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RE: Comments on the draft 2013 Nitrogen Fertilizer Management Plan.

The Minnesota Independent Crop Consultants Association (MNICCA) appreciates the opportunity to comment on the draft 2013 Nitrogen Fertilizer Management Plan (NFMP) that the Minnesota Department of Agriculture (MDA) is proposing. After reviewing the draft 2013 NFMP, questions arise as to the need for a revision of the 1990 plan. The 1990 NFMP is as valid today as it was in 1990. The 1990 plan was written with significant input from agriculture stakeholders and was designed to accommodate future changes in agricultural practices. Nitrogen fertilizer use in Minnesota has been flat for the last 25 years, while yields have increased significantly. Nitrogen fertilizer use efficiency today is as high as scientific processes and technology allows. Minnesota farmers are not interested in using more nitrogen fertilizer than is needed to optimize economic yields for the crops they produce. Competitive pressures prevent them from doing otherwise.

Farmers in Minnesota use lower rates of nitrogen per acre than farmers in any of the surrounding states with similar yield levels. This is due to the soil and climatic conditions that exist in Minnesota, as well as the need to maximize economic returns. Both over and under application of nitrogen have a negative impact on yields and quality of crops grown in Minnesota; and therefore, there is no economic incentive to over apply nitrogen. If anything, nitrogen fertilizer rates are below optimum for the yields that are now being produced. In fact, a five year MDA study indicates this. Higher economic yields were obtained from rates that were 30-40 lbs/acre higher than the existing University of Minnesota nitrogen fertilizer guidelines.

There is no evidence provided in the draft 2013 NFMP to indicate that groundwater nitrate problems are increasing due to the use of nitrogen fertilizers. Therefore, we question the MDA motives in redoing the 1990 plan with the inclusion of a phased approach to regulation of nitrogen fertilizer that is outlined on pages 10, 76, 78 & 130 of the draft. The Phase Approach being proposed is adapted from an approach used in Nebraska. The Nebraska situation is unique and there are no areas in Minnesota that are comparable to the Nebraska region which has high nitrates in groundwater. Irrigation wells in this Nebraska region are in very shallow groundwater aquifers, and an established linkage between the irrigation well high nitrate levels versus past intensive irrigation and excessive nitrogen fertilizer usage had previously been documented. The type of irrigation management and nitrogen use that helped create the Nebraska situation has never existed in Minnesota. In Nebraska, irrigation well concentrations are the triggering mechanism for phasing in regulation, not unrelated drinking water wells, as is being proposed in Minnesota.

The draft NFMP (on pages 10, 76, 78 & 130) addresses mitigation phases and criteria that are part of the proposed regulatory process. Private drinking water wells tests will be used to trigger the various phases of the process. Serious concern exists over the lack of scientifically established cause & effect linkage of high nitrate wells to nitrogen fertilizer usage. There are other well-established causes of wells testing high in

nitrates. These causes include contamination from other nitrogen sources, such as nitrates produced from soil organic matter mineralization, septic systems, manure, atmospheric deposition, etc. The recently released Minnesota Pollution Control Agency (MPCA) Nitrogen Report indicates that more than 75-80% of the source nitrogen which can impact ground or surface waters is from non-fertilizer nitrogen sources. Most of this comes from soil organic matter mineralization. The MDA does not have statutory authority over the naturally occurring soil organic matter mineralization process.

There can be other causes of high nitrates in wells, in addition to all the non-fertilizer nitrogen sources, that can cause high nitrates. These causes include poor well construction, improper well placement, cracked or rusted out casings, dug wells and many other possible causes. Trying to relate drinking water well nitrates levels to nitrogen fertilizer use is a flawed concept. Existing drinking water well nitrate levels should not be considered as an indicator of groundwater nitrate levels because of the site-specific problems that exist with them. MNICCA is very concerned that the use of existing drinking water wells in the phased approach, as is being proposed in the 2013 NFMP, is likely to trigger negative public perceptions of nitrogen fertilizer usage and possible regulations when nitrogen fertilizer is not the problem.

There are better approaches to monitoring groundwater nitrate levels than a township well testing program. One approach might be to install properly constructed and designed monitoring wells in various groundwater aquifers around the state. These monitoring wells would need to be constructed and properly placed in order to account for all the nitrate-nitrogen sources and various pathways of nitrates to the monitoring well.

In addition to the concerns regarding the township well testing program as a part of the phased approach to regulation, MNICCA would like to point out a number of other concerns with the draft NFMP.

Concern 1: On pages 18-19 the draft NFMP indicates that methemoglobinemia can develop in infants when fed high nitrate-nitrogen formula. The Plan goes on to indicate that a number of other possible negative effects of high nitrates have been suggested; however, the cause and effect relationships with these other effects have never been proven. This paragraph should be removed because unproven speculation is not appropriate for the NFMP. On the contrary, there are a number of studies that have established a positive relationship between high nitrates and human health. The positive benefits of high nitrates should be included within the NFMP, in order to provide an appropriate balance in the document.

