AGENDA ITEM 6

RULE SUMMARY

Subject: **Amendment to Acceptable Ambient Level for Arsenic** (514)

Rule Citation	What is Changed	Purpose of Change (Why)	Who is Affected and How	Impacts
15A NCAC 02D .1104 *Toxic Air Pollutant Guidelines*	The Acceptable Ambient Level (AAL) value for arsenic and arsenic-containing inorganic compounds (arsenic compounds) of 2.3 x 10^{-7} milligrams per cubic meter (mg/m^3) has changed to 2.1 x 10^{-6} mg/m^3 on an annual average basis.	In response to a request made by the North Carolina Division of Air Quality (DAQ), the Secretary's Science Advisory Board for Toxic Air Pollutants (NCSAB) reassessed the AAL for arsenic compounds. Based on up-to-date information and risk assessment methods widely accepted and used by regulatory bodies, the NCSAB recommends an update to the AAL for these compounds.	There are three groups of affected parties: 1. Currently 450 facilities with emissions of arsenic compounds required to have an air quality permit. Reduced regulatory burden due to amendments as 137 fewer facilities are affected.	The analysis assumed $196,000 in annualized avoided costs begin the first year due to less restrictive permit conditions or not installing add-on controls. These cumulative avoided costs reach $980,000 within the five year period of analysis, assuming two percent more of the potentially affected facilities each year experience these cost savings.
15A NCAC 02Q .0711 *Emission Rates Requiring a Permit* 15A NC	The corresponding value for toxic air pollutant permitting emissions rates (TPER) for arsenic compounds has changed from 0.016 pounds per year to 0.053 pounds per year.	The TPER must likewise be changed because its value is derived directly from the AAL value.	2. Less DAQ compliance modeling demonstration review effort due to a lower TPER affecting fewer facilities.	Annual avoided cost for DAQ modeling effort of $14,700.
			3. The North Carolina general public.	May reduce regulatory burden without compromising the health based guidelines of the NCSAB.

15A NCAC 02D .1104 is proposed for amendment as follows:

15A NCAC 02D .1104 TOXIC AIR POLLUTANT GUIDELINES

A facility shall not emit any of the following toxic air pollutants in such quantities that may cause or contribute beyond the premises (adjacent property boundary) to any significant ambient air concentration that may adversely affect human health. In determining these significant ambient air concentrations, the Division shall be guided by the following list of acceptable ambient levels in milligrams per cubic meter at 77° F (25° C) and 29.92 inches (760 mm) of mercury pressure (except for asbestos):

Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
acetaldehyde (75-07-0)				27
acetic acid (64-19-7)				3.7
acrolein (107-02-8)				0.08
acrylonitrile (107-13-1)		0.03	1	
ammonia (7664-41-7)				2.7
aniline (62-53-3)			1	
arsenic and inorganic arsenic compounds	~~2.3 x 10^{-7}~~ 2.1 x 10^{-6}			
asbestos (1332-21-4)	2.8 x 10^{-11} fibers/ml			
aziridine (151-56-4)		0.006		
benzene (71-43-2)	1.2 x 10^{-4}			
benzidine and salts (92-87-5)	1.5 x 10^{-8}			
benzo(a)pyrene (50-32-8)	3.3 x 10^{-5}			
benzyl chloride (100-44-7)			0.5	
beryllium (7440-41-7)	4.1 x 10^{-6}			
beryllium chloride (7787-47-5)	4.1 x 10^{-6}			
beryllium fluoride (7787-49-7)	4.1 x 10^{-6}			
beryllium nitrate (13597-99-4)	4.1 x 10^{-6}			
bioavailable chromate pigments, as chromium (VI) equivalent	8.3 x 10^{-8}			
bis-chloromethyl ether (542-88-1)	3.7 x 10^{-7}			
bromine (7726-95-6)				0.2

Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
1,3-butadiene (106-99-0)	4.4×10^{-4}			
cadmium (7440-43-9)	5.5×10^{-6}			
cadmium acetate (543-90-8)	5.5×10^{-6}			
cadmium bromide (7789-42-6)	5.5×10^{-6}			
carbon disulfide (75-15-0)		0.186		
carbon tetrachloride (56-23-5)	6.7×10^{-3}			
chlorine (7782-50-5)		0.0375		0.9
chlorobenzene (108-90-7)		2.2		
chloroform (67-66-3)	4.3×10^{-3}			
chloroprene (126-99-8)		0.44	3.5	
cresol (1319-77-3)			2.2	
p-dichlorobenzene (106-46-7)				66
dichlorodifluoromethane (75-71-8)		248		
dichlorofluoromethane (75-43-4)		0.5		
di(2-ethylhexyl)phthalate (117-81-7)		0.03		
dimethyl sulfate (77-78-1)		0.003		
1,4-dioxane (123-91-1)		0.56		
epichlorohydrin (106-89-8)	8.3×10^{-2}			
ethyl acetate (141-78-6)			140	
ethylenediamine (107-15-3)		0.3	2.5	
ethylene dibromide (106-93-4)	4.0×10^{-4}			
ethylene dichloride (107-06-2)	3.8×10^{-3}			
ethylene glycol monoethyl ether (110-80-5)		0.12	1.9	
ethylene oxide (75-21-8)	2.7×10^{-5}			
ethyl mercaptan (75-08-1)			0.1	
fluorides		0.016	0.25	
formaldehyde (50-00-0)				0.15
hexachlorocyclopentadiene (77-47-4)		0.0006	0.01	
hexachlorodibenzo-p-dioxin (57653-85-	7.6×10^{-8}			

Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
7)				
n-hexane (110-54-3)		1.1		
hexane isomers except n-hexane				360
hydrazine (302-01-2)		0.0006		
hydrogen chloride (7647-01-0)				0.7
hydrogen cyanide (74-90-8)		0.14	1.1	
hydrogen fluoride (7664-39-3)		0.03		0.25
hydrogen sulfide (7783-06-4)		0.12		
maleic anhydride (108-31-6)		0.012	0.1	
manganese and compounds		0.031		
manganese cyclopentadienyl tricarbonyl (12079-65-1)		0.0006		
manganese tetroxide (1317-35-7)		0.0062		
mercury, alkyl		0.00006		
mercury, aryl and inorganic compounds		0.0006		
mercury, vapor (7439-97-6)		0.0006		
methyl chloroform (71-55-6)		12		245
methylene chloride (75-09-2)	2.4×10^{-2}		1.7	
methyl ethyl ketone (78-93-3)		3.7		88.5
methyl isobutyl ketone (108-10-1)		2.56		30
methyl mercaptan (74-93-1)			0.05	
nickel carbonyl (13463-39-3)		0.0006		
nickel metal (7440-02-0)		0.006		
nickel, soluble compounds, as nickel		0.0006		
nickel subsulfide (12035-72-2)	2.1×10^{-6}			
nitric acid (7697-37-2)				1
nitrobenzene (98-95-3)		0.06	0.5	
n-nitrosodimethylamine (62-75-9)	5.0×10^{-5}			
non-specific chromium (VI)	8.3×10^{-8}			

Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
compounds, as chromium (VI) equivalent				
pentachlorophenol (87-86-5)		0.003	0.025	
perchloroethylene (127-18-4)	1.9 x 10^{-1}			
phenol (108-95-2)			0.95	
phosgene (75-44-5)		0.0025		
phosphine (7803-51-2)				0.13
polychlorinated biphenyls (1336-36-3)	8.3 x 10^{-5}			
soluble chromate compounds, as chromium (VI) equivalent		6.2 x 10^{-4}		
styrene (100-42-5)			10.6	
sulfuric acid (7664-93-9)		0.012	0.1	
tetrachlorodibenzo-p-dioxin (1746-01-6)	3.0 x 10^{-9}			
1,1,1,2-tetrachloro-2,2,- difluoroethane (76-11-9)		52		
1,1,2,2-tetrachloro-1,2- difluoroethane (76-12-0)		52		
1,1,2,2-tetrachloroethane (79-34-5)	6.3 x 10^{-3}			
toluene (108-88-3)		4.7		56
toluene diisocyanate, 2,4- (584-84-9) and 2,6- (91-08-7) isomers		0.0002		
trichloroethylene (79-01-6)	5.9 x 10^{-2}			
trichlorofluoromethane (75-69-4)			560	
1,1,2-trichloro-1,2,2- trifluoroethane (76-13-1)				950
vinyl chloride (75-01-4)	3.8 x 10^{-4}			
vinylidene chloride (75-35-4)		0.12		
xylene (1330-20-7)		2.7		65

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.107(a)(3),(4),(5); 143B-282; S.L. 1989, c. 168, s. 45;*

Eff. May 1, 1990;
Amended Eff. September 1, 1992; March 1, 1992;
Temporary Amendment Eff. July 20, 1997;
Amended Eff. __________; March 1, 2010; June 1, 2008; April 1, 2005; April 1, 2001; July 1, 1998.

15A NCAC 02Q .0711 is proposed for amendment as follows:

15A NCAC 02Q .0711 EMISSION RATES REQUIRING A PERMIT

(a) A permit to emit toxic air pollutants is required for any facility whose actual (or permitted if higher) rate of emissions from all sources are greater than any one of the following toxic air pollutant permitting emissions rates:

Pollutant (CAS Number)	Carcinogens lb/yr	Chronic Toxicants lb/day	Acute Systemic Toxicants lb/hr	Acute Irritants lb/hr
acetaldehyde (75-07-0)				6.8
acetic acid (64-19-7)				0.96
acrolein (107-02-8)				0.02
acrylonitrile (107-13-1)		0.4	0.22	
ammonia (7664-41-7)				0.68
aniline (62-53-3)			0.25	
arsenic and inorganic arsenic compounds	~~0.016~~ 0.053			
asbestos (1332-21-4)	1.9 X 10^{-6}			
aziridine (151-56-4)		0.13		
benzene (71-43-2)	8.1			
benzidine and salts (92-87-5)	0.0010			
benzo(a)pyrene (50-32-8)	2.2			
benzyl chloride (100-44-7)			0.13	
beryllium (7440-41-7)	0.28			
beryllium chloride (7787-47-5)	0.28			
beryllium fluoride (7787-49-7)	0.28			
beryllium nitrate (13597-99-4)	0.28			
bioavailable chromate pigments, as chromium (VI) equivalent	0.0056			
bis-chloromethyl ether (542-88-1)	0.025			
bromine (7726-95-6)				0.052
1,3-butadiene (106-99-0)	11			
cadmium (7440-43-9)	0.37			
cadmium acetate (543-90-8)	0.37			
cadmium bromide (7789-42-6)	0.37			
carbon disulfide (75-15-0)		3.9		

