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Environmental Quality Board
P. O. Box 8477
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June 30, 2014

<u>**SUBMITTED ELECTRONICALLY AND VIA U.S. MAIL**</u>

Re: Proposed Ozone RACT Rulemaking

Dear Division of Air Resources Chief Kirit Dalal, Stationary Sources Chief Randy Bordner, Assistant Counsel Robert Reiley, and the Environmental Quality Board,

The Sierra Club, Clean Air Council ("CAC"), Earthjustice, Environmental Integrity Project ("EIP"), American Lung Association in Pennsylvania, and Group Against Smog and Pollution ("GASP") (collectively, the "Commentors") hereby submit comments on Pennsylvania's proposed rulemaking concerning new Reasonably Available Control Technology ("RACT") requirements and emission limits for ozone precursor pollutants nitrogen oxides ("NOx") and volatile organic compounds ("VOCs") from certain major stationary sources (the "RACT Proposed Rule"). The RACT Proposed Rule is based on a woefully inadequate assessment of available control technology, favoring controls that are actually far inferior to the selective catalytic reduction technology ("SCR") already in place throughout Pennsylvania. Thus, for the single largest source category of NOx emitters in the state—coal-fired power plants—Pennsylvania is proposing limits so weak that they are actually *higher* than current actual emission levels. Pennsylvania Department of Environmental Protection ("DEP") compounds this failure by offering alternative compliance mechanisms that vitiate the limits proposed. In short, the proposed RACT determination fails to satisfy Pennsylvania's obligations under the Clean Air Act.[1]

Accordingly, Pennsylvania must prepare a new RACT Proposed Rule that sets proper limits, consistent with emissions reductions achievable through the use of SCR, and does not unlawfully undercut those limits through alternative compliance mechanisms.

I. Background

A. Ground-Level Ozone Is Dangerous to Human Health

Ozone exposure causes a number of significant health impacts, particularly for the respiratory system. Severe health impacts are experienced from both individual incidents of high-level exposure and chronic exposure over time; such negative health impacts of both short-term and long-term ozone exposure have been repeatedly demonstrated through numerous human exposure, epidemiologic, and toxicological studies.[2] These include demonstrated respiratory and cardiovascular morbidity, premature mortality, and perinatal and reproductive impacts, along with other suggested impacts such as to the central nervous system. The physiological impacts of ozone exposure are experienced even by healthy individuals and even at relatively low concentrations of ozone. Certain sensitive groups and individuals—such as children, asthmatics, and the elderly—however, are found to have significantly greater susceptibility to ozone-related health impacts. Moreover, while the impacts of acute ozone exposure are better understood, there is a growing body of scientific evidence showing that repeated exposure over time causes additional health impacts which may even be more severe and less reversible.

Exposure to ozone, in the short-term (acute) and repeat (chronic) exposure, is well understood to cause or exacerbate respiratory impacts such as breathing discomfort (e.g., coughing, wheezing, shortness of breath, pain upon inspiration), decreasing lung function and capacity, and lung inflammation and injury. Research on the relationship between ozone exposure and respiratory effects is well-documented, and indeed EPA's Integrated Science Assessment of 2013 made a conclusive determination that ozone is responsible adverse respiratory effects.[3]

Epidemiologic studies have demonstrated consistently that increasing concentrations of ozone are associated with lung function decrements, increases in respiratory symptoms,

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[1] Sierra Club and CAC alerted Pennsylvania as to these failings over five months ago. *See* January 17, 2014 Correspondence to Randy Bordner and Robert Reiley, attached hereto as Exhibit 1.

[2] *See* U.S. Environmental Protection Agency (2013). Integrated Science Assessment for Ozone and Related Photochemical Oxidants (Final Report). EPA/600/R-10/076F, 2013, *available at* http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492 [hereinafter, ISA (2013)].

[3] *See* note 2, *supra*.

pulmonary inflammation in children with asthma, increases in respiratory-related hospital admissions and emergency department visits, and increases in respiratory mortality.

During acute increases in ozone, more frequent emergency room visits and hospital admissions are associated with asthma exacerbations as well as other respiratory symptoms and diseases. In addition to acute ozone levels being linked to an increase in visits, there is also evidence for an association between asthma hospitalizations and long-term, chronic exposure to ozone.[4]

Ozone exposure has been linked to not only the exacerbation of asthma, but also to asthma induction and new development of the disease. For individuals already diagnosed with asthma, evidence shows that ozone exposure increases the likelihood of having an asthma attack.[5] Ozone exposure has been shown to have especially significant effects on asthma exacerbation among children.[6] Children living in areas with higher ambient ozone concentrations have been shown to be more likely to either have asthma or to experience asthma attacks compared with children living in areas having lower ambient ozone concentrations.[7]

Evidence also shows positive associations between long-term exposures to ozone and new-onset asthma. For adults, studies showing increased risks for developing asthma per 10 ppb increase in annual mean ozone or 8-hour average.[8]

Acute and chronic ozone exposure are both linked to premature mortality. Epidemiological and toxicological studies show a strong relationship between short-term ozone exposures and premature mortality.[9] The ISA describes how numerous studies across the U.S.,

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[4] *See, e.g.*, Moore et al. (2008), Ambient ozone concentrations cause increased hospitalizations for asthma in children: An 18-year study in Southern California, Environ. Health Perspect. 116:1063-1070; Meng et al (2010), Outdoor air pollution and uncontrolled asthma in the San Joaquin Valley, California, J. Epidemiol. Community Health 64:142-147, *available at* http://dx.doi.org/10.1136/jech.2008.083576; Meng, (2007), Traffic and outdoor air pollution levels near residences and poorly controlled asthma in adults, Ann. Allergy Asthma Immunol. 98:455-463, *available at* http://www.ncbi.nlm.nih.gov/pubmed/17521030; Künzli (2012), Is air pollution of the 20th century a cause of current asthma hospitalisations? [Editorial], Thorax 67:2-3, *available at* http://dx.doi.org/10.1136/thoraxjnl-2011-200919; Lin et al. (2008b), Chronic exposure to ambient ozone and asthma hospital admissions among children, Environ. Health Perspect. 116:1725-1730, *available at* http://dx.doi.org/10.1289/ehp.11184.

[5] *See, e.g.*, Franze et al. (2005), Protein nitration by polluted air, Enviro. Sci. Technol. 39:1673-1678, *available at* http://dx.doi.org/10.1021/es0488737; U.S. Environmental Protection Agency (2006), Air quality criteria for ozone and related photochemical oxidants [EPA Report], (EPA/600/R-05/004AF), Research Triangle Park, NC, *available at* http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=149923.

[6] *See, e.g.*, Youssef et al (2012), Air pollution indicators predict outbreaks of asthma exacerbations among elementary school children: integration of daily environmental and school health surveillance systems in Pennsylvania, J. Environ. Monit. Dec. 14(12):3202-10, *available at* http://www.ncbi.nlm.nih.gov/pubmed/23147442.

[7] Akinbami (2010), The association between childhood asthma prevalence and monitored air pollutants in metropolitan areas, United States, 2001-2004, Environ. Res. Apr. 110(3):294-301, *available at* http://dx.doi.org/10.1016/j.envres.2010.01.001.

[8] McDonnell et al. (1999), Long-term ambient ozone concentration and the incidence of asthma in nonsmoking adults: the Ahsmog study, Environ. Res. 80:110-121, *available at* http://www.ncbi.nlm.nih.gov/pubmed/10092402; Greer et al. (1993), Asthma related to occupational and ambient air pollutants in nonsmokers, J. Occup. Environ. Med. 35:909-915, *available at* http://www.ncbi.nlm.nih.gov/pubmed/8229343.

[9] *See generally* the ISA (2013) and U.S. Environmental Protection Agency (2013). *Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards*, Second External Review Draft [hereinafter, Policy

Canada, and Europe—including multi-city, multi-continent, and single city studies—demonstrate positive links between ambient ozone concentrations and respiratory-related mortality. On the whole, ozone-induced premature mortality in these studies found to occur at mean 8-hour maximum concentrations of less than 63 ppb.[10] One important study examining 98 U.S. cities with mean long-term temperatures of 26.8 ppb found associations between ozone level and mortality. Across communities, a 10 ppb increase in the prior week's ozone level was associated with a 0.52% increase in mortality. Higher effect estimates were associated with factors such as race and socioeconomic status (e.g., including unemployment, public transportation use, and owning an air conditioner). In another a 14-year study of 95 U.S. cities found links between short-term increases in ozone and premature mortality, even when excluding days exceeding 60 ppb, finding that that "daily changes in ambient O3 exposure are linked to premature mortality, even at very low pollution levels."[11] Thus, the harmful effects of ozone air pollution are well-established in the medical literature and public record, underscoring the critical importance of meaningful RACT determinations to address ozone pollution sources.

B. Ozone National Ambient Air Quality Standards, Pennsylvania, and Pennsylvania's RACT Proposal

In 2008, EPA revised the 1997 ozone NAAQS to 75 parts per billion with an 8-hour averaging period.[12] In 2012, EPA finalized designations, including nonattainment designations, under this 2008 NAAQS, adding to unresolved nonattainment designations in Pennsylvania under the preexisting 1997 NAAQS.

Seventeen counties centered around Pittsburgh and Philadelphia are designated nonattainment under the 2008 ozone NAAQS.[13] These seventeen counties contain over 8 million residents, or roughly two-thirds of Pennsylvania's total population.[14]

Assessment (2014)]. Both conclude that there is a likely causal relationship between short-term ozone increases and total mortality.

[10] *See* ISA (2013) at 2-22 summarizing existing research.

