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Clean Air Board of Central Pennsylvania:  
*A Faith-based Group of Concerned Citizens*

528 Garland Drive, Carlisle, PA 17013

**Comments by Thomas Y. Au, President of the Clean Air Board, May 29, 2014**

My name is Thomas Au. I am here today on behalf of the Clean Air Board of Central Pennsylvania, 528 Garland Drive, Carlisle, PA 17013. The Clean Air Board was formed in the fall of 2005 after over 100 Cumberland County physicians signed and published in the local newspapers an open letter informing the community of the growing danger of air pollution. Initially a small group of people of faith gathered to support the physicians in educating our community and advocating for cleaner air. We have grown to include not only that faith community, but also people in business, teachers, lawyers, parents, scientists, and the medical community.

Summer will soon be here and that can mean high levels of pollutants in our air, specifically ozone and small particles, commonly known as smog. Meteorologists declare "Air Quality Action" days when they project that weather conditions are conducive for unhealthy air pollution. In 2012, an extremely hot year, the Pennsylvania Department of Environmental Protection (DEP) called eleven "action days" for the Susquehanna Valley due to high concentrations of ozone. In 2013, DEP called four action days in the Susquehanna Valley due to ozone.

We should heed those warnings. Recent scientific studies conclude that short-term exposure to unhealthy air pollution can have significant adverse effects on pregnant women, children, the elderly, and even the general population--especially those with pre-existing conditions such as asthma. There is increasing scientific evidence that exposure to ozone can lead to neurological disorders.

Short term symptoms resulting from breathing high levels of ozone and fine particulate include chest pain, coughing, nausea, throat irritation, and congestion. These pollutants also aggravate

bronchitis, heart disease, emphysema, and asthma—and can increase risks of stroke. Children, senior citizens, and those with asthma or other respiratory problems are urged to limit outdoor activities during action days.

Air Quality Action days are often declared when there is little wind and when the amount of ozone or particles in stagnant air are projected to exceed federal health standards. Smog is caused when chemicals including nitrogen oxides react in sunlight, forming ground-level ozone.

Coal fired power plants are the single largest source of smog-causing pollutants in Pennsylvania. While nearly all of the state's largest coal plants have the technology to reduce nitrogen oxides, many do not use the available technology. The Clean Air Act requires that existing sources of emissions which contribute to the ozone problem install reasonably available control technology. Reasonably available control technology (RACT) is defined as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Accordingly, RACT determinations must set limits as rigorous as could be met through use of feasible control technology.

The proposed regulation does not set reasonably available control technology for Pennsylvania coal plants anywhere close to the what can be achieved through control technology. Most of Pennsylvania coal plants have highly effective NOx emission controls installed, such as Selective Catalytic Reduction ("SCR") and low NOx burners. However, in the emission limits proposed, the RACT NOx emission limit for a coal-fired boiler would be an extremely permissive range of between 0.45 lbs/MMBtu and 0.20 lbs/MMBtu. See Proposed 25 Pa. Code § 121.97(g)(1)(v)-(vi). These limits are far higher than recent emissions history and higher than RACT limits set in nearby states. The Sierra Club has submitted detailed information to the Department to document this point. (Sierra Club letter, Jan. 17, 2014)

This proposed limit is not only based on technology inferior to that already in place at nearly all coal-fired power plants in Pennsylvania, but is also significantly more permissive than what those facilities are capable of achieving. In fact, under the averaging rule proposed the coal plants would not need to achieve these limits during ozone action days. See Proposed 25 Pa. Code § 129.98(a). This is like bypassing your catalytic converter in your car to save a few pennies.

The most serious health risks from ozone are associated with high energy demand days when the non-SCR units are almost certain to be operating. Therefore it is imperative that these units be capable of curtailing their NOx emissions on these days so that they comply with emission limits consistent with the installation and operation of reasonably available emission technology found elsewhere in this region.