carbon tetrachloride (56-23-5)	460			
chlorine (7782-50-5)		0.79		0.23
chlorobenzene (108-90-7)		46		
chloroform (67-66-3)	290			
chloroprene (126-99-8)		9.2	0.89	
cresol (1319-77-3)			0.56	
p-dichlorobenzene (106-46-7)				16.8
dichlorodifluoromethane (75-71-8)		5200		
dichlorofluoromethane (75-43-4)		10		
di(2-ethylhexyl)phthalate (117-81-7)		0.63		
dimethyl sulfate (77-78-1)		0.063		
1,4-dioxane (123-91-1)		12		
epichlorohydrin (106-89-8)	5600			
ethyl acetate (141-78-6)			36	
ethylenediamine (107-15-3)		6.3	0.64	
ethylene dibromide (106-93-4)	27			
ethylene dichloride (107-06-2)	260			
ethylene glycol monoethyl ether (110-80-5)		2.5	0.48	
ethylene oxide (75-21-8)	1.8			
ethyl mercaptan (75-08-1)			0.025	
fluorides		0.34	0.064	
formaldehyde (50-00-0)				0.04
hexachlorocyclopentadiene (77-47-4)		0.013	0.0025	
hexachlorodibenzo-p-dioxin (57653- 85-7)	0.0051			
n-hexane (110-54-3)		23		
hexane isomers except n-hexane				92
hydrazine (302-01-2)		0.013		
hydrogen chloride (7647-01-0)				0.18
hydrogen cyanide (74-90-8)		2.9	0.28	
hydrogen fluoride (7664-39-3)		0.63		0.064
hydrogen sulfide (7783-06-4)		1.7		
maleic anhydride (108-31-6)		0.25	0.025	
manganese and compounds		0.63		
manganese cyclopentadienyl tricarbonyl (12079-65-1)		0.013		

manganese tetroxide (1317-35-7)		0.13		
mercury, alkyl		0.0013		
mercury, aryl and inorganic compounds		0.013		
mercury, vapor (7439-97-6)		0.013		
methyl chloroform (71-55-6)		250		64
methylene chloride (75-09-2)	1600		0.39	
methyl ethyl ketone (78-93-3)		78		22.4
methyl isobutyl ketone (108-10-1)		52		7.6
methyl mercaptan (74-93-1)			0.013	
nickel carbonyl (13463-39-3)		0.013		
nickel metal (7440-02-0)		0.13		
nickel, soluble compounds, as nickel		0.013		
nickel subsulfide (12035-72-2)	0.14			
nitric acid (7697-37-2)				0.256
nitrobenzene (98-95-3)		1.3	0.13	
n-nitrosodimethylamine (62-75-9)	3.4			
non-specific chromium (VI) compounds, as chromium (VI) equivalent	0.0056			
pentachlorophenol (87-86-5)		0.063	0.0064	
perchloroethylene (127-18-4)	13000			
phenol (108-95-2)			0.24	
phosgene (75-44-5)		0.052		
phosphine (7803-51-2)				0.032
polychlorinated biphenyls (1336-36- 3)	5.6			
soluble chromate compounds, as chromium (VI) equivalent		0.013		
styrene (100-42-5)			2.7	
sulfuric acid (7664-93-9)		0.25	0.025	
tetrachlorodibenzo-p-dioxin (1746- 01-6)	0.00020			
1,1,1,2-tetrachloro-2,2,- difluoroethane (76-11-9)		1100		
1,1,2,2-tetrachloro-1,2- difluoroethane (76-12-0)		1100		
1,1,2,2-tetrachloroethane (79-34-5)	430			
toluene (108-88-3)		98		14.4

toluene diisocyanate,2,4-(584-84-9) and 2,6- (91-08-7) isomers		0.003		
trichloroethylene (79-01-6)	4000			
trichlorofluoromethane (75-69-4)			140	
1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1)				240
vinyl chloride (75-01-4)	26			
vinylidene chloride (75-35-4)		2.5		
xylene (1330-20-7)		57		16.4

(b) For the following pollutants, the highest emissions occurring for any 15-minute period shall be multiplied by four and the product shall be compared to the value in Paragraph (a). These pollutants are:

(1) acetaldehyde (75-07-0);
(2) acetic acid (64-19-7);
(3) acrolein (107-02-8);
(4) ammonia (7664-41-7);
(5) bromine (7726-95-6);
(6) chlorine (7782-50-5);
(7) formaldehyde (50-00-0);
(8) hydrogen chloride (7647-01-0);
(9) hydrogen fluoride (7664-39-3); and
(10) nitric acid (7697-37-2).

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.108; 143B-282; S L. 1989, c. 168, s. 45;*
Rule originally codified as part of 15A NCAC 02H .0610;
Eff. July 1, 1998;
Amended Eff. __________; January 1, 2010; June 1, 2008; April 1, 2005; February 1, 2005; April 1, 2001.

AGENDA ITEM 6

ECONOMIC ANALYSIS

Rule Citation Number: 15A NCAC 02D .1104 *Toxic Air Pollutant Guidelines*, and 02Q .0711 *Emission Rates Requiring a Permit (*TPER*)*

Rule Topic: **Amendments to Acceptable Ambient Level for Arsenic** (514)

DENR Division: Division of Air Quality

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Impact Summary:

State government:	Yes
Local government:	No
Substantial impact:	Yes
Federal government:	Yes
Private Industry:	Yes

Authority: G.S. 143 215.3(a)(1); 143 215.107(a)(4); 143 215.108

Necessity: In response to a request made by the North Carolina Division of Air Quality (DAQ), the Secretary's Science Advisory Board for Toxic Air Pollutants (NCSAB) has reassessed arsenic and arsenic-containing inorganic compounds (AsC) and recommends an update to the Acceptable Ambient Level (AAL) for these compounds. It is in the public interest to adopt these amendments because it may reduce regulatory burden without compromising health benefits.

I. Executive Summary

This document evaluates the costs and benefits associated with a revision to the acceptable ambient level (AAL) for Arsenic Compounds (AsC).This change involves amending two rules: 15A NCAC 02D .1104, Toxic Air Pollutant Guidelines and 02Q .0711, Emission Rates Requiring a Permit, which is commonly referred to as the "toxics permit emission rate" (TPER). See Appendix for proposed rule text. These state air toxics program rules establish the value against which a facility's emissions and resulting modeled ambient concentrations are compared in the permitting process. DAQ staff and the North Carolina Science Advisory Board (NCSAB) support the amendment.

The current AAL for AsC is 2.3 x 10^{-7} milligrams per cubic meter (mg/m^3). The proposed amendment would change the annual AAL for Arsenic Compounds to 2.1 x 10^{-6} mg/m^3. The proposed standard would be less stringent than the one currently utilized. Amending the annual AAL would require changing the corresponding emission rate requiring a permit (TPER). The amendment replaces the current annual TPER of 0.016 pounds per year with an annual TPER of 0.053 pounds per year. These amendments may represent a potential cost savings for operations when any modification is evaluated against a related existing permit restriction at a facility.

Arsenic is a known human carcinogen. The NCSAB recommendation to revise the AAL for AsC is based upon current scientific studies and widely accepted risk assessment methods. The NCSAB establishes the AAL based on inhalation exposure limits to ambient arsenic concentrations. The board's final recommendation, referred to as the "central estimate" or "central AAL" in this analysis, is 2.1 x 10^{-6} mg/m^3. This recommendation is within an exposure range from a statistical lower bound of 1.6 x 10^{-6} mg/m^3 to an upper bound of 3.0 x 10^{-6} mg/m^3. Public health would not be impacted by the proposed relaxation of the AsC standard The change in the standard is possible due to better data quality that shows a higher arsenic AAL would not increase the public health risk.

In November 2012, The Division of Air Quality reviewed its emission inventory of North Carolina facilities that emit arsenic compounds to determine if any economic impacts are likely to occur from the proposed rule change. Accordingly, there were 450 facilities out of 686 with actual arsenic emissions that were greater than the current TPER of 0.016 pounds per year. Under existing rules, all of these 450 facilities are required to demonstrate compliance with the NC Air Toxics Program when their permit modification triggers review. After the amendment becomes effective, only 313 emitting facilities will exceed the proposed annual TPER of 0.053 pounds per year. Therefore, the impact of this proposed rule change is that 137 fewer facilities would exceed the proposed annual TPER limit. For approximately 80 percent of these permitted facilities, this proposed AAL will have no impact with respect to toxic air pollutant compliance and demonstration modeling. Occasionally, some of the 137 facilities that previously limited production to remain below the existing annual AAL limit may get some regulatory relief, but only if a previously required permit restriction can be modified.

Table 1, Avoided Cost Summary, estimates substantial economic impacts in the form of regulatory relief that results in avoided cost impacts from adoption of these rule amendments. The relief may affect government owned state or federal facilities. There are avoided costs for the Division of Air Quality. Local governments did not own any of the facilities that are expected to receive regulatory relief due to the rule amendments associated with the central AAL. There are no impacts on any of the three local air programs in North Carolina. There may be related small business impacts due to the regulatory relief that are similar to typical facilities. The five-year net present value of the proposed rule is $2.4 million in savings.

Table 1. Avoided Cost Summary

	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18
Local Government Impact	$0	$0	$0	$0	$0
State Government Impact	$14,700	$14,700	$14,700	$14,700	$14,700
Federal Government Impact	$5,600	$11,200	$16,800	$22,400	$28,000
Private Sector Impact	$190,400	$380,800	$571,200	$761,600	$952,000
Total Impact	$210,700	$406,700	$602,700	$798,700	$994,700

Depending on the type of compliance actions facilities currently perform, savings can either be one-time modeling cost avoidance or recurring add-on control cost avoidance. The analysis assumed that approximately $211,000 in annual avoided costs begins to occur the first year. The portion of the cost representing cost savings from annualized add-on control cost grows each year using an assumption that two percent more of the potentially affect parties experience these same cost savings. The total annual avoided cost may grow to $994,700 within the five year period of this analysis. It also is possible that none of these facilities will need to make a modification that would result in an increase in their arsenic limit and trigger a permit review. In such a case, the proposed rule change would result in no cost savings.

Due to regulatory relief, these rule amendments are estimated to cause substantial economic impacts as defined in the Administrative Procedures Act in N.C.G.S. *150B-21.4.*

Proposed Effectiveness Date is August 1, 2013.

II. Background

The state air toxics rules administered by the Division of Air Quality (DAQ) were established in the early 1990s in the absence of an effective federal program to protect citizens from adverse health effects from exposure to toxic air pollutants. North Carolina's health risk-based air toxics rules provide for local scale evaluation of the maximum impact of air toxic emissions from a facility at or beyond its property boundary through site-specific emissions estimates and modeling.

The rules set Acceptable Ambient Level (AAL), where "acceptable" means "below the concentration that would produce adverse health effects in sensitive subgroups of the general population."[1] The rules require the regulated community to reduce emissions of toxic air pollutants below those levels that are predicted to exceed the AAL beyond their property line. The DAQ air toxics program uses computer-based air dispersion models to compare toxic air pollutant emissions to AALs.

