoff concern. To maintain consistency with state water quality rules, this requirement should be included within the siting standards.

Engineering Question 8: *What are the costs to close a livestock facility if it ceases to operate? What are environmental and health risks from the failure to close a non-operating facility? How do the costs and risks increase based on facility size?*

Recommendation for Question 8: It is not practical to cite an average cost of manure storage facility closure due to the wide range of conditions that are likely to be encountered. Generally costs and risks will be proportional to facility size and costs for complete closure, if necessary, will likely exceed the initial installation cost. Factors that will determine costs of closure will include:

- Alternate uses. (Many storage facilities are likely to be redeployed for manure storage or other uses)
- Size of storage facility.
- Solids remaining in the storage that can't be removed with conventional means.
- Remediation of any leakage and removal of any contaminated soil.
- Design of system including liner type.
- Need and availability of material to fill any remaining cavity (this is a big variable since the fill taken from a storage excavation during construction is often used for building foundations).

Abandoned earthen feedlot areas can pose an environmental hazard. After abandonment, soil structure is restored, increasing infiltration and leaching of nitrate. Proper abandonment needs to include the removal of organics and planting crops to extract surplus nitrogen.

Fly and vermin control can be a significant problem with abandoned facilities and could be a nuisance and support vectors for disease.

Rationale: There are mechanisms to assign financial responsibility for a bankrupt operation, including the disposition of the manure storage facilities. However, emergency pumping of storage facilities may be required and paid for before the court has assigned a responsible party. Damages caused by spills or leakage may fall outside of the financial responsibility of a secured party and outside of the coverage of liability insurance. Financial responsibility for closures, spills and emergency pumping is outside of the scope of this report and the expertise of most of the committee. If this complicated subject is to be pursued by the Department, committee member John Roach has offered his expertise.

Odor Recommendations

Rule References: ATCP 51.14, Appendix A # 12, #13, #14, & Worksheet 2

Objective 1 – Do the requirements of Odor and Air Emissions, ATCP 51.14, Appendix A and the odor model accurately predict odors based on current research and field experience?

Recommendation for Objective 1: The requirements in the rule must be based on accurate odor predictions. Before making rule revisions, DATCP should ground truth and evaluate proposed changes in the odor standard by running the odor model and conducting site visits on permitted and other farms.

Odor Question 1: Should the odor generation number be higher or lower than the current value for these structures in the production area (Appendix A, Worksheet 2, Chart 2 p. 390-25):

- A. slatted floor, pork (PGSF)
- B. alley flush to storage (DBAF)
- C. long-term waste storage (WSLT) applied to smaller structures
- D. should existing odor generation numbers for other structures on Chart 2 be reconsidered?

Recommendation for Question 1: The existing odor generation numbers for housing and manure management structures should be modified as specified in Table 1.

| <i>Existing Odor Source</i> | <i>Recommendation</i> |
|---|--|
| Dairy free stall (DBSS, DBAF, DBSC & DBBP) | Clarify that this housing type includes natural and power ventilated barns. The generation number is accurate |
| Alley flush to storage (DBAF) | Increase the odor generation number from 10 to 20 |
| Poultry Housing, layers (PLAY) | Better differentiate odor generation numbers for high rise housing (birds and litter in same building) and belt system housing (litter stored separately from birds). |
| Waste Storage Facilities (WSST & WSLT) | Change the method for predicting odors by switching from storage duration to storage surface area. Assign the current odor generation number of 28 to structures less than one acre and assign the current odor generation of 13 to structures larger than 1 acre, when measured at the maximum operating level (MOL). |
| Slatted floor, pork gestation (PGSF) and finishing (PFSF), and other current odor sources | No change, the current generation numbers accurately predict odor from these sources. |

Rationale: These recommendations are based on the results of odor research, field experience, and studies including the *WI Dairy and Livestock Air Emission/Odor Project* funded by NRCS Conservation Innovation Grant (Final report available at <http://www.datcp.state.wi.us/arm/agriculture/land->

water/odor/pdf/CIGFinalReport.pdf) and research studies conducted by the University of Minnesota (U of MN). The quality of this review was enhanced by the knowledge and experience of subcommittee members who have nationally recognized expertise in odor and air emissions. The following specific justifications are provided in support of the recommendations:

- The current generation number for dairy alley flush systems is too low relative to results of ongoing research, documented instances of odor events and other observable evidence involving more than one Wisconsin facility. Producers can use existing control practices to mitigate odors, including the newly-recognized practice involving the immediate return of waste water before it becomes anaerobic.
- Odor generation is more accurately predicted based on the surface area of a manure storage structure, not if the storage duration is shorter or longer than six months. More odors are generated per square foot of surface area by structures having less than one acre of total exposed surface area than by structures having more than one acre of total surface area. In determining that odor generation is more accurately predicted based on the surface area of a manure storage structure, the group considered measurements used in other odor models such as OFFSET and their underlying dispersion models. Size-based criteria will be easier for local governments to verify.
- The current odor generation numbers for pork facilities correlates with outputs from other odor prediction models: Odors From Feedlots Estimation Tool (OFFSET) Version 2.0, U of MN; Multi-Source Setback Model, Purdue University; Odor Footprint Tool, University of Nebraska-Lincoln; and Odor Site Index Tool, Pennsylvania State Conservation Commission.

Odor Question 2: Should new structures or manure management methods not included in Appendix A Worksheet 2, Chart 2, p. 390-25 be assigned an odor generation number e.g. sand separation lanes, sand separation buildings/systems, layers with dry belt system, feed storage areas? Are odors from any newly identified structures or methods similar to an existing manure management method on Chart 2, or should a new odor generation number be created? As an alternative, could a management plan that includes descriptive methods to deal with new odor sources and management practices equal to an odor reduction credit? If new odor sources are identified, consider what, if any, control practices are appropriate.