We continue to suffer from high ozone days during the summer. Air quality in Pennsylvania continues to violate national ambient air quality standards. To achieve compliance with the 2008 8-hour ozone NAAQS, reductions from all major sectors — in-state stationary sources, in-state mobile sources, and out-of-state stationary sources — are essential. This proposed regulation needs to be revised to achieve real reductions in smog causing pollutants.





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January 17, 2014

**VIA ELECTRONIC MAIL AND U.S. MAIL**

**Re: Proposed RACT Rulemaking**

Dear Stationary Sources Chief Randy Bordner and Assistant Counsel Robert Reiley,

Clean Air Council ("CAC") and the Sierra Club have reviewed the proposed rulemaking Pennsylvania Environmental Quality Board ("EQB") is preparing concerning reasonably available control technology ("RACT") requirements and emission limits for emissions of nitrogen oxides ("NOx") and volatile organic compounds ("VOCs") from certain major stationary sources, and applaud the decision to revise RACT requirements in Pennsylvania.

However, the proposed rulemaking suffers from two large problems. First, it fails to set sufficiently stringent NOx emission limits for coal-fired boilers, and moreover proposes RACT technology that is actually inferior to what is already in place in the majority of coal-fired electric generating units ("EGUs") in Pennsylvania. Second, the contemplated alternative compliance mechanisms would make it very unlikely that significant ozone reduction would be achieved, as their long-term averaging periods and bubbling of emissions across multiple sources would allow potentially extreme spatial and temporal hot spots of NOx and VOCs.

For those reasons, as more thoroughly explained below, EQB should revise the proposed RACT rulemaking to incorporate more stringent NOx emission limits and to close the loopholes in the contemplated alternative compliance mechanisms.

### **Regulatory Background**

RACT determinations and RACT-based emission limits are required by the Clean Air Act for areas failing to attain National Ambient Air Quality Standards (“NAAQS”). *See* 42 U.S.C. § 7502(c)(1). RACT is defined as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. *See, e.g.,* 57 Fed. Reg. 55,620, 55,624 (Nov. 25, 1992). Accordingly, RACT determinations must set limits as rigorous as could be met through use of feasible control technology.

In 2008, EPA revised the 1997 ozone NAAQS to 75 parts per billion with an 8-hour averaging period. 73 Fed. Reg. 16,483 (March 27, 2008). In 2012, EPA finalized designations, including nonattainment designations, under this 2008 NAAQS, adding to unresolved nonattainment designations in Pennsylvania under the preexisting 1997 NAAQS. Because of these nonattainment designations, and because Pennsylvania is part of the Ozone Transport Region, RACT must be set for major stationary sources of the ozone precursor pollutants NOx and VOCs in Pennsylvania.

EQB has accordingly begun the process of proposing a rulemaking to revise RACT standards in Pennsylvania for these pollutants.

### **The RACT Proposals for Coal-Fired Combustion Are Far Too Lax**

Under the contemplated rulemaking, the presumptive RACT NOx emission limit for a coal-fired boiler would be an extremely permissive range of between 0.45 lbs/MMBtu and 0.20 lbs/MMBtu. *See* Proposed 25 Pa. Code § 121.97(g)(1)(v)-(iv) (setting limits of 0.45 lbs/MMBtu for coal combustion units with heat inputs between 50 MMBtu/hour and 250 MMBtu per hour, and limits of 0.20 lbs/MMBtu, 0.35 lbs/MMBtu, and 0.40 lbs/MMBtu for larger units using circulating fluidized bed technology, tangentially fired technology, or other boiler technology, respectively). This is, according to EQB, reflective of RACT of low NOx burners (“LNB”). *See* Regulatory Analysis Form at 13.

Such a RACT limit is not only based on technology inferior to that *already in place* at nearly all coal-fired EGUs in Pennsylvania, but is also significantly more permissive than what those facilities are already and demonstrably capable of achieving, contrary to the requirements for RACT. Further, these limits are much more lax than what other, similarly-situated mid-

Atlantic states are proposing and implementing as RACT for NOx. Finally, tighter NOx limits at coal-fired units could readily be achieved at *below* the cost threshold of \$2,500 EQB employed to justify the presumptive RACT.