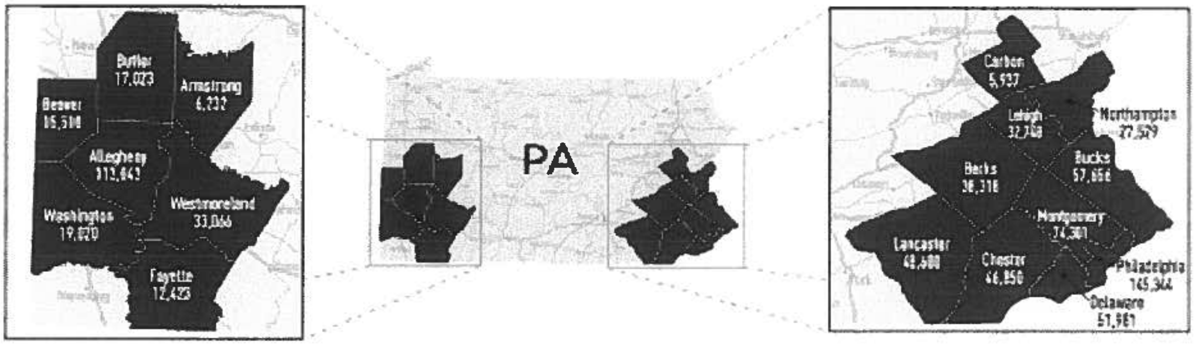
[11] Bell et al. (2006), The Exposure-Response Curve for Ozone and Risk of Mortality and Adequacy of Current Ozone Regulations, Environ Health Perspect. 114:532-536, *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1440776/.

[12] 73 Fed. Reg. 16,483 (March 27, 2008).

[13] These seventeen counties are Allegheny, Armstrong, Beaver, Berks, Bucks, Butler, Carbon, Chester, Delaware, Fayette, Lancaster, Lehigh, Montgomery, Northampton, Philadelphia, Washington and Westmoreland. *See* Pennsylvania DEP, Attainment Status by Principal Pollutants, *at* http://www.dep.state.pa.us/dep/deputate/airwaste/aq/attain/status.htm.

[14] To be precise, 8,071,358 out of 12,764,475 Pennsylvanians (US Census Bureau 2012) live in ozone nonattainment areas.

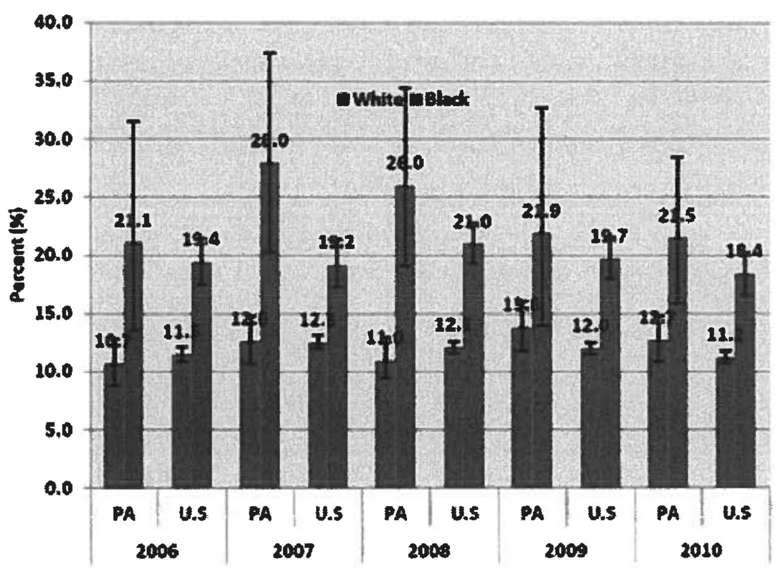
Figure 1: Pennsylvania Ozone Nonattainment Areas



COUNTIES IN NON-ATTAINMENT FOR THE FEDERAL OZONE STANDARD WITH NUMBER OF VULNERABLE CHILDREN AND ADULTS SUFFERING FROM ASTHMA

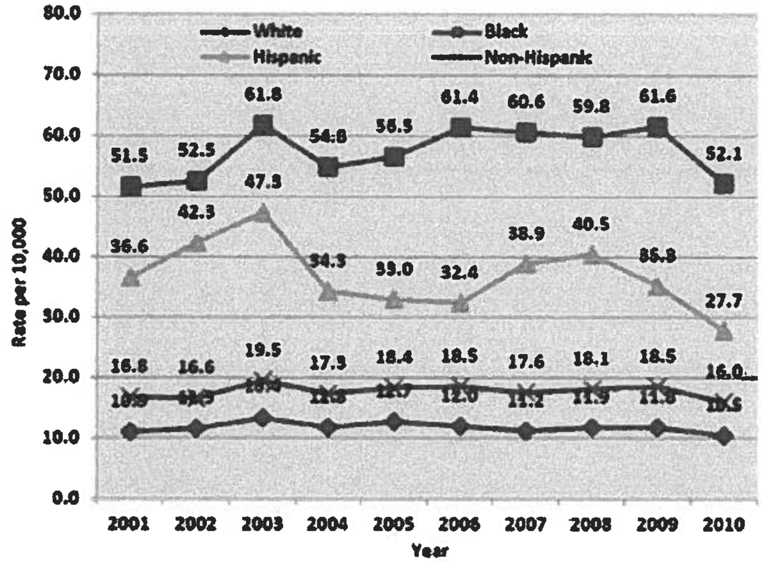
Moreover, huge numbers of Pennsylvania residents are particularly susceptible to ozone pollution, including more than 1.2 million seniors, 1.7 million children, and nearly 750,000 asthma sufferers.[15] Additionally, minority groups in Pennsylvania tend to suffer disproportionately from asthma, with child lifetime asthma prevalence being roughly double the rate for African American Pennsylvanians as for White Pennsylvanians; similarly, African Americans and Hispanics in Pennsylvania have significantly higher asthma hospitalization rates than for White Pennsylvanians. *See* Figure 2 and Figure 3, below.

Figure 2: Child Lifetime Asthma Prevalence by Race, PA compared to the U.S., 2006-2010[16]



[15] *See* American Lung Association State of the Air 2013, *available at* http://www.stateoftheair.org/2013/states/pennsylvania/.
[16] Figures 2 and 3 taken from the 2012 Pennsylvania Dept. of Health Asthma Burden Report, *available at* http://www.portal.state.pa.us/portal/server.pt/document/1281643/2012_asthma_burden_report_pdf.

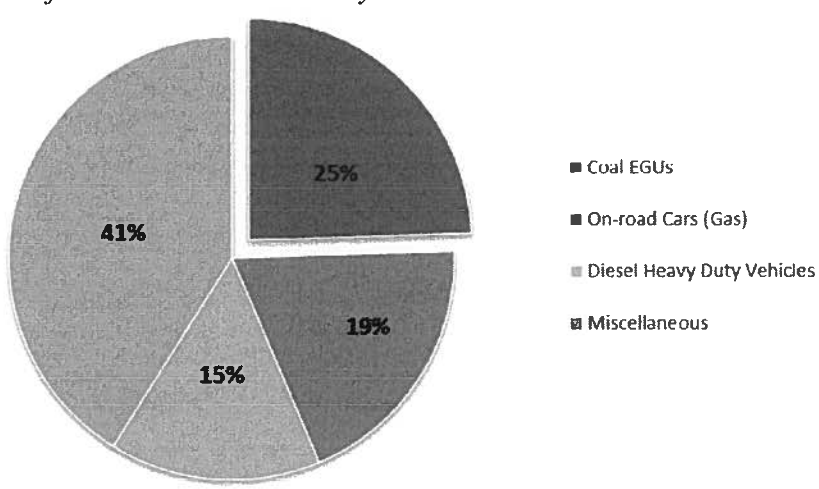
Figure 3: PA Inpatient Hospitalization with Asthma Rate by Race & Ethnicity, 2001-2010



Because of these nonattainment designations, and because Pennsylvania is part of the Ozone Transport Region, DEP must require RACT for major stationary sources of the ozone precursor pollutants NOx and VOCs in Pennsylvania. *See* 42 U.S.C. § 7502(c)(1).

In Pennsylvania, coal-fired electrical generating units ("EGUs"), are the largest single source of NOx, comprising 25 percent of all NOx emissions in the state.

Figure 4: Sources of NOx Pollution in Pennsylvania[17]



With its RACT Proposed Rule, Pennsylvania has proposed new RACT standards for a variety of source categories, including coal combustion. Under the proposal, the presumptive RACT NOx emission limit for a coal-fired boiler would be an extremely permissive range of

[17] Data from the National Emissions Inventory 2011.

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.

II. SCR is RACT for Coal Combustion, and Pennsylvania's RACT Proposal Must Be Revised to Incorporate Limits Consistent with SCR Operation

Despite the fact that SCR is in widespread use across the country—and is in even *wider* use in Pennsylvania—DEP's RACT proposal is premised on the use of low-NOx burners: a technology that is surpassed by the actual controls in place on nearly every coal-fired EGU boiler in the commonwealth. This is unlawful; far from fulfilling the requirements of Section 172 of the Clean Air Act and imposing technology-derived emission limits to decrease ozone-causing pollution, Pennsylvania's proposal would incorporate RACT-based emission limits higher than actual plant emission levels. Consistent with determinations in neighboring states, national adoption of SCR technology, the use of SCR in Pennsylvania as well as historical emissions achievements and DEP's own statements concerning SCR, Pennsylvania must consider emission limits derived from SCR controls as RACT for coal combustion.

A. The Legal Standard for RACT

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 a technology-forcing standard intended to ensure that polluting sources are controlled consistent with available methods for reducing pollution. As a result, RACT is a stringent standard, designed to induce and require improvements in control technology and reductions in pollutant emissions. Indeed, EPA has long maintained that "RACT should represent the toughest controls considering technological and economic feasibility that can be applied to a specific situation" and that "[a]nything less than this is by definition less than RACT."[18]

RACT is defined as "the lowest emissions limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[19] The RACT definition comprises two parts: (a) technological feasibility and (b) economic feasibility.

[18] Memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management, U.S. EPA, to Regional Administrators, Regions I - X (Dec. 9, 1976), at 2 (hereinafter "Strelow Memo").
[19] COMAR 26.11.01.01.B(40); *accord* U.S. EPA, State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 55,620, 55,624 (Nov. 25, 1992).