Recommendation: Odor generation numbers should be created for new types of structures and manure management methods as specified in Table 2. Other facilities evaluated do not warrant a generation number.

| Table 2. Recommendations for Odor Question 2 | |
|---|---|
| <i>New Odor Source</i> | <i>Recommendation</i> |
| Goat and sheep housing | Assign a generation number of 2 |
| Sand and solids separation systems - sand separation lanes (a.k.a. sand channels) and | Distinguish between parts of the system used for separation and those used for storage of separated materials. Assign an odor generation number of 40 |

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| mechanical separation systems (e.g. screen, friction dryers, and screw presses) | to the treatment area (e.g. lane where sand is separated, building housing mechanical separation equipment) and a generation number of 2 for the sand/solids storage area. For systems enclosed by buildings, recognize that appropriate odor control practices can be applied e.g. bio-filters. |
| Concrete feeding lanes in unpaved animal lots | Does not warrant a separate odor generation number, or recognition as a new control practice |
| Feed storage areas | Insufficient evidence to create an odor generation number, yet practices designed to reduce impacts (e.g. clean up spilled feed, harvest at correct moisture, keep bunkers covered, remove waste feed) can be incorporated into management plans. |
| Additional odor sources | None were identified |

Rationale: These recommendations are based on the results of odor research, field experience, and studies, including the *WI Dairy and Livestock Air Emission/Odor Project* and work conducted by the U of MN. Additionally, the subcommittee drew on the knowledge and experience of members who have nationally recognized expertise in odor and air emissions. The following specific justifications are provided in support of the recommendations:

- Odors from goat and sheep housing are similar to dairy bedded pack; therefore using the dairy manure stack generation number is appropriate.
- Sand separation lanes were an emerging technology when the rule was finalized in 2006. The group considered comparable odor sources and unpublished field studies to confirm sand channels as major odor sources, and that sand stacking areas generate far less odor.
- Based on field studies and comparisons with similar odor sources, sand separation buildings and manure solids separation buildings share key characteristics with sand settling lanes and should be treated as major odor sources. The structures are very distinct odor sources, performing like a point source rather than an area source, the generation number should be appropriately high for the treatment area, with the recognition that control practices can control odors from buildings where these activities are carried out. The subcommittee considered, but did not recommend, an exemption for this odor source, similar to the exemption for animal housing for buildings with relatively small footprints. It was recognized that odors are minimal from separation systems enclosed within pipes, and that applicants can submit information to the department for a reduced odor score.
- While there is inadequate research to establish an odor generation number for feed storage, there are identifiable practices that can reduce odors and these should be recognized as part of the management plan requirements. There are reasons to revisit the issue of feed storage as an odor source, including the increased use of distiller's grains and other by-product feeds.

Odor Question 3: *Should the multiplier (reduction credit) be higher or lower than the current value for these odor control practices (Appendix A, Worksheet 2, Chart 3, p. 390-26):*

- A. *anaerobic digestion (E1)*
- B. *chemical or biological additives (E2)*
- C. *compost (E3)*
- D. *solids separation and reduction (E4)*
- E. *aeration (F1)*
- F. *geotextile cover (F3)*
- G. *natural crust (F5)*
- H. *Should multipliers for other practices on Chart 3 be reconsidered?*

Recommendation: Current odor control practice multipliers for housing, manure management and animal lot practices should be modified as specified in Table 3.

| Table 3. Recommendations for Odor Question 3 | |
|--|--|
| <i>Existing Odor Control Practice</i> | <i>Recommendation</i> |
| Diet manipulation (A1) | Reduce the current credit from 20% to 10%. Improve the definition to include odor control as a feed management goal and require documentation. |
| Bio-filter (B1) | Reduce the current credit from 90% to 50%. |
| Fresh Water Flush (B3) | Eliminate this practice. |
| Treated Water Flush (B4) | Redefined the practice to exclude the use of anaerobic digestion as a treatment method and retained 30% credit. |
| Air Dam (B5) and Windbreak (C1) | Allow air dam as a control practice applicable to all types of positively ventilated animal housing (not just swine). Merge the windbreak and air dam definitions; a separate air dam control practice is not needed. |
| Anaerobic digestion (E1) | Reduce the current credit from 80% to 40%. Allow digestion to be combined with solid separation from Category E to increase the combined credit to 60%, and consider increasing the credit when there is documentation demonstrating that operating conditions or enhancements provide additional odor reductions. |
| Chemical or biological additives (E2) | Require applicants to identify specific additives and provide science-based documentation that the products are effective in controlling odors. The current credit of 20% is appropriate. Allow this practice to be combined with other complementary odor control practices listed in Category E, such as solid separation. |
| Compost (E3) | Reduce the current credit from 80% to 50%. Consider allowing additional credit for indoor composting if the building's exhaust air is treated with an odor control practice such as a bio-filter. |
| Solids separation and reduction (E4) | Reduce the current credit from 40% to 20%. Ensure periodic checks (e.g. after agitation) to document compliance with the two or less percent solids requirement. Allow this practice to |

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| | be combined with other practices in Category E to qualify for a combined reduction. |
| Aeration (F1) | Reduce the current credit from 70% to 30%. |
| Geotextile cover (F3) | Increase the current credit from 50% to 60%. |
| Natural crust (F5) | Retain the current 70% credit, but strengthen the definition with more measurable criteria, e.g. “80% of the surface, 80% of the time.” |
| The remaining control practice in Categories A, B, C, D, E, F, G, H, I and J in Chart 3 | Retain the current credits |

Rationale: These recommendations are based on the results of odor research, field experience, and studies including the *WI Dairy and Livestock Air Emission/Odor Project* and U of MN research work. In addition to improved access to research, including research advances since 2006, the quality of the review was improved by participation of national experts who provided critical input based on direct research and field experiences, as well as knowledge of odor research and developments in the agricultural and related fields of municipal waste management. In reaching its conclusions, the group considered the treatment of odor control practices in other regulatory and non-regulatory odor prediction models, including whether specific control practices were recognized within those systems. The subcommittee’s analysis represents a more comprehensive and scientifically-defensible approach, compared to the less advanced methods used to originally set credits for odor control practices. The following specific justification is provided in support of the recommendations:

- Current research and data do not support a 20% credit for diet manipulation. From a performance standpoint, feed management is driven primarily by cost and animal performance considerations, not odor control. Properly balanced rations will limit use of distillers grains and other byproducts as a protein source. There was a concern that producers may not have adequate documentation to demonstrate that diets are selected and managed with odor control as a goal.
- The current bio-filter odor control credit of 90% reduction assumes that all of the exhaust air from a confinement building is filtered. However it is common to only vent the most odorous exhaust air from the manure pit beneath the animal housing through a bio-filter. A separate credit should not be provided for bio-filters placed on reception pits in animal housing, since pit odors are not counted separately in the odor model, but are included within the housing generation number.
- In light of concerns over groundwater conservation, the impacts on waste storage capacity, and its lack of practicality (e.g., no farm to date has taken this credit), it was recommended to remove the fresh water flush practice.
- The group considered the merits of options for treatment of flush water, including anaerobic digestion and a relatively new practice where the flush water is taken from a reception pit rather than a manure storage basin. This

form of “rapid recirculation” prevents the liquid from going anaerobic, thus greatly reducing odors.

- The group confirmed the appropriate credit for air dams and application of this practice to all positively ventilated housing, not just swine. The definition of windbreak should be expanded to include air dams because air dams function in the same manner as windbreaks and are given the same odor control credit.
- The group reviewed a summary of anaerobic digestion odor control research, including the unpublished findings of field studies conducted by U of MN. Actual odor control from digesters varies based on a number of operational factors, and is generally less than 80% for most installations. Performance can be influenced by the types and amounts of substrates used, and substrates should be reviewed on a case-by-case basis. The recommendation is predicated on the subcommittee’s overall view that digesters function as part of system to effectively manage odor. ATCP 51’s innovative practice provision can be used to account for improvements in odor control technology, such as two-stage systems, and the use of substrates. It was recognized that operating conditions and enhancements can improve performance in controlling odor, and some digesters might be able to achieve the current 80% odor control credit under certain specific conditions.
- There are a wide variety of chemical and biological additives currently on the market; and their relative effectiveness in controlling odors varies. For example, a Purdue University study concluded that only 5 out of 35 additives tested provided any measureable reduction in odor. Enzymes are an emerging technology that seems to hold some promise. Acidifiers have been shown to effectively limit the release of ammonia from manure storage structures.
- Composting can have a positive effect on odors if properly managed; however, the 80% credit in the current siting rule is too high. The group considered the emissions from compost piles, and the importance of limiting stack height to achieve good aeration of the windrows and avoid odors. No agreement was reached on how to differentiate composting of different manures (e.g. poultry litter vs. cow manure). Indoor composting may be given added odor control credit over open air composting when exhaust air is treated.
- Current experience and research, including experience in related industries, does not support the 40% odor control credit provided for solids separation and reduction, nor does it support distinguishing credits for different separation processes. From a performance standpoint, there was significant concern that separation systems may not achieve required levels of separation. The rule should recognize the cumulative benefits of using solid separation with other practices such as digesters and chemical additives to provide more effective odor control.
- There was a general concern that aeration does not perform at the level required to achieve the high degree of reduction required to receive this credit. In most cases, aeration is not adequate to achieve the required 2

mg/l of dissolved oxygen. In evaluating the appropriate credit, members considered research and experience in related areas of waste treatment, the necessity for separating solids before aeration, and field observations that suggested that a 30% credit might be generous.

- The *WI Dairy and Livestock Air Emission/Odor Project* indicated that geotextile covers are upwards of 70% effective at controlling odors from manure storage. U of MN research findings about an early generation of covers indicated control effectiveness between 30% and 70%, and the group acknowledged that there have been improvements in this technology.
- It was recommended that DATCP consult with DNR staff to ensure consistency with the NR 445 Ag Waste Committee findings. Specifically coordination in defining aeration, natural crust, geotextile covers, anaerobic digestion, and the use of digester substrates.

Odor Question 4: *In light of the advances in research and new technologies, what new odor control practices should be added (Appendix A Worksheet 2 Chart 3, p. 390-26)? Consider the air emission control practices under review by the NR 445 animal waste advisory committee which are not included in the odor standard. Are any newly-identified odor control practices similar to an existing practice on Chart 3 in terms of effectiveness, or should a new multiplier be created?*

Recommendation: New odor control practice multipliers should be created for new practices specified in Table 4.

| Table 4. Recommendations for Odor Question 4 | |
|---|--|
| <i>New Odor Control Practice</i> | <i>Recommendation</i> |
| Poultry layer housing utilizing a dryer belt system | Further research the impacts of drying poultry litter inside housing to better understand the effectiveness of this practice to reduce odors. |
| Immediate return flush | Assign an odor control credit of 50%, and develop a definition that accurately captures the practice of re-circulating flush liquids taken from a reception pit rather than a manure storage facility. |
| Wet scrubber (chemical process) | Allow recognition under the current DATCP process for approving innovative control practices. |
| Bio scrubber (non-chemical process) | Allow recognition under the current DATCP process for approving innovative control practices. |

Rationale: These recommendations are based on the results of odor research, field experience, and studies, as well as the knowledge and experience of members who have nationally recognized expertise in odor and air emissions. The following specific justifications are provided in support of the recommendations:

- Before assigning a credit for the layer dryer belt control practice, the department needs to better define poultry layer housing and review the research on control practices. The department should consider research

from Purdue University and other sources, plus field experience to verify the odor control benefits of drying poultry litter with a dryer belt system.