1. *The Majority of Coal-Fired EGUs in Pennsylvania Already Have Controls Better than the Proposed RACT*

Although the proposed rulemaking contemplates low NOx burners as RACT, the majority of coal-fired electric-generating boilers in Pennsylvania are already equipped with better NOx controls. In fact, only a handful of small boilers lack low NOx burners; by contrast, *every single other coal-fired EGU boiler has controls that exceed the RACT as proposed in the rulemaking.* See Table 1, *infra*.

This disparity is particularly stark when viewed in terms of nameplate capacity: over 85% of the EGU coal fleet in terms of capacity already has controls or will shortly have controls<sup>1</sup> surpassing the RACT contemplated in the proposed rulemaking.

*Table 1: Pennsylvania Coal-Fired EGU Boilers and Current NOx Controls<sup>2</sup>*

	<u>Unit ID</u>	<u>Nameplate Capacity (MW)</u>	<u>NOx Controls</u>
	GEN 3	114	LNBO, SNCR
	1	914	LNBO, SCR
	2	914	LNBO, SCR
	3	914	LNBO, SCR
	GEN1	98	SNCR
	1	637	LNC3, SCR
	COLV	118	SNCR
	1	936	LNC3, SCR 2014
	2	936	LNC3, SCR 2014
	GEN1	58	None
	SG-101	47.3	FBC
	1	660	LNBO, SCR
	2	660	LNBO, SCR
	3	692	LNBO, SCR
	GEN1	88	FBC, OV

<sup>1</sup> Conemaugh will be installing SCR on its two coal-fired boilers this year.

<sup>2</sup> All of the information displayed in Table 1 was retrieved from EPA's Air Market Program Database (see <http://ampd.epa.gov/ampd/>) or Title V air permits for the respective facilities. Table 1 employs the following acronyms: LNBO: Low NOx Burners; LNC3: Low NOx Coal and Air Nozzles with Close Coupled & Separated Overfire Air; FBC: Fluidized Bed Combuster; OV: Overfire Air.

	1	936	LNC3, SCR
	2	936	LNC3, SCR
	GEN1	57.5	FBC
	GEN1	114	SNCR
	GEN1	94	SNCR
	1	363	LNC3
	2	405	LNC3
	3	790	LNC3
	1	806	LNC3, SCR
	2	819	LNC3, SCR
	GEN1	95	SNCR
	FB1	585	SNCR
	SNCP	99	FBC
	GEN1	36	None
	GEN1	48	FBC, Other

As a result, the RACT proposal would affect only seven units (highlighted in Table 1), or merely 3% (433.8 megawatts out of the total 13,970 megawatts) of coal-fired EGU capacity in Pennsylvania. Effectively, the proposed rulemaking contemplates RACT that lags immensely behind what is overwhelmingly already in place in Pennsylvania.

2. *When Coal-Fired EGUs in Pennsylvania Run Their Existing Controls, They Emit Much Less NOx than the RACT Limits Contemplate*

The actual historical performance of the Pennsylvania coal-fired EGU fleet demonstrates that the NOx emission rates for coal-fired combustion units in Pennsylvania's RACT proposal are far too lax. Based on the 2012 data available in EPA's Clean Air Markets Program Database, all of the coal combustion units 60 megawatts or larger in Pennsylvania are already in compliance with the proposed NOx emission rates. Indeed, many of these units achieved much lower NOx emission rates in 2012, such as Bruce Mansfield, the largest coal-fired power plant in Pennsylvania. Bruce Mansfield Units 1-3 emitted average NOx rates of 0.1 lbs/MMBtu, 0.11 lbs/MMBtu, and 0.11 lbs/MMBtu respectively, which are all substantially lower than the 0.40 lbs/MMBtu emission rate proposed as RACT for this plant. See Table 2, *infra*.