Currently, the Secretary of Environment and Natural Resources maintains a scientific body of experts known as the Science Advisory Board (NCSAB),[2] whose job it is to continually review the scientific information that forms the basis of the AALs. As this information changes, the NCSAB recommends updates to the AALs. The NCSAB reviews are focused on recommending safe exposure concentrations for toxic air pollutants that allow an ample margin of safety for people with potential exposures. NCSAB's final recommendations are considered by DAQ in drafting rules for AAL concentrations; however, any changes to the AALs go through the normal rulemaking process, with the Environmental Management Commission making the final decision.

Determining what exposure level to a toxic air pollutant is acceptable is challenging. First, health assessment professionals carefully study what is known about a pollutant to determine

[1] North Carolina Academy of Sciences (1986). Report and Recommendations of the Air and Toxics Panel of the North Carolina Academy of Sciences. http://daq.state.nc.us/toxics/riskintro.pdf

[2] The NCSAB is composed of eight individuals, appointed to four-year terms, having expertise in environmental health, occupational and pediatric medicine, toxicology, risk assessment, exposure assessment, epidemiology and biostatistics. The NCSAB meets regularly to perform risk assessments on toxic air pollutants emitted in North Carolina.

if it is a carcinogen or not. Next, they identify the lowest level known to harm people or the highest level at which health effects are not observed. Then, from one of these starting points, several safety factors may be used to reduce that level in order to protect sensitive people, such as children or asthmatics, or to account for other possible adverse health effects that have not been fully studied. In general, larger safety factors are used when less is known about the health impacts of a chemical. For example, if an adverse health effect is observed in a study of human adult males, then to protect children, the level that caused harm in the adults is reduced using safety factors that address differences in body mass or gender. In the some cases, evidence of toxic effects in animals can be extrapolated to humans after making adjustments for differences in physiology, breathing patterns or other factors. The use of safety factors is a standard approach employed by health professionals in federal, state and academic institutions when determining safe exposure levels. It is especially valuable when there are gaps in scientific data.

For toxic air pollutants that are known to cause cancer, especially for those known to cause cancer in humans such as arsenic, risk assessment methods assume by default that any exposure contains some risk. (double negative). In these cases, the conventional scientific approach used by academia and state and federal health protection programs is to set extremely low risk exposure guidelines, usually based on a concept of additional cancers not to exceed "one in a million." Meaning, if one million people were exposed to this pollutant level continuously, then statistically one additional person would be expected to develop cancer from this exposure over and above the "usual" cancer rate expected in a population. (Similarly, the excess cancer risk is less restrictive for those chemicals that are known to cause cancer in animals, but evidence in humans is incomplete.)

The North Carolina air toxics rules approach protection of public health differently than the United States Environmental Protection Agency's (USEPA) regulations for toxic air pollution. In the 1990 Clean Air Act Amendments, Congress directed USEPA to use a technology-based approach to significantly reduce emissions of air toxics from major stationary sources of air pollution, followed by a risk-based approach to address any remaining, or residual risks. Under the technology-based approach, USEPA develops standards for controlling the emissions of air toxics from each major type of source within an industry group. These standards, known as Maximum Achievable Control Technology (MACT) and Generally Available Control Technology (GACT), are based on emission levels that are already being achieved by the better-controlled and lower-emitting sources in an industry. The USEPA has issued all of the technology based standards (although a few are being reconsidered), and is in the process of addressing residual risks from each of the source categories. To date, USEPA has issued 40 percent of the residual risk regulations.

A new provision in Session Law 2012-91 specifies that sources subject to the federal air toxics requirement for MACT and GACT equipment installation would not have to demonstrate compliance with the state rules, unless the DAQ director determined that the source emissions posed unacceptable health risks. DAQ makes this determination by performing demonstration modeling. Often times, installing the technologies required under the federal rules allows a facility to also meet the state health-based standard, which evaluates emissions at a facility's property boundaries, so no further action is required. If the emissions however still exceed the public health guideline at the property boundary, the state program works with the facility to identify other measures the facility can implement to lower the level of toxic air pollutants.

The session law also requires DAQ to review all permit applications for new sources or for modifications to existing facilities in which there are toxics emissions increases to ensure the protection of public health. This is performed through demonstration modeling.

III. Necessity for Rule Change

The proposed amendments are necessary to revise the AAL for Arsenic Compounds (AsC) as a result of the agency identifying a possible burden reduction that would not affect health standards. This reduction is possible due to new data showing the health standard of no more than one additional cancer case in a million can be achieved with a less stringent emission rate. The amendments are being proposed based on recommendation of the North Carolina Science Advisory Board (NCSAB). This change involves amending two rules: 15A NCAC 02D .1104, Toxic Air Pollutant Guidelines and 02Q .0711, The Emission Rates Requiring a Permit (also referred to as the "toxics permit emission rate" - TPER).

The NCSAB recommendation to revise the AAL for AsC is based upon current scientific studies and widely accepted risk assessment methods. The final recommendation from NCSAB is 2.1 x10^{-6} mg/m^3, the central estimate, within an exposure range from a statistical lower bound of 1.6 x 10^{-6} mg/m^3 to an upper bound of 3.0 x 10^{-6} mg/m^3.

Health benefits remain unchanged from adoption of the proposed AAL, The change in the standard is possible due to better data quality that shows a higher AsC AAL would not increase the public health risk. These amendments, however, may reduce the financial burden of these rules since in certain circumstances they could present cost savings for public and private operations when an existing permit restriction is modified at a facility.

These amendments also are consistent with the General Assembly mandated review of the state air toxics rules in Session Law 2012-91. The law requires the state Division of Air Quality, or DAQ, to review the state air toxics rules and determine whether changes could be made to reduce unnecessary regulatory burden and increase efficient use of DAQ resources while maintaining protection of public health.

IV. Description of the Current Rules and Proposed Changes

15A NCAC 02D .1104, *Toxic Air Pollutant Guidelines*. The table included in the rule establishes Acceptable Ambient Level (AAL) concentrations expressed in milligrams per cubic meter for each toxic air pollutant. Depending on the health effect toxicology, there may be a one-hour AAL established for acute systemic or irritant toxicants or a 24-hour AAL established in consideration of chronic effects. In the case of arsenic, the existing annual AAL was established for carcinogens.

15A NCAC 02Q .0711, *Emission Rates Requiring a Permit* (TPER). The table included in this rule contains toxic permit emission rates with annual, daily or hourly periods associated with their corresponding AALs. A facility must demonstrate through modeling that predicted maximum concentrations at and beyond the property boundary line are below AALs as defined in Toxic Air Pollutant Guidelines.

The NCSAB recommends amending the current annual AAL of 2.3 x 10^{-7} mg/m^3 for Arsenic Compounds to 2.1 x10^{-6} mg/m^3, their central estimate. Modification of any AAL requires changing the corresponding emission rate requiring a permit (TPER) for that averaging period. These amendments will replace the current TPER of 0.016 pounds per year with the "central estimate" TPER of 0.053 pound per year. The recommended AAL range corresponds to a low TPER of 0.041 to a high TPER of 0.076 pound per year.

V. Establishment of the Regulatory Baseline

To understand what the impact of the proposed rule would be, it is important to establish a baseline for comparison. Table 2 below shows the current number of arsenic-emitting facilities by industry. Total annual arsenic compound emissions from these 686 facilities summed to 3,740 pounds emitted in North Carolina. Based on small fluctuations in recent trends, this analysis assumes that the number of facilities and emissions remain constant over the next five years.

Table 2. Summary of Facility Counts ranked by percentage of total Annual Arsenic Compound Emissions, by North American Industry Classification System (NAICS)

NAICS DESCRIPTIONS	Facility Count	Arsenic (lb/yr)	% of Total Arsenic
Fossil Fuel Electric Power Generation	26	2,377	63.5%
Paper (except Newsprint) Mills	4	551	14.7%
National Security	6	277	7.4%
Glass Container Manufacturing	3	86	2.3%
Sawmills	15	55	1.5%
Noncellulosic Organic Fiber Manufacturing	5	48	1.3%
Other Electric Power Generation	3	36	1.0%
Cut Stock, Resawing Lumber, and Planing	13	28	0.8%
Broadwoven Fabric Mills	4	28	0.7%
Nonupholstered Wood Household Furniture Manufacturing	28	25	0.7%
Tobacco Stemming and Redrying	2	25	0.7%
Brick and Structural Clay Tile Manufacturing	11	25	0.7%
Phosphatic Fertilizer Manufacturing	1	20	0.5%
Steam and Air-Conditioning Supply	2	19	0.5%
Softwood Veneer and Plywood Manufacturing	3	12	0.3%
Ready-Mix Concrete Manufacturing	181	12	0.3%
All Other Miscellaneous Wood Product Manufacturing	8	12	0.3%
Solid Waste Combustors and Incinerators	4	9	0.2%
Flat Glass Manufacturing	2	8	0.2%
Hardwood Veneer and Plywood Manufacturing	8	8	0.2%
Reconstituted Wood Product Manufacturing	5	7	0.2%
Asphalt Paving Mixture and Block Manufacturing	87	7	0.2%
Textile and Fabric Finishing (except Broadwoven Fabric) Mills	8	7	0.2%
Other Animal Food Manufacturing	13	6	0.2%
Iron and Steel Mills	1	4	0.1%
Rendering and Meat Byproduct Processing	3	4	0.1%
Corrugated and Solid Fiber Box Manufacturing	4	4	0.1%
106 Additional NAICS CODES Combined	236	40	1.1%
Total	**686**	**3,740**	**100.0%**

Facilities with emissions greater than the current TPER face three different tiers of compliance costs: simple modeling, complex modeling, and add-on controls. Both simple and complex modeling costs are generally born by DAQ. This is a result of the session law 2012-91 that requires DAQ to review all permit applications for new sources or for modifications to existing facilities that would result in toxics emission increases, including those exempt by virtue of complying with MACT and GACT federal requirements, in order to ensure the protection of public health at the facility boundary and beyond. This review includes demonstration modeling, which requires inputs that represent the maximum average emission rate associated with annual averaging periods and the emission profile represents a temporal distribution of emissions. Annual arsenic concentrations determine compliance with the AAL and the TPER is based on threshold levels measures in pound of AsC per year.

The regulatory baseline assumes that if a facility has annual AsC emissions above the TPER but less than ten times the TPER, then the first level of regulatory burden results in average opportunity costs by DAQ for simple modeling of $2,000 per facility. The required air dispersion models use simple site-specific parameters including: stack height and location, property boundary distance, plus exit gas temperature and velocity. Quite often this simple modeling process is able to demonstrate compliance with the AAL without add-on controls or the addition of enforceable permit restrictions. The modeling cost estimates contained in this analysis were validated by DAQ permitting staff.