- The group considered the merits of options for treatment of flush water, including anaerobic digestion, and a relatively new practice where the flush water is taken from a reception pit rather than a manure storage basin. This form of rapid recirculation reduces the residence time of manure in storage limiting anaerobic activity and the odors that are generated. .
- Wet and bio scrubbers are an emerging technology which cannot be currently assigned a control credit at this time. The group emphasized that these technologies differ in their use of chemical agents, and wet scrubbers may require producers to properly dispose of waste products after treatment. Likewise ozone/hydroxyl ion radical technology and non-thermal plasma are not at an advanced stage of development and a control credit can not be assigned at this time. DATCP can assign a credit under the innovative practice approval process if an applicant provides sufficient documentation to demonstrate an odor reduction from these practices.
- Maintaining clean buildings (e.g. cleaning exhaust fans, sanitizing pens between turns) is a baseline activity in a well managed farm and is not deserving of a separate odor control credit.

Odor Question 5: *Is it technically justified to continue the exemption from the odor standard for livestock facilities that have all of their livestock structures located at least 2,500 feet from the nearest affected neighbor (ATCP 51.14(2)(c) and Appendix A Worksheet 2, p. 390-22)?*

Recommendation: Eliminate the exemption for livestock facilities that have all of their livestock structures located at least 2,500 feet from the nearest affected neighbor. Applicants should complete the odor standard to determine what, if any, controls are needed.

Rationale: There is not sufficient technical justification to continue the exemption based on distance to the nearest neighbor. To better address public concerns the odor standard should be equally applied to applicants to ensure that farm neighbors are treated fairly. It was generally believed that odors beyond 2,500 feet are minimal, and in most cases determining compliance with the standard will not place undue burdens on applicants. In light of this recommendation, DATCP should review the exemption for expansions under 1,000 animal units with due consideration for the benefits (e.g. improved planning and risk management) and impacts (e.g., increased costs) for producers.

Odor Question 6: *What is the relationship between the requirements of the management plans and the management of odor (Appendix A, Application for Local Approval, Nos. 12 and 13, p. 390-18)? In light of this relationship, is it appropriate from a technical standpoint to award 80 points toward a passing odor score? If not, should the point total be adjusted upward or downward? Could other requirements/actions be added to the mandatory plans to justify points awarded (e.g. specific requirements for odor control related to feed storage, mortality management, or field application of manure)?*

Odor Question 7: *What is the relationship between the requirements for an optional odor management plan and the management of odor (Appendix A, Application for Local Approval, No. 14, p. 390-18)? In light of this relationship, is it appropriate from a technical standpoint to award 20 points toward a passing odor score? If not, should the point total be adjusted upward or downward? Could other requirements/actions be added to the mandatory plans to justify points awarded?*

Recommendation for Question 6 and 7: The recommendations for the mandatory Employee Training Plan and Environmental Incident Response Plan, and the optional Advanced Odor Management Plan can be divided into three areas:

1. To justify awarding points in the odor score for completing management plans, the plan requirements must be strengthened (which includes consolidation of plan requirements into one mandatory plan as described in more detail below). Planning standards should include better defined requirements with a greater focus on odor management, and stronger compliance responsibilities. To ensure uniformity and consistency, the state should develop a state approved form (e.g. fillable form with options for tailoring to meet individual needs) that individual facilities must use to complete their management plans. Specific plan requirements include expanded training requirements to ensure that affected employees understand general odor principals and specific information on using the odor control practices authorized in the local siting permit. Plans should have detailed odor complaint response protocols that cover internal complaint investigation processes, documentation, recordkeeping, and actions taken to investigate and respond to complaints. The management plan must clearly define the acceptable management practices to control odor from animal housing, animal lots, manure storage, feed storage, mortalities, reducing dust, managing community conflict and water conservation. The plan should include documentation to illustrate that required practices are properly maintained, including schedules for inspection.
2. The Advanced Odor Management Plan should be eliminated, and the elements currently included in this plan should be incorporated into the mandatory plan requirements for all facilities. Plan requirements for facilities exempt from the odor standard should cover basic management approaches for minimizing odor from manure handling and storage, animal housing and animal lots, as well as the current advanced odor management plan components. Facilities that must comply with the odor standard should address the advanced odor management components (e.g. feed storage, dust) and specify which odor control practices are being utilized to address those components.
3. Reduce the points awarded in the odor score for completing management plans from the current 100 to a maximum of 50.

Rationale: The subcommittee recognized the importance of management plans in promoting positive outcomes on permitted farms, while recognizing that the baseline components to ensure that permitted farms responsibly address odor and related management issues must be specific and enforceable. The subcommittee looked at options for improving the plans before considering how many points to award towards a passing odor score. The group agreed that plans must be strengthened to ensure they achieve their intended purposes, including odor control. Because plans are an important tool in promoting responsible behavior,

including efforts to manage odor, the subcommittee determined that the odor plan requirements should be required of all applicants, although the specific requirements for odor plans should vary depending on whether the applicant is required to complete Worksheet 2. In light of the recommendations to strengthen all plans and the removal of the optional plan, the subcommittee concluded that there was insufficient technical basis to award 100 points toward a passing odor score and recommended that a maximum of 50 points be credited in the odor model. Among factors the subcommittee considered was the degree to which the revised plans addressed odors and how management points impact the integrity of the model.

Odor Question 8 *What items should be included in a checklist to determine compliance as part of a monitoring program?*

Recommendation: The checklist approach currently used for nutrient management should be used as a model for developing odor management compliance questions that producers and local governments can use to verify that a facility has installed, and continues to properly operate, odor control practices and management activities authorized by a siting permit. Specific checklist questions related to odor management should be developed, for example documentation of chemical additives used for odor control, and verification that feed is managed to control odor. DATCP should provide guidance and training to local authorities on compliance monitoring and how to respond to changes at permitted facilities, and should work with these authorities to collect accurate information concerning the implementation of the siting law and the performance of permitted farms, including their record of compliance.