Concern 2: Also on page 19 the first paragraph indicates that the average adult in the U.S. consumes 20-25 milligrams of nitrate every day in food, largely from vegetables. The Plan does not relate this information to the Public Drinking Water Standard of 10 ppm. This information should be converted to a concentration of nitrate-nitrogen in water for comparison, in order to put it into a perspective that is relative to drinking water levels. The 20-25 milligrams of nitrate consumed by the average adult would equate to drinking a liter (1.2 quarts) of water daily with a concentration of 20-25 parts per million (ppm) of nitrate-nitrogen. If all adults stepped it up to consume 4 times more vegetables daily as recommended, the nitrates consumed would be equivalent to drinking a liter of 100 ppm nitrate-nitrogen water daily.

Concern 3: On pages 128-129 of the draft NFMP, there are graphs that show the increasing trend of daily nitrate-nitrogen loading from two springs in SE Minnesota. What are the concentrations of nitrates in the water? Loading is not an appropriate way to present this information. Concentrations may actually be dropping if the water discharge is increasing due to increases in precipitation. It is well established that precipitation has increased significantly in SE Minnesota over the years cited.

Concern 4: The graph on page 38 is a conceptual graph and doesn't have actual data to support it. Many different factors impact the potential for nitrate leaching losses. This graph implies that nitrogen fertilizer rate is the only factor controlling leaching losses. It is not appropriate to include this graph without discussion of the multitude of other factors that relate to leaching losses.

Concern 5: The graph on page 39 can be confusing. The ratio should be inverted and graphed as pounds of nitrogen fertilizer input per bushel of corn produced. In this way the pounds of nitrogen per bushel of grain produced can be placed on the same graph. This will allow a quick reference of how close the nitrogen input is to nitrogen uptake by the crop. When crop removal nitrogen exceeds input of nitrogen, a net mining of soil

organic matter occurs. Mining of soil organic matter,is not a sustainable management practice and therefore the promotion of mining of soil organic matter nitrogen should not be a goal of this Plan.

Concern 6: The NFMP does not address the point that crop rooting zone nitrate concentrations need to be high in order to supply the nitrogen needs of a growing crop. Crop rooting zone water needs to be separately defined from surface water and groundwater. Crop rooting zone water supplies the crop needs and is the conduit for delivery of nitrate-nitrogen to the plant. Nitrate concentrations in crop rooting zone water are dynamic throughout the year because of the biological processes that occur in the soil. Typically nitrate-nitrogen concentrations in the crop rooting zone water need to be above 100 ppm in order to prevent nitrogen deficiency from occurring.

Concern 7: On pages 34 & 105 references are made to the contribution of nitrogen from soil organic matter through the mineralization process. The process of mineralization and immobilization of soil organic nitrogen is continuous throughout the spring, summer and fall. Soil organic matter nitrogen when mineralized will supply the majority of nitrogen for crop growth, typically 75-80% of the nitrogen supplied to a crop. Nitrate produced by this source is just as susceptible to leaching as any other source. Why isn't it considered as a major component of groundwater contamination versus the emphasis that is placed on nitrogen fertilizer?

Concern 8: The draft NFMP references significant portions of the recently released Minnesota Pollution Control Agency (MPCA) Nitrogen Report. This report was released in June 2013, well after the last meeting of the NFMP advisory committee meeting in 2012. This report is poorly written, portions are inaccurate and it is extremely biased against agriculture. This report should have been provided to the NFMP advisory committee so they could determine the parts that were relevant to the NFMP.

Concern 9: The "Other Risks" section, on page 22 of the draft NFMP references various surface water concerns that have not been confirmed or are not supported by independent scientific studies. These non-validated surface water concerns should not be included in this document because the NFMP should relate to groundwater. If speculative statements about surface waters are included in this report, then proven positive impact of nitrates on surface water quality should also be included. These positive effects include the suppression of methyl mercury production and the suppression of blue-green algae in surface waters. Methyl mercury and blue-green algae toxins are two of the most serious water quality impairments in Minnesota surface waters.

In summary, MNICCA has a number of concerns regarding the draft 2013 Nitrogen Fertilizer Management Plan. The primary concern is the concept of using a township well testing program as part of the phased approach to the regulation of nitrogen fertilizer. This approach has serious technical and scientific flaws and is likely to result in serious economic harm to Minnesota agriculture. It is also unlikely that this program would have any positive impact on groundwater quality. In addition, the MDA needs to rethink whether the 1990 NFMP needs to be revised, and if so, it needs to fully engage the agricultural community as part of that revision similar to what was done in 1990. MNICCA appreciates the opportunity to comment on the proposed plan and expects that our concerns will be fully considered.

Sincerely,

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