Summary of EPA Regulations and Guidelines
Filed on Behalf Of KHCA
November 25, 2013

RE: Special Exception No. S-2863 (Automobile Filling Station)
Costco

NAAQS and Background Monitor Concentrations

This analysis is prepared to assist the Hearing Examiner in reviewing the various scientific disputes relating to the measurement of the various pollutants emitted by the proposed station. In that regard, while some of the questions to be resolved turn on purely scientific issues, others have been addressed by statute, rules, and guidance, and it is important to understand what level of authority applies and the degree to which it is binding on an applicant and not subject to interpretation. Moreover, the rules setting the emission standards do not merely state a number, but describe factors such as whether it is applied as an area-wide standard or a point-source maximum, how the background is to be measured, how monitors are to be sited and the like. Unless all of those factors are taken into account, one cannot determine whether a particular modeled reading does or does not satisfy the standard, any more than if one were told that 98.6 was a "normal" body temperature without any guidance as to how that temperature standard should be measured.

This analysis is comprised of four sections:

I. PM2.5 Standards
II. NO2 Rule
III. CO Rule
IV. Prevention of Significant Deterioration (PSD)

I. PM2.5 -- Federal Register Vol. 78, No. 10, (Jan. 15, 2013), at page 3086 *et seq.*; all references are listed as "FR 2013, p. x."

We will look first at the January 2013 rule establishing the current annual limits for exposure to PM2.5. This limit was first set in 1997 at a level of 15 $\mu g/m^3$, based on "an annual arithmetic mean, averaged over 3 years," based on "measurements made at sites that represent 'community-wide air quality' *recording the highest level*, or, if specific requirements were satisfied, to average measurements from multiple community-wide air quality monitoring sites ('spatial averaging')." See table 1 at FR 2013, p. 3091. (Emphasis added.)

A. History of Rule

In 1997, the EPA proposed to establish two new PM2.5 standards (in addition to the prior PM10 standards dealing with coarser particulate matter): "an annual standard of 15.0 $\mu g/m^3$, based on the 3-year average of annual arithmetic mean PM2.5 concentrations from single or multiple monitors sited to represent community-wide air quality and a 24-hour standard of 65

ug/m3."[1] FR 2013, p. 3091. That rule went to the Supreme Court over the level of authority delegated to the EPA to set these rules, and the EPA eventually won unanimously. FR 2013, pp. 3091-92; *Whitman v. American Trucking Associations*, 531 U.S. 457, 464, 475–76 (2001).

While that review process was underway, the EPA began another round of periodic review of these standards. FR 2013, p. 3092. As part of that review, in 2005, the majority of the Clean Air Scientific Advisory Committee (CASAC) recommended reducing the annual level to the range of 30-35 $\mu g/m^3$ and the annual level to 13-14 $\mu g/m^3$. FR 2013, p. 3092. In 2006, the EPA published a draft rule with a number of options. CASAC again recommended consideration of its proposals. FR 2013, p. 3092. When EPA issued its final rule that fall, though, while there was a reduction of the 24 hour standard to 35, no change was made to the annual standard other than to tighten the provisions for "spatial averaging." FR 2013, p. 3092-93.

After that rule was issued, CASAC wrote yet again and restated its continuing concerns:

> "EPA's final rule on the NAAQS for PM does not reflect several important aspects of the CASAC's advice'' (Henderson et al., 2006b, p. 1). With regard to the primary PM2.5 annual standard, CASAC expressed serious concerns regarding the decision to retain the level of the standard at 15 $\mu g/m^3$. Specifically, CASAC stated, ''It is the CASAC's consensus scientific opinion that the decision to retain without change the annual PM2.5 standard does not provide an 'adequate margin of safety * * * requisite to protect the public health' (as required by the Clean Air Act), leaving parts of the population of this country at significant risk of adverse health effects from exposure to fine PM'' (Henderson et al., 2006b, p. 2). Furthermore, CASAC pointed out that its recommendations ''were consistent with the mainstream scientific advice that EPA received from virtually every major medical association and public health organization that provided their input to the Agency'' (Henderson et al., 2006b, p. 2). FR 2013, p. 3093.

Thus, contrary to the testimony of Dr. Chase (Sept. 16, pp. 50 - 52), the EPA is not required to accept the recommendations of CASAC in promulgating its rules.[2]

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[1] For purposes of the remainder of this discussion, we will concentrate primarily on the annual standard. The 24-hour standard is measured based on a "98th percentile" reading, averaged over three years. That means that one uses not the absolute highest number for the year, but rather the number that is at or above 98% of the readings; this is done to smooth out the variances somewhat. FR. 2013, p. 3127.

[2] Dr. Chase appeared to be substantially confused in a number of respects regarding the role of CASAC in the process of setting standards. His overstatement of its role appeared to be intended to suggest that this group, which tends to have the most single-minded focus on health effects, has the dispositive role in proposing and setting the standards, as well as determining what is an appropriate "margin of safety" that exists *above* the level of the standards. In fact, CASAC's role is, exactly as its name states, nothing more than an advisory (*albeit* influential) committee, and no one, including the EPA, sets some other limit above the standard to which they consider it appropriate to expose the general population. To be sure, as can be seen here, a failure to adequately explain why the comments of CASAC (and the underlying health community to which it may cite) are not heeded may lead to the rule being remanded on appeal, but that is a distinctly different matter than a contention that CASAC actually proposes or has a veto power over the EPA administrator.