Rationale: Compliance monitoring is essential to proper functioning of the siting law. When administered under the umbrella of compliance assistance, it enables farmers to understand and implement their permit responsibilities. Combined with other quality assurance methods, it provides farmers opportunities to improve their operations and avoid costly environmental problems. Effective oversight builds public confidence that farms are meeting requirements in their local permits. Compliance monitoring data sheds critical light on implementation of the siting law and areas for improvement in the rule. The checklist approach, now used to evaluate nutrient management compliance, is an appropriate approach to carry out a broader range of monitoring activities. This approach can support different monitoring activities, including self-reporting from farm operators, requests by permitting authorities for documentation, and on-site inspections of permitted facilities.

Livestock Structures; Location on Property Recommendations

Rule Reference: ATCP 51.12

Objective 2: *Are the property line and road setbacks in Livestock Structures; Location on Property, ATCP 51.12 adequate bearing in mind impacts to adjacent neighbors, public health and other planning and zoning considerations?. If you find the setbacks are not adequate, what recommendations would you make to address the shortcomings? The Engineering Subcommittee may provide consultation on these issues.*

Recommendation: The siting standards for manure storage, runoff management, odor management and nutrient management do not directly address all offsite impacts, however the setback requirements in ATCP 51.12 influence impacts to neighbors. All farm structures have the potential to impact neighbors to some degree, whether from noise, light, dust, visual or other impacts, and therefore can reasonably be lumped together for setback purposes. The department should consider the following factors in addressing the offsite impacts (noise, light, dust, visual and others) of livestock operations:

- a. An appropriate way to gauge facility impacts is with animal units. While increasing numbers of animals may contribute more to impacts, there are no bright line distinctions in size where the impacts become measurably significant.
- b. Tools other than setbacks may be considered to address offsite impacts, including:
 - i. Changing on-farm management or operations to mitigate impacts may be possible, including the installation of new technologies and adoption of management practices.
 - ii. Educating producers about off-site impacts and building awareness of the strategies to minimize these impacts.
 - iii. While local regulation of light, noise and other impacts is an option if the regulations are fairly applied to all businesses, this approach may not be practical to implement.
- c. Recognizing the gaps in the current setback requirements, the department should evaluate allowing local governments to set separation distances between livestock structures and neighboring occupied residences and high use buildings, consistent with state established maximum setbacks and the requirements of zoning law. Structure-to-structure setbacks should only be extended to neighboring buildings that are actively used, as defined in the ATCP 51.01(2) definition of affected neighbor (which is currently used in the odor score calculation). In advancing this concept the Department should consider:
 - i. Structure-to-structure setbacks should be reasonable and workable in Wisconsin's landscape (e.g. 2,600 foot setbacks are not appropriate).
 - ii. Neighbors covered by structure-to-structure setbacks must have the right to opt out in the same manner that the neighbors can exclude themselves from the odor score calculation (see ATCP 51.01(2)(b)).
 - iii. Structure-to-structure separation distances should not differ based on the type of livestock structure, as defined in ATCP 51.01(20).

- d. Setbacks for new livestock operations should be treated differently than expansions of existing operations, except in cases where the expansions are equivalent to a new operation, e.g. a 100 cow dairy expands to 2,500 cows.
- e. There is a need to understand how effectively the siting law manages off-site impacts, and to this end it would be valuable to establish a better system for collecting and reporting implementation data.

Rationale: Jointly assigned to consider setbacks, the odor and engineering subcommittees focused on the aspects of this question that best suited their expertise, and as result did not complete the table listed in the assignment. As engineers, regulators and odor specialists, the group had the knowledge and expertise of farm structures and operations to identify off-site impacts, and evaluate those impacts based on farm size. While they accurately described impacts such as noise and equipment operation, they could not agree on the facility size where these impacts can be differentiated. They also were in the position to evaluate technical solutions to the impacts, including the application of best management practices. They were specifically able to consider the impacts on residences and other occupied buildings close to livestock structures. In making its recommendations, the group focused on technical approaches, and did not feel qualified to address significant policy dimensions such as imposing specific setbacks distances. The group recognized the importance of local government land use planning and implementation efforts, and the value of education in reducing conflicts between rural residents and livestock farmers.

Nutrient Management Recommendations

Rule References: ATCP 51.16, Appendix A, Worksheet 3 Parts A, B & C

***Objective:** Does the current approach in Nutrient Management, ATCP 51.16 involving the nutrient management plan checklist, nutrient application restriction maps and ability of the local government to request more information provide a workable system for producers and local government?*

Nutrient Management Question 1: *In reviewing an application for local approval, can a nutrient management plan be properly evaluated for compliance based on the submission of a checklist and a map of land spreading acres, in lieu of a complete nutrient management plan that addresses the maximum number of animals proposed to be kept at the facility (Appendix A, Worksheet 3, Parts A, B, and C, 390-30 to 390-32)?*

Recommendation 1 for Question 1: Retain the current application requirement that allows submission of a checklist to demonstrate that a nutrient management plan meets standards, but make additions to the application worksheet requirements to improve credibility of application materials.

Rationale: There is no persuasive technical reason for requiring a full plan for every applicant. Nor is there an alternative approach to the checklist that can be technically justified such as the 590 EZ form. The current process is a practical compromise that gives local authorities the right to seek supporting documentation used to complete the checklist. However, several modifications to the checklist in the following recommendations make it more useful for local reviewers.

Recommendation 2 for Question 1: The department should harmonize the rule update process of ATCP 50, ATCP 51 and NR 151 to have practice standards as consistent as possible.

Rationale: The NM subcommittee does not want differing standards in ATCP 51, ATCP 50, and NR 151.

Recommendation 3 for Question 1: USDA-NRCS changes to the Wisconsin “T” and “K” factors of RUSLE 2 should be coordinated with DATCP, DNR, UWEX and the UW developers of Snap Plus software to allow producers enough lead time to adapt to the changes. It is anticipated that the changes will occur sometime between Sept. 2011 and Jan. 2012, with a staged implementation into conservation plans.