If annual arsenic emissions at a facility are between ten-times and one hundred times the TPER, then this regulatory burden results in an average modeling cost of $8,000 per facility. This stage utilizes more complex dispersion models and additional detailed site-specific parameters including building dimensions and terrain geography. For this analysis, expenses incurred for the complex modeling process are assumed to result in an adequate compliance demonstration with the AAL without add-on controls or enforceable permit restrictions.

The final level of baseline regulatory impact assumes that facilities with annual arsenic emissions that are one-hundred times above the TPER are going to incur expenditures related to purchase and operate pollution abatement controls or enforceable permit restrictions. A previous study, performed by the DAQ modeling staff, revealed that 76% of compliance demonstrations required permit restrictions. These restrictions included permit limits on emissions (47%), operating hours (38%), and/or limits on fuel usage (21%), in various combinations. Additional permit restrictions involve physical modification (add-on controls) at the facility and include control devices (43%), stack modifications (11%), source relocation (2%), source design (6%) and/or reformulation (4%).

There are a wide range of reasonably available add-on controls based on the emission profile of different industry groups and processes. Previous 2008 analysis prepared for the Director's Call and cost estimates for particulate controls on the combustion source exemption rules for the air toxics program assumed an average annualized cost of $280,000 for such add-on controls (this includes both capital costs and operation and maintenance costs).[3] This estimate represents an average composite cost of add-on controls, usually these are some combination

[3] North Carolina Office of State Budget and Management. Regulatory Analysis. "Economic Analysis: Address Combustion Source Exemption in North Carolina Air Toxics Rules (472)" approved by OSBM on 9/8/2008. http://www.osbm.state.nc.us/files/pdf_files/DENR09082008.pdf

of filter baghouses or electro static precipitators. The range of controls is selected to represent the variability expected between the extremes of these cost savings.

As mentioned above, besides installing emission reducing add-on controls this impact category accounts for various alternative methods of demonstrating compliance with the AAL such as: fuel-switching, stack modification, process reformulation, or binding permit condition. The suitability of these options is site and source dependent. Due to this uncertainty, the average add-on control is used as a proxy for these generalized other compliance costs, which a presumably lower, so the 2008 cost estimate of $280,000 is not adjusted for inflation. Note that while the facility bears the cost of add-on controls, complex modeling analysis is done by DAQ to determine compliance through permit conditions.

In summary, there are several options responses that a facility may use to demonstrate compliance with the current AAL for AsC. For the purpose of this fiscal analysis the Division of Air Quality assumed that under the current rules if a facility's annual emissions exceed the TPER, but are less than ten-times the TPER, then simple dispersion modeling, at an average cost of $2,000 is assumed to be conducted by the DAQ. Complex modeling, also performed by DAQ and which costs $8,000, is assumed when emissions are greater than ten-times. If annual emissions are greater than one hundred-times the TPER, then add-on controls with average annualized costs of $280,000 are assumed to be required or permit conditions that demonstrate compliance which is determined though DAQ modeling efforts.

VI. Changes from the Baseline

All facilities in North Carolina with any Arsenic Compound (AsC) emissions that are currently subject to property boundary air toxic concentration limits or whose operations have been constrained by these binding permit restrictions may potentially be affected by the proposed AAL increase (i.e. relaxation of the standard). For such facilities, the baseline has required expenditures that could be reduced or eliminated with the proposed less stringent AAL.

There are a total of 686 facilities in the state that emit AsC. Figure 1 below shows a graphical representation of how many of these facilities emit at or above certain levels of AsC (in pounds per year). Facilities are ranked in descending order by annual Arsenic Compounds (AsC) emissions, expressed in pounds per year and shown on the vertical axis, according to DAQ's most 2011 annual emission inventory. The horizontal axis shows the number of facilities above the current, 0.016 lbs/year, and the proposed, 0.053 lbs/year, toxics permit emission rates (TPER). The figure also presents the statistical range from a "Low TPER" of 0.041 pounds per year to a "High TPER" of 0.076 pounds per year. Approximately, 450 facilities exceed the current annual TPER and 313 would exceed the proposed TPER, which means about 137 facilities would be impacted by this rule change.

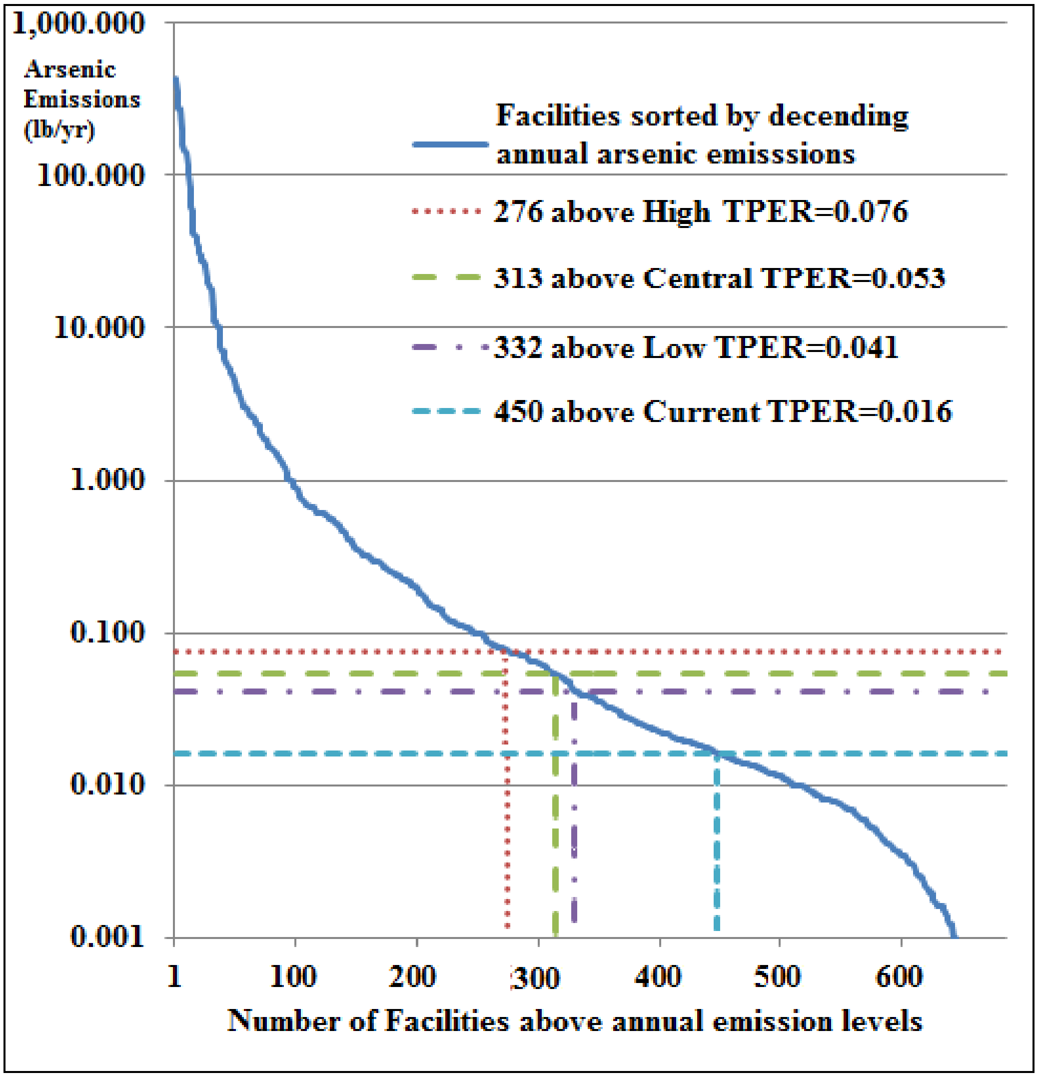

Figure 1. Number of Facilities with Arsenic Compounds (AsC) emissions in pounds per year, with the current toxic permit emission rate (TPER) compared to high, low and central estimate.

Figure 2 shows a detailed graphic illustration of the rank ordered facilities that have annual arsenic emissions greater than ten times (10x) the TPER. Two hundred and nine facilities are over ten times the current TPER, which mean that under the current rules a maximum of 241 facilities can be subject to simple modeling (= 450 facilities operating over current TPER as seen in Figure 1 less 209). Under the proposed rule, 132 facilities would emit over ten times the proposed TPER, which means a maximum of 181 facilities could be subject to simple modeling (= 313 facilities operating over proposed TPER as seen in Figure 1 less 132). As a result of the rule change, a maximum of 60 fewer facilities (=241-181) could be subject to simple modeling.

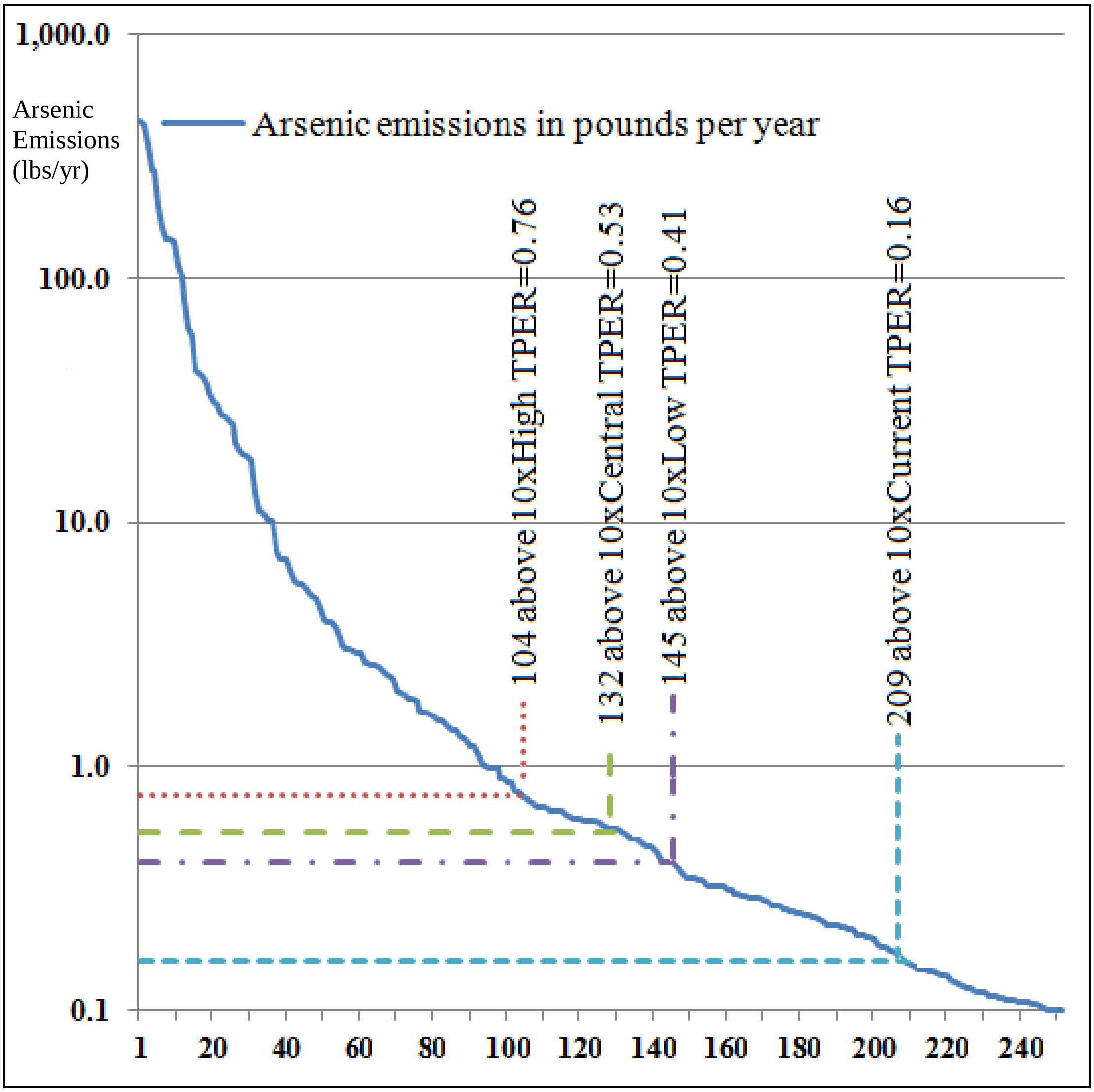

Figure 2. Facilities with annual emissions greater than 10x the proposed TPER.

Figure 3 shows similar detailed view of the rank ordered facilities having emissions greater than one hundred times (100x) the TPER. This provides the basis for comparison of the various TPER alternatives and a method to estimate the marginal cost avoided impacts. Eighty-one facilities operate over a hundred times the current TPER, which mean that under the current rules a maximum of 128 facilities can be subject to complex modeling without add-on controls (= 209 facilities operating over 10x current TPER as seen in Figure 2 less 81). Under the proposed rule, 46 facilities would emit over a hundred times the proposed TPER, which means a maximum of 86 facilities could be subject to simple modeling (= 132 facilities operating over 10x proposed TPER as seen in Figure 2 less 46). As a result of the rule change, a maximum of 42 fewer facilities (=128-86) could be subject to complex modeling without additional add-ons and 35 fewer facilities (=81-46) could be subject to complex modeling plus add-on controls.

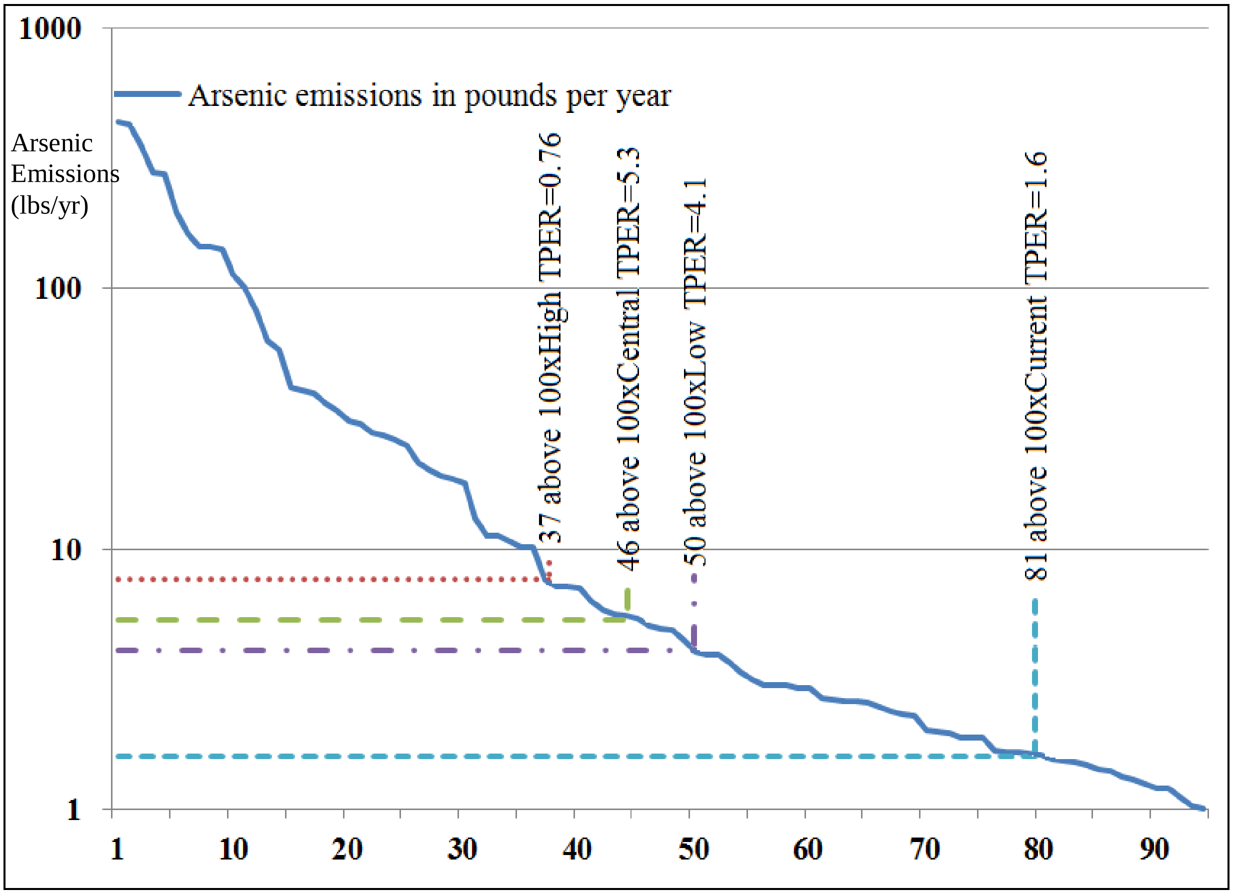

Figure 3. Facilities with annual emissions greater than 100x the proposed TPER.

Table 3 below summarizes the information discussed above and shows the assumed maximum number of facilities subject to different types of compliance options the existing TPER and under the proposed TPER associated with the NCSAB recommendation for the Arsenic AAL, as well as the difference between the two situations. The last column of the table present the amount of savings a facility could incur depending on the type of compliance option.

Table 3. Model baseline and the maximum number of facilities that may be impacted by the change in recommended Central AAL

Compliance Options	Baseline	Proposed Central AAL	Net Change from Baseline	Savings per facility
Simple Model	241	181	-60	$2,000
Complex Model	128	86	-42	$8,000
Add-on Controls Plus Complex Model	81	46	-35	$8,000 for modeling + reoccurring $280,000/yr
Facilities above TPER	**450**	**313**	**-137**	

Note that the maximum of 137 facilities shown above includes those that are exempt from the state air toxics permit because they comply with federal MACT or GACT requirements. The reason for this is that DAQ still has to perform modeling for these facilities under recent legislation and may incur some cost savings as a result of the relaxation in the AAL. Also, the proposed rule change could positively impact the very small number of these facilities qualifying for exemptions that still need to implement add-on controls due to a DAQ determination that their emissions at the property boundary pose an unacceptable health risk. For these calculations, 33 percent of the facilities with arsenic emission were assumed to qualify for that categorical exemption. The assumption is based on a matched query of facilities with arsenic emissions and also subject to federal MACT or GACT.

Table 4 below shows a summary, by industry type, of the maximum pool of 137 facilities that could be impacted, as well as their current AsC emissions in pounds per year. The total arsenic compound emissions from these marginally affected parties were below four pounds per year, a very small fraction of the 3,740 total pounds per year emitted in North Carolina.

Table 4. Summary of Affected Facilities and Arsenic Compound Emissions, by North American Industry Classification System (NAICS) Codes

NAICS CODE	NAICS Description	Facility Count	Sum Arsenic (lb/yr)
32732	Ready-Mix Concrete Manufacturing	50	1.243
324121	Asphalt Paving Mixture and Block Manufacturing	27	0.876
62211	General Medical and Surgical Hospitals	6	0.154
313312	Textile and Fabric Finishing (except Broadwoven Fabric) Mills	4	0.141
327331	Concrete Block and Brick Manufacturing	3	0.060
32739	Other Concrete Product Manufacturing	3	0.077
334413	Semiconductor and Related Device Manufacturing	3	0.090
92811	National Security	2	0.067
313311	Broadwoven Fabric Finishing Mills	2	0.035
337211	Wood Office Furniture Manufacturing	2	0.063
325199	All Other Basic Organic Chemical Manufacturing	2	0.073
33612	Heavy Duty Truck Manufacturing	2	0.067
Multiple	Group of 31 NAICS Descriptions with a single facility count*****	31	0.995
TOTAL	**Affected NAICS Industry Codes with ASC greater than current TPER (0.016 lb /yr), but less than proposed TPER (0.053 lb/yr)**	**137**	**3.941**

* Group of 31 NAICS Descriptions based on single facility count includes:All Other Basic Inorganic Chemical Manufacturing; All Other Nonmetallic Mineral Mining; Ball and Roller Bearing Manufacturing; Biological Product (except Diagnostic) Manufacturing; Cigarette Manufacturing; Colleges, Universities, and Professional Schools; Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing; Concrete Pipe Manufacturing; Correctional Institutions; Corrugated and Solid Fiber Box Manufacturing; Cut Stock, Resawing Lumber, and Planing; Dog and Cat Food Manufacturing; Electric Power Distribution; Fossil Fuel Electric Power Generation; Glass Container Manufacturing; Glass Product Manufacturing Made of Purchased Glass; Hardwood Veneer and Plywood Manufacturing; Motor Vehicle Body Manufacturing; Nonupholstered Wood Household Furniture Manufacturing; Other Hosiery and Sock Mills; Other Major Household Appliance Manufacturing; Other Millwork (including Flooring); Paint and Coating Manufacturing; Petroleum Bulk Stations and Terminals; Plastics Material and Resin Manufacturing; Residential Mental Retardation Facilities; Sawmills; Soybean Processing; Steam and Air-Conditioning Supply; Toilet Preparation Manufacturing; Yarn Spinning Mills.

This maximum number of 137 potentially affected facilities assumes that all facilities chose to make a modification resulting in an increase in their AsC emission level. Such a scenario is not realistic. It is possible that some of these facilities are operating below their current limit, so an increase in the TPER would not provide them with any regulatory relief. Also, 77 (more than 50 percent) of the 137 facilities are asphalt or concrete batch plants, and for these small sources there is currently an ongoing modeling review because they require DAQ assistance with modeling. Aside from DAQ incurring some savings from needing to perform less modeling for them, it is unlikely that these sources would be impacted by the proposed change.

Moreover, some benefits derived from the relaxation of the AAL may be delayed due to a current provision in 15A NCAC 02Q .0709(e), *Demonstrations*, which explicitly addresses any previous permit conditions and sets forth options that an affected facility may select regarding changes in any Acceptable Ambient Level. That existing rule states that:

> "When an acceptable ambient level for a toxic air pollutant in 15A NCAC 02D .1104 is changed, any condition that has previously been put in a permit to protect the previous acceptable ambient level for that toxic air pollutant shall not be changed until:
>
> (1) The permit is renewed, at which time the owner or operator of the facility shall submit an air toxic evaluation showing that the new acceptable ambient level will not be exceeded. If additional time is needed to bring the facility into compliance with the new acceptable ambient level, the owner or operator shall negotiate a compliance schedule with the Director. The compliance schedule shall be written into the facility's permit and final compliance shall not exceed two years from the effective date of the change in the acceptable ambient level.); or
>
> (2) The owner or operator of the facility requests that the condition be changed and submits along with that request an air toxic evaluation showing that the new acceptable ambient level shall not be exceeded."

Due to this provision, the rule change may create an additional cost to DAQ for preparing the evaluation to show the new AAL will not be exceeded at the time of permit renewal: however, this cost is expected to be minimal.

The division does not expect all 137 facilities to incur a benefit due to the reasons mentioned above. It is challenging to determine how many and which specific facilities out of the maximum total would experience lower costs as a result of the increase to the AAL propose in this rulemaking. There is little readily available information upon which to base impact estimates of the proposed change to the AAL. Without reviewing each and every permit there is no practical way to ascertain which facilities are operating at their permit limit, and would therefore be impacted by the rule. Therefore, this analysis assumes, based on staff's knowledge and best judgment, that only ten percent of the entire population of facilities would make a modification sometime within the next five-year period. A simplifying assumption is also made that these modifications would be evenly distributed among the five years (i.e. 2% of facilities would request a permit modification each year).

VII. Estimating the Cost Impacts to Affected Sources

As described in the section above, there are potential cost-savings to private sector sources due to these rule amendments. Compared to the current TPER, the proposed "central estimate" AAL may provide different degrees of regulatory relief for 137 facilities. If a facility doesn't wish to expand, then relaxing a non-binding permit restriction may not result in actual emissions increases. Such changes may provide only an extra compliance assurance margin, the value of which is not possible to estimate and is not presented in this analysis.

If facilities have been restricting operation due to the current annual AAL, they may request to modify those permit restrictions in response to these proposed amendments. The potential cost savings of this regulatory relief is uncertain due to limited knowledge of the site specific emission profiles and resulting regulatory responses of the facilities. For these reasons, the potential cost savings estimates included in the final cost summation of this economic analysis contain uncertainty.

Table 5 shows the type of compliance options and each one's potential costs impacts. The DAQ Permit Section provided the following cost estimates of the compliance cost options.

Table 5. Cost Estimated of various Compliance Options

Simple Modeling by DAQ	Complex Modeling by DAQ	Complex Modeling by DAQ plus Annualized Add-on Controls or Permit Conditions on Facilities
$2,000	$8,000	$8,000+$280,000= $288,000

A. Summary of Costs/Savings Incurred by DAQ:

Calculations in the first part of Table 6 below assume that the maximum number of facilities, as presented in Table 3, has modifications resulting in net increase in arsenic emissions, and is therefore required to perform simple or complex modeling (see estimate cost of each option in Table 5 above). Note, facilities that have to install add-on controls still have to undergo demonstration modeling, so there could be 77 fewer facilities undergoing complex (= 42 less facilities face complex modeling plus 35 less face add-on controls and complex modeling, as shown in Table 3). As mentioned in the section above, the maximum impact estimates, however, is not very likely to occur, so for the purposes of this analysis, DAQ assumes only a fraction of the total impact is likely to occur. The second part of Table 6 presents the annual cost savings DAQ would incur from the rule change, assuming that two percent of that maximum impact is the "annual" avoided cost for DAQ over the five year period of this analysis. Therefore, the proposed AAL change would provide about $14,700 in annual avoid cost for the implementing agency each year.

Table 6. Maximum and annual avoided costs by DAQ demonstration modeling

DAQ Modeling Impacts	Average Cost	#	Baseline	#	Central AAL	#	Change from Baseline
Simple Model	$2,000	241	$482,000	181	$362,000	-60	-$120,000
Complex Model	$8,000	209	$1,672,000	132	$1,056,000	-77	-$616,000
Maximum Impact on DAQ		450	$2,154,000	313	$1,418,000	-137	-$736,000
Annual Impact on DAQ	**2% of total**	9	$43,100	6	$28,400	-3	-$14,700

B. Summary of Costs/Savings Incurred by Facilities:

As noted at the beginning of this section, facilities may incur some benefits from being able to expand their operations and having extra compliance margin that are not included in this analysis due to lack of data and wide range of possibilities. However, a limited number of facilities will incur cost savings from not needing to install add-on controls.

Table 7 shows the additional annual impact to facilities assuming that only 2% of the maximum number of impacted facilities is expected to trigger a compliance demonstration due to a net increase in toxic emissions of arsenic each year.

Table 7. Maximum and annual avoided cost estimates

Facility Impacts	Average Cost	#	Baseline	#	Central AAL	#	Change from Baseline
Add-on Controls	$280,000	81	$22,680,000	46	$12,880,000	-35	-$9,800,000
Additional Annual impact (2%/yr)	$280,000	2	$453,600	1	$257,600	-1	-$196,000

These impacts are further assumed to grow cumulatively. These add-on control costs are reoccurring, so the annual impact estimate above is assumed to grow cumulatively by adding another two percent more of the maximum impacts each year during the five year period of this analysis. Therefore, the cost saving amount will increase each year as more facilities experience relief until these annual savings reach the avoided costs of $980,000 during the fifth year of this analysis.

C. Impact on Units of Local Government:

There are four facilities owned by a unit of local government among the maximum potentially affected facilities, however this analysis assumes only 10% of these would request modification in the next 5 years. Table 9 estimates the number of local government owned facilities that may be impacted by the baseline and proposed central AAL. There are no changes from the baseline, therefore none of these facilities are expected to experience economic relief due to adoption of the proposed central AAL.

Table 8. Maximum number of facilities owned by units of local Government potentially affected

Local Govt. Owned Facilities	Baseline	Central AAL	Change from Baseline
Simple Model	2	2	0
Complex Model	1	1	0
Add-on Controls	1	1	0
Local Govt. Owned above TPER	**4**	**4**	**0**

When compared with the baseline, the three local air programs in North Carolina incur no cost impacts. These local government agencies are responsible for adopting federally enforceable rules that are nearly identical to state rules and subsequent amendments. These local air quality programs may do that either “by reference”, or they can adopt an equally stringent local version of these regulations. Impacts from these locally mirrored regulations are expected to change relative to the baseline similar to the regulatory relief DAQ will experience.

D. Impact on Units of Federal Government:

There may be federally owned government facilities that are among the potentially affected community. The proposed amendments may be expected to generate additional cost savings to federal government facilities as a result of Arsenic emissions at these locations. Of the eleven federally owned facilities, Table 9 shows the maximum number impacted for the baseline and central AAL and may experience similar proportion of economic burden relief. The savings for demonstration modeling that DAQ could incur if indeed one federal facility would not require simple modeling and one would not require complex modeling are already included in the DAQ estimated savings in table 6.

Table 9. Maximum number of facilities owned by Federal government affected by the existing baseline and central AAL.

Federal Owned Facilities	Baseline	Central AAL	Change from baseline
Simple Model	3	2	-1
Complex Model	0	0	0
Add-on Controls	4	3	-1
Federal Owned above TPER	7	5	-2

Table 10 shows the cost saving one federal facilities may incur if it no longer would need add-on controls to meet the AAL requirements. Note this annual estimate represents an expected value – if one facility would actually be impacted by the proposed rule change, the cost saving would be of $280,000 per year. Also, this savings would be reoccurring on a yearly basis, as in the case of private facilities, and would increase to $28,000 over the 5-year period considered by this analysis. Note the avoided cost of this one federal facility that would not require add-on controls has already been included in the estimated savings in table 7.

Table 10. Maximum and annual avoided cost estimates for federal facilities

Federal Facilities	Average Cost	#	Baseline	#	Central AAL	#	Change from Baseline
Add-on Controls	$280,000	77	$1,120,000	43	$840,000	-1	-280,000
Additional annual impact (2%/yr)	$280,000		22,400		16,800		-$5,600

E. Impact on State Government:

Permitting Authority or Implementing Agency – The proposed amendments improve regulatory flexibility at sources that are already regulated by the Division of Air Quality, which is the primary implementing agency responsible for enforcing these rule amendments. The Central AAL may result in annual avoided costs of $14,700 per year during the five year period of this analysis, because fewer facilities will exceed the TPER which will reduce the burden on DAQ modeling staff. Calculations of these impacts are included in Table 6 found in an earlier section of this analysis.

State Facilities – Fifteen state owned facilities were identified as having arsenic emissions. Some of these facilities may experience related economic relief relative to existing baseline requirements. Table 11 shows the initial step in determining the number within each compliance impact option. Only a maximum of three state facilities could be impacted and not required to participate in simple modeling demonstrations. The cost savings from this would be incurred by DAQ and it is already reflected in the savings to the division presented in Table 6.

Table 11. Maximum number of State Owned Facilities impacted by compliance impact option

State Owned Facilities	Baseline	Central AAL	Change from Baseline
Simple Model	4	1	-3
Complex Model	2	2	0
Add-on Controls	0	0	0
State Owned above TPER	6	3	-3

F. Impact on Private Facilities

The cost savings some private facilities would incur from no longer needing to install add-on controls are include in Table 7, alongside the impact to federal facilities. Given the expected probability of the impact on the federal facility (shown in Table 10), the expected probability of the annual impact on privately owned facilities is presented in Table 12 below. This annual savings would be cumulative and would increase to $952,000 by year 5.

Table 12. Maximum and annual avoided cost estimates for private facilities

Private Facilities	Average Cost	#	Baseline	#	Central AAL	#	Change from Baseline
Add-on Controls	$280,000	77	$21,560,000	43	$12,040,000	-34	-$9,520,000
Additional annual impact (2%/yr)	$280,000		$431,200		$240,800		-$190,400

G. Public Benefit:

The NCSAB reviewed the human health exposure risks associated with arsenic emissions. NCSAB's "Recommendation for the Revision of the AAL for Arsenic" as the result of a thorough discussion of the most recent studies and evaluation by Department of Environment and Natural Resources' panel of scientific experts. The central estimate or "Central AAL" provides the greatest amount of confidence toward the public health goal of providing the one in a million level of protection against an excess lung cancer death. The level of protection is established by the NCSAB risk assessment criteria and their scientific methodology. As mentioned in previous sections, public health would not be impacted by the proposed relaxation of the AsC standard. The change in the standard is possible due to better data quality that shows a higher AsC AAL would not increase the public health risk.

Table 13 shows a summary of avoided cost impacts associated with the proposed Central AAL over a 5 year period. Net Present Value calculation uses statutorily mandated 7% discount rate.

Table 13. Summary of avoided cost impacts associated with the proposed Central AAL

Impact from Central AAL	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18
Local Government Impact	$0	$0	$0	$0	$0
State Government Impact	$14,700	$14,700	$14,700	$14,700	$14,700
Federal Government Impact	$5,600	$11,200	$16,800	$22,400	$28,000
Private Sector Impact	$190,400	$380,800	$571,200	$761,600	$952,000
Total Impact	**$210,700**	**$406,700**	**$602,700**	**$798,700**	**$994,700**
5-year Net Present Value	**$2,362,740**				

VIII. Consideration of Alternatives

This economic analysis considered two alternatives relative to the proposed Central AAL and their corresponding TPER. The NCSAB's "Central AAL" recommendation identified the statistical bounds of the range of their recommendation for setting the AAL at a level that it is protective against one in one million excess risk of lung cancer. In proposing the rule change, DAQ considered both the lower and higher AALs that represent the statistical bounds.

Marginal changes in avoided cost impacts have been estimated in Table 14 for the low AAL alternative and in Table 15 for the high AAL, along with change from the baseline. Over the five-year period of this analysis, the low AAL alternative could result in $273,000 fewer savings in net present value terms than the Central AAL. The High AAL alternative could result in $612,000 more savings in net present value terms than the Central AAL.

Table 14. Avoided cost estimates of the Low AAL alternative

DAQ Modeling Impacts	Average Cost	#	Baseline	#	Low AAL	#	Change from Baseline
Simple Model	$2,000	241	$482,000	187	$374,000	-54	-$108,000
Complex Model	$8,000	209	$1,672,000	145	$1,160,000	-64	-$512,000
Total Impact on DAQ	-	450	$2,154,000	332	$1,534,000	-118	-$620,000
Annual Impact on DAQ (2% per year)	-	9	$43,080	7	$30,680	-2	-$12,400

Facility Impacts	Average Cost	#	Baseline	#	Low AAL	#	Change from Baseline
Add-on Controls*	$280,000	81	$22,680,000	50	$14,000,000	0-31	-$8,680,000
Annual impacts (2%/yr)	**$280,000**	**2**	**$453,600**	**1**	**$280,000**	**-0.62**	**-$173,600**

Impact - Low AAL	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18
Total Impact	$186,000	$359,600	$533,200	$706,800	$880,400
5-year NPV	$2,090,098				

Table 15. Avoided cost estimates of the High AAL alternative

DAQ Modeling Impacts	Average Cost	#	Baseline	#	High AAL	#	Change from Baseline
Simple Model	$2,000	241	$482,000	172	$344,000	-69	-$138,000
Complex Model	$8,000	209	$1,672,000	104	$832,000	-105	-$840,000
Total Impact on DAQ	-	450	$2,154,000	276	$1,176,000	-174	-$978,000
Annual Impact on DAQ	-	9	$43,080	6	$23,520	-3	-$19,560

Facility Impacts	Average Cost	#	Baseline	#	High AAL	#	Change from Baseline
Add-on Controls	$280,000	81	$22,680,000	37	$10,360,000	-44	-$12,320,000
Annualized (2%/yr)	**$280,000**	**2**	**$453,600**	**1**	**$207,200**	**-0.88**	**-$246,400**

Impact - High AAL	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18
Total Impact	$265,960	$512,360	$758,760	$1,005,160	$1,251,560
5-year NPV	$2,974,627				

The NCSAB recommendation was based on determining an acceptable risk over a statistical confidence range. When compared to the proposed Central AAL, Table 15 shows that the High AAL alternative is less costly. Due to uncertainties in the impact assumptions, the precision of these avoided cost estimates may not be statistically different from the avoided costs of the central AAL. From a statistical standpoint, the NCSAB has the greatest confidence in the Central AAL value with regard to acceptable health risks. The mathematical methodology used to derive this range of risk is designed to provide public health protection benefits against one in a million additional lung cancer deaths. There is insufficient data to estimate and consider any possible health risk trade-off of this potentially less costly alternative. Therefore, since valid cost effectiveness comparisons cannot be calculated, there is no justification to stray from the NCSAB recommendation of the proposed Central AAL.

IX. Risk Analysis

The estimates contained in this fiscal note rely on multiple assumptions to simplify these calculations. This was necessary because the compliance cost scenario model that was developed is very general and based on rules of thumb to characterize individual decisions by hundreds of facilities. There is not adequate information available to find out if, when and which of these facilities may benefit from the burden relief offered by these proposed changes.

Possibly the greatest contributor to the uncertainty in these estimates is the baseline assumption that ten percent of the facilities would have triggered an air toxics review due to modification resulting in net increases in arsenic emissions or concentrations over the next 5 years, at a rate of two percent per year. The assumption that two percent of the facilities are impacted each year simplifies and allows for calculations, but it may very well not reflect the reality that eventually occurs. Given this assumption, the calculated net present value (NPV) over the five year period of this analysis of these annual cost savings from adoption of the “central AAL” is $2.4 million.

The period of analysis was chosen as being likely to hold within the five year period which corresponds to the five year permit renewal cycle. As such, that assumption places an upper limit on the cost savings estimate. Shortening or lengthening the period of analysis causes the result to vary according to the time value of money principle using a statutorily fixed discount rate of seven percent for NPV calculations. Also, if a smaller number or size of the facilities ever triggered review, then these estimated, cumulative impacts would be reduced proportionately.

Recent changes to state law also will affect this estimate. Some regulatory baseline requirements have been modified due to recent legislative action by the North Carolina General Assembly that became effective July 3, 2012. The DAQ will immediately implement provisions that accept compliance with federal MACT as being sufficient to demonstrate compliance to the NC Air Toxics Program, unless the Director’s Call provision is warranted.

X. Conclusion

After these amendments become effective, facilities whose annual arsenic emissions are less than the revised TPER may no longer be required to demonstrate compliance with the AAL during an air toxics review. Such a review is normally triggered when a modification results in net increase in arsenic emissions. All facilities with a modeled concentration of arsenic that is numerically near the existing annual AAL will have the potential for some regulatory relief.

There may be substantial economic impacts in terms of avoided cost that result from these rule amendments, estimated at $2.4 million over five years in net present value terms. There is considerable uncertainty, however, related to individual responses to the amended AAL and resultant TPER. The general method applied throughout this analysis was to statistically distribute maximum cost impacts at a chance rate of two percent per year.

Most of the 137 facilities that are potentially impacted are privately owned (and some may be small businesses), and the regulatory relief comes from not having an otherwise restrictive permit condition or the need to install add-on controls. Due to the proposed rule amendments, owners of regulated facilities may incur impacts in the form of avoided costs of almost one million dollars by the fifth year of this analysis.

No local government owned facilities will be affected by the proposed change. There could be some unquantified savings incurred by state and federal facilities, as well as add-on controls cost avoidance from a single federal owned facility assumed to be impacted at that level. The Division of Air Quality may experience a reduction in annual modeling efforts for an estimated $14,700 in administrative cost savings relative to the baseline when compared to the proposed central AAL. There are no changes from the baseline to the three local air programs in North Carolina, which are units of local government that implement their own equally stringent version of these rules.

As shown in Table 13, within the five year period of this analysis, the total potential annual avoided costs would grow to almost $1 million by adopting the NCSAB’s recommended Central AAL for arsenic compounds. The five year net present value (NPV) of the impacts reaches $2.36 million. In conclusion, the impacts may potentially represent avoided cost and as such these rule amendments are expected to cause substantial economic impacts as defined in Administrative Procedures Act in N.C.G.S. *150B-21.4, Fiscal notes on rules*. The term "substantial economic impact" means an aggregate financial impact on all persons affected of at least one-half million dollars ($500,000) in any 12-month period.

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APPENDIX

15A NCAC 02D .1104 is proposed for amendment as follows:

15A NCAC 02D .1104 TOXIC AIR POLLUTANT GUIDELINES

A facility shall not emit any of the following toxic air pollutants in such quantities that may cause or contribute beyond the premises (adjacent property boundary) to any significant ambient air concentration that may adversely affect human health. In determining these significant ambient air concentrations, the Division shall be guided by the following list of acceptable ambient levels in milligrams per cubic meter at 77° F (25° C) and 29.92 inches (760 mm) of mercury pressure (except for asbestos):

Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
acetaldehyde (75-07-0)				27
acetic acid (64-19-7)				3.7
acrolein (107-02-8)				0.08
acrylonitrile (107-13-1)		0.03	1	
ammonia (7664-41-7)				2.7
aniline (62-53-3)			1	
arsenic and inorganic arsenic compounds	~~2.3×10^{-7}~~ 2.1×10^{-6}			
asbestos (1332-21-4)	2.8×10^{-11} fibers/ml			
aziridine (151-56-4)		0.006		
benzene (71-43-2)	1.2×10^{-4}			
benzidine and salts (92-87-5)	1.5×10^{-8}			
benzo(a)pyrene (50-32-8)	3.3×10^{-5}			
benzyl chloride (100-44-7)			0.5	
beryllium (7440-41-7)	4.1×10^{-6}			
beryllium chloride (7787-47-5)	4.1×10^{-6}			
beryllium fluoride (7787-49-7)	4.1×10^{-6}			
beryllium nitrate (13597-99-4)	4.1×10^{-6}			
bioavailable chromate pigments, as chromium (VI) equivalent	8.3×10^{-8}			
bis-chloromethyl ether (542-88-1)	3.7×10^{-7}			
bromine (7726-95-6)				0.2

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Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
1,3-butadiene (106-99-0)	4.4×10^{-4}			
cadmium (7440-43-9)	5.5×10^{-6}			
cadmium acetate (543-90-8)	5.5×10^{-6}			
cadmium bromide (7789-42-6)	5.5×10^{-6}			
carbon disulfide (75-15-0)		0.186		
carbon tetrachloride (56-23-5)	6.7×10^{-3}			
chlorine (7782-50-5)		0.0375		0.9
chlorobenzene (108-90-7)		2.2		
chloroform (67-66-3)	4.3×10^{-3}			
chloroprene (126-99-8)		0.44	3.5	
cresol (1319-77-3)			2.2	
p-dichlorobenzene (106-46-7)				66
dichlorodifluoromethane (75-71-8)		248		
dichlorofluoromethane (75-43-4)		0.5		
di(2-ethylhexyl)phthalate (117-81-7)		0.03		
dimethyl sulfate (77-78-1)		0.003		
1,4-dioxane (123-91-1)		0.56		
epichlorohydrin (106-89-8)	8.3×10^{-2}			
ethyl acetate (141-78-6)			140	
ethylenediamine (107-15-3)		0.3	2.5	
ethylene dibromide (106-93-4)	4.0×10^{-4}			
ethylene dichloride (107-06-2)	3.8×10^{-3}			
ethylene glycol monoethyl ether (110-80-5)		0.12	1.9	
ethylene oxide (75-21-8)	2.7×10^{-5}			
ethyl mercaptan (75-08-1)			0.1	
fluorides		0.016	0.25	
formaldehyde (50-00-0)				0.15
hexachlorocyclopentadiene (77-47-4)		0.0006	0.01	
hexachlorodibenzo-p-dioxin (57653-85-7)	7.6×10^{-8}			
n-hexane (110-54-3)		1.1		