Moreover, a number of the plants equipped with highly effective NOx emission controls such as Selective Catalytic Reduction ("SCR") have demonstrated that they can achieve very low emission rates for at least 60 consecutive days:



Table 2: Pennsylvania Coal-Fired EGU Boilers and Historical NOx Emission Rates<sup>3</sup>

Unit ID	Name-plate Capacity (MW)	Proposed RACT	2012 Avg NOx Rate (lbs/MMBtu)	2012 Avg O3 Season NOx Rate (lbs/MMBtu)	Lowest 60 Day Avg NOx Rate (lbs/MMBtu)	Lowest 60 Day Dates
GEN 2	35	N/A	N/A	N/A	N/A	N/A
GEN 3	114	N/A	N/A	N/A	N/A	N/A
1	914	0.40	0.100	0.110	0.060	5/7-9/30/03
2	914	0.40	0.110	0.123	0.064	6/1-8/31/03
3	914	0.40	0.110	0.108	0.066	5/1-6/30/05
GEN1	98	N/A	N/A	N/A	N/A	N/A
1	637	0.35	0.310	0.310	0.077	5/1-6/30/03
COLV	118	N/A	N/A	N/A	N/A	N/A
1	936	0.35	0.315	0.319	0.28	5/21-7/21/00
2	936	0.35	0.303	0.299	0.25	5/16-7/16/00
GEN1	58	0.40	N/A	N/A	N/A	N/A
1	660	0.40	0.178	0.170	0.061	6/9-9/23/05
2	660	0.40	0.233	0.220	0.088	7/27-9/27/05
3	692	0.40	0.198	0.207	0.070	6/14-8/10/05
GEN1	88	0.20	N/A	N/A	N/A	N/A
1	936	0.40	0.355	0.361	0.047	7/8-9/4/09
2	936	0.40	0.350	0.340	0.042	7/7-9/30/08
GEN1	114	0.20	N/A	N/A	N/A	N/A
GEN1	94	N/A	N/A	N/A	N/A	N/A

<sup>3</sup> All of the information displayed in Table 2 was retrieved from EPA's Air Market Program Database (see <http://ampd.epa.gov/ampd/>) or Title V air permits for the respective facilities. "N/A" corresponds to entries for small sources for which the Air Market Program Database data was not available.

<sup>4</sup> As noted above, Conemaugh will be installing SCR on its two coal-fired boilers later this year. If the controls are operated, Conemaugh's ability to lower NOx emissions is thus likely to decrease significantly.

							N/A
	1	363	0.40	0.378	0.360	0.27	7/16-9/16/05
	2	405	0.40	0.379	0.378	0.28	7/7-9/7/05
	3	790	0.40	0.340	0.331	0.24	7/14-9/14/05
	1	806	0.40	0.390	0.399	0.071	6/3-8/5/08
	2	819	0.40	0.390	0.414	0.058	11/16/10-1/17/11
	11	17	0.40	N/A	N/A	N/A	N/A
	GEN1	95	N/A	N/A	N/A	N/A	N/A
	FB1 Unit 1	585	0.20	0.088	0.082	0.082	5/16-7/16/07
	FB2 Unit 2		0.20	0.086	0.074	0.066	5/26-7/26/12
	SNCP	99	0.20	N/A	N/A	N/A	N/A
	GEN1	48	0.20	N/A	N/A	N/A	N/A

For example, while PPL Montour Units 1 and 2 each had 2012 annual NO<sub>x</sub> emission rates of 0.39 lbs/MMBtu, Unit 1 achieved 0.07 lbs/MMBtu (June 3 to August 5, 2008) and Unit 2 achieved 0.05 lbs/MMBtu (November 16, 2010 to January 17, 2011). Similarly, while Keystone Units 1 and 2 emitted NO<sub>x</sub> at an average annual rate of 0.35 lbs/MMBtu in 2012, even though both units can achieve 0.04 lbs/MMBtu for at least 60 days (July 8 to September 4, 2009, and July 7 to September 30, 2008, respectively.)

Plainly, all of Pennsylvania's significantly sized coal-fired EGUs are capable of complying with much more rigorous standards than those EQB is contemplating with the technology currently in place. This RACT proposal is accordingly insufficient as it suggests a standard below what is actually available and currently in practice—in effect, the proposed rulemaking would confer *no benefits* in terms of emissions reductions from these facilities. Ignoring the emission levels actually achieved and achievable by facilities employing controls already in place is thoroughly inconsistent with a proper RACT determination; the limits contemplated by EQB here are a far cry from the lowest emission limitation capable of being met by available control technology.

3. *The RACT Limits in the Proposed Rulemaking Fall Far Short of Those In Other States*

The RACT limits for coal-fired boilers contemplated in the proposed rulemaking are significantly out of step with those of nearby states. Maryland, for example, is proposing RACT limits for nearly every single one of its coal-fired EGUs of 0.11 lbs/MMBtu or less on a 24-hour averaging period; for some units, Maryland is proposing limits as low as 0.06 lbs/MMBtu.<sup>5</sup>

New York has implemented similarly stringent NOx limits as part of its RACT determination. There, RACT for coal-fired boilers is 0.20 lbs/MMBtu for wet-bottom coal cyclone boilers, 0.12 lbs/MMBtu for tangential and wall coal-fired boilers, and 0.08 lbs/MMBtu for fluidized bed coal-fired boilers:

*Table 3: New York RACT Determination NOx Emission Limits (lbs/MMBtu)<sup>6</sup>*

<i>Fuel Type</i>	<i>Tangential</i>	<i>Wall</i>	<i>Cyclone</i>	<i>Fluidized Bed</i>
Gas Only	0.08	0.08	na	na
Gas/Oil	0.15	0.15	0.20	na
Coal Wet Bottom	0.12	0.12	0.20	na
Coal Dry Bottom	0.12	0.12	na	0.08

Likewise, Delaware has adopted regulations restricting NOx emissions much more stringently than Pennsylvania is contemplating in the proposed rulemaking. For coal-fired units larger than 25 megawatts, Delaware sets a NOx emission limit of 0.125 lb/MMBtu, demonstrated on a rolling 24-hour average basis. *See* 7 Del. Admin. Code § 1146-4.3.

As such, Pennsylvania's contemplated RACT emission limits are multiple times higher than those being set or already set by neighboring states. Again, this is inconsistent with a proper RACT determination.

<sup>5</sup> See Maryland RACT Proposal at .03 General Requirements, available at [http://www.mde.state.md.us/programs/regulations/air/Documents/Draft\\_COMAR\\_26.11.38\\_12\\_11\\_13.pdf](http://www.mde.state.md.us/programs/regulations/air/Documents/Draft_COMAR_26.11.38_12_11_13.pdf).

<sup>6</sup> See 6 NYCRR § 227-2.4(a)(1)(ii).

4. *Failing to Impose RACT Limits in Line with the Controls Currently on Pennsylvania Coal-Fired EGUs Places Greater Burdens on Other Sources*

As noted above, a RACT determination of low NO<sub>x</sub> burners and emission limits ranging from 0.20-0.45 lbs/MMBtu, as the proposed rulemaking contemplates, is inconsistent with the stronger controls and higher reduction capabilities of the coal-fired EGU fleet in Pennsylvania. This is particularly problematic given EQB's own calculations concerning cost-effective RACT—by failing to require coal-fired EGUs to achieve low-cost reductions and operate already-installed controls, a greater and more expensive share of the overall NO<sub>x</sub> reductions Pennsylvania seeks to achieve falls on other NO<sub>x</sub> sources.