Rationale: The NRCS Standard 590 Nutrient Management includes the requirement to meet tolerable soil loss, or “T”, which is calculated using the Revised Universal Soil Loss Equation (RUSLE2). Further, the P index relies on RUSLE2 to calculate the risk of phosphorus losses. Changes to specific “T” and “K” (soil erodibility factor) values could have management implications for an operation’s compliance with “T” and P index requirements for state, federal, and local programs, including Livestock Siting. These changes should be made deliberately so that producers can adjust appropriately.

Recommendation 4 for Question 1: Modify the nutrient management checklist as follows: The references to UW nutrient recommendations (A2809) should be simplified by striking the title, “Soil Test Recommendation for Field, Vegetable and Fruit Crops”, because there are two allowable titles, depending on the A2809 version of applicant preference. Refer to the UW nutrient recommendations simply as “A2809” without a title, in Worksheet 3 Part C, item 4. (These and other recommended changes to Nutrient Management Worksheets suggested below are attached following the nutrient management recommendations).

Rationale: This change removes a potential point of confusion about the appropriate version of UW nutrient recommendations to apply. Current rules allow either of two versions (1997 version or the most recently posted version on the UW website). This change to a “generic” reference to UW bulletin “A2809” would not suggest a preference for either version.

Nutrient Management Question 2A: *In reviewing the application for local approval, what should be required with respect to the following components of a nutrient management plan?*

- A. *The use of rented land for manure spreading, e.g. the appropriate documentation, duration of a rental arrangement?*

Recommendation for Question 2A: Provide a breakdown of the total acres available for land spreading by owned acres, rented acres, and acres under other land spreading agreements. Add line items for Worksheet 3, Part B, item 4 as follows:

- o 4a. acres of owned land
- o 4b acres of rented land
- o 4c acres under other land spreading agreement

Rationale: The siting permit must confirm that farms have enough land to comply with their 590 plan. However, many people do not like to sign rental contracts, documentation is time-consuming, and rental agreements are sometimes problematic. Annual NM plan updates will show how much land will receive nutrients. NRCS contracts require producers to demonstrate control of land, which can be done in a statement. DNR requires CAFO’s to submit a form showing the breakdown of field acres owned as well as rented in the nutrient management plan. Signed rental contracts are not required. Ultimately, the recommended acreage breakdown in the three categories above provides some information on the types of land available for land spreading but does not divulge landowner names nor does it require signed contracts.

Nutrient Management Question 2B: *In reviewing the application for local approval, what should be required with respect to the following components of a nutrient management plan?*

- B. *Determination and documentation of the field locations with respect to sensitive features and soils, e.g. karst, tile lines?*

Recommendation for Question 2B: The text in Worksheet 3 Part C, 9 should include “ongoing identification of sensitive features.”

Rationale: To determine and document environmentally sensitive features such as direct conduits to groundwater, karst, tile lines, concentrated flow channels, and other environmentally sensitive areas, the committee wishes to reinforce the current requirement of the NM plan to identify features and update maps as features are found by the planner, farmer, or conservation professionals. As currently required, the NM planner is required to identify these groundwater conduits and update maps as features are found by the farmer or conservation professionals.

Nutrient Management Question 3A: *Should applicants be required to more clearly document the following as part of Appendix A, Worksheet 3, Part B, 390-31:*

A. *Manure disposal methods other than land application, e.g. processed and sold under a fertilizer license?*

Recommendation for Question 3A: Include an expanded description of disposition methods of manure other than land application in Worksheet 3 Part B, item 2. If applicable, require applicants to provide their DATCP fertilizer license number or confirmation that a license was applied for.

Rationale: There is insufficient space in the Worksheets to describe alternative methods of waste disposal, and there is no request for a DATCP fertilizer license number if one exists. The description would provide the local authority better knowledge to account for alternative methods of waste disposition.

Nutrient Management Question 3B: *Should applicants be required to more clearly document the following as part of Appendix A, Worksheet 3, Part B, 390-31:*

B. *Application of nutrients other than manure including substances comingled and land applied with manure such as digester substrates?*

Recommendation for Question 3B: Include “organic by-products” (not the term “biosolids”) as a nutrient source in Worksheet 3 Part A column B. Add “organic by-products” as a nutrient source in Worksheet 3 Part C, item 4. Also, add an acknowledgement statement to Worksheet 3 Part B, item 4: “The applicant acknowledges that the nutrient management plan shall account for all of the applicant’s field-applied livestock facility manure as well as any additional field applications of: 1. organic by-products, 2. other manure from non-applicant facilities, and 3. commercial fertilizer.”

Rationale: The subcommittee was concerned that applications of organic by-products could go unaccounted in a nutrient management plan if not specifically cited as a source to be included in the plan.

Nutrient Management Question 4: *How do we determine compliance with a nutrient management plan? What are the appropriate methods for determining compliance with a nutrient management plan as part of a monitoring program, e.g. database updates or*

spreading logs? In addition to the updates using the current checklist, should there be an option to demonstrate compliance based on SNAP Plus?

Recommendation 1 for Question 4: Local authorities should periodically monitor the nutrient management plans of operations with siting permits. Agencies should assist in statewide review of these plans when asked. State agencies should supply local authorities with available staff resource contacts.

Rationale: Nutrient management plans are meant to be updated annually to keep pace with the changes that typically occur on farms. Producers are required to update their plans and it is the local authority's responsibility to ensure that the plans remain in compliance over time. Reviewing a nutrient management plan for compliance with standards requires technical knowledge including the use of software programs, such as SNAP Plus. The local authority may lack these capabilities and should seek state and county level assistance if needed.

Recommendation 2 for Question 4: Given the dynamic nature of livestock operations, DATCP should clarify the intent of ATCP 51.34 (4) as to the local authority's ability to conduct monitoring and maintain compliance with the standards in Sub ch. II if changes occur after permit approval. DATCP should provide guidance and training to local authorities on compliance monitoring and how to respond to changes at permitted facilities, and should work with these authorities to collect accurate information concerning the implementation of the siting law and the performance of permitted farms, including their record of compliance.