The rule was appealed by a number of parties. In *American Farm Bureau Federation v. EPA*, 559 F. 3d 512 (D.C. Cir. 2009) the DC Circuit remanded the standard, finding that the Administrator had failed to adequately explain why the standard provided the requisite level of protection, particularly for at-risk populations including children. P. 3093. The court did so even though there were only a relative handful of studies at the time that directly demonstrated health effects below the 15 $\mu g/m^3$ standard. The Court deferred to the Agency's decision not to use risk analyses that would support even lower standards based on the level of uncertainty associated with those analyses. *AFB*, 559 F.3d at 527-28.

While the appeal of the 2006 rule was still pending, the EPA initiated another round of rulemaking for the next periodic review in June 2007. CASAC was allowed to comment in November 2007 on the proposals for the review plan after it was developed by EPA. FR 2013, p. 3093. There was a multi-year review process to complete an "Integrated Science Assessment" ("ISA"), which went through three iterations in 2008 and 2009. Various iterations of a Risk Assessment and Policy Assessment (which presents "conclusions related to the broadest range of policy options that could be supported by the currently available information") were also completed during this time period, and extending into 2010 and 2011. CASAC did comment on these documents throughout this period. FR 2013, p. 3094. The final Policy Assessment was completed in April 2011; the actual proposed rule though did not issue until June 2012, under a court-ordered schedule mandating that the rule issue by that date. FR 2013, p. 3094.

In the 2013 discussion of the proposed rule (the "Notice"), the EPA noted that, in addition to all of the new studies it had to consider since those that went into the 2006 rule, there was yet more "'new' science" that had emerged since the mid-2009 cutoff for inclusion in the ISA. A preliminary assessment was done of those studies that concluded that:

> the "new" studies expand the scientific information considered in the Integrated Science Assessment and provide important insights on the relationship between PM exposure and health effects. The provisional assessment also found that the ''new'' studies *generally strengthen the evidence* that long- and short-term exposures to fine particles are associated with a wide range of health effects. Some of the ''new'' epidemiological studies r*eport effects in areas with lower PM2.5-concentrations than those in earlier studies* considered in the Integrated Science Assessment. (Emphases added). FR 2013, p. 3095.

The provisional assessment concluded that the new studies were not so different that they required holding up issuance of the current rule (particularly in light of the court-ordered schedule). Rather, it indicated, they would be taken into account in its next periodic review (which would likely need to commence almost immediately in any case). The current review used peer-reviewed work that had been extensively critiqued; EPA wanted to wait to include the additional information until it had undergone the same scrutiny. FR 2013, p. 3095-6.

B. The Standard Itself

1. General Provisions and Analysis of Prior Standard

The EPA issued its final version of the new standard in the January 15, 2013 Federal Report notice above, which included a determination to lower the annual standard from 15 to 12 $\mu g/m^3$. In discussing how the final decision was made to set the final level (i.e., 12 $\mu g/m^3$ and not a lower or higher number), the Notice stated, "in selecting the final standards, the Administrator is seeking not only to prevent fine particle concentrations that have been demonstrated to be harmful but also to prevent lower fine particle concentrations that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree." FR 2013, p. 3097. It also noted, though, that:

> However, evidence- and risk-based approaches using information from epidemiological studies to inform decisions on PM2.5 standards are complicated by the recognition that ***no population threshold, below which it can be concluded with confidence that PM2.5-related effects do not occur, can be discerned from the available evidence. . .*** . This includes consideration of how to weigh the uncertainties in the reported associations across the distributions of PM2.5 concentrations in the studies and the uncertainties in quantitative estimates of risk, in the context of the entire body of evidence before the Agency. Such approaches are consistent with setting standards that are neither more nor less stringent than necessary, *recognizing that a zero-risk standard is not required by the CAA*. FR 2013, p. 3098. (Emphases added.)[3]

The Notice describes the Policy Assessment as having concluded that the primary effects appeared to come from long-term exposures to relatively low levels so that the primary focus should be on reducing the generally applicable ambient levels, while still maintaining a 24-hour standard to guard against peak exposures. FR 2013, p. 3100. The Notice added, FR 2013, p. 3101 that "In the absence of any discernible thresholds, the Agency's general approach for identifying appropriate standard levels for consideration involved *characterizing the range of $PM_{2.5}$ concentrations* ***over which we have the most confidence*** *in the associations reported in epidemiological studies.* (Footnotes omitted.) (Emphases added.)

The Notice then stated its findings on the health effects at p. 3103-04 including that:

> (4) the EPA concludes that *a causal relationship exists* between both long and short-term exposures to PM2.5 and premature mortality and cardiovascular effects and a *likely causal relationship exists* between long- and short-term PM2.5 exposures and respiratory effects. Further, there *is evidence suggestive of a causal relationship* between long-term PM2.5 exposures and other health effects, including developmental and reproductive effects (e.g., low birth weight, infant

[3] The Notice reiterated its finding of "no threshold" at FR 2013, p. 3119, noting "The Integrated Science Assessment concluded that this evidence collectively supported the conclusion that a no-threshold, log-linear model is most appropriate (U.S. EPA, 2009a, sections 6.2.10.10, 6.5.2.7, and 7.6.4). CASAC likewise advised that ''[a]lthough there is increasing uncertainty at lower levels, there is no evidence of a threshold'' (Samet, 2010d,p. ii).

> mortality) and carcinogenic, mutagenic, and genotoxic effects (e.g., lung cancer mortality)
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> **(5)** ***The newly available evidence significantly strengthens the link between long- and short-term exposure to PM2.5 and premature mortality, while providing indications that the magnitude of the PM2.5-mortality association with long-term exposures may be larger than previously estimated.***
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> (10) Specific groups within the general population are at increased risk for experiencing adverse health effects related to PM exposures. The currently available evidence expands our understanding of previously identified at-risk populations (i.e., children, older adults, and individuals with pre-existing heart and lung disease) and supports the identification of additional at-risk populations (e.g., persons with lower socioeconomic status, genetic differences). *Evidence for PM-related effects in these at-risk populations has expanded and is stronger than previously observed*. There is emerging, though still limited, evidence for additional potentially at-risk populations, such as those with diabetes, people who are obese, pregnant women, and the developing fetus. (Emphases added.)

Our experts will talk more about those findings, but suffice it to say that a "causal relationship" is the strongest term that the EPA uses in discussing the evidence of connections between pollutants and health effects. It goes on to discuss the risk assessment it conducted, but notes, at FR 2013, p. 3106 that "estimates of absolute risk remaining for each of the alternative standard levels considered, particularly in the context of long-term exposure-related mortality, may be underestimated." FN 35

> FN 35 Based on the consideration of both the qualitative and quantitative assessments of uncertainty, the Risk Assessment concluded that it is unlikely that the estimated risks are over-stated, particularly for premature mortality related to long term PM2.5 exposures. In fact, the Policy Assessment and the Risk Assessment *concluded that the core risk estimates for this category of health effects may well be biased low* based on consideration of alternative model specifications evaluated in the sensitivity analyses (U.S. EPA, 2011a, p. 2B41; U.S. EPA, 2010a, p. 5B16; Figures 4B7 and 4B8). In addition, the Policy Assessment recognized that the *currently available scientific information included evidence for a broader range of health endpoints and at-risk populations beyond those included in the quantitative risk assessment, including decrements in lung function growth and respiratory symptoms in children as well as reproductive and developmental effects* (U.S. EPA, 2011a, section 2.2.1). (Emphases added.)

The Notice describes at pages 3106-08 studies showing health effects across wide levels of existing PM 2.5 exposures including those where levels ranged from a low of 6.6-7.9 $\mu g/m^3$ up to 18.8-24.6 $\mu g/m^3$ for annual exposures (at a time when the annual exposure standard was 15 $\mu g/m^3$). Moreover, studies continued to turn up positive, significant results even as the overall ambient levels were declining over time during the study period. In its discussion, CASAC

noted that, although the last standard had been put in place under the same legal requirement to be protective of human health, the "'currently available information clearly calls into question the adequacy of the current standards'' (Samet, 2010d, p. i) and that the current standards are 'not protective'" FR 2013, p. 3109.

One of the things the EPA does discuss at length is the difficulty of confounding effects between the different pollutants that are combined in emissions from car engines and traffic. It noted, for instance, that it had not included studies evaluating "exposure to the undifferentiated 'traffic related air pollution' mixture" because studies did not allow it to determine the effect of PM2.5 pollution, standing alone. FR 2013, p. 3111. While that may well be correct for EPA's purposes, because it is required to regulate each pollutant separately, it remains the fact that those living near major roads – or, in this case, a mega gas station, – *are* exposed to the full mix and it is undisputed that the various pollutants combine and affect each other in various ways. (I.e., ozone and tailpipe emissions of NO combine to create NO_2 and oxygen molecules (O_2).) That mix of pollutants may have other effects that are not yet well-studied (and that the EPA concludes fall outside its authority.) The Notice discussed in detail the EPA's efforts to tease out the separate effects of different pollutants and only attribute the effects solely arising from the pollutant under consideration in setting the regulatory levels for that pollutant. FR 2013, pp. 3115-17. Clearly, this approach is likely to result in conservative levels of perceived risk, compared to the results that would come from considering all of the pollutants as a whole.

Based on all of the evidence, the EPA decided the standard needed to be lowered from the 15 $\mu g/m^3$ level because "evidence of serious health effects reported in exposure studies conducted in areas with long-term mean concentrations ranging from approximately at or above the level of the annual standard to long-term mean concentrations significantly below the level of the annual standard to be compelling." P. 3120. The Notice added that "that revision of the current suite of PM2.5 standards to provide increased public health protection is necessary. Based on these considerations, the Administrator concludes that the current suite of primary PM2.5 standards is not sufficient, and thus not requisite, to protect public health with an adequate margin of safety, and that revision is needed to increase public health protection." The Notice did indicate that while there were some studies dealing with ultrafine particles, that work was not yet sufficient to be able to allow direct regulation of those elements. P. 3121-22.

2. Specific Aspects of Measuring Emissions

(a) Spatial Averaging Eliminated; Highest Monitor to be Used

One of the most significant aspects of the revised standard was the elimination of any form of "spatial averaging" of monitoring readings. The Notices states, FR 2013, p. 3124, fn. 66, that the notion of averaging a series of monitor readings to capture the overall reading for a wide-spread area was unique to the prior annual PM2.5 standard. That approach was limited in the 2006 rule in that there could be "disproportionate impacts on potentially at-risk populations, [in that] the highest concentrations in an area tend to be measured at monitors located in areas where the surrounding population is more likely to have lower education and income levels and higher percentages of minority populations." FR 2013, p. 3125.

The Notice went on that:

> "[T]he Policy Assessment concluded that it was appropriate to consider revising the form of the annual PM2.5 standard such that it did not allow for the use of spatial averaging across monitors. In doing so, *the level of the annual PM2.5 standard would be compared to measurements made at the monitoring site that represents area-wide air quality recording the highest PM2.5 concentrations* (U.S. EPA, 2011a, p. 2–60).
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> The CASAC agreed with staff conclusions that it was ''reasonable'' for the EPA to eliminate the spatial averaging provisions (Samet, 2010d, p. 2). Further, in CASAC's comments on the first draft Policy Assessment, it noted, ''Given mounting evidence showing that persons with lower SES levels are a susceptible group for PM-related health risks, CASAC recommends that the provisions that allow for spatial averaging across monitors be eliminated for the reasons cited in the (first draft) Policy Assessment'' (Samet, 2010c, p. 13). . . .
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> Thus, the Administrator proposed revising the form of the annual PM2.5 standard to compare the level of the standard with measurements from each ''appropriate'' monitor in an area with no allowance for spatial averaging. Thus, for an area with multiple monitors, *the appropriate reporting monitor with the highest design value* would determine the attainment status for that area."

The Notice then states that "The Administrator concludes that public health would not be protected with an adequate margin of safety in all locations, as required by law, if disproportionately higher exposure concentrations in at-risk populations such as low income communities as well as minority communities were averaged together with lower concentrations measured at other sites in a large urban area." Accordingly, the provision for spatial averaging was eliminated." FR 2013, p. 3127.

(b). Near-Road Monitoring

The EPA decided to impose that requirement in tandem with a new requirement (see FR 2013, p. 3238) for placement of "near-road monitors" to better capture exposures of vulnerable groups (including those of lower socio-economic status who would be more likely to be exposed to the toxins). The Notice rejected arguments by some that this would make the standard more stringent (FR 2013, p. 3126), stating that "Monitoring in such areas does not make the standard more stringent than warranted, *but rather affords the intended protection to the exposed populations,* among them at-risk populations, exposed to fine particles in these areas."(Emphasis added.)

The Notice (FR 2013, p. 3238) stated several values to be served by the placement of the near-road monitors:

> The EPA further noted that by adding a modest number of PM2.5 monitoring sites that are leveraged with measurements of other pollutants in the near-road environment, a number of key monitoring objectives will be supported, including collection of NAAQS comparable data in the near-road environment, support for long-term health studies investigating adverse effects on people, providing a better understanding of pollutant gradients impacting neighborhoods that parallel major roads, availability of data to validate performance of models simulating near-road dispersion, characterization of areas with potentially elevated concentrations and/or poor air quality, implementation of a multi-pollutant paradigm as stated in the NO_2 NAAQS proposed rule (74 FR 34442, July 15, 2009), and monitoring goals consistent with existing objectives noted in the specific design criteria for PM2.5.

The Notice again rejected the view that this would make the standard more stringent than appropriate, stating at FR 2013, p. 3240:

> *A significant fraction of the population lives in proximity to major roads. These exposures occur in locations that represent ambient air for which the agency has a responsibility to ensure the public is protected with an adequate margin of safety. Ignoring monitoring results from such areas (or not monitoring at all) would abdicate this responsibility. Put another way, monitoring in such areas does not make the standard more stringent, but rather affords requisite protection to the populations, among them at-risk populations, exposed to fine particulate in these areas. Thus, the EPA has made a determination to protect all area-wide locations, including those locations with populations living near major roads that are representative of many such locations throughout an area. As discussed above, EPA concludes that the requirement to locate monitors to represent ambient air, along with other siting requirements, will ensure that monitors represent PM2.5 concentrations in areas of potential public exposure. (Emphasis added).*

"Near-road" monitors are to be located as near as practicable to the road edge, but no further than 50 meters. (FR 2013, pp. 3246). The new monitors will also allow for better data collection for future standards. However, because such monitors are to be phased in over time, and data collection and studies will take time, the Notice recognizes that the three years of monitoring data from such stations needed to determine attainment issues for the overall region will not be available for several years. (FR 2013, pp. 3241 and 3249-50). But the standard *is* now in effect and *does* require looking at the values from the highest local monitor. What is also clear is that, until the new monitors are put in place, we won't know what that highest reading will be, but it is certainly likely to be above that taken from a relatively rural monitor such as Beltsville. That uncertainty cuts against the applicant.

3. Picking the New Level

The Notice discusses the various studies and the evidence of effects at different PM2.5 levels. It noted (FR 2013, p. 3136) that:

> "[A] standard level of 12 μg/m^3,upper end of this range, was somewhat below the long-term mean PM2.5 concentrations reported in all the multi-city, long- and short-term exposure studies that *provided evidence of positive and statistically significant associations with health effects classified as having evidence of a causal or likely causal relationship*, including premature mortality and hospitalizations and emergency department visits for cardiovascular and respiratory effects as well as respiratory effects in children." (Emphasis added).

It further noted:

> "A level of 11 μg/m^3 would reflect placing more weight on the distributions of health event and population data, in that this level was within the range of PM2.5 concentrations corresponding to the 25th and 10th percentiles of all the available distributions of such data. In addition, a level of 11 mg/m3 was somewhat below the lowest long-term mean PM2.5 concentrations reported in reproductive and developmental effects studies that are suggestive of a causal relationship. Thus, a level of 11 μg/m^3 would reflect an approach to translating the available evidence that places relatively more emphasis on margin of safety considerations and less certain causal relationships than would a standard set at a higher level. Such a policy approach would tend to weigh uncertainties in the evidence in such a way as to avoid potentially underestimating PM2.5-related risks to public health."

The Notice has a lengthy discussion of the position of various commentators including the views of various health experts who tended to push for the 11 μg/m^3 level, but noted that much of the evidence they pointed to was, as yet, only suggestive of a causal relationship, while the Administrator was placing more weight on studies that showed a causal or likely causal relationship. FR 2013, p. 3155. The Notice discusses the issue in great detail (FR 2103, pp. 3159-61) and points out that there is no bright line to be drawn. It also notes that it is reasonable to set the standard *below* the mean level at which actual health effects were demonstrated since those effects may be spread out over a range of emission values that could extend well below the mean. "On balance, the Administrator concludes that an annual standard level of 12 μg/m^3 would be requisite to protect the public health with an adequate margin of safety from effects associated with long- and short-term PM2.5 exposures, while still recognizing that uncertainties remain in the scientific information." (FR. 2013, p. 3161.) The final conclusion in the Notice was that the standard would be set at 12 μg/m^3, based on the "*highest appropriate area-wide monitor in an area, with no option for spatial averaging."* (FR 2013, p. 3164.) (Emphasis added.)

In discussing those issues and reaching a conclusion, the EPA was, of course, concerned with setting a standard that must be met by the whole country which does have significant

consequences for the economy as a whole. Moreover, it has to decide how far to rely on data that are still coming in about health effects, particularly at the lower levels that are now being achieved. In that regard, it is worthy of note that the review of the new studies that went into the 2013 standard showed that health effects continued to be demonstrated, even as the overall ambient levels declined during that period. As a result, it is not yet possible to tell if health effects will continue to show up at levels below the current level of 12 $\mu g/m^3$ until that level is actually achieved on a general basis for a period of time. However, while EPA can continue to wait and revisit that issue over time as it conducts its periodic reviews, the same is not true for a particular community which will be irrevocably saddled with the burdens from the station once built. As a result, the precautionary concerns based on the new studies showing effects at ever lower levels and for more subtle health concerns, such as developmental effects, take on much greater weight in deciding whether to approve a facility such as the one proposed here. And, that is particularly true for a facility that doesn't need to be built at all and creates pollution exposures that do not currently exist and need not ever exist if the existing dispersed model of station operations is maintained.

II. NO_2 Rule – Vol. 75, No. 26, Feb. 9, 2010, pp. 6474 et seq.; all references are stated as FR 2010, p. x.

In this Notice, the EPA established a new short-term standard of 100 ppb to supplement the existing annual standard of 53 ppb. It also added new near-road monitoring requirements here as well, as with the PM2.5 standard. (FR 2010, p. 6475.) (Remember that PPB need to be roughly doubled to get to the $\mu g/m^3$ used by Mr. Sullivan in his work, so this 100 level corresponds to the 190 limit he refers to.)

A. History of the Rule

The EPA established an initial standard for NO_2 in 1971, which it set at 53 ppb [100 $\mu g/m^3$] as an annual average. (FR 2010, p. 6475). It retained that standard in reviews done in 1985 and 1996. It began a new review in December 2005. Various drafts of an ISA and Risk Assessment were released during 2007 and 2008 and comments thereon were received from CASAC and other outside parties. As part of that review process, CASAC recommended the preparation of a Policy Assessment (i.e., the sort of document that was discussed above with respect to the later PM2.5 standard) (FR 2010, pp. 6476-77). The Notice also notes that this review, like the PM2.5 standard was being prepared under the impetus of a court-imposed deadline that required the notice of proposed rulemaking be issued by no later than June 2009. (FR 2010, p. 6477).

As with the PM2.5 standard, the EPA was considering a whole range of additional new studies that informed its judgments beyond those in the earlier reviews. And, as with the PM2.5 standard, it had to, in essence, impose a cutoff date for which "new new studies" it could look at. And, again, at least due in part to the court-ordered schedule to complete the rule, the EPA concluded, after a provisional look at the studies, that they did not contradict its conclusions so as to require it to delay issuing the new rule. FR 2010, pp. 6477-78.

And, indeed, on May 3, of this year, the EPA did issue a Federal Register Notice about the issuance of its "Draft Plan for Development of the Integrated Science Assessment for Nitrogen Oxides—Health Criteria," which is the first step in the next round of reviews. (See Federal Register, Vol. 78, No. 86, p. 26026 et seq.)

At page 6478, the Notice discusses the nature of NO_2 air quality and notes that current monitors are not generally placed near roadways. This is true despite the fact that near-roadway and, in fact, on-roadway exposures while driving are among the most significant sources of exposure to NO_2 emissions.

> On-road and non-road mobile sources account for approximately 60% of NO_X emissions (ISA, table 2.2–1) and traffic-related exposures can dominate personal exposures to NO_2 (ISA section 2.5.4). While driving, personal exposure concentrations in the cabin of a vehicle could be substantially higher than ambient concentrations measured nearby (ISA, section 2.5.4). For example, estimates presented in the REA suggest that on/near roadway NO_2 concentrations could be approximately 80% (REA, section 7.3.2) higher on average across locations than concentrations away from roadways, and that roadway-associated environments could be responsible for the majority of 1-hour peak NO_2 exposures (REA, Figures 8–17 and 8–18). Because monitors in the current network are not sited to measure peak roadway-associated NO_2 concentrations, individuals who spend time on and/or near major roadways could experience NO_2 concentrations that are considerably higher than indicated by monitors in the current area-wide NO_2 monitoring network.
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> . . . . This situation typically produces a gradient in pollutant concentrations, with concentrations decreasing with increasing distance from the road, and concentrations generally decreasing to near area-wide ambient levels, or typical upwind urban background levels, within a few hundred meters downwind. While such a concentration gradient is present on almost all roads, the characteristics of the gradient, including the distance from the road that a mobile source pollutant signature can be differentiated from background concentrations, are heavily dependent on factors such as traffic volumes, local topography, roadside features, meteorology, and photochemical reactivity conditions. (FR 2010, p. 6479.)

As a result, "we have identified a range of concentration gradients in the technical literature which indicate that, on average, peak NO_2 concentrations on or immediately adjacent to roads may typically be between 30 and 100 percent greater than concentrations monitored in the same area but farther away from the road. FR 2010, p. 6479.

At page 6480, the Notice states that the ISA found a "likely causal relationship for respiratory effects following short-term NO_2 exposure (ISA, sections 3.1.7 and 5.3.2.1)" and that "*the strongest evidence for an association between NO_2 exposure and adverse human health effects comes from epidemiologic studies of respiratory symptoms, emergency department visits, and hospital admissions*." (Emphasis added.)

These results were found in "studies conducted in areas where the whole distribution of ambient 24-hour average NO_2 concentrations was below the current NAAQS level of 53 ppb (annual average). With regard to this evidence, the ISA concluded that NO_2 epidemiologic studies provide "*little evidence of any effect threshold*" (ISA, section 5.3.2.9, p. 5–15). In studies

that have evaluated concentration-response relationships, they appear linear within the observed range of data (ISA, section 5.3.2.9)." (FR 2010, p. 6480). (Emphasis added.) The Notice did state that, as with the PM 2.5 standard, isolating NO_2 effects specifically from other elements of traffic pollution is difficult and make it harder to set the standard based on only preventing those isolated effects, but that the effects were still found after accounting for those effects. (FR 2010, p. 6480). The Notice discusses a number of other health effects at FR 2010, pp. 6480-83, including relationships to asthma and other respiratory effects, noting that about 10% of adults and 13% of children have asthma and that 6% of adults have chronic obstructive pulmonary disease. (FR 2010, p. 6482). Further, at page 6482, it notes that the current annual standard of 53 ppb is based on readings from area-wide monitors not set near roadways, so the values at closer points to traffic can be as much as 30 to 100% higher.

The Notice reports (FR 2010, p. 6484), that "The ISA concluded that the result of epidemiologic and experimental studies form a plausible and coherent data set that supports a *relationship between NO_2 exposures and respiratory endpoints*, including respiratory symptoms and respiratory-related hospital admissions and emergency department visits, at ambient concentrations *that are present in areas that meet the current NO_2 NAAQS* (ISA, section 5.4). (Emphasis added.) Thus, once again, although the EPA has set those prior levels at a point that it had thought would be sufficient to protect human health, the subsequent evidence showed that the standard levels were still too high. As a result, the EPA concluded (FR 2010l, p. 6490) that the existing standard was not sufficient to protect human health and would have to be revised downward.

In determining the form of the standard, the Notice states that "the Administrator has considered two different approaches to setting the 1-hour NO_2 primary NAAQS. In the proposal, each of these approaches was linked with a different range of standard levels. Specifically, the Administrator proposed to set a 1-hour standard reflecting the maximum allowable NO_2 concentration anywhere in an area and to set the level of such a standard from 80 to 100 ppb [150-190 $\mu g/m^3$]. The Administrator also solicited comment on the alternative approach of setting a standard that reflects the allowable area-wide NO_2 concentration and setting the standard level from 50 to 75 ppb. [94-141 $\mu g/m^3$] (FR 2010, p. 6493). The Notice further referenced the fact that adverse health exposures can be seen in as little as 30 minutes and that "such health effects have been associated with exposure to the distribution of short-term ambient NO_2 concentrations across an area, including higher short-term (i.e., peak) exposure concentrations, such as those that can occur on or near major roadways and near other sources of NO_2, *as well as the lower short-term exposure concentrations that can occur in areas not near major roadways or other sources of NO_2.*" (FR 2010, p. 6493). (Emphasis added.)

The Notice repeated that the proposed approach (FR 2010, p. 6494) of using the "maximum allowable NO_2 concentration anywhere in an area" would result in setting "the level of the standard such that, when available information regarding the concentration gradient around roads is considered, appropriate public health protection would be provided by limiting the higher short-term peak exposure concentrations expected to occur on and near major roadways, *as well as the lower short-term exposure concentrations expected to occur away from those roadways."* (Emphasis added.) Setting the maximum anywhere level at 100 ppb [190 $\mu g/m^3$] "would be expected to maintain *peak area-wide NO_2 concentrations* considerably below

those measured in locations where key U.S. epidemiologic studies have reported associations with more serious respiratory effects, as indicated by increased emergency department visits and hospital admissions" (i.e., in the range of 93 to 112 ppb) [175 to 210 μg/m^3]. (FR 2010, p. 6494). Those studies provided support for an *area-wide* standard at a 98th percentile measurement of 85 ppb [160 μg/m^3]. (FR 2010, p. 6494) and a "maximum anywhere level" of 100 ppb [190 μg/m^3] could be expected to limit peak *area-wide* levels to 75 ppb [141 μg/m^3] or below. (FR 2010, p. 6494). (Indeed, one study supported a limit of 50 ppb [94 μg/m^3] on an area-wide basis).

The alternative considered (FR 2010, p. 6595) was to set a substantially lower overall area concentration (in the range of 50 to 75 ppb) [94 to 141 μg/m^3] with the assumption that this would mean that the higher peak concentrations on the roadway would not be expected to exceed the 100 ppb [190 μg/m^3] level that was deemed problematic. This approach was thought more likely to ensure area-wide protection, but less certainty about the highest exposures because of the lack of certainty about the relationship between area-wide and peak exposures. The majority of the CASAC favored the first approach with the creation of an additional monitoring network to include "near-road" monitors. (FR 2010, p. 6496). CASAC discussed the appropriate maximum level and noted that it should not exceed 100 ppb, while noting that it would be reasonable to go as low as 80 ppb, although a level below that point would be based more on a policy judgment about uncertainty in view of the limited health effect at that level. (FR 2010, p. 6497).

The Notice discusses both of these concepts in great detail and eventually adopts the first approach. "After considering the evidence and uncertainties, and the advice of the CASAC Panel, the Administrator judges that the most appropriate approach to setting a 1-hour standard to protect against the distribution of short-term NO_2 concentrations across an area, including the higher concentrations that can occur around roads and result in elevated exposure concentrations, is to *set a standard that reflects the maximum allowable NO_2 concentration anywhere in an area*." (Emphasis added.) (FR 2010, p. 6500). Again, the assumption is that, in light of the 30-100 increase between local areas and roadways, a maximum level of 100 ppb could be expected to result in levels of 50 to 75 ppb in the surrounding areas. (FR 2010, p. 6501.) In setting even those levels, the Notice points out that the standard is not intended to ensure that there is zero risk or that the level will protect the most sensitive individual (P. 6502).

The primary point, though, is that under either approach the goal was to ensure against exposures at a continuum of levels – not just 100 ppb for those on a roadway, but also levels well below that – in the range of 50-75 ppb or less – for those living near but not on those roads. Put another way, saying that an area a few hundred meters off a heavily trafficked area did not read at 100 ppb reading does not suggest that there is not a problem in the area. One would have to go to the highest points and see what the exposures are at thos locations and then work out from there.

The Notice further discusses (FR 2010, pp. 6503-04) provisions for including additional near-road monitors to measure those peak concentrations and imposes that obligation at FR 2010, pp. 6508-09, 6813 (setting the maximum distance at 50 meters). This emphasis on peak concentrations on roadways or in specific hot spots is critical. The Notice further states that even the "second tier" of monitors should be designed to measure "highest area-wide concentrations

to characterize the wider area impact of a variety of NO_2 sources on urban populations." (FR 2010, p. 6504). Mr. Sullivan testified that, based on his experience, people don't monitor or calculate exposures in the middle of where a source operates, so the exposures on the Mall parcel itself are irrelevant. He also suggested that one wouldn't put a receptor in the middle of the source itself and that monitors weren't put in the roadways. [Testimony, Sept. 18, pp. 188 – 190]

While that once may have been true, the provisions of this rule strongly indicate that such may no longer be the case. The history of the rule suggests that those points were not measured in the past because one was working with an area-wide standard. By amending the rule, though, it is clear that the EPA is, in fact, concerned with peak readings that are being seen in the middle of the generating source (i.e., in cars driving on the roadway). Using that analysis, it would be entirely logical to have a receptor there. Second, while, of course, one generally can't put a physical monitor in the middle of a road, the new requirements in the PM2.5 and NO_2 rules require that one do as close to that as is practicable. Third, since permitting agencies typically are dealing with major industrial facilities with smoke stacks that disperse the pollution widely, it may make sense not to monitor right next to them. However, roadway exposures and exposures such as to this localized filling station hotspot don't have those same dispersal mechanisms – which is precisely why the EPA now requires roadside monitors, in order to capture the actual emission levels generated by automobile use (in contrast to other types of pollution sources).

Further, we are again in the situation with the PM2.5 monitors – new and more stringent monitoring requirements have been imposed and there is good reason to believe they will result in substantially higher background readings, thereby creating further difficulty for the applicant in trying to show compliance with the new standards, but those readings aren't yet available to us and a determination on non-attainment status is several years down the road (FR 2010, p. 6521). So, again, the applicant can't present data that will show whether it will be able to be in compliance based on those higher monitor levels that will be showing up very shortly. What we *do* know is that, under the applicant's original modeling – even with its *incorrect* background levels, the rural charts showed levels above 190 $\mu g/m^3$ on the roadways and levels of 94 and above at nearby homes and up to 175 (or probably higher) on the Mall parcel. All of those levels are clearly high enough to indicate that the standards were being triggered. And, of course, with the revised levels, the values would be far higher.