(a) Technological Feasibility

"The technological feasibility of applying an emission reduction method to a particular source should consider the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements."[20]

There is no dispute that installation of SCR would be technologically feasible at Pennsylvania coal plants. SCR is a mature technology that is, as described more fully below, installed on half the U.S. coal fleet, and on four-fifths of Pennsylvania's own coal EGU fleet.

(b) Economic Feasibility

As EPA has explained, "[e]conomic feasibility considers the cost of reducing emissions and the difference in costs between the particular source and other similar sources that have implemented emission reduction."[21] Specifically,

> EPA presumes that it is reasonable for similar sources to bear similar costs of emission reductions. **Economic feasibility rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources. Less efficient sources would be rewarded by having to bear lower emission reduction costs if affordability were given high consideration. Rather, economic feasibility for RACT purposes is largely determined by evidence that other sources in a source category have in fact applied the control technology in question.**[22]

Further, EPA has explained that RACT is not intended to enshrine existing installed control technologies, but rather is technology-forcing.[23] Thus, "[i]n determining RACT for an individual source or group of sources, the control agency, using the available guidance, should select the best available controls, *deviating from those controls only where local conditions are such that they cannot be applied there* and imposing even tougher controls where conditions allow."[24] Accordingly, given the widespread application of SCR, a less effective technology could only be chosen for a specific source if SCR physically could not be applied at that specific source

B. <u>SCR is Widely Available, and SCR-Equipped Facilities Are Readily Capable of Achieving Emission Rates as Low as 0.07 lbs NOx/MMbtu or Lower</u>

SCR is far more than reasonably available—it is *actually* available and in operation on half of the country's mid-size to large coal-fired EGUs. Specifically, fully 47 percent of the

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[20] U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental, 57 Fed. Reg. 18,070, 18,074 (Apr. 28, 1992).
[21] 57 Fed. Reg. at 18,074.
[22] 57 Fed. Reg. at 18,074 (emphasis added).
[23] Strelow Memo at 2.
[24] Strelow Memo at 2 (emphasis added).

nation's active coal units larger than 150 MW are equipped with SCR. When units that have announced an intention to retire are excluded from this list, the percentage of units over 150 MW with SCR or with plans to install SCR rises to nearly 52 percent. Indeed, SCR is actually *the most prevalent* NOx control for coal combustion in the United States.

SCR is even more prevalent in the Mid-Atlantic. In Delaware and New Jersey, every single coal unit sized 125 MW or larger is equipped with SCR. In Pennsylvania itself, 78% of the coal units 125 MW or larger have installed or announced plans to install SCR.

SCR is capable of high rates of NOx removal. SCR systems maintained consistent with good operating procedures can regularly ensure NOx emission reductions of 90% or more. This translates to emission limits as low as 0.05 lbs/MMBtu or lower, such that a 0.07 lbs/MMBtu rate is consistently achievable on 30-day averages. Nor are such emission reductions theoretical: the actual historical experience of the Pennsylvania coal fleet has been that, when the Pennsylvania facilities run their SCR systems, they have achieved very high rates of NOx removal.

Table 1: Historically Achieved Low NOx Emission Rates from Large SCR-Equipped Pennsylvania Coal EGUs[25]

Facility Name	Unit ID	Associated Stacks	Year	Month	Avg. NOx Rate (lb/MMBtu)	NOx (tons)	Heat Input (MMBtu)	Operating Time	Gross Load (MW-h)
Montour	2		2003	7	0.030	67.1	4439436.4	744	536857
Cheswick	1		2012	5	0.032	0.588	35245.188	101.18	36
Montour	2		2003	9	0.038	76.344	4123397.3	720	499275
Keystone	2		2007	7	0.040	112.732	5665959.7	744	640802
Keystone	1		2003	5	0.040	118.068	5859460.6	744	646929
Keystone	2		2004	5	0.040	114.972	5703423.8	744	660861
Keystone	1		2003	8	0.040	118.286	5865375	744	645819
Keystone	2		2007	5	0.040	116.926	5791947.1	744	644098
Keystone	2		2007	8	0.040	115.714	5726245.2	744	652474
Keystone	1		2005	9	0.041	113.99	5636526.6	720	625140
Keystone	1		2006	9	0.041	115.749	5707471.6	720	613484
Keystone	2		2010	8	0.041	124.326	6126809.2	744	674539
Keystone	1		2003	9	0.041	113.58	5592747.1	720	619893
Keystone	2		2008	9	0.041	115.562	5650612.5	720	625472
Montour	2		2004	8	0.041	88.05	4407282.1	744	512416
Keystone	1		2006	5	0.042	121.882	5873818.6	744	646370
Montour	2		2004	7	0.042	92.634	4531632.4	744	524862
Keystone	2		2008	6	0.042	116.154	5595462	720	630999
Keystone	2		2005	7	0.042	117.264	5638788.3	744	646167
Keystone	2		2003	7	0.042	102.321	5161755.284	655.54	575235
Montour	2		2006	6	0.042	85.84	4210710	720	500644
Keystone	1		2006	8	0.042	114	5660406.822	702.13	617690
Montour	1		2005	8	0.042	98.216	4692243.3	744	548099
Montour	2		2004	6	0.042	87.029	4185072	720	482174
Keystone	1		2003	7	0.043	120.762	5800313.2	744	645725
Keystone	2		2010	9	0.043	124.082	5791138.9	720	643614
Montour	1		2003	5	0.043	86.214	4172669.3	744	488193
Montour	1		2003	7	0.043	97.155	4579253.7	744	526681
Montour	1		2004	8	0.043	92.851	4388824.7	744	499426
Montour	2		2007	8	0.043	100.713	4715245.9	744	564056
Keystone	1		2005	6	0.043	117.118	5583698.5	720	609977

[25] Data taken from U.S. EPA's Air Markets Database, *available at* http://ampd.epa.gov/ampd/.

Keystone	1	2004	5	0.043	111.845	5392678.613	694.97	606445
Keystone	1	2005	8	0.043	124.287	5924907.2	744	649394
Cheswick	1	2003	8	0.044	66.075	3064135.7	744	376917
Keystone	2	2008	5	0.044	120.629	5583061.9	744	630889
Keystone	2	2009	2	0.044	114.36	5243190.4	672	596584
Keystone	2	2010	5	0.044	127.333	5824804.1	744	651472
Keystone	1	2005	7	0.044	119.069	5513428.04	697.1	600535
Keystone	2	2008	8	0.044	121.724	5818626.565	732.02	635635
Keystone	2	2003	9	0.044	123.735	5594491	720	623178
Keystone	2	2010	10	0.044	134.278	6036814.9	744	655498
Montour	2	2005	8	0.044	104.979	4750366.6	744	554523
Montour	1	2003	9	0.045	96.161	4402838.5	720	500590
Montour	2	2000	8	0.045	102.498	4597455.5	744	527334
Keystone	2	2010	6	0.045	122.603	5667520.546	715.73	634835
Montour	1	2008	8	0.045	15.817	704049.22	106.8	77906
Keystone	2	2010	4	0.045	125.975	5691292.1	720	642937
Keystone	2	2009	3	0.045	130.202	5780320.6	744	656156
Montour	1	2003	8	0.045	98.488	4534403.9	744	515840
Keystone	2	2010	1	0.046	127.776	5738525.8	744	666152
Keystone	1	2006	7	0.046	123.511	5515930.472	700.16	607318
Keystone	1	2006	6	0.046	124.226	5498493.328	708.8	602567
Keystone	2	2008	7	0.046	130.683	5932011.6	744	647563
Montour	1	2005	7	0.046	103.265	4600618.2	744	539606
Montour	1	2003	6	0.047	86.746	3914353.4	720	450434
Montour	1	2006	6	0.047	96.12	4171816.3	720	502086
Montour	2	2006	7	0.047	91.26	4091489.974	683.41	484712
Cheswick	1	2003	9	0.047	58.531	2694701.412	697.23	330643
Montour	2	2005	9	0.047	105.137	4464323.4	720	524176
Montour	1	2004	7	0.048	104.511	4434905.9	744	505947
Keystone	1	2009	8	0.048	133.631	5603868.2	744	645152
Montour	1	2005	9	0.048	106.054	4470857	720	521034
Keystone	2	2004	6	0.048	124.727	5429282.6	720	617362
Keystone	1	2003	6	0.048	111.497	4864688.19	642.3	537339
Montour	1	2004	9	0.049	99.722	4103421.6	720	478214
Montour	2	2003	6	0.049	74.863	3345036.754	647.34	403755
Keystone	2	2005	6	0.049	97.685	4347359.412	598.93	496629
Montour	1	2006	8	0.049	106.304	4311772.008	738.33	531098
Keystone	2	2003	6	0.049	128.762	5528386.09	719.9	608507
Keystone	1	2007	8	0.050	133.845	5503301.8	744	653050
Montour	1	2006	7	0.050	105.205	4397388	744	528127
Keystone	1	2005	5	0.050	126.863	5429174.66	699.82	588554
Keystone	1	2010	6	0.050	144.737	5780176.2	720	641856
Keystone	2	2005	5	0.050	128.387	5477229	744	630823
Montour	1	2007	8	0.050	114.684	4581728.1	744	533517
Keystone	2	2003	5	0.050	100.231	4268130.166	563.32	474305
Montour	2	2007	9	0.050	112.935	4507820.8	720	536571
Montour	1	2006	5	0.050	106.735	4310819.7	744	519205
Keystone	1	2007	5	0.051	145.762	5712706.8	744	650215
Keystone	1	2009	7	0.051	113.213	4737472.379	651.76	541948
Keystone	1	2010	8	0.051	152.639	5990596.6	744	669599
Keystone	1	2010	9	0.052	146.121	5674395.1	720	639307
Keystone	2	2009	1	0.052	139.232	5750126	744	649321
Keystone	1	2010	5	0.052	148.113	5791544.8	744	644327
Keystone	1	2009	12	0.052	152.335	5854402.1	744	672058
Keystone	2	2007	9	0.053	119.857	4684463.18	622.64	530819
Keystone	2	2009	7	0.053	127.679	5162814.304	690.83	564361
Keystone	2	2003	8	0.053	120.464	4937351.476	642.03	551836
Montour	1	2005	6	0.054	114.326	4338969.4	720	508440
Keystone	2	2007	6	0.054	103.178	4340638.132	591.56	483415
Montour	1	2007	7	0.054	122.431	4572721.6	744	523045
Montour	1	2009	3	0.054	121.922	4540397.3	744	523361
Keystone	1	2009	6	0.054	117.05	4566425.597	623.69	524741
Keystone	1	2010	10	0.055	147.988	5601051.18	739.9	634498
Cheswick	1	2003	7	0.055	68.347	2778570.434	698.08	328214

Montour	2		2003	8	0.055	96.629	3642299.201	699.88	447330
Bruce Mansfield	1	MS1A, MS1B	2003	6	0.056	126.544	4563727.9	720	574675
Keystone	2		2006	5	0.056	139.477	5395247.14	735.52	623124
Keystone	1		2010	7	0.056	168.277	6034383.8	744	660722
Keystone	1		2004	6	0.057	107.733	4315921.66	569.26	477163
Bruce Mansfield	3	MS3A, MS3B	2005	5	0.057	150.553	5292144.7	744	641675
Keystone	1		2010	1	0.057	163.683	5895917.4	744	672754
Keystone	1		2010	4	0.057	156.169	5654026.3	720	634793
Montour	1		2009	7	0.057	137.654	4926893.1	744	521721
Montour	2		2005	7	0.057	108.57	4068449.3	744	459714
Montour	2		2010	12	0.057	128.541	4499373.4	744	555083
Keystone	1		2010	2	0.057	138.747	5008294.24	625.1	566803
Keystone	2		2010	7	0.057	122.096	4459914.556	585.14	495821
Montour	2		2004	5	0.057	111.611	4161139.228	677.44	470150
Montour	1		2009	2	0.058	117.562	4100018.2	672	477837
Cheswick	1		2003	6	0.058	94.561	3372816.3	720	357948
Montour	2		2006	5	0.058	101.767	3811081.603	664.95	452392
Montour	1		2004	6	0.058	113.071	4017715.2	709.48	458048
Keystone	2		2004	7	0.059	143.343	5028431.47	668.22	571750
Montour	2		2006	9	0.059	125.415	4259988	720	504968
Montour	1		2007	9	0.060	101.639	3644159.541	652.5	446656
Keystone	2		2009	6	0.060	119.418	4282524.051	572.84	469497
Homer City	1		2006	9	0.061	119.361	3947780.2	720	444131
Homer City	1		2005	7	0.061	132.522	4380951.4	744	481003
Homer City	1		2005	8	0.062	136.908	4438118.5	744	485917
Montour	2		2004	9	0.063	129.886	4240015.3	720	500903
Homer City	1		2006	6	0.063	126.702	3983712.7	720	451522
Keystone	1		2007	9	0.064	170.901	5345386.9	720	632436
Homer City	2		2006	7	0.064	130.854	4056510.6	744	447616
Bruce Mansfield	2	MS2A, MS2B	2005	5	0.065	168.187	5207301.4	744	621467
Keystone	1		2009	10	0.065	104.135	3451199.249	456.27	391201
Bruce Mansfield	1	MS1A, MS1B	2012	2	0.065	142.759	4372958.3	696	491167
Montour	2		2001	5	0.066	155.928	4737194.8	744	527504
Montour	2		2003	5	0.066	115.101	3632931.472	668.53	442468
Homer City	1		2005	9	0.066	135.781	4157677	720	466586
Montour	2		2001	8	0.066	156.025	4759565.7	744	524923
Keystone	2		2009	8	0.066	190.941	5741709.6	744	637227
Homer City	1		2006	7	0.067	136.98	4113099.7	744	462874
Bruce Mansfield	1	MS1A, MS1B	2005	5	0.067	151.791	4850905.825	737.5	590200
Montour	2		2007	7	0.067	128.34	4159041.928	670.26	491905
Montour	1		2008	6	0.067	130.214	4238735.25	714.5	486000
Montour	1		2009	4	0.068	121.22	3743460.243	637.85	413289
Bruce Mansfield	1	MS1A, MS1B	2007	9	0.068	174.528	5161775	720	607226
Homer City	1		2006	5	0.068	147.544	4301079.2	744	479114
Montour	2		2001	6	0.069	144.912	4199958.5	720	476719
Bruce Mansfield	2	MS2A, MS2B	2003	7	0.069	169.455	5092103.375	709.25	573960
Homer City	2		2006	9	0.069	113.652	3442640.383	673.35	385976
Keystone	2		2009	4	0.069	195.181	5606989.5	720	630282
Bruce Mansfield	1	MS1A, MS1B	2008	7	0.069	198.379	5749920.8	744	644504
Bruce	1	MS1A,	2004	6	0.070	176.7	5021082.3	720	570982

Mansfield		MS1B							
Cheswick	1		2004	8	0.070	100.668	3254830.324	701.22	322538
Cheswick	1		2004	9	0.070	101.226	3133899.647	705.25	330034
Bruce Mansfield	1	MS1A, MS1B	2008	9	0.070	188.69	5396446.1	720	628014
Montour	1		2009	6	0.070	136.068	4090406.03	651.01	432885
Keystone	1		2008	5	0.070	205.1	5870815.6	744	634256

Table 1 above demonstrates this. As the shaded column records, Pennsylvania coal plants equipped with SCR have historically achieved 30-day periods with average NOx emission rates lower than 0.07 lbs/MMBtu; many, in fact, have emitted at even *lower* rates—as low as 0.04 or even 0.03 lbs/MMBtu. Plainly, the actual experience of SCR in Pennsylvania is that, when facilities operate the controls, very low levels of NOx emissions are the result.

Indeed, Pennsylvania itself has recognized that coal-fired EGUs equipped with SCR are capable of dramatic reductions in NOx. For example, in 2000, Pennsylvania DEP stated in a public notice that operation of SCR controls at a coal-fired EGU

> [W]ill control the nitrogen oxides emissions from Unit #1 and, when operating, will reduce the nitrogen oxides emissions by up to 90% from the level which currently exists. The resultant nitrogen oxides emission rate may be as low as .04 pounds per million BTU of heat input.[26]

Pennsylvania has thus long-acknowledged that SCR-equipped facilities can achieve very low rates of NOx emissions. Moreover, DEP's assessment of the reduction rate for the SCR controls referenced in the public notice proved accurate: while operating its SCR, the plant in question—Montour—has achieved extremely high rates of NOx removal, with emissions in the 0.04 lbs/MMbtu range for multiple months in 2003, 2004, 2005, and 2008. *See* Table 1, *supra*. Accordingly, a RACT/RACM determination of 0.07 lbs/MMbtu is well-supported by this and other Pennsylvania facilities' actual historical experience.

Such rates of NOx removal can be achieved at very low cost, moreover. Particularly for the vast majority of units in Pennsylvania that are *already* equipped with SCR, the cost of operating their controls is quite modest:

[26] June 20, 2000 Correspondence from DEP to Linda A. Boyer, PPL Electric Utilities Corporation Re: Plan Approval Application #OP-47-0001D, at 2 (attached hereto as Exhibit 2).

Table 2: Calculated NOx Cost-per-Ton Removal Rates for SCR-Equipped PA Coal EGUs[27]

Plant	Unit	MW	Proper RACT Limit (30d) (lb/MMBtu)	Median 2011-2013 Actual 30d NOx Rate (lb/MMBtu)	NOx Reduction with Proper. RACT Limit (tpy)	Catalyst Replacement Cost ($/yr)	Cat. Repl. Cost Effectiveness ($/ton)	Full SCR O/M Cost Effectiveness ($/ton)
Bruce Mansfield	1	914	0.07	0.127	1817	2241859	1234	2628
Bruce Mansfield	2	914	0.07	0.119	1553	2241859	1444	3076
Bruce Mansfield	3	914	0.07	0.128	1829	2241859	1226	2611
Cheswick	1	637	0.07	0.341	3566	878869	246	572
Conemaugh	1	936	0.07	0.321	7515	2152332	286	615
Conemaugh[28]	2	936	0.07	0.321	7521	2152332	286	614
Homer City	1	660	0.07	0.192	2202	1214136	551	1220
Homer City	2	660	0.07	0.243	3129	1214136	388	858
Homer City	3	692	0.07	0.215	2743	1273003	464	1027
Keystone	1	936	0.07	0.372	8933	2152332	241	517
Keystone	2	936	0.07	0.361	8623	2152332	250	536
Montour	1	806	0.07	0.393	7431	1606277	216	473
Montour	2	819	0.07	0.388	7424	1632185	220	481

The full operation and maintenance costs for SCR on these units averages less than $1200 per ton when hitting an emission rate of 0.07 lbs/MMBtu—less expensive than the presumptive reduction costs DEP has calculated for nearly every source category covered in the RACT Proposed Rule.[29] *See* Regulatory Analysis Form. Thus, in addition to being technologically feasible, emission limits consistent with SCR operation are also quite economically feasible. *Compare* Montour cost-per-ton *with* Pennsylvania proposed presumptive cost-efficacy threshold of $2,500 per ton.

Indeed, these cost-per-ton analyses are consistent with EPA's own assessment of the cost figures for SCR operation. For example, EPA calculates that SCR controls can eliminate NOx emissions at a cost of between $1,550 and $2,066 per ton.[30] Similar assessments exist for specific facilities: a removal rate of $1,583 to $2,297 per ton for the Gerard Gentleman facility in Nebraska,[31] $1,504 per ton for the Big Stone Generating Station in South Dakota,[32] $1,738 per ton for the Jeffrey Energy Center in Kansas, $2,240 per ton for the Navajo facility in Arizona,[33] and $2,405 per ton for Arizona's Coronado facility.[34] As such, both the widespread application of SCR and the cost of NOx removal through SCR demonstrate that SCR is RACT, even when using Pennsylvania's own assumed cost-efficacy threshold of $2,500 per ton.

However, this threshold is itself inappropriate. First, Pennsylvania's arbitrary $2,500 per ton limit is out of step with cost-efficacy determinations in other states. For example, New

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[27] Table 2 is a summary of the data and calculations in the spreadsheet Pennsylvania – Summary of Large Units NOx RACT Analysis, attached hereto as Exhibit 3.

[28] Conemaugh is in the process of installing SCR on its coal-fired units, and thus would not be installing SCR as part of compliance with any new RACT limits Pennsylvania imposes—the controls would already be in place.

[29] Notably, the cost per ton *drops* if a higher rate of NOx removal consistent with a limit of 0.05 lbs/MMBtu is used.

[30] U.S. EPA, Menu of Control Measures, *available at* http://www.epa.gov/air/criteria.html.

[31] *See* 77 Fed. Reg. 40,151 (July 6, 2012); 77 Fed. Reg. 12,770 (March 2, 2012).

[32] *See* 76 Fed. Reg. 80,754 (Dec. 27, 2011); 76 Fed. Reg. 52,604 (Aug. 23, 2011).

[33] *See* 78 Fed. Reg. 8,273 (Feb. 5, 2013).

[34] *See* 77 Fed. Reg. 72,511 (Dec. 5, 2012); 77 Fed. Reg. 42,834 (July 20, 2012).

York's 2013 Economic and Technical Analysis for RACT Networks establishes a cost per ton threshold of $5,000/ton for NOx RACT. *See* New York State Dep't of Envtl. Conservation, DAR-20: Economic and Technical Analysis for Reasonably Available Control Technology Networks (Aug. 8, 2013), at 1-2 (adjusting to 2012 dollars the $3,000/ton cost threshold for NOx established by DEC in 1994). Second, while Pennsylvania proposes a $2,500/ton cost threshold for NOx, it proposes a $5,000/ton threshold for VOCs. Given that NOx is actually the more significant ozone precursor in the Northeast U.S., especially considering sources such as coal-fired power plants located in Pennsylvania and other upwind states, the NOx cost-effectiveness threshold should be as high, if not higher, than the VOC cost effectiveness threshold. Using a properly higher cost efficacy threshold for NOx would, of course, demonstrate even further the cost efficacy of SCR as RACT for coal combustion.

C. Pennsylvania's Proposed RACT Limits for Coal Combustion Are Woefully Inadequate

Despite the fact that SCR is RACT, and that SCR-equipped units can readily achieve a 0.07 lbs/MMBtu NOx emission rate, DEP now proposes that the far inferior control technology of low NOx burners should be considered RACT. Not only is this inconsistent with the suite of controls presently available nationwide, it is completely out of step with the level of controls already present in Pennsylvania's coal fleet: the majority of coal-fired electric-generating boilers in Pennsylvania are already equipped with far better NOx controls than the low NOx burners Pennsylvania is proposing as RACT. 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 3, *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[35] surpassing the RACT proposal Pennsylvania makes now.

Table 3: Pennsylvania Coal-Fired EGU Boilers and Current NOx Controls[36]

Plant Name	Unit ID	Nameplate Capacity (MW)	NOx Controls
AES Beaver Valley *(Cogen)*	GEN 3	114	LNBO, SNCR
Bruce Mansfield	1	914	LNBO, SCR
Bruce Mansfield	2	914	LNBO, SCR
Bruce Mansfield	3	914	LNBO, SCR
Cambria *(Cogen)*	GEN1	98	SNCR
Cheswick Power Plant	1	637	LNC3, SCR
Colver Power Project *(Waste Coal)*	COLV	118	SNCR

[35] Conemaugh is in the process of installing SCR on its two coal-fired boilers this year.
[36] All of the information displayed in Table 1 was retrieved from U.S. EPA's Air Market Program's Database 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.

Conemaugh	1	936	LNC3, SCR 2014
Conemaugh	2	936	LNC3, SCR 2014
Ebensburg Power	GEN1	58	None
Foster Wheeler *(Cogen)*	SG-101	47.3	FBC
Homer City Station	1	660	LNBO, SCR
Homer City Station	2	660	LNBO, SCR
Homer City Station	3	692	LNBO, SCR
John B Rich Memorial *(Waste Coal)*	GEN1	88	FBC, OV
Keystone	1	936	LNC3, SCR
Keystone	2	936	LNC3, SCR
Kline *(Cogen)*	GEN1	57.5	FBC
Northampton *(Waste Coal)*	GEN1	114	SNCR
Panther Creek *(Waste Coal)*	GEN1	94	SNCR
PPL Brunner Island	1	363	LNC3
PPL Brunner Island	2	405	LNC3
PPL Brunner Island	3	790	LNC3
PPL Montour	1	806	LNC3, SCR
PPL Montour	2	819	LNC3, SCR
Scrubgrass *(Waste Coal)*	GEN1	95	SNCR
Seward *(Waste Coal)*	FB1	585	SNCR
St Nicholas *(Cogen)*	SNCP	99	FBC
Westwood Generating Station	GEN1	36	None
Wheelabrator Frackville Energy	GEN1	48	FBC, Other

As a result, the RACT proposal would affect only seven units (highlighted in Table 3), 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.

Thus, Pennsylvania's coal fleet is already emitting at lower rates than would be required by Pennsylvania's proposed RACT limits. *See* Table 4, *infra*; *see also* Figure 5, *infra*. 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 effectively 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.

Table 4: Pennsylvania Coal-Fired EGU Boilers and 2012 NOx Emission Rates[37]

Plant Name	Unit ID	Name-plate Capacity (MW)	Pro-posed 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
AES Beaver Valley *(Cogen)*	GEN 2	35	N/A	0.398	0.423	0.394	3/1-4/30/12
AES Beaver Valley *(Cogen)*	GEN 3	114	N/A	0.497	0.503	0.468	2/1-3/31/12
Bruce Mansfield	1	914	0.40	0.100	0.110	0.060	5/7-9/30/03
Bruce Mansfield	2	914	0.40	0.110	0.123	0.064	6/1-8/31/03
Bruce Mansfield	3	914	0.40	0.110	0.108	0.066	5/1-6/30/05
Cambria *(Cogen)*	GEN1	98	N/A	0.21	0.199	0.094	5/1-6/30/09
Cheswick	1	637	0.35	0.310	0.310	0.077	5/1-6/30/03
Colver Power *(Cogen)*	COLV	118	0.20	0.170	0.159	0.120	5/1-6/30/11
Conemaugh	1	936	0.35	0.315	0.319	N/A	N/A
Conemaugh	2	936	0.35	0.303	0.299	N/A	N/A
Ebensburg Power *(Waste Coal)*	GEN1	58	0.40	0.100	0.088	N/A	
Homer City	1	660	0.40	0.178	0.170	0.061	6/9-9/23/05
Homer City	2	660	0.40	0.233	0.220	0.088	7/27-9/27/05
Homer City	3	692	0.40	0.198	0.207	0.070	6/14-8/10/05
John B Rich *(Cogen)*	GEN1	88	0.20	0.050	0.044	N/A	
Keystone	1	936	0.40	0.355	0.361	0.047	7/8-9/4/09
Keystone	2	936	0.40	0.350	0.340	0.042	7/7-9/30/08
Northampton *(Waste Coal)*	GEN1	114	0.20	0.080	N/A	0.074	11/1-12/31/12
Panther Creek *(Waste Coal)*	GEN1	94	N/A	0.130	N/A	0.123	6/1-7/31/12
PPL Brunner Island	1	363	0.40	0.378	0.360	N/A	N/A
PPL Brunner Island	2	405	0.40	0.379	0.378	N/A	N/A
PPL Brunner Island	3	790	0.40	0.340	0.331	N/A	N/A
PPL Montour	1	806	0.40	0.390	0.399	0.071	6/3-8/5/08
PPL Montour	2	819	0.40	0.390	0.414	0.058	11/16-1/17/11
PPL Montour	11	17	0.40	N/A	N/A	N/A	N/A
Scrubgrass *(Waste Coal)*	GEN1	95	N/A	0.350	N/A	0.120	6/1-7/31/11
Seward *(Waste Coal)*	FB1	585	0.20	0.088	0.082	N/A	N/A

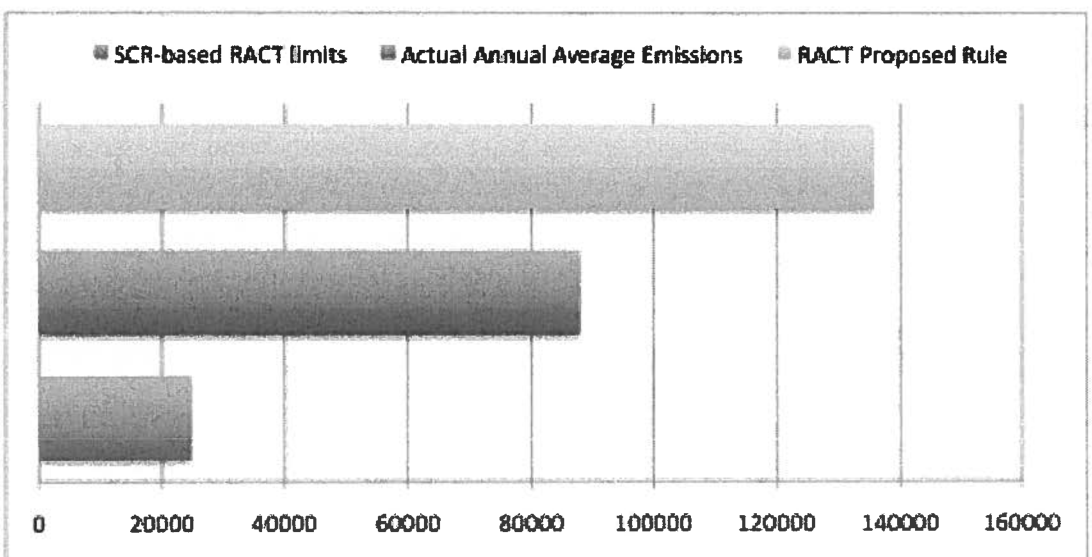
[37] All of the information displayed in Table 2 was retrieved from U.S. EPA's Air Market Program's Database or Title V air permits for the respective facilities. "N/A" corresponds to entries for small sources for which the Air Market Program Database data was not available.

			0.20	0.086	0.074	0.066	5/26-7/26/12
St Nicholas *(Cogen)*	SNCP	99	0.20	0.040	0.043	N/A	N/A
Wheelabrator Frackville Energy	GEN1	48	0.20	0.180	0.164	N/A	N/A

This 2012 data also demonstrates that SCR-equipped facilities are capable of achieving emission rates in the 0.05-0.07 lbs/MMBtu range discussed above as appropriate for RACT. For example, while PPL Montour Units 1 and 2 each had 2012 annual NOx emission rates of 0.39 lbs/MMBtu, they each experienced 60-day periods of much lower emissions: 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 NOx at an average annual rate of 0.35 lbs/MMBtu in 2012, both units achieved 0.04 lbs/MMBtu for at least 60 days (July 8 to September 4, 2009, and July 7 to September 30, 2008, respectively). *See also* Table 1, *supra.*

This effect is readily apparent when comparing the aggregate emissions that the eight largest coal plants in Pennsylvania would generate if limited appropriately consistent with SCR operation, with actual emissions, and emissions consistent with Pennsylvania's proposed RACT standard, based on recent capacity factor data.

Figure 5: Comparison of Annual Average NOx Emissions in Tons per Year from Pennsylvania's Eight Largest Coal Plants, with SCR-Based RACT Limits, Actual Historical Emissions, and Pennsylvania's RACT Proposed Rule Emission Limits [38]



[38] Data is based on the actual emissions and heat inputs of the Bruce Mansfield, Brunner Island, Cheswick, Conemaugh, Homer City, Keystone, Montour, and Seward facilities, taken from the data in U.S. EPA's Air Markets Database, for the years 2010-2013. *See* Exhibit 4.

If the eight largest coal plants in Pennsylvania were required to abide by RACT limits consistent with SCR operation, they would (based on historical levels of operation) emit less than 25,000 tons of NOx per year; by comparison, these facilities have averaged emissions of nearly 88,000 tons per year, and would emit nearly 136,000 tons per year under the limits DEP's RACT Proposed Rule (again, based on historical levels of plant operation).[39]

In other words, the emission limits in the current, inadequate proposal would actually set ostensibly RACT-based limits *higher* than what Pennsylvania's coal fleet is currently emitting, and over five times higher than what would be achieved with a RACT proposal based on use of SCR. Plainly, all of Pennsylvania's significantly sized coal-fired EGUs are capable of complying with much more rigorous standards with the technology currently in place. This RACT Proposed Rule is 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 Pennsylvania here are a far cry from the lowest emission limitation capable of being met by available control technology.

The emission limits for coal-fired boilers contemplated in the RACT Proposed Rule are not just inconsistent with the actual prevalence of SCR in Pennsylvania, they are also significantly weaker than those of nearby states, including Ozone Transport Region 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.[40]

Also, 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 6: New York RACT Determination NOx Emission Limits (lbs/MMBtu)[41]

Fuel Type	Tangential	Wall	Cyclone	Fluidized Bed
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

[39] *See id.*
[40] *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 .
[41] *See* 6 NYCRR § 227-2.4(a)(1)(ii).

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.

III. The Proposed Alternative Compliance Measures are Impermissible Loopholes

As currently written, the proposed rulemaking contains two impermissible loopholes to the emission limits contemplated for all sources: system-wide emissions averaging or "bubbling," and emissions averaging over rolling, 30-day periods.[42] Both of these alternative compliance mechanisms would severely undercut the proposed rulemaking's ability to deliver meaningful reductions in ozone concentrations.

A. System-Wide Averaging Will Lead to the Creation of NOx Hotspots

States such as Pennsylvania that contain ozone nonattainment areas and are within the ozone transport region must set emission limits that drive "reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of [RACT] . . ."[43] As stated previously, RACT is defined as "the lowest emissions limit that *a particular source* is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[44] Thus, RACT must be viewed as a measure intended to reduce transported pollutants as well as to improve local air quality.[45]

Under the RACT Proposed Rule, DEP would require sources to submit an operating permit modification for averaging NOx emissions on either a facility-wide or system-wide basis, using a 30-day rolling average.[46] The permit modification would be required, according to the Proposed Rule, to demonstrate that the aggregate NOx emissions emitted by the sources included in the facility-wide or system-wide NOx emissions averaging plan are not greater than ninety percent of the sum of the NOx emissions that would be emitted by the group of included sources if each source complied with the applicable NOx RACT requirement or NOx RACT emission limitation (*see* Section 129.97) on a source-specific basis.[47] However, simply allowing sources to move high and low NOx emissions from source to source does not sufficiently limit NOx emissions *at each source*. A given facility or system would be still be able to emit to disparately high levels of NOx pollution at the discretion of the owner or operator.

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[42] Proposed 25 Pa. Code § 129.98(a).
[43] Section 172(c)(1) of the CAA, 42 U.S.C.A. § 7502(c)(1).
[44] *See* U.S. EPA, State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 55,260, 55,624 (Nov. 25, 1992).
[45] *See* U.S. EPA, State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental, 57 Fed. Reg. 18,070, 18,074 (Apr. 28 1992).
[46] Proposed Pa. Code § 129.98(b).
[47] Proposed Pa. Code § 129.98(d).

Failing to require reductions at all sources, and instead allowing some sources to compensate to allow others to pollute at heightened levels, would lead to the creation of NOx hotspots, and by extension, ozone hotspots. Each plant affected by the proposed rulemaking must be required to reduce emissions locally, and should not be permitted to "trade" reductions in other areas to justify high emissions by less-controlled plants.

B. The Proposed Rule Implicates Serious Environmental Justice Concerns

By permitting system-wide averaging as an alternative method of compliance with the proposed rulemaking, DEP also runs the risk of exposing certain Pennsylvanians, including those living in environmental justice communities, to a disproportionate amount of ozone pollution. In accordance with recommendations from the Environmental Justice Workgroup ("EJWG"), DEP identifies environmental justice areas of concern as any census tract where twenty percent or more of the area population lives in poverty.[48] The EJWG also recommended that DEP "seek to improve the condition of environmentally burdened communities by establishing benchmarks for improvement, assessing DEP programs for effectively improving conditions of [identified environmental justice areas of concern], and developing plans to improve conditions."[49] In furtherance of the EJWG's proposals, the Pennsylvania Environmental Justice Advisory Board ("EJAB") was created to review and make recommendations to DEP management on existing and proposed regulations that impact the environmental health of affected communities.[50] The EJAB is to, among other its objectives, "eliminate any existing environmental disparities in minority and low-income communities."[51]

Concurrently, EPA is required to "make achieving environmental justice part of its mission by identifying and addressing . . . disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories . . ."[52] EPA defines environmental justice concerns as "disproportionate impacts on minority, low-income, or indigenous populations" that exist prior to or may result from official decision or action.[53] When assessing environmental justice concerns, EPA places emphasis on the public health of and environmental conditions affecting minority, low-income, and indigenous populations because of historical exposure to physical, chemical, biological, social, and cultural factors that have imposed greater environmental burdens on these populations than those placed on the general population.[54] EPA encourages state agencies to consider these assessments when developing and implementing environmental regulations.[55]

As noted above, the proposed alternative compliance mechanism of bubbling emissions across fleets of NOx sources poses the severe risk of creating hotspots of high levels of ozone

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[48] DEP Policy Office, Environmental Justice Public Participation Policy (2004). Document ID 012-0501-002.

[49] *Id.*

[50] http://www.portal.state.pa.us/portal/server.pt/community/environmental_justice_advisory_board/14051.

[51] *Id.*

[52] Exec. Order No. 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994).

[53] *Id.*

[54] U.S. EPA, EPA's Action Development Process: Interim Guidance on Considering the Development of an Action (2010).

[55] *Id.*

pollution; this risk can be seen plainly be examining one of the largest fleets of coal-fired power plants in Pennsylvania. NRG Energy, Inc. (formerly Reliant Energy and RRI Energy, and now including GenOn, Inc., after the 2012 GenOn-NRG merger) fully owns and operates five coal-fired EGUs in Pennsylvania, and has ownership stakes in two other facilities.[56] All seven facilities are in areas where thirty percent or greater of the surrounding population is below the poverty line. Two facilities, Keystone and Cheswick, utilize SCR to control emissions of NOx.[57] Conemaugh utilizes LNBs (although is installing SCR), and Seward utilizes SNCR.[58] Under the proposal, in order to maximize cost savings, NRG could potentially operate controls at its SCR-equipped units[59] and avoid having to operate or install more effective controls at its other units. Alternately, SCR controls could be operated only intermittently to hit a fleetwide average, increasing emissions in local areas.

This outcome would be potentially disastrous for low-income Pennsylvanians living in close proximity to these facilities and is clearly out of step with the recommendations of the EJWG. By allowing system-wide averaging, DEP is ignoring EPA mandates on environmental justice concerns and the responsibilities of the EJAB.

C. Emissions Averaging Over Lengthy Time Periods Is Inconsistent with the Attainment and Maintenance of the Ozone NAAQS

Thirty-day rolling averages are inconsistent with the short-term standard established in the ozone NAAQS. The 2008 ozone NAAQS is an 8-hour standard, allowing for variability in concentrations of ozone while concurrently addressing impacts to human health that result from exposure to ozone, even over short periods of time. By averaging, an owner or operator of a NOx major source is given the option to intermittently emit high volumes of NOx and still remain in compliance with the proposed rulemaking. As with system-wide averaging, these thirty-day averaging periods can potentially lead to disproportionate levels of NOx and thereby, disproportionate concentrations of ozone.[60]

If DEP intends to allow longer averaging periods for facilities, it must demonstrate that real reductions in actual emissions will be achieved.[61] In particular, and according to EPA guidance regarding alternative compliance mechanisms, DEP must prohibit emission reductions created outside the ozone season from being used during the ozone season.[62] Further, DEP must

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[56] These facilities are Cheswick, New Castle, Portland, Seward, and Shawville. NRG also operates and has 20% ownership stakes in the Conemaugh and Keystone facilities. *See* http://www.nrgenergy.com/about/assets.html; *see also* http://www.epa.gov/reg3artd/globclimate/r3pplants.html. At present, New Castle, Shawville, and Portland are slated for retirement.

[57] *See* http://www.epa.gov/reg3artd/globclimate/r3pplants.html.

[58] *Id.*

[59] Albeit not very rigorously, given the extremely permissive limits Pennsylvania is proposing as RACT.

[60] In previous instances, DEP has limited averaging times for criteria pollutants at certain facilities to meet the applicable NAAQS. *Sierra Club v. Pa. Dept. of Environmental Protection and Homer City OL1-OL8, LLC, and EME Homer City Gen. LLP* (EHB Docket No. 2012-093-L) (DEP agreed to match 1-hour sulfur dioxide emission limits to the corresponding 1-hour standard).

[61] U.S. EPA, Improving Air Quality with Economic Incentive Plans (2001). EPA-452/R-01-001.

[62] *Id. See also* Memorandum from O'Connor, J.R., U.S. EPA, OAQPS, to Regional Air Division Directors, "Averaging Times for Compliance with VOC Emission Limits – SIP Revisions Policy," January 20, 1994; Technical Support Document from Aburano, Douglas, U.S. EPA, Region 5, "Approval of Wisconsin Nitrogen

also demonstrate that long-term averaging will not jeopardize attainment and maintenance of the ozone NAAQS.[63]

However, DEP has failed to make any such demonstration or representation in the proposed rulemaking or supporting documentation for the proposed rule. Instead, DEP made only a cursory reference to attainment of the ozone NAAQs and asserted that "by providing flexibility in compliance through emissions averaging and case-specific options, the owners and operators of affected facilities would be able to achieve compliance in the most cost-effective manner."[64] As stated above, DEP's requirements in proposed § 129.98(d) for sources wishing to use 30-day averaging encourage owners or operators of affected sources to maximize cost savings by using more expensive controls less efficiently. This will lead to higher NOx emissions and ozone concentrations in certain affected areas than in others.

Further, there are no ozone season restrictions in the proposed rule nor are such restrictions mentioned in the supporting documentation for the proposed rule. EPA guidance and recent NOx RACT plan approvals have dictated the inclusion of ozone season restrictions as part of the requisite demonstration that alternative compliance mechanisms for NOx RACT—such as 30-day averaging—will not contribute to nonattainment of the ozone NAAQS.[65] The proposed rule also fails to disallow the use of excess NOx emission reductions created outside of the ozone season during the ozone season, which is also noted in the aforementioned EPA guidance and RACT plan approvals.[66]

IV. Conclusion

As explained above, the proposed Pennsylvania RACT Determination would incorporate improperly permissive NOx emission limits for coal-fired EGUs, and would involve a technological standard *inferior* to what is in place for the vast majority of Pennsylvanian's coal-fired fleet. The RACT Determination must be revised before finalization 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 to prevent concentration of harmful emissions near one or more large sources of ozone precursor pollution.

Sincerely,

/s/

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Oxides (NOx) Reasonably Available Control Technology (RACT) and Additions and Amendments to Other Non-RACT NOx Rules," January 25, 2009. EPA-R05-OAR-2007-0587-0003.
[63] *Id.*
[64] Regulatory Analysis Form at 10.
[65] *See* note 54, *supra*.
[66] *Id.*

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EXHIBIT 1

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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. <u>*The Majority of Coal-Fired EGUs in Pennsylvania Already Have Controls Better than the Proposed RACT*</u>

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[1] surpassing the RACT contemplated in the proposed rulemaking.

Table 1: Pennsylvania Coal-Fired EGU Boilers and Current NOx Controls[2]

Plant Name	Unit ID	Nameplate Capacity (MW)	NOx Controls
AES Beaver Valley *(Cogen)*	GEN 3	114	LNBO, SNCR
Bruce Mansfield	1	914	LNBO, SCR
Bruce Mansfield	2	914	LNBO, SCR
Bruce Mansfield	3	914	LNBO, SCR
Cambria *(Cogen)*	GEN1	98	SNCR
Cheswick Power Plant	1	637	LNC3, SCR
Colver Power Project *(Waste Coal)*	COLV	118	SNCR
Conemaugh	1	936	LNC3, SCR 2014
Conemaugh	2	936	LNC3, SCR 2014
Ebensburg Power	GEN1	58	None
Foster Wheeler *(Cogen)*	SG-101	47.3	FBC
Homer City Station	1	660	LNBO, SCR
Homer City Station	2	660	LNBO, SCR
Homer City Station	3	692	LNBO, SCR
John B Rich Memorial *(Waste Coal)*	GEN1	88	FBC, OV

[1] Conemaugh will be installing SCR on its two coal-fired boilers this year.
[2] 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.

Keystone	1	936	LNC3, SCR
Keystone	2	936	LNC3, SCR
Kline *(Cogen)*	GEN1	57.5	FBC
Northampton *(Waste Coal)*	GEN1	114	SNCR
Panther Creek *(Waste Coal)*	GEN1	94	SNCR
PPL Brunner Island	1	363	LNC3
PPL Brunner Island	2	405	LNC3
PPL Brunner Island	3	790	LNC3
PPL Montour	1	806	LNC3, SCR
PPL Montour	2	819	LNC3, SCR
Scrubgrass *(Waste Coal)*	GEN1	95	SNCR
Seward *(Waste Coal)*	FB1	585	SNCR
St Nicholas *(Cogen)*	SNCP	99	FBC
Westwood Generating Station	GEN1	36	None
Wheelabrator Frackville Energy	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[3]

Plant Name	Unit ID	Name-plate Capacity (MW)	Pro-posed 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
AES Beaver Valley *(Cogen)*	GEN 2	35	N/A	N/A	N/A	N/A	N/A
AES Beaver Valley *(Cogen)*	GEN 3	114	N/A	N/A	N/A	N/A	N/A
Bruce Mansfield	1	914	0.40	0.100	0.110	0.060	5/7-9/30/03
Bruce Mansfield	2	914	0.40	0.110	0.123	0.064	6/1-8/31/03
Bruce Mansfield	3	914	0.40	0.110	0.108	0.066	5/1-6/30/05
Cambria *(Cogen)*	GEN1	98	N/A	N/A	N/A	N/A	N/A
Cheswick	1	637	0.35	0.310	0.310	0.077	5/1-6/30/03
Colver Power *(Cogen)*	COLV	118	N/A	N/A	N/A	N/A	N/A
Conemaugh[4]	1	936	0.35	0.315	0.319	0.28	5/21-7/21/00
Conemaugh	2	936	0.35	0.303	0.299	0.25	5/16-7/16/00
Ebensburg Power *(Waste Coal)*	GEN1	58	0.40	N/A	N/A	N/A	N/A
Homer City	1	660	0.40	0.178	0.170	0.061	6/9-9/23/05
Homer City	2	660	0.40	0.233	0.220	0.088	7/27-9/27/05
Homer City	3	692	0.40	0.198	0.207	0.070	6/14-8/10/05
John B Rich *(Cogen)*	GEN1	88	0.20	N/A	N/A	N/A	N/A
Keystone	1	936	0.40	0.355	0.361	0.047	7/8-9/4/09
Keystone	2	936	0.40	0.350	0.340	0.042	7/7-9/30/08
Northampton *(Waste Coal)*	GEN1	114	0.20	N/A	N/A	N/A	N/A
Panther Creek	GEN1	94	N/A	N/A	N/A	N/A	

[3] 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.

[4] 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.

(Waste Coal)								N/A
PPL Brunner Island	1	363	0.40	0.378	0.360	0.27	7/16-9/16/05
PPL Brunner Island	2	405	0.40	0.379	0.378	0.28	7/7-9/7/05
PPL Brunner Island	3	790	0.40	0.340	0.331	0.24	7/14-9/14/05
PPL Montour	1	806	0.40	0.390	0.399	0.071	6/3-8/5/08
PPL Montour	2	819	0.40	0.390	0.414	0.058	11/16/10-1/17/11
PPL Montour	11	17	0.40	N/A	N/A	N/A	N/A
Scrubgrass *(Waste Coal)*	GEN1	95	N/A	N/A	N/A	N/A	N/A
Seward *(Waste Coal)*	FB1 Unit 1	585	0.20	0.088	0.082	0.082	5/16-7/16/07
Seward *(Waste Coal)*	FB2 Unit 2		0.20	0.086	0.074	0.066	5/26-7/26/12
St Nicholas *(Cogen)*	SNCP	99	0.20	N/A	N/A	N/A	N/A
Wheelabrator Frackville Energy	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 NOx 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 NOx 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.[5]

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)[6]

Fuel Type	Tangential	Wall	Cyclone	Fluidized Bed
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.

[5] *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.
[6] *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 NOx 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 NOx reductions Pennsylvania seeks to achieve falls on other NOx sources.

Pennsylvania determined that a reasonable cost per ton of NOx 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 NOx, 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 NOx 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 NOx 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 NOx burners, installation and operation of SNCR would achieve reductions of NOx 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 NOx reductions to other sources, which can have a detrimental effect on Pennsylvania's economic competitiveness. Again, any RACT determination for NOx 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 NOx 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 NOx 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 NOx—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 NOx 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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EXHIBIT 2

Pennsylvania Department of Environmental Protection
208 West Third Street, Suite 101
Williamsport, PA 17701-6448
June 20, 2000

Northcentral Regional Office

Fax 570-327-3420

Linda A. Boyer
Senior Environmental Compliance Engineer
PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, PA 18101-1179

Re: Plan Approval Application #OP-47-0001D
Montour SES
Derry Township, Montour County

Dear Ms. Boyer:

As the Montour SES is a Title V facility, the enclosed notice must be published in a newspaper of general circulation in the Derry Township, Montour County area on at least three separate days. The publication of this notice is the responsibility of PPL and should be accomplished within 14 days of your receipt of this letter. Please do not modify the notice in any way without first obtaining Department approval to do so.