Rationale: It was unclear to the subcommittee the meaning of ATCP 51.34 (4). DATCP staff provided the following clarifications: Local governments can withdraw a permit if the applicant misrepresents items in the application. Also, if a permit is granted, applicants must continue to follow the standards, and changes to the operation must be documented. However, if changes to agreed upon practices occur at the facility, the local authority cannot revoke the permit if the changes result in continuing compliance with the standards. But, changes to the facility which result in non-compliance could result in revocation of the permit. The complexities of this part of the code were not well understood and thus some effort needs to be made by the agency to better communicate the meaning and implementation of the section.

Nutrient Management Question 5: *Under NR 243, livestock facilities over 1,000 animal units are restricted in spreading manure in the winter (frozen or snow covered conditions). Under ATCP 51, a local government may adopt local winter spreading restrictions to protect surface and ground water in its siting ordinance, even though it cannot impose local restrictions under Section V.A.2.b(2) of the 590 Standard. What conditions, if any, would serve as an appropriate basis for imposing additional restrictions and what land-spreading practices might be suitable responses to those conditions?*

Recommendation for Question 5: Develop a mechanism, possibly by restoring Section V.A.2.b(2) of the 590 Standard, to allow for local restriction of nutrient applications on frozen and snow covered ground in "areas delineated in a conservation plan as

contributing nutrients to direct conduits to groundwater or surface water as a result of runoff.” Such a provision should only be used when the permitting authority is responsible for developing the conservation plan (or modifying an existing plan) at no expense to the farmer. An oversight and appeals mechanism should be developed in the rule to ensure that local spreading restrictions are appropriate or are in response to a documented event such as field runoff. Oversight and appeal mechanisms may involve the land conservation committee, DATCP, the Livestock Facility Siting Review Board or other identified entities.

Rationale: The committee recognized the complexity of nutrient management implementation by local authorities. Concern and documented groundwater issues can be found throughout the state. This was a factor in the DNR decision to impose NR243 nutrient management requirements which are more restrictive than those contained in the 590 Standard. Likewise counties are concerned about ensuring that farmers implement protective practices in known sensitive areas. Achieving consistency between existing DATCP rules (ATCP 50 and 51), and improving implementation, is preferable to waiting for the legislature to create new groundwater protection laws.

The full group discussed the current process to identify local winter spreading restrictions under NRCS standard 590, and believed that with the correct controls the process to locally identify areas for winter restrictions could be applied to farms permitted under the siting law. A 590 standard provision, *Section V.A.2.b(2)*, currently allows a county Land Conservation Committee (LCC) to require additional protections by designating locally identified winter spreading restricted areas within the farm’s conservation plan. For this 590 provision to be enforceable the conservation plans must follow specific resource and procedural criteria, the plan must be approved by a qualified individual, and the farmer and land conservation committee must both approve the plan. LCC’s can apply local winter spreading restrictions, *Section V.A.2.b(2)*, to farms under the state agricultural performance standards (ATCP 50) but cannot apply this provision under ATCP 51. The full committee recognized the need to find compromise on this issue.

The committee considered a proposal to require NR243 restrictions, and some additional restrictions on industrial wastes for all siting applicants. The group concurred that these recommendations are not appropriate to be included in the siting rule at this time. While it was thought that livestock facilities under 1,000 animal units permitted under the siting law should not be subject to the spreading restrictions that apply to CAFOs permitted by DNR, in general the group agreed that permitted facilities under 1,000 AU should have to meet the same water quality standards that apply to all other farms of similar size in Wisconsin.

Recommended Changes to Nutrient Management Application Worksheets

Arm-lwr- 11/04 January 2006



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 2811 Agriculture Drive, PO Box 8911, Madison WI 53708-8911
 Phone: (608) 224-4622 or (608) 224-4500

Worksheet 3 - Waste and Nutrient Management

Part A. Waste Generation and Storage Summary

Instructions: You must complete Parts A and B of this worksheet. If your *livestock facility* will have fewer than 500 *animal units* you may be exempt from Part C, depending on results of Part B. If Part C applies, it must be signed by a *qualified nutrient management planner* (you must also sign).

You are NOT required to complete this worksheet if you already hold a *WPDES* permit for the proposed *livestock facility* (for the same or greater number of *animal units*). Simply check the following box, sign at the bottom of this page, and include a copy of the *WPDES* permit with your application.

I enclose a copy of my *WPDES* permit in place of Worksheet 3.

Specify a single livestock type (dairy, beef, swine, etc.). *Use a separate worksheet for each livestock type.*

Livestock Type: _____

| Description of Storage | Column A Waste Storage Capacity (Gallons or Tons) | Column B Source of Waste (Animal Waste, Wastewater, Leachate, etc) | Column C Average Annual Volume of Waste Produced from Each Source (Gallons or Tons) | Column D Total Average Annual Volume Waste Produced (Gallons or Tons) | Column E Storage Duration in Days (Column A divided by Column D times 365 days) |
|--------------------------|---|--|---|---|---|
| Example: Unit 1 - lagoon | 5,000,000 gallons | <i>Animal waste</i> | 4,000,000 gallons | 7,500,000 gallons | 243 days |
| | | <i>Wastewater</i> | 1,000,000 gallons | | |
| | | <i>Leachate</i> | 2,000,000 gallons | | |
| | | <i>Organic by-products</i> | 500,000 gallons | | |
| Unit 1 | | | | | |
| Unit 2 | | | | | |
| Unit 3 | | | | | |

Applicant affirms that the information provided in Part A is accurate.

Signature of Applicant or Authorized Representative

Date

Part B – Land Base for Applying Nutrients

1. Enter total *animal units* in proposed *livestock facility* (from worksheet 1): _____.

2. What percentage of the waste from the *livestock facility* will be:

- a. Applied to land: _____%. Attach map showing where waste will be applied to land.
- b. Processed and sold as commercial fertilizer, under a fertilizer license: _____%
 DATCP license # or date applied for: _____.
- c. Disposed of with alternative methods: _____%.