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Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
hexane isomers except n-hexane				360
hydrazine (302-01-2)		0.0006		
hydrogen chloride (7647-01-0)				0.7
hydrogen cyanide (74-90-8)		0.14	1.1	
hydrogen fluoride (7664-39-3)		0.03		0.25
hydrogen sulfide (7783-06-4)		0.12		
maleic anhydride (108-31-6)		0.012	0.1	
manganese and compounds		0.031		
manganese cyclopentadienyl tricarbonyl (12079-65-1)		0.0006		
manganese tetroxide (1317-35-7)		0.0062		
mercury, alkyl		0.00006		
mercury, aryl and inorganic compounds		0.0006		
mercury, vapor (7439-97-6)		0.0006		
methyl chloroform (71-55-6)		12		245
methylene chloride (75-09-2)	2.4×10^{-2}		1.7	
methyl ethyl ketone (78-93-3)		3.7		88.5
methyl isobutyl ketone (108-10-1)		2.56		30
methyl mercaptan (74-93-1)			0.05	
nickel carbonyl (13463-39-3)		0.0006		
nickel metal (7440-02-0)		0.006		
nickel, soluble compounds, as nickel		0.0006		
nickel subsulfide (12035-72-2)	2.1×10^{-6}			
nitric acid (7697-37-2)				1
nitrobenzene (98-95-3)		0.06	0.5	
n-nitrosodimethylamine (62-75-9)	5.0×10^{-5}			
non-specific chromium (VI) compounds, as chromium (VI) equivalent	8.3×10^{-8}			
pentachlorophenol (87-86-5)		0.003	0.025	
perchloroethylene (127-18-4)	1.9×10^{-1}			

Pollutant (CAS Number)	Annual (Carcinogens)	24-hour (Chronic Toxicants)	1-hour (Acute Systemic Toxicants)	1-hour (Acute Irritants)
phenol (108-95-2)			0.95	
phosgene (75-44-5)		0.0025		
phosphine (7803-51-2)				0.13
polychlorinated biphenyls (1336-36-3)	8.3×10^{-5}			
soluble chromate compounds, as chromium (VI) equivalent		6.2×10^{-4}		
styrene (100-42-5)			10.6	
sulfuric acid (7664-93-9)		0.012	0.1	
tetrachlorodibenzo-p-dioxin (1746-01-6)	3.0×10^{-9}			
1,1,1,2-tetrachloro-2,2,-difluoroethane (76-11-9)		52		
1,1,2,2-tetrachloro-1,2-difluoroethane (76-12-0)		52		
1,1,2,2-tetrachloroethane (79-34-5)	6.3×10^{-3}			
toluene (108-88-3)		4.7		56
toluene diisocyanate, 2,4- (584-84-9) and 2,6- (91-08-7) isomers		0.0002		
trichloroethylene (79-01-6)	5.9×10^{-2}			
trichlorofluoromethane (75-69-4)			560	
1,1,2-trichloro-1,2,2- trifluoroethane (76-13-1)				950
vinyl chloride (75-01-4)	3.8×10^{-4}			
vinylidene chloride (75-35-4)		0.12		
xylene (1330-20-7)		2.7		65

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.107(a)(3),(4),(5); 143B-282; S.L. 1989, c. 168, s. 45;*
Eff. May 1, 1990;
Amended Eff. September 1, 1992; March 1, 1992;
Temporary Amendment Eff. July 20, 1997;
Amended Eff. __________; March 1, 2010; June 1, 2008; April 1, 2005; April 1, 2001; July 1, 1998.

AGENDA ITEM 6

15A NCAC 02Q .0711 is proposed for amendment as follows:

15A NCAC 02Q .0711 EMISSION RATES REQUIRING A PERMIT

(a) A permit to emit toxic air pollutants is required for any facility whose actual (or permitted if higher) rate of emissions from all sources are greater than any one of the following toxic air pollutant permitting emissions rates:

Pollutant (CAS Number)	Carcinogens lb/yr	Chronic Toxicants lb/day	Acute Systemic Toxicants lb/hr	Acute Irritants lb/hr
acetaldehyde (75-07-0)				6.8
acetic acid (64-19-7)				0.96
acrolein (107-02-8)				0.02
acrylonitrile (107-13-1)		0.4	0.22	
ammonia (7664-41-7)				0.68
aniline (62-53-3)			0.25	
arsenic and inorganic arsenic compounds	~~0.016~~ 0.053			
asbestos (1332-21-4)	1.9 X 10^{-6}			
aziridine (151-56-4)		0.13		
benzene (71-43-2)	8.1			
benzidine and salts (92-87-5)	0.0010			
benzo(a)pyrene (50-32-8)	2.2			
benzyl chloride (100-44-7)			0.13	
beryllium (7440-41-7)	0.28			
beryllium chloride (7787-47-5)	0.28			
beryllium fluoride (7787-49-7)	0.28			
beryllium nitrate (13597-99-4)	0.28			
bioavailable chromate pigments, as chromium (VI) equivalent	0.0056			
bis-chloromethyl ether (542-88-1)	0.025			
bromine (7726-95-6)				0.052
1,3-butadiene (106-99-0)	11			
cadmium (7440-43-9)	0.37			
cadmium acetate (543-90-8)	0.37			
cadmium bromide (7789-42-6)	0.37			
carbon disulfide (75-15-0)		3.9		
carbon tetrachloride (56-23-5)	460			

chlorine (7782-50-5)		0.79		0.23
chlorobenzene (108-90-7)		46		
chloroform (67-66-3)	290			
chloroprene (126-99-8)		9.2	0.89	
cresol (1319-77-3)			0.56	
p-dichlorobenzene (106-46-7)				16.8
dichlorodifluoromethane (75-71-8)		5200		
dichlorofluoromethane (75-43-4)		10		
di(2-ethylhexyl)phthalate (117-81-7)		0.63		
dimethyl sulfate (77-78-1)		0.063		
1,4-dioxane (123-91-1)		12		
epichlorohydrin (106-89-8)	5600			
ethyl acetate (141-78-6)			36	
ethylenediamine (107-15-3)		6.3	0.64	
ethylene dibromide (106-93-4)	27			
ethylene dichloride (107-06-2)	260			
ethylene glycol monoethyl ether (110-80-5)		2.5	0.48	
ethylene oxide (75-21-8)	1.8			
ethyl mercaptan (75-08-1)			0.025	
fluorides		0.34	0.064	
formaldehyde (50-00-0)				0.04
hexachlorocyclopentadiene (77-47-4)		0.013	0.0025	
hexachlorodibenzo-p-dioxin (57653- 85-7)	0.0051			
n-hexane (110-54-3)		23		
hexane isomers except n-hexane				92
hydrazine (302-01-2)		0.013		
hydrogen chloride (7647-01-0)				0.18
hydrogen cyanide (74-90-8)		2.9	0.28	
hydrogen fluoride (7664-39-3)		0.63		0.064
hydrogen sulfide (7783-06-4)		1.7		
maleic anhydride (108-31-6)		0.25	0.025	
manganese and compounds		0.63		
manganese cyclopentadienyl tricarbonyl (12079-65-1)		0.013		
manganese tetroxide (1317-35-7)		0.13		
mercury, alkyl		0.0013		
mercury, aryl and inorganic compounds		0.013		

mercury, vapor (7439-97-6)		0.013		
methyl chloroform (71-55-6)		250		64
methylene chloride (75-09-2)	1600		0.39	
methyl ethyl ketone (78-93-3)		78		22.4
methyl isobutyl ketone (108-10-1)		52		7.6
methyl mercaptan (74-93-1)			0.013	
nickel carbonyl (13463-39-3)		0.013		
nickel metal (7440-02-0)		0.13		
nickel, soluble compounds, as nickel		0.013		
nickel subsulfide (12035-72-2)	0.14			
nitric acid (7697-37-2)				0.256
nitrobenzene (98-95-3)		1.3	0.13	
n-nitrosodimethylamine (62-75-9)	3.4			
non-specific chromium (VI) compounds, as chromium (VI) equivalent	0.0056			
pentachlorophenol (87-86-5)		0.063	0.0064	
perchloroethylene (127-18-4)	13000			
phenol (108-95-2)			0.24	
phosgene (75-44-5)		0.052		
phosphine (7803-51-2)				0.032
polychlorinated biphenyls (1336-36- 3)	5.6			
soluble chromate compounds, as chromium (VI) equivalent		0.013		
styrene (100-42-5)			2.7	
sulfuric acid (7664-93-9)		0.25	0.025	
tetrachlorodibenzo-p-dioxin (1746- 01-6)	0.00020			
1,1,1,2-tetrachloro-2,2,- difluoroethane (76-11-9)		1100		
1,1,2,2-tetrachloro-1,2- difluoroethane (76-12-0)		1100		
1,1,2,2-tetrachloroethane (79-34-5)	430			
toluene (108-88-3)		98		14.4
toluene diisocyanate,2,4-(584-84-9) and 2,6- (91-08-7) isomers		0.003		
trichloroethylene (79-01-6)	4000			
trichlorofluoromethane (75-69-4)			140	

1,1,2-trichloro-1,2,2-trifluoroethane (76-13-1)				240
vinyl chloride (75-01-4)	26			
vinylidene chloride (75-35-4)		2.5		
xylene (1330-20-7)		57		16.4

(b) For the following pollutants, the highest emissions occurring for any 15-minute period shall be multiplied by four and the product shall be compared to the value in Paragraph (a). These pollutants are:

(1) acetaldehyde (75-07-0);
(2) acetic acid (64-19-7);
(3) acrolein (107-02-8);
(4) ammonia (7664-41-7);
(5) bromine (7726-95-6);
(6) chlorine (7782-50-5);
(7) formaldehyde (50-00-0);
(8) hydrogen chloride (7647-01-0);
(9) hydrogen fluoride (7664-39-3); and
(10) nitric acid (7697-37-2).

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.108; 143B-282; S L. 1989, c. 168, s. 45;*
Rule originally codified as part of 15A NCAC 02H .0610;
Eff. July 1, 1998;
Amended Eff. __________; January 1, 2010; June 1, 2008; April 1, 2005; February 1, 2005; April 1, 2001.