You are required to submit proof of publication of the respective notice to the Department.

Should you have any questions regarding this matter, I can be contacted at 570-327-3640.

Sincerely,

Richard L. Maxwell Jr.

Richard L. Maxwell, Jr.
Chief, Engineering Services
Air Quality Program

Enclosure

cc: File

RLM/bls

Notice

PPL Electric Utilities Corporation
Montour SES
Derry Township, Montour County

PPL Electric Utilities Corporation (2 North Ninth Street, Allentown, PA 18101-1179) has submitted an application (#OP-47-0001D) to the Department of Environmental Protection for plan approval to install two air cleaning devices, an electrostatic precipitator and a selective catalytic reduction system, on a 750 megawatt rated capacity bituminous coal-fired utility boiler (Unit #1) at the Montour SES located in Derry Township, Montour County. In accordance with 25 Pa. Code §§ 127.44(b) and 127.424(b), the Department of Environmental Protection intends to issue plan approval for the installation of the respective air cleaning devices should the Department's review of the respective application convince the Department that plan approval is warranted. The plan approval, if issued, will subsequently be incorporated into a Title V operating permit via administrative amendment in accordance with 25 Pa. Code § 127.450.

The Montour SES is a major facility for which a Title V operating permit application (#TVOP-47-00001) has been submitted but for which no Title V operating permit has yet been issued. The proposed electrostatic precipitator will control particulate matter emitted from Unit #1 and will replace the electrostatic precipitator currently used for that purpose. The resultant particulate matter emissions will be no greater than .1 pound per million BTU of heat input and may be less.

The proposed selective catalytic reduction system will control the nitrogen oxides emissions from Unit #1 and, when operating, will reduce the nitrogen oxides emissions by up to 90% from the level which currently exists. The resultant nitrogen oxides emission rate may be as low as .04 pounds per million BTU of heat input.

The plan approval, should the Department of Environmental Protection decide to issue one, and any subsequent administratively-amended Title V operating permit, will contain appropriate conditions pertaining to the operation of the electrostatic precipitator and the selective catalytic reduction system as well as appropriate recordkeeping and reporting conditions to ensure compliance.

A copy of the plan approval application is available for public inspection during normal business hours at the addressed listed below. Persons interested in inspecting the application should schedule an appointment in advance.

Any person wishing to protest the issuance of plan approval or provide the Department with additional information which he/she believes should be considered in the Department's review of the respective plan approval application may do so by submitting the protest or information in writing to the Department at the address listed below. Protests or comments must be received by the Department within 30 days from the last day of publication of this notice in order to be considered. Each protest or comment should include the following: name, address and telephone number of the person submitting the protest or comment and a concise statement explaining the relevancy of the protest or comment being presented to the Department.

A public hearing may be held if the Department, in its discretion, decides that such a hearing is warranted based on the information received. All persons submitting comments, protesting the issuance of plan approval or requesting a hearing will be notified of the decision to hold a hearing by publication in a newspaper of general circulation in the Derry Township area or by letter or telephone if the Department feels that such contact is adequate.

Written comments, protests or a request for a public hearing should be directed to David W. Aldenderfer, Environmental Program Manager, Air Quality Program, Department of Environmental Protection, 208 West Third Street, Suite 101, Williamsport, PA 17701-6448.

For additional information regarding the respective plan approval application, contact Richard L. Maxwell, Jr., Chief of Engineering Services, Air Quality Program, Department of Environmental Protection, 208 West Third Street, Suite 101, Williamsport, PA 17701-6448. Telephone 570-327-3745.

PA - SUMMARY OF LARGE

Plant	Unit	MW	Heat Rate (Btu/kWh)	HI (MMBtu/hr)	Cap. Factor [2]	Existing SCR	Suggested RACT Limit (30d) (lb/MMBtu)	Median 2011-2013 Actual 30d NOx Rate (lb/MMBtu)
Bruce Mansfield	1	914	9,884	9034	0.8	Y	**0.07**	0.127
Bruce Mansfield	2	914	9,884	9034	0.8	Y	**0.07**	0.119
Bruce Mansfield	3	914	9,884	9034	0.8	Y	**0.07**	0.128
Cheswick	1	637	10,488	6681	0.45	Y	**0.07**	0.341
Conemaugh	1	936	9,737	9114	0.75	Y	**0.07**	0.321
Conemaugh	2	936	9,737	9114	0.75	Y	**0.07**	0.321
Homer City	1	660	10,417	6875	0.6	Y	**0.07**	0.192
Homer City	2	660	10,417	6875	0.6	Y	**0.07**	0.243
Homer City	3	692	10,417	7209	0.6	Y	**0.07**	0.215
Keystone	1	936	9,630	9014	0.75	Y	**0.07**	0.372
Keystone	2	936	9,630	9014	0.75	Y	**0.07**	0.361
Montour	1	806	10,015	8072	0.65	Y	**0.07**	0.393
Montour	2	819	10,015	8202	0.65	Y	**0.07**	0.388

[1] Assumes $350/kW Capital Cost

[5] Assuming interest = 7% and 20 yr li

[2] Consistent with 2010-2012 performance

[3] At $0.35/MWh (consistent with EPA IPM, see http://www.epa.gov/airmarkt/progsregs/epa-ipm/docs/v410/Appendix52A.pdf, p. 6, "VOMW").

[4] Includes FOM and VOM per EPA IPM, see http://www.epa.gov/airmarkt/progsregs/epa-ipm/docs/v410/Appendix52A.pdf, p. 6.

[5] Assumes i=7% and N=20 years

[6] Since the RACT limits in DEP's proposal are greater in every instance than the actual Nox emissions, there is NO additional NOx reduction due to the proposed PA RACT

UNITS NOx RACT Analysis

SCR Cap Cost (MM)[1]	NOx Reduction with Ach. RACT Limit (tpy)	Catalyst Replacement Cost ([3] ($/yr)	Cat. Repl. Cost Effectiveness ($/ton)	Full SCR O/M Cost ($/yr) [4]	Full SCR O/M Cost Effectiveness ($/ton)	PA Proposed NOx Limit Rate (lb/MMBtu)
Sunk	1817	2241859	1234	4775906	2628	0.4
Sunk	1553	2241859	1444	4775906	3076	0.4
Sunk	1829	2241859	1226	4775906	2611	0.4
Sunk	3566	878869	246	2039496	572	0.35
Sunk	7515	2152332	286	4620283	615	0.35
Sunk	7521	2152332	286	4620283	614	0.35
Sunk	2202	1214136	551	2685514	1220	0.4
Sunk	3129	1214136	388	2685514	858	0.4
Sunk	2743	1273003	464	2815720	1027	0.4
Sunk	8933	2152332	241	4620283	517	0.4
Sunk	8623	2152332	250	4620283	536	0.4
Sunk	7431	1606277	216	3512580	473	0.4
Sunk	7424	1632185	220	3569235	481	0.4
fe	**64286**					

[6]

PA - ANNUAL NOx COMPARISONS UNDER DIFFERENT SCENARIOS

Plant	Unit	Suggested RACT Limit (30d) (lb/MMBtu)	PA Proposed NOx RACT Limit (lb/MMBtu)	Avg. Heat Input 2010-2013 (MMBtu/yr)	Average Actual NOx 2010-2013 (tpy)	Annual NOx with Suggested RACT (tpy) [1]	Annual NOx with PA RACT (tpy) [2]	Suggested RACT NOx Minus Actual NOx (tpy)
Bruce Mansfield	1	**0.07**	0.4	58622584	3800	2052	11725	-1748
Bruce Mansfield	2	**0.07**	0.4	54295453	3223	1900	10859	-1322
Bruce Mansfield	3	**0.07**	0.4	60300137	4911	2111	12060	-2800
Brunner Island	1	**0.07**	0.4	16470958	2993	576	3294	-2416
Brunner Island	2	**0.07**	0.4	21186913	3797	742	4237	-3055
Brunner Island	3	**0.07**	0.4	40538087	7513	1419	8108	-6094
Cheswick	1	**0.07**	0.35	24923324	3908	872	4362	-3036
Conemaugh	1	**0.07**	0.35	56282597	9378	1970	9849	-7408
Conemaugh	2	**0.07**	0.35	53422898	8558	1870	9349	-6688
Homer City	1	**0.07**	0.4	32440378	3363	1135	6488	-2228
Homer City	2	**0.07**	0.4	33952540	4084	1188	6791	-2896
Homer City	3	**0.07**	0.4	35032020	3815	1226	7006	-2588
Keystone	1	**0.07**	0.4	56514972	7539	1978	11303	-5561
Keystone	2	**0.07**	0.4	57776656	7575	2022	11555	-5553
Montour	1	**0.07**	0.4	40130683	6147	1405	8026	-4742
Montour	2	**0.07**	0.4	38679999	5795	1354	7736	-4441
Seward	1	**0.07**	0.2	14205892	746	497	1421	-249
Seward	2	**0.07**	0.2	14493493	745	507	1449	-238
All Units Above					87888	24824	135618	**-63063**

[1] Suggested RACT Limits and Average Annual Heat Input 2010-2013.

[2] PA Proposed Nox RACT Rate and Average Annual Heat Input 2010-2013.

Data taken from U.S. EPA Air Markets Database

Suggested RACT NOx Minus PA RACT NOx (tpy)
-9673
-8959
-9950
-2718
-3496
-6689
-3489
-7880
-7479
-5353
-5602
-5780
-9325
-9533
-6622
-6382
-923
-942
-110794