Describe alternative methods:

3. Multiply the percent in line 2a by the number of *animal units* in line 1. Result (# of *animal units*): _____

4. Total acres of cropland currently available for land application: _____

- a. acres owned: _____
- b. acres rented: _____
- c. acres under other agreement _____

5. Divide # of acres in line 4 by # of *animal units* in line 3 to obtain ratio of acres to *animal units*: _____

6. Is the ratio in line 5 equal to or greater than the applicable ratio in Table 1? _____
 If YES, and if the # of *animal units* in line 1 is less than 500, you need NOT complete Part C. Otherwise, complete Part C.

Table 1: Acreage per Animal Unit

| Animal Type | Acres per Animal Unit* |
|----------------|------------------------|
| Dairy | 1.5 |
| Beef | 1.5 |
| Swine | 1.0 |
| Chickens/Ducks | 2.5 |
| Turkeys | 5.5 |
| Sheep/Goats | 2.0 |

* NOTE: A *livestock facility* is NOT required to attain or exceed this ratio of acres to *animal units*. But IF your *livestock facility* will attain or exceed this ratio and will have fewer than 500 *animal units*, you need NOT complete Part C of this worksheet.

Applicant affirms that the information provided in Part B is accurate.

 Signature of Applicant or Authorized Representative

 Date

Part C – Nutrient Management Checklist

Instructions: All applicants must submit this checklist unless exempted under Part A or B. The checklist is based on the NRCS Technical Guide Nutrient Management Standard 590 (September 2005).

| | | |
|--|-----------------|--|
| County Name: | Date Submitted: | Township (T. _____ N., S.) – (R. _____ E., W.) |
| Cropland Acres: (owned, rented, or with manure spreading agreement) | | Name of livestock operator submitting checklist: |
| | | Yes NA |
| 1. Are the following field features identified on maps or aerial photos? | | |
| a) Field location, soil survey map unit(s), field boundary, and field identification number | | |
| b) Areas prohibited from receiving nutrient applications: Surface water, established concentrated flow channels with perennial cover, permanent non-harvested vegetative buffer, non-farmed wetlands, sinkholes, lands where established vegetation is not removed, nonmetallic mines, and fields eroding at a rate exceeding tolerable soil loss (T) | | |
| c) Areas within 50 feet of a potable drinking water well where mechanically-applied manure is prohibited. | | |
| d) Areas prohibited from receiving winter nutrient applications: Slopes > 9% (12% if contour-cropped); Surface Water Quality Management Area (SWQMA) defined as land within 1,000 ft of lakes and ponds or within 300 ft of perennial streams draining to these waters, unless manure is deposited through winter gleaning/pasturing of plant residue and not exceeding the N and P requirements of this standard | | |
| e) Areas where winter applications are restricted unless effectively incorporated within 72 hours: Land contributing runoff within 200 feet upslope of direct conduits to groundwater such as a well, sinkhole, fractured bedrock at the surface, tile inlet, or nonmetallic mine | | |
| f) Sites vulnerable to N leaching: Areas within 1,000 feet of a municipal well, and soils listed in Appendix 1 of the Conservation Planning Technical Note WI-1 | | |
| 2. Are erosion controls implemented so the crop rotation will not exceed T on fields that receive nutrients according to the conservation plan or WI P Index model? | | |
| 3. Check the methods below used to determine field soil nutrient levels: | | |
| a) Soil samples were collected and analyzed within the last 4 years according to UW Publication A2100 recommendations | | |
| b) For fields not meeting (a.) above, soil test phosphorus levels are assumed to be greater than 100 ppm soil test P. * | | |
| c) For fields not meeting (a.) above, preliminary estimates of soil nutrients were determined using limited soil sampling (> 5 acre per sample) but analyzed by a DATCP certified laboratory. * | | |
| *For fields with soil nutrient levels determined under (b) or (c), the applicant must collect and analyze soil samples meeting the requirements of A2100 within 12 months of siting approval, and revise the nutrient management plan accordingly. | | |
| 4. Using the field's predominant soil series and realistic yield goals, are planned nutrient application rates, timing, and methods of all forms of N, P, and K, listed in the plan and consistent with UW Publication A 2809, <i>Soil Test Recommendations for Field, Vegetable and Fruit Crops</i>, and the 590 standard? The applicant acknowledges that the nutrient management plan accounts for the applicant's livestock facility nutrient sources and any other sources applied to fields in this plan including organic by-products, manure from non-applicant facilities, and commercial fertilizers. | | |
| 5. Do manure production and collection estimates correspond to the acreage needed in the plan? Are manure application rates realistic for the calibrated equipment used? | | |
| 6. Is a single phosphorus (P) assessment of either the P Index or soil test P management strategy uniformly applied to all fields within a tract? | | |
| 7. Are areas of concentrated flow, resulting in reoccurring gullies, planned to be protected with perennial vegetative cover? | | |
| 8. Will nutrient applications on non-frozen soil within the SWQMA comply with the following? | | |
| a) Unincorporated liquid manure on unsaturated soils will be applied according to Table 1 of the 590 standard to minimize runoff | | |
| b) One or more of the following practices will be used: 1) Install/maintain permanent vegetative buffers, or 2) Maintain greater than 30% crop residue or vegetative coverage on the surface after nutrient application, or 3) Incorporate nutrients leaving adequate residue to meet tolerable soil loss, or 4) Establish fall cover crops promptly following application | | |
| 9. Is a narrative included which describes proposed manure collection, transportation, application methods, and recordkeeping as well as ongoing identification of environmentally sensitive features. | | |

I certify that the documentation supporting this checklist is complete and accurate:

Signature of *Qualified Nutrient Management Planner*, other than applicant: _____
(qualified by 1. NAICC-CPCC, 2. ASA-CCA, 3. ASA-Professional Agronomist, 4. SSSA-Soil Scientist)

Signature of Applicant or Authorized Representative:
