North Carolina Department of Environmental Quality

Pat McCrory
Governor

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Secretary

November 13, 2015

Deanne Grant
U.S. Environmental Protection Agency, Region 4
Air, Pesticide & Toxics Management Division
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Subject: North Carolina 112(r) End-of-Year Report

Dear Ms. Grant:

Please accept the attached North Carolina Chemical Accident Prevention Program 112(r) end-of-year report for federal fiscal year (FFY) 2015 (October 1, 2014 to September 30, 2015). The intent of this report is to satisfy the 105 Grant Commitment Item # 8 titled "Implement the CAA section 112(r) program for affected sources" for the Region 4 – Air Planning Agreement's Monitoring and Enforcement Section. If you have any questions, please feel free to contact me at mike.reid@ncdenr.gov or (919) 707-8443.

Sincerely,

Michael W. Reid, 112(r) Program Coordinator
Division of Air Quality, NCDEQ

Enclosure: North Carolina 112(r) End of Year Report

cc: Sheila Holman, DAQ Director
Lee Daniel, DAQ Technical Services Section Chief
Michael Pjetraj, Stationary Source Compliance Branch Supervisor
Sushma Masemore, DAQ Planning Section Chief

North Carolina
Department of Environment Quality
Division of Air Quality
Chemical Accident Prevention Program

112(r) End-of-Year Report for Federal Fiscal Year 2015

Introduction:

This annual report is a summary of activities of the North Carolina Chemical Accident Prevention Program for the United States Environmental Protection Agency's (EPA) federal fiscal year (FFY) 2015 (October 1, 2014 - September 30, 2015) and work plan for FFY 2016. This report is required by FFY 2015 Section 105 Grant Commitment Item # 8 titled "Implement the CAA section 112(r) program for affected sources" for the Region 4 – Air Planning Agreement's Monitoring and Enforcement Section.

Background:

40 CFR Part 68 "Chemical Accident Prevention Provisions" is a federal regulation designed to meet the chemical accident prevention requirements within Section 112(r) of the 1990 Clean Air Act Amendment (CAAA). In North Carolina, EPA delegated implementation and enforcement authority for 40 CFR Part 68 to the North Carolina Division of Air Quality (DAQ). DAQ incorporated 40 CFR Part 68 by reference into State rules under 15A NCAC 2D. 2100, "Risk Management Program."

Program Implementation:

The primary mission of the North Carolina Chemical Accident Prevention Program is to promote accidental chemical release prevention measures and reduce the impact of releases that do occur on the environment and public health through safety programs, emergency preparedness, and public access to information. In order to achieve these goals, the following objectives have been established:

1) **Strategic Planning:** To coordinate chemical accident prevention activities with existing health and safety programs.

    a) Memorandum of Agreements (MOA): As part of the original implementation strategy, DAQ requested assistance through memoranda of agreements (MOAs) with partner agencies. Among other things, the stated purpose of these MOAs was to request assistance with the inspection of water and wastewater treatment plants to determine compliance with 15A NCAC 2D .2100 "Risk Management Program" (RMP).

    After careful review of this implementation strategy, it was determined that the number of RMP subject water and wastewater treatment plants continues to decrease over time as more and more facilities switch from large capacity gaseous chlorination systems to safer alternative systems. As a result, dated MOA's with the Division of Water Resources (DWR) was terminated on July 9, 2015.

Agreements continue with partner agencies including the Division of Emergency Management (DEM) to assist with emergency planning activities and with the NC Occupational Safety and Health (OSHNC) to support related chemical accident prevention programs.

b) 112(r) Task Force: In order to promote consistency among DAQ's seven regional offices and its partner agencies, an internal work group meets quarterly. For this reporting cycle meetings were held on October 14th, January 8th, April 16th, and July 16th.

2) **Compliance Assistance:** To offer technical assistance to the regulated community, emergency response community, and interested members of the public.

a) Technical Assistance: Continue to offer technical assistance through telephonic communication, email correspondence, and through a 112(r) web portal (http://daq.state.nc.us/toxics/risk/112r/).

b) Risk Management Plan (RMP) Screening: By utilizing industry submitted RMPs as mandated by §68.190, EPA's Central Data Exchange was used to screen data on a regular basis for reporting inconsistencies including but not limited to failure to update plans, new stationary sources, deregistered stationary sources, errors in RMP submissions, and other required updates. For this reporting cycle:

i) *Five year resubmission deadline*: For this reporting cycle, twenty three (23) stationary sources were due to update their RMPs within the FFY. Of those, all were telephonically contacted and reminded of their pending update requirements.

ii) *New stationary sources*: Three (3) new facilities were identified during the previous reporting period that submitted new RMPs. Of those, all three new RMPs were inspected and technical assistance provided.

iii) *Deregistered stationary sources:* Five (5) owner/operators submitted deregistration requests to the RMP Reporting Center. Of those, three (3) reported that they no longer use any regulated substance(s) and the other two (2) reported do have reduced inventory of all regulated substances to below the threshold quantity.

3) **Regulatory Review and Enforcement:** To inspect subject stationary sources to determine compliance with 40 CFR Part 68.

a) Air Permitted Facility Inspections: In Title V of the CAAA, section 502(b)(5)(A), Congress mandated that a permitting authority must have the authority to "assure compliance by all sources required to have a permit under this title with each applicable standard, regulation or requirement under this act." 40 CFR Part 68 is an "applicable requirement." In general, the permitting authority must ensure that permits include conditions relative to 40 CFR Part 68. In addition, DAQ has opted to include 112(r) compliance statements in all Title V, Synthetic Minor and Minor facility permits. For this reporting cycle:

i) *Title V facilities*: 40 CFR Part 68.215(e)(1) was addressed as a potential applicable requirement in two hundred ninety seven (297) title V facility inspections;

ii) *Synthetic Minor facilities*: 40 CFR Part 68(e)(1) was addressed as a potential applicable requirement in six hundred fifty five (655) synthetic minor facility inspections; and

iii) *Minor facilities*: 40 CFR Part 68(e)(1) was addressed as a potential applicable requirement in two thousand three hundred eight three (2383) minor facility inspections.

b) RMP Inspections: In order to evaluate compliance with 40 CFR Part 68, subject stationary sources are scheduled for routine inspections of their risk management program. Inspections consist of a records review of all program elements, employee interviews, and on-site inspection of regulated processes.

For the reporting cycle, EPA established a national compliance monitoring goal to inspect at least 5% of the total number of stationary sources, of which 25% of those inspections to take place at "High Risk" stationary sources. In order to meet and exceed the national compliance monitoring goal, DAQ has implemented a strategy to inspect at least 20% of the total number of stationary sources subject to the rule per year; furthermore, to also inspect 40% of those stationary sources identified by EPA as "High Risk." For this reporting cycle:

i) *"High Risk" facility inspections*: Of the two hundred twenty (220) facilities under the jurisdiction of this program, EPA identified twenty four (24) subject stationary sources as "High Risk" facilities for this reporting cycle. In order to achieve a 40% inspection rate, nine (9) of those stationary sources were inspected **(see Figure 1)**.

ii) *Inspections*: Of the remaining one hundred ninety six (196) stationary sources, thirty nine (39) facilities were scheduled for inspection in order to achieve a 20% inspection rate. Of those scheduled, twenty seven (27) facilities were inspected for the reporting cycle for a 14% inspection rate (**see Figure 1**).

2015 FFY
112(r) Inspection Target
(October 1, 2014 to September 30, 2015)

Agency	Total Facilities	20% Inspection Target					"High Risk" Insp. Target				
		FFY 2015 Commitment	20% Insp. Rate	Facilities Inspected	Percent Complete	Remaining	Total "High Risk"	40% Insp. Rate	Facilities Inspected	Percent Complete	Remaining
DAQ	174	150	30	27	90%	3	24	9	9	100%	0
DEH	32	32	6	0	0%	6	0	0	0	0%	0
DWQ	12	12	2	0	0%	2	0	0	0	0%	0
NCDA	2	2	0	0	0%	0	0	0	0	0%	0
Total	220	196	39	27	69%	12	24	9	9	100%	0

Figure 1: RMP inspection summary

c) Incident Investigations: Investigations into accidental chemical releases are initiated by DAQ whenever initial reports appear to involve or have the potential to involve a catastrophic release of a regulated substance at a fixed facility. Investigations typically involve a determination of the cause of the incident as well as compliance with 40 CFR Part 68. For this reporting cycle, seven (7) accidental chemical releases involving regulated substances at fixed stationary sources were identified. Of the identified incidents, only one appeared to result in a catastrophic release (**see Figure 2**):

i) *General duty*: Two (2) incidents were determined to have occurred at stationary sources with less than threshold quantities of the regulated substance and therefore only subject to the general duty clause as mandated by the Clean Air Act Section 112(r)(1). Follow-up inquiry into these releases determined that neither appeared to result in a catastrophic release.

ii) *RMP stationary sources*: Five (5) incidents were determined to have occurred at stationary sources subject to 40 CFR Part 68. Investigations into each of the releases were limited to ensuring that the subject stationary source investigated the release appropriately as mandated by §68.60 or §68.81.

Number per year	Chemical Accident Report				
	Date Reported	Chemical(s) released	Amount	Comments	Impacts?
1	27-Feb-15	Ammonia (anhydrous)	approx. 100 lbs.	Leak in Condenser tubing	None Reported
2	24-Apr-15	Sulfur Dioxide	unknown	Leak from 3- 125 lbs. SO2 Cylinders due to valve malfunction	None Reported
3	29-May-15	Chlorine	Unknown	small gas leak overnight from one of two tanks	None Reported
4	17-Jun-15	Formaldehyde solution	2900 lbs.	Due to reator overheating	5 employees evacuated
5	9-Jul-15	Ammonia (anhydrous)	less than 100 lbs.	1/4" tube fitting to compressor failure	None Reported
6	27-Aug-15	Ammonia (anhydrous)	unknown	Release from solenoid valve malfunction	None Reported
7	21-Sep-15	Ammonia (anhydrous)	approx. 569 lbs.	Leak was an approximate 1/16 inch diameter pinhole in the piping	None Reported

Figure 2: Reported chemical accidents of regulated substances at fixed facilities.

d) Enforcement Actions: By utilizing the compliance tools mentioned in sections 3a - 3c above, regulated stationary sources may be assessed civil penalties when violations of 40 CFR part 68 occur. For the reporting cycle, there was a total of 36 inspections at RMP regulated facilities. Of those inspections, fifty two (52) separate potential citations were noted from fourteen (14) separate facility inspections (**see Figure 3**).

i) *Recommendations for Improvement*: Of the potential citations referenced above, ten (10) inspections resulted in forty four (44) separate recommendations for improvement.

ii) *Notice of Violation/ Notice of Recommendation for Enforcement (NOV/NRE)*: Four (4) separate facility inspections were deemed significant enough to result in twenty six (26) notices of violations. Of those violations one (1) resulted in a recommendation for enforcement. NOV/NREs represent significant or high potential for environmental or public health harm. The NOV/NRE resulted in the assessment of a civil penalty totaling $5,955.

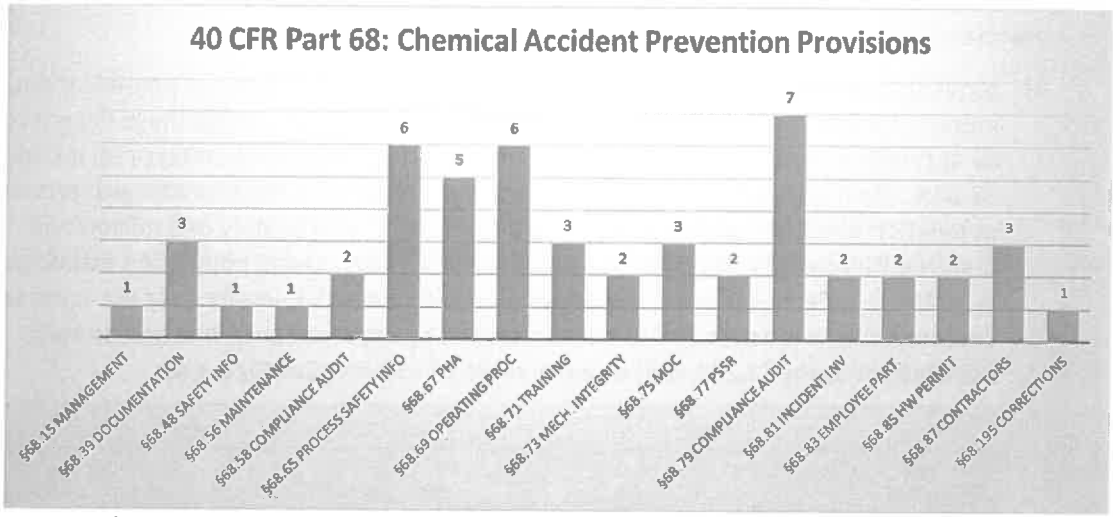

Figure 3: Total number of identified compliance issues by section

4) **Emergency Response Planning**: Stationary sources subject to 40 CFR Part 68 must coordinate emergency response plans with emergency responders as mandated by Subpart E – Emergency Response. In order to promote this collaborative effort, DAQ has partnered with the North Carolina Division of Emergency Management (DEM). For this reporting cycle, the DEM reported the following:

   a) *Outreach:* To promote awareness of SARA title III and the 112(r) program by presenting to LEPCs and professional conferences. The DEM reported to have participated in 12 local emergency planning committee (LEPC) meetings to include: Orange, Haywood, Cumberland, Cabarrus, Union, Gaston, Scotland, Mecklenburg, Warren, Caldwell, Nash, and Scotland County LEPCs.

   b) *Program Coordination*: To guide chemical accident mitigation strategies through planning, training, exercise, etc. The DEM provided program updates to quarterly meetings of the North Carolina Emergency Response Commission (NCSERC). The DEM also provided on-site emergency planning assistance to sixteen (16) owner/operators of RMP regulated stationary sources.

   c) *Technical Hazards Identification and Risk Assessment (T-HIRA) Plan*: The purpose of this plan is to support state and local government agencies and first responders, and their industry and community partners in identifying chemical hazards, prioritizing technological risks, and identifying actionable mitigation options to eliminate or reduce risk whenever possible. For this reporting cycle, a technical hazards mitigation study was completed for Mecklenburg, Union, and Gaston counties. It is anticipated that the results of the study will be used for future hazardous materials planning and mitigation activity.

5) **RMP Trends Analysis**: In order to assess effectiveness, a set of performance indicators was used to evaluate success of the program. Since it is not possible to prove how many accidents were prevented, performance indicators were limited to measuring reductions in potential impacts. These indicators include measuring changes in community

vulnerabilities, number of subject stationary sources, and measuring impacts from associated chemical accidents. For this reporting cycle:

a) Modeling: Using data that identified hazard zones, an assessment of possible offsite impacts for 2014 revealed an increase in the total population within these hazard zones by approximately six hundred forty one thousand eighty two (641,082) or an increase of 22.06%. Over the last ten years, there continues to be an overall downward trend in the population identified within these hazard zones by approximately one million two hundred thousand (1,271,670) or a decrease of 23.78%. Using population estimates from the U.S. Census Bureau, the population within North Carolina over the same ten year time frame is estimated to have increased by approximately one million two hundred thousand (1,282,903) or an increase of 15.55% (**See Figure 4**).

Change in NC Population within Hazard Zones						
Calendar Year	Population within Hazard Zones	% Change in Population	Population within Toxic Zones	Population Within Flammable Zones	NC Census	% Change in NC Population
2005	4,819,301	-----	4,814,306	4,995	8,661,061	------
2006	4,865,795	0.96%	4,860,262	5,533	8,845,343	2.13%
2007	3,980,524	-18.19%	3,975,014	5,510	9,041,594	2.22%
2008	3,769,569	-5.30%	3,763,943	5,626	9,222,414	2.00%
2009	2,966,424	-21.31%	2,961,232	5,192	9,380,884	1.72%
2010	2,959,864	-0.22%	2,954,307	5,557	9,535,483	1.65%
2011	2,898,373	-2.08%	2,891,747	6,626	9,656,401	1.27%
2012	2,868,964	-1.01%	2,862,422	6,542	9,752,073	0.99%
2013	2,906,549	1.31%	2,898,792	7,757	9,848,060	0.98%
2014	3,547,631	22.06%	3,540,544	7,087	9,943,964	0.97%
* Total Change:	-1,271,670	-23.78%	-1,273,762	2,092	1,282,903	13.93%

* Note: 2005 was used as reference year.

Figure 4: Change in at risk population by year

b) Stationary Sources: An assessment of the number of regulated stationary sources reported to have current RMPs in North Carolina decreased by one (1) stationary source and five (5) regulated processes from the previous year. Over the last ten years, the overall trend of stationary sources continues to trend downward by thirty two (32) stationary sources or a decrease of 12.0% and by forty (40) regulated processes or a decrease of 12.0%. During the same ten year time period, the total quantity of regulated substances reported in RMPs continues to show an increased trend in total quantities by approximately one hundred eight million pounds (108,574,095 lbs.) or an increase of 151.6% (**see Figure 5**).