Pennsylvania determined that a reasonable cost per ton of NO<sub>x</sub> reduction is \$2,500. *See* Regulatory Analysis Form at 12. While the proposed rulemaking would set RACT for coal-combusting units at a cost of only \$849 per ton of NO<sub>x</sub>, it sets control requirements for nearly every other source category consistent with much more costly reductions: in excess of \$2,400 per ton for natural gas boilers, No. 2 fuel oil boilers, lean burn engines, and natural gas turbines. *Id.* at 13. Yet, further reductions in NO<sub>x</sub> emissions can readily be achieved by coal-fired combustion units at prices less than those contemplated in determining RACT controls for other sources—particularly where, as here *nearly every large coal-fired EGU already has those controls installed.*

Operation of SCR and SNCR technology at Pennsylvania's coal-fired EGU fleet would be dramatically cheaper than the presumptive reasonable cost of \$2,500 per ton of NO<sub>x</sub> reduced, as the capital costs of installation have already been incurred. Further, even for those few boilers that lack controls superior to the contemplated RACT of low NO<sub>x</sub> burners, installation and operation of SNCR would achieve reductions of NO<sub>x</sub> at significantly less than \$2,500 per ton.

Essentially, by only requiring coal-fired units to operate inexpensive and relatively ineffective controls, the proposed rulemaking shifts the burden of NO<sub>x</sub> reductions to other sources, which can have a detrimental effect on Pennsylvania's economic competitiveness. Again, any RACT determination for NO<sub>x</sub> in Pennsylvania should incorporate the controls already in place and the reduction levels already achievable by coal-fired EGUs.

**The Alternative Compliance Mechanisms in the Proposed Rulemaking Severely Undercut Any Ozone Reduction Benefits the RACT Standard Would Engender**

As currently written, the proposed rulemaking contains two large loopholes to the emission limits contemplated for all sources: 30-day rolling averaging, and the ability to bubble emissions systemwide. *See* Proposed 25 Pa. Code § 129.98(a). Both of these alternative

compliance mechanisms would severely undercut the proposed rulemaking's ability to deliver necessary reductions in ozone.

First, 30-day rolling averages are entirely inconsistent with the short-term standards in the ozone NAAQS. The 2008 ozone NAAQS is an 8-hour standard, recognizing the strong variability in ozone concentrations and the significant impacts to human health that come from even relatively short-term exposure to ozone. By proposing to afford NO<sub>x</sub> and VOCs emitters the ability to average potentially weeks of high emissions against shorter periods of low or no emissions, the contemplated rulemaking would permit large swings in NO<sub>x</sub> and VOCs emissions, and accordingly in concentrations of ozone.

Second, the problem identified above is only exacerbated by allowing bubbling of emissions not only among multiple sources at a single facility, but system-wide across sources owned by a single operator. Failing to require reductions at all sources, and instead allowing some sources to over-reduce to allow others to go on polluting at heightened levels, would allow the creation of ozone hot spots. Furthermore, given the reality that many large sources of NO<sub>x</sub>—such as the coal-fired EGUs discussed above—already have pollution controls superior to what the proposed rulemaking contemplates as RACT, this provision would allow the continuation of a situation in which the operator of one facility could simply run its pollution controls so that the remaining sources owned by that operator need not run controls at all. Effectively, the combination of lax limits for sources such as coal-fired EGUs and the bubbling provision could ensure that very few, if any, large coal-fired sources of ozone-causing pollution reduce emissions at all. Such a result is entirely inappropriate. Accordingly, the alternative compliance mechanisms should be tightened to remove long-term 30-day averaging periods and to disallow bubbling of emissions across potentially geographically far-flung systems of facilities.

### **Conclusion**

As explained above, the proposed rulemaking to set RACT for Pennsylvania would incorporate improperly permissive NO<sub>x</sub> emission limits for coal-fired EGUs, and would involve a technological standard *inferior* to what is in place for the vast majority of Pennsylvanian coal-fired EGUs. Before EQB releases the draft regulations for notice and comment, it should revise them to correct these deficiencies.

Additionally, the alternative compliance mechanisms in the proposed rulemaking should be altered to reflect the short-term nature of the ozone NAAQS, and should not allow bubbling emissions across fleets that may be spread out far across the state.

We would be happy to meet with you to discuss Pennsylvania's development of a revised ozone RACT, or to provide any additional information you may find useful.

Sincerely,

/s/

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