Further, even under the revised assumptions, background levels that start at 90 $\mu g/m^3$ (or as more likely is proper, at levels ranging from 100 up to as high as 122 $\mu g/m^3$)[4] are already problematic for human health issues. When one models virtually any degree of additional pollutant levels onto them, we are immediately into the range of 50-85 ppb (94 to 160 $\mu g/m^3$) that the regulations clearly indicate the standards are designed to avoid. Another point that is crucial here is that the August 2013 study dramatically contracts the area for which emissions information is plotted (with no back-up data for even this limited area being provided to the opposition). The new charts completely exclude the levels on surrounding roadways – even though that is the major focus of the rules. If the roadways remain above 190 $\mu g/m^3$ (with the

[4] Note, the requirements expect the second-tier monitors to be cited so as to measure the "highest area-wide concentrations;" that being the case, there is little basis to accept Mr. Sullivan's choice (which he could not explain or justify) to pick a monitor that was far from reading the "highest area-wide concentration." Had he done the latter, his numbers would be higher by anywhere from 10 to 32 $\mu g/m^3$ for 2012 readings.

correct background and whatever revised assumptions Mr. Sullivan chooses to make), this area will again be running up against the limits set by the 2010 rule *even if the levels somewhat off the roadway are below the 190* μg/m^3 *mark.*

In any event, it is clear that the very limited data picked out for presentation by the applicant does *not* provide any adequate basis to determine if there is a problem in this area or if the standard is already exceeded so that no new permits could be issued under the EPA standards. It is certainly clear, though, that even under Sullivan's urban model with his new inputs, the level in the backyards of the existing homes and those to be built on Mt. McComas is well within the range of concern for area concentrations. Any number of adjustments that will be suggested by other witnesses, particularly Dr. Cole, can increase those numbers. And, although Mr. Sullivan claims that he continues to be conservative, all the while he is still tinkering with the numbers to reduce them further, we believe our evidence will show that not to be the case.

III. CO Rule – 76 CFR, No. 169, p. 54294 (August 31, 2011); all references are to FR 2011, p. x.

A. History of Rule

The standard was first set in 1981 at 9 ppm for an 8-hour average, and 35 ppm for a 1-hour level, both of which were not to be exceeded more than once a year. (FR 2011, p. 54295). The level was reviewed several times over the ensuing years, but left unchanged through the current review. This review commenced in 2007, with the same ISA process and CASAC review as with the other rules discussed above. (FR 2011, pp. 54295-96). And, as with the other two rules, the EPA was acting under a court-ordered deadline and had some "new studies" that it was not able to include due to that deadline. (FR 2011, pp. 54296-97). It did conclude that the new studies were broadly consistent with its existing conclusions. (FR 2011, p. 54297). Based on its review, the EPA concluded that the existing levels remained adequate to provide the requisite health protection. (FR 2011, p. 54297).

The clearest evidence regarding health effects, the Notice stated, (FR 2011, pp. 54298-99), had to do with cardiovascular effects, finding that "a causal relationship is likely to exist between relevant short-term CO exposures and cardiovascular morbidity." The Notice further stated (FR 2011, p. 54299) that the evidence was "suggestive of causal relationships between relevant ambient CO exposure and several other health effects: Relevant short- and long-term CO exposures and central nervous system (CNS) effects, birth outcomes and developmental effects following long-term exposure, respiratory morbidity following short-term exposure, and mortality following short-term exposure (ISA, section 2.5)," but that, as yet, there was "only limited evidence for these relationships." Based on the relative weight of the data, the Administrator chose to concentrate on the evidence related to cardiovascular issues.

The Notice then set out the Administrator's basis for concluding that the level should be left as is, while noting that the CASAC preferred a lower level.[5] Because CASAC conceded

[5] The last CASAC report, at http://yosemite.epa.gov/sab/sabproduct.nsf/99283699B101E63D8525773D003DEED9/$File/EPA-CASAC-10-013-unsigned.pdf, p. 13, discussed levels in the range of 3 to 6 ppm (3435 μg/m^3

there was some basis for leaving the standards where they were, and noting the difficulties in separating out CO effects from those of other pollutants, the difficulty in determining how much weight to accord epidemiological evidence, and the unique nature of the way in which health effects relating to CO were measured compared to other pollutants, the EPA chose to leave the standards where they were. The Administrator noted that background levels in most areas were well below the standards and, indeed, below the level the monitors read, and that relatively few studies were conducted at those low levels. (FR 2011, pp. 54303-07).[6] Notably, in dealing with the health effects of the mixed pollutants being emitted from vehicles idling at a gas station, the Notice describes the problems with trying to separate out the effect of only one such pollutant in assessing the adverse effects from the entire mix. (FR 2011, p. 54305). The CASAC comments also noted the inadequacies of the current monitoring network. (FR 2011, p. 54304). The Notice also considered that the ambient levels of CO were generally already well below the standard being considered and that, as a result, it was rare that persons would actually be exposed to such levels. (FR 2011, p. 54308).

The Rule does require new "near-road" monitors for CO as well, again to ensure that peak concentrations are properly being captured and included in the analysis and the determination of effects on likely vulnerable populations that tend to live near such sources. (FR 2011, 54113-15.)

> The Agency believes that the use of near-road CO monitors as proposed is not a departure from the Agency's longstanding intent to measure peak concentrations of CO in the near-road environment. Rather, the proposal was consistent with the Agency's approach to require monitors for CO, and other criteria pollutants, in locations that likely experience peak ambient concentrations. The Agency also notes that source-oriented monitoring is and has long been a common practice in ambient monitoring networks, although more often associated with stationary sources, where the ambient data collected are used for comparison to the NAAQS. Data on ambient air concentrations, including near-road data, which may be most appropriately classified as on-road mobile source oriented, are appropriate to compare to the NAAQS.[7