RMP Regulated Facility Data								
Calendar Year	Facilities	% Change in Facilities	Processes	% Change in Processes	Quantity of RS (lbs.)	% Change in RS	Toxic RS (lbs.)	Flammable RS (lbs.)
2005	275	-----	347	-----	61,106,906	-----	44,072,935	17,033,971
2006	282	2.5%	348	0.3%	55,765,984	-8.7%	43,903,288	11,862,696
2007	280	-0.7%	343	-1.4%	128,626,426	130.7%	41,883,026	86,743,400
2008	279	-0.4%	342	-0.3%	131,537,988	2.3%	41,966,608	89,571,380
2009	263	-5.7%	322	-5.8%	126,013,917	-4.2%	37,885,155	88,128,762
2010	262	-0.4%	319	-0.9%	125,688,294	-0.3%	37,698,623	87,989,671
2011	258	-1.5%	314	-1.6%	142,078,062	13.0%	38,499,105	103,578,957
2012	246	-4.7%	305	-2.9%	143,683,275	1.1%	40,604,318	103,078,957
2013	244	-0.8%	302	-1.0%	165,335,066	15.1%	58,627,549	106,707,517
2014	243	-0.4%	307	1.7%	169,681,001	2.6%	63,007,859	106,673,142
Total Change	-32	-12.0%	-40	-12.0%	108,574,095	151.6%	18,934,924	89,639,171

Note: 2005 was used as a reference year

Figure 5: Change in total regulated stationary sources by year for last ten years

c) Accidental Releases: An assessment of chemical accident history data reported under section §68.195 revealed that there have been 46 reported accidents over the last ten years. Of those reported, equipment failure was identified as the most common cause of the accidental release at 63% followed by human error at 33%. Of the regulated substances involved, anhydrous ammonia (CAS # 7664-41-7) was the most commonly reported substance released at 61% followed by chlorine (CAS # 7782-50-5) at 20%. As the chart below indicates, the reported releases resulted in significant impacts to the community including five (5) fatalities, one hundred twenty five (125) injuries, almost three thousand (2,962) evacuated or asked to shelter-in-place (SIP), and resulted in millions of dollars in property damage from the estimated total release of approximately forty seven thousand pounds (47,029 lbs.) of regulated substances (**see Figure 6**).

Year	Accidents	Fatalities	Injuries	Evacuation / SIP	Property Damage	Quantity Released (lbs)
2005	7	0	4	2	$3,201	1,186
2006	5	0	5	0	$6,000	563
2007	5	0	2	0	$500	13
2008	3	0	1	0	$0	615
2009	9	5	92	55	$50,000,000	19,678
2010	0	0	0	0	$0	0
2011	8	0	1	305	$17,100,000	20,102
2012	5	0	9	0	$0	479
2013	3	0	1	100	$700	2,420
2014	1	0	10	2,500	$3,400,000	1,973
Totals	46	5	125	2,962	$70,510,401	47,029

Figure 6: Yearly summary of reported accidental releases

6) **Work Plan for FFY 2016**: In order to focus on key priorities, it is important to identify techniques that are effective in the prevention of accidental chemical releases of regulated substances and the reduction in the severity of those releases that do occur. For FFY 2016 priorities include:

   a) Strategic Planning: To continue building partnerships with existing health and safety programs by:

      i) *DEM*: Continuing to promote chemical hazard mitigation planning.

      ii) *OSHNC*: Continuing to support the process safety management standard.

   b) Compliance Assistance: To promote the mission of the program by:

      i) *Technical Assistance*: Continue to offer technical assistance through telephonic and email communication and through the web portal.

      ii) *RMP Screening*: Provide direct technical assistance to owners/operators of stationary sources that have data errors or are at risk of failing to update their RMPs at least once every five years as well as other updates required by §68.190.

   c) Regulatory Review and Enforcement: To continue to promote effective chemical risk management programs through:

      i) *Air Permitted facilities*: Continue to assure that air permitted facility representatives address RMP implementation as part of their air permit.

      ii) *RMP Inspections*: To inspect at least 20% of all regulated facilities and at least 40% of EPA designated "High Risk" facilities annually. Also, ensure that all RMP regulated facilities are inspected at least once every five years.

      iii) *Investigate Incidents*: Investigate reports of chemical accidents involving regulated substances.

      iv) *Enforcement Actions*: To utilize enforcement authority when violations occur.

   d) Emergency Response Planning: To plan for handling accidental chemical releases.

      i) *Emergency Planning*: Continue to work with LEPCs, SERC, or other related associations.

      ii) *Industry Outreach*: Collaborate with industry representatives through on-site consultation and emergency planning as mandated by Subpart E to 40 CFR Part 68.

      iii) *North Carolina Chemical Hazard Mitigation Plan*: Continue to support efforts to assess the risk of chemical hazards in North Carolina as part of the Federal Emergency Management Agency's (FEMA) Threat and Hazard Identification and Risk Assessment (THIRA) process.

   e) Trends Analysis: To continue to measure effectiveness of the program through identified performance indicators such as reductions in community vulnerabilities to releases of regulated substances, number of subject facilities, and impacts from associated chemical accidents.