



Anhydrous Ammonia Report 2013



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Executive Summary

The 2011 Minnesota State Legislature enacted MN Session Laws 2011, Chapter 14, Sec 3, Subd. 2. which provided a \$280,000.00 General Fund appropriation to the Minnesota Department of Agriculture (MDA) to increase anhydrous ammonia regulatory oversight. By February 1, 2013, the commissioner is required to report regarding the progress in addressing the department's shortfall of necessary inspections and recommendations for fee changes to eliminate the shortfall. Additionally, the commissioner may adopt rules to certify a person to offer or perform a regulatory compliance inspection of facilities that store, handle, or distributes ammonia or anhydrous ammonia fertilizer.

Anhydrous Ammonia Inspections:

The Facility Response Unit (FRU) of the Pesticide and Fertilizer Management Division (PFMD) was restructured in early 2012 and a new unit supervisor was hired. The MDA filled two (2) new anhydrous ammonia facility inspector positions in May, 2012, to complement the existing inspector staff. By July, 2012, all FRU inspectors were equipped and trained to independently perform inspections at targeted facilities located in Minnesota.

In FY 13, FRU inspectors totaled 3.2 full time employees. This staffing increase from previous years enabled the MDA to successfully perform more inspections during the first half of FY 13 than in either FY 11 or FY 12. Sites that had not been inspected in the past five (5) to seven (7) years were inspected during this period. MDA anticipates that once inspections projected for the next six (6) months are complete and by the end of FY 13, the interval between anhydrous ammonia facility inspections will be approximately every four (4) years.

Anhydrous Ammonia Rules:

The legislative appropriation also supports rule writing authorized by 2012 Minnesota Statute Chapter 18C, Section 121, Subdivision 1. In January, 2013 the MDA hired a Project Consultant to draft new rules as authorized by 2012 Minnesota Statutes 18C.111, Sub. 4 to certify a person to offer to perform or perform a regulatory anhydrous ammonia compliance inspection of any facility that stores, handles, or distributes anhydrous ammonia in Minnesota. MDA published notice with the State Registrar of our intent to propose new anhydrous ammonia rules on May 23, 2012. MDA was only recently able to find and hire a suitable candidate for this position. MDA projects having a first draft of new anhydrous ammonia rules ready and available for public review and comment in the summer of 2013.

Spending of the Appropriation:

The MDA has spent \$115,566 of the \$280,000.00 appropriation primarily on salaries, office space, travel and supplies during FY 12 and the first six (6) months of FY 13. The MDA will use the remaining dollars of the appropriation in the last half of FY 13 and FY 14 to support the work of inspection staff at anhydrous ammonia facilities and the effort of the Project Consultant writing rules.

The anhydrous ammonia inspection program has a long history in PFMD. Before the general fund appropriation, the program was funded by fertilizer inspection fees. MDA is committed to managing an effective anhydrous ammonia regulatory program. MDA anticipates needing additional funds to continue this critical work and expects to use monies from the fertilizer account to maintain

anhydrous ammonia inspection commitments and rule-writing expenses after the general fund appropriation is depleted.

Introduction

During the 2011 legislative session the MDA requested an increase in tonnage fees to support efforts needed to perform additional anhydrous ammonia inspections by MDA personnel at agricultural chemical facilities that store, handle and distribute anhydrous ammonia in order to lower the interval between inspections. MDA would also use these fees to develop a process to certify private third-party individuals who would perform regulatory anhydrous ammonia inspections on a for hire basis. The 2011 legislature did not authorize a fertilizer inspection fee increase and instead provided a one-time \$280,000.00 General Fund appropriation to the Minnesota Department of Agriculture to be used to:

1. Hire and train additional anhydrous ammonia inspectors;
2. Focus added inspection capacity on decreasing the interval between inspections;
3. Hire a person to write anhydrous ammonia rules; and
4. Draft rules enabling a process to certify a person to offer or perform a regulatory compliance inspection of any person or facility that stores, handles, or distributes ammonia or anhydrous ammonia fertilizer per Minnesota Statutes 18C.111, Subd. 4.

Attached to this report is the April, 2011 MDA fact sheet, distributed to the 2011 legislature with proposed anhydrous ammonia inspection program changes. The fact sheet explained the reason for the MDA's concern for additional inspections, an MDA proposal for addressing these concerns and proposed accomplishments. The fact sheet included recommendations for funding the increased regulatory oversight and suggested a annual anhydrous ammonia public safety surcharge of \$0.75/ton and a \$400 re-inspection fee.

Background

Anhydrous ammonia is a critical agricultural fertilizer input. Its use in Minnesota is widespread because it is easy to handle and use, and readily available. However, anhydrous ammonia is classified as an "Extremely Hazardous Material" and is very dangerous if it is not handled properly.

MDA's Pesticide and Fertilizer Management Division is authorized to regulate the storage, handling and use of anhydrous ammonia. Currently MDA is tasked with regulating 287 storage facilities with more than 490 bulk storage tanks and 10,000 nurse tanks through permitting and inspections. Regulatory inspections performed by MDA provide a critical safeguard to facility operations and employees, as well as to people and population centers that are located in close proximity to the anhydrous ammonia. Nearly 70 percent of anhydrous ammonia facilities are located in or near cities and towns around agricultural regions of Minnesota.

Product releases can have widespread and serious effects. Such incidents include: in 2010 two (2) major anhydrous ammonia incidents occurred in Morris and Randolph with hundreds of people evacuated from

homes, schools and businesses. Fortunately no serious injuries resulted from either incident; however past anhydrous ammonia incidents have resulted in injuries and even death.

Anhydrous ammonia operations are necessary and are complex by nature. An MDA inspector looking at an active operation needs a considerable amount of time to complete a thorough inspection. The rate of noncompliance at inspected facilities has been high. For the past several years, nearly all completed inspections resulted in some level of enforcement action ranging from a warning letter to issuance of financial penalties. The range of noncompliance varies from minor to serious.

In FY 11 and FY 12 approximately 75% and in FY 13 approximately 60% of the facility and storage inspection files have warranted financial penalties. Inspection files are referred to the MDA’s Enforcement Unit for further review because of either serious violations, a high number of violations, and/or because of a compliance history showing same or similar violations in the past.

MDA’s ability to inspect sites has been limited by staff resources. Through FY 12, MDA’s anhydrous ammonia inspection program operated with fewer than 2.0 full time employee inspector positions. MDA’s interval between inspections at anhydrous ammonia facilities at the time of the incidents in 2010 was one (1) inspection every seven (7) years (see Table 1). MDA is very concerned about this inspection interval considering the hazards associated with this material. Universally, stakeholders supported steps be taken to lower the inspection interval and level the regulatory playing field among facilities.

Table 1. Comparison of Anhydrous Ammonia Field Inspectors and Completed Inspections.

Fiscal Year (FY)	Full Time Employee Inspectors (FTE)	Inspection Totals	Interval between Inspections (Years)
11 - 7/1/10-6/30/11	1.7	42	7
12 - 7/1/11-6/30/12	1.3 ¹	58	5
13 - 7/1/12-12/31/12 ²	3.2	75	4 ³

¹ MDA hired 2 inspectors to assist FY 12 inspections as part of their training.

² First 6 months of FY 13.

³ Projected inspection interval by FY 13 end.

In 2011, the MDA proposed a fertilizer inspection fee increase and a re-inspection fee to the legislature as a means to increase MDA inspection capacity, thereby reducing the interval between inspections and helping address concerns about facility compliance. The additional proposed revenues would enable the MDA to hire staff to conduct enough additional inspections to dramatically shorten the inspection interval that was at seven (7) years at the end of FY 11.

Additionally, the MDA proposed to develop innovative procedures through new rules to improve compliance and safety for farmers, applicators, and those near storage facilities or application sites. This concept was to create a certification of third-party inspectors who would be certified to conduct “for hire” compliance inspections of anhydrous ammonia facilities and allowing the market place to drive the support for additional private inspection capacity.

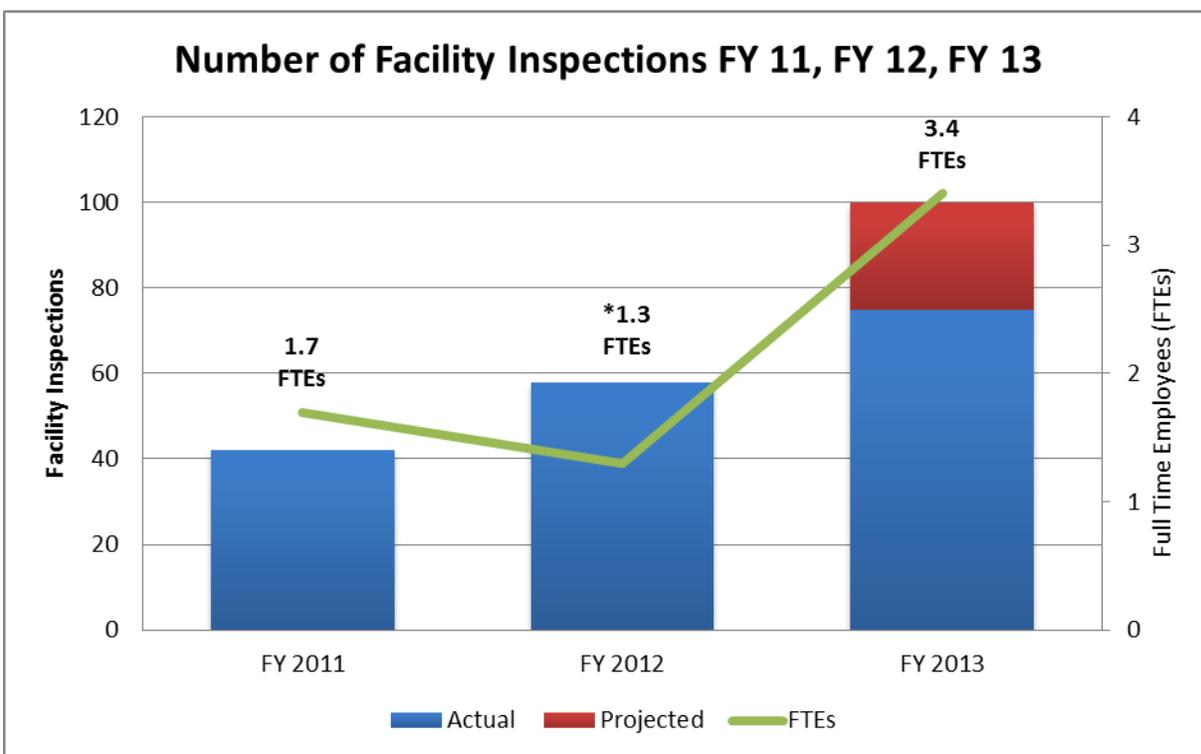
The 2011 legislature, in lieu of the fee increase, provided MDA a \$280,000.00 general fund appropriation which was an amount lower than originally requested. MDA was tasked to use these monies to reduce inspection intervals and write rules to certify private persons to perform regulatory anhydrous ammonia compliance inspections at facilities to improve facility performance and reduce noncompliance.

Anhydrous Ammonia Facility Inspection Trends

Number of Inspections

By the end of December 2012, the number of anhydrous ammonia inspector positions totaled 3.2 full time employees. This staffing increase from previous years enabled the MDA to successfully perform more inspections during the first half of FY 13 than in all of either FY 11 or FY 12. Since hiring two (2) additional anhydrous ammonia inspectors in May, 2012 the number of inspections has increased from 42 inspections in Fiscal Year (FY) 11 and 58 in FY 12 to 75 in the first six (6) months of FY 13.

Table 2. The Number of Anhydrous Ammonia Facility Inspections by FY.

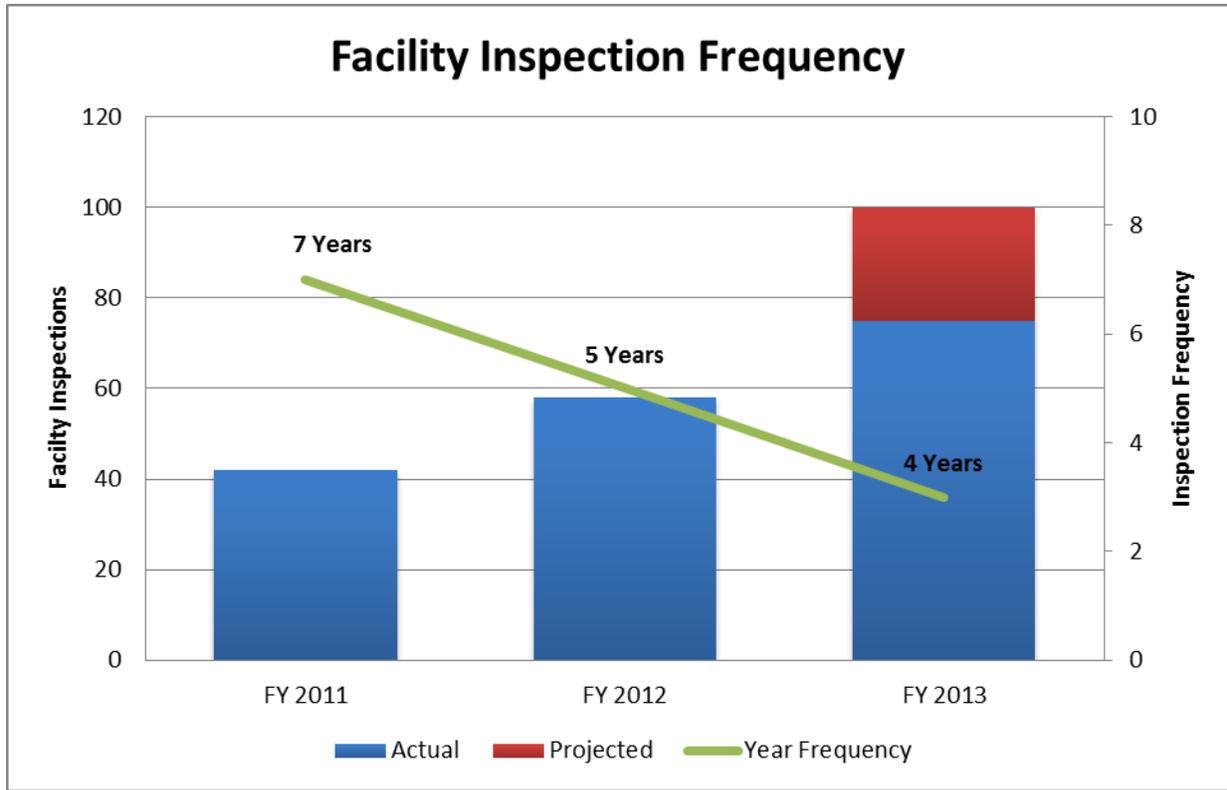


* MDA hired 2 inspectors to assist FY 12 inspections as part of their training.

Inspection Frequency

The inspection frequency has increased substantially since MDA hired two (2) anhydrous ammonia inspectors in May, 2012. The frequency a facility would be inspected in FY 11 was once every seven (7) years; by FY 12 it was once every five (5). The inspection frequency continues to be lowered. The MDA anticipates that approximately 100 anhydrous ammonia inspections will be completed by the end of FY 13 and as a result the interval between inspections will be approximately an inspection at each facility once every four (4) years. During the first 6 months of FY 13 sites that had not been inspected in the past five (5) to seven (7) years were inspected during this period and during the last half of FY 13 MDA will inspect sites that have not been visited in the past five (5) years. MDA anticipates that the interval between anhydrous ammonia facility inspections will be approximately every four (4) years by the end of FY 13 and anticipates reaching a three (3) year interval by July 1, 2014 with this interval with our current staffing level.

Table 3. Facility Inspection Frequency by FY.



Anhydrous Ammonia Incident Trends

Number of Anhydrous Ammonia Incidents per FY and Common Causes of Incidents:

An incident is defined as a flood, fire, tornado, transportation accident, storage container rupture, portable container rupture, leak, spill, emission, discharge, escape, disposal, or other event that releases or immediately threatens to release an agricultural chemical accidentally or otherwise into the environment, and may cause unreasonable adverse effects on the environment. Agricultural chemicals include both pesticide and fertilizer. Anhydrous ammonia is a fertilizer. An incident does not include a release resulting from the normal use of a product or practice in accordance with law.

Since FY 11 roughly one third of spills/incidents reported to the Minnesota Duty Officer have involved anhydrous ammonia. Each year one (1) to three (3) ammonia incidents will require an evacuation of homes located in the area of the incident and one (1) to two (2) people will be injured as a result of anhydrous ammonia exposure. Deaths related to anhydrous ammonia exposure are rare but they have occurred.

The number one cause of ammonia incidents is the failure to properly tighten nurse tank valves (unseated valves) which results in leaking anhydrous ammonia. While a valve left open is not done intentionally, this is not an accident. This is an entirely preventable incident that causes nuisance odors, potentially exposing nearby residents and prompting unnecessary emergency response of

local fire departments and law enforcement. Such incidents put emergency responders at risk, as they need highly protective equipment to safely approach and address leaky unseated valves.

MDA takes incidents seriously. All anhydrous ammonia incidents are investigated by the MDA. These investigations are conducted separately from facility inspections. The MDA issues financial penalties when major violations of statutes or rules are documented. In FY 11, the most common violation resulting in an incident and resulting in monetary penalties was an inoperable quick coupler and in FY 12, FY 13, the most common violation was an excessively long withdrawal hose. The quick coupler needs to be in working order to protect the withdrawal hose from rupturing if the nurse tank separates from the application rig and a withdrawal hose that is too long drags or rubs causing it to weaken and rupture.

Table 4. Incident Results and Causes by FY.

Fiscal Year (FY)	Injuries - I Deaths - D Evacuations - E	Common Causes of Incidents Ranked	Number and Causes of Incidents Resulting in Financial Penalties
11 ¹	I = 5 D = 0 E = 3	1: Unseated valve 2: Quick coupler, hitch failure, tip or rollover.	7: Quick coupler 3: Handling in a manner that endangers humans 1: Hose length 1: Withdrawal hose not rated for anhydrous ammonia 1: Not monitored during anhydrous ammonia transfer
12	I = 2 D = 0 E = 0	1: Unseated valve 2: Piping component failure	4: Hose length 1: Quick coupler
13 ²	I = 1 D = 1 E = 1	1: Unseated valve 2: Product transfer, piping component failure	2: Hose length

Anhydrous Ammonia Certification Program

In January, 2013, the MDA hired a Project Consultant to draft the rules to certify a third-party individual to offer or perform a regulatory compliance inspection of any person or facility that stores, handles, or distributes ammonia or anhydrous ammonia fertilizer per Minnesota Statutes 18C.111, Subd. 4. The Project Consultant is an unclassified position and the MDA anticipates that the rule writing process, including writing the Statement of Need and Reasonableness (SONAR) will take at least eighteen (18) months to complete, although the exact timeline for developing rules will be dependent on comments received about the proposed rules.

The MDA had anticipated hiring a Project Consultant sooner however no qualified candidates applied for the position despite outreach attempts to gain interest from the public including a six week posting period to allow interested persons to apply for the position. The MDA revised the position description reducing the experience level requirement with the understanding that MDA's anhydrous ammonia inspectors and staff would provide assistance to the Project Consultant in writing the rules. This will place additional time demands not previously anticipated on current anhydrous ammonia staff.

Implementation of Anhydrous Ammonia Certification Program

The MDA is aware of the substantial amount of time and resources that implementation of such a first-of-its-kind certification program would require. The intention of the rules and statute are to certify third-party inspectors who would offer their services for hire, and who are qualified to perform anhydrous ammonia inspections at a similar competency level as the MDA inspectors. The MDA is not aware of any other similar anhydrous ammonia certification or licensing program in the United States. MDA is looking at variety of pesticide certification and license programs as potential models. A certification program such as this will require the following, at a minimum:

1. Perform a job analysis that defines inspector tasks.
2. Develop a training manual blueprint, learning objectives and a manual outline.
3. Write a certification study manual.
4. Create a written certification exam, and a practicum exam.
5. Develop a credentialing process.
6. Establish on-going training and recertification standards.
7. Identify partners and establish responsibilities.
8. Establish necessary support to administer program and update materials.
9. Account for additional staffing and resource support and to operate certification program.

Educational and Outreach Activities

The anhydrous ammonia education and outreach efforts are extensive and have attempted to highlight and focus on ways to prevent serious incidents from happening, and inform and educate farmers and dealers on anhydrous ammonia safety. Incident prevention, and worker safety, are the messages repeated and stressed through the program's outreach activities. The information which has been provided to farmers and dealers include:

Correspondence, Newsletters titled "Safety Alerts", MDA Update newsletters and MDA webpage:

- Pre-notification letters are issued to permitted facilities, annually, prior to routine anhydrous inspections. The letter lets facilities know that an inspection is imminent and provides information on compliance items that will be inspected during the inspection.
- The "Safety Alert" newsletter is issued annually and most recently in February, 2012. This is a one-page one (1) page compliance assistance document that informs permitted facilities, farmers and the public of anhydrous ammonia compliance issues. Most recently addressed topics include hose length and operational quick couplers as well as other safety related items.
- Since 2002, MDA Update newsletter articles have featured topics including, in part, a description of incidents resulting from the incorrect hose length, inoperable quick couplers, leaky valves,

anhydrous ammonia safety tips and compliance assistance. The MDA Update is widely distributed to private applicators, commercial facilities and other industry stakeholders.

- MDA's webpage: www.mda.state.mn.us/nh3 offers a number of fact sheets that address the correct installation of break-away coupling devices, hose length and specific compliance requirements with MN anhydrous ammonia rules and statutes.

Safety Campaign: safety messages on anhydrous ammonia rated safety gloves, mini-posters:

- In FY 13 the MDA:
 1. Developed a laminated compliance assistance mini-poster relating to hose length, incident reporting requirements and MDA contact information; and
 2. Purchased for distribution anhydrous ammonia rated safety gloves with the message "Keep WD Hose Above the Hitch" (meaning: use the correct length withdrawal hose). This message was in response to the MDA's concern that the incorrect hose length was the cause of increased number of anhydrous ammonia incidents in FY 12, FY 13.

Beginning in August, 2013 these posters and gloves were handed out to stakeholders free of charge at Farmfest (an agricultural event held annually in Morgan, MN), at facility inspections, and at Private and Commercial pesticide applicator workshops.

Safety Information Handed Out at Farmfest, Commercial and Private Pesticide Applicator Workshops:

- Farmfest: For the past several years the MDA anhydrous ammonia program has provided a manned booth and exhibit at Farmfest. The exhibit includes a nurse tank that is cracked, different kinds of quick couplers with manufacturer's instructions on their proper installation, handouts including the Safety Alert newsletter and informational anhydrous ammonia Fact Sheets. In FY 13, 125 pairs of safety gloves and mini posters with hose length, quick coupler and incident reporting safety messages were handed out at the event.
- Commercial and Pesticide Applicator Workshops: Safety information is offered at these workshops and includes Anhydrous Ammonia Safety Alert newsletter, safety gloves and mini posters with hose length, quick coupler and incident reporting safety messages.

Presentations at Industry Sponsored Events:

- Anhydrous ammonia program staff presented information on anhydrous ammonia safety at MN Grain & Feed Dealers Association, St. Cloud, MN during the fall of 2012.

Summary

- 1) The MDA anticipates its inspectors will complete approximately 100 anhydrous ammonia inspections by the end of FY 13.
- 2) MDA projects the inspection frequency to increase at facilities and inspection intervals to decrease to an estimated four (4) year interval by the end of FY 13 compared to a seven (7) year rotation in FY 11.

- 3) The MDA hired a Project Consultant in January, 2013 to write rules to certify a person to offer or perform a regulatory compliance inspection of any person or facility that stores, handles, or distributes ammonia or anhydrous ammonia fertilizer per Minnesota Statutes 18C.111, Subd. 4.
- 4) Looking to pesticide certification and licensing and other potential models, MDA recognizes that developing and implementing a certification program will be resource intensive. A certification program such as this will require the following, at a minimum:
 - Development of a job scope.
 - Establishing training standards.
 - Creation of a training manual.
 - Creation of a written test, and a practicum exam.
 - On-going training and recertification.
 - Program support and updating of materials.
 - Additional support and technical staff to operate certification program.
- 5) Funding a certification effort will be an issue that will need to be addressed. Using pesticide certification programs as a model, the design and implementation of the anhydrous ammonia certification program will be expensive and costs could range between \$200,000 and \$400,000.
- 6) The MDA anhydrous ammonia program will look for other sources of revenue to maintain the future program operation.
- 7) The MDA is uncertain of the actual participation in the anhydrous ammonia certification program because of expectation that inspections will be completed at the same level and detail as the MDA conducts inspections.
- 8) The MDA is uncertain of the actual interest that agricultural chemical facilities will have in hiring and paying for a third party inspector. Currently the facilities receive inspections from the MDA for free.
- 9) By the end of FY 13 the MDA anticipates that the entire \$280,000.00 allotment will be expended, and the program will continue using Fertilizer revenue and dollars from other sources.

Recommendations

- 1) Continue compliance inspections and efforts to maintain a short inspection interval.
- 2) Continue program outreach focused on best way to keep workers and the public safe from exposure to anhydrous ammonia.
- 3) Examine and determine the:
 - need for a certification program to certify a person to offer or perform a regulatory compliance inspection of any person or facility that stores, handles, or distributes ammonia or anhydrous ammonia fertilizer per Minnesota Statutes 18C.111, Subd. 4.
 - anticipated response by persons who would become certified inspectors.

- anticipated response and participation by agricultural facilities to the regulatory compliance inspection program.
 - costs and funding source for the development, implementation and execution of certification program.
- 4) Create partnerships to the extent MDA's ability to address program issues.
 - 5) Examine the feasibility of the MDA conducting anhydrous ammonia inspections. The additional inspection staff has reduced the inspection intervals in FY 13 and if the current inspector staffing levels remain at 3.4 full time employees inspection intervals will continue to be shortened.
 - 6) Examine the role of existing and upcoming anhydrous ammonia safety and compliance programs that are or will be available to the public that may increase safety and compliance with anhydrous ammonia equipment and bulk storage requirements. The Asmark Institute (www.asmark.org) offers an anhydrous ammonia handler three (3) training program and the National Board of Boiler and Pressure Vessel Inspectors (NBIC) is creating an on-line and classroom program which may be available within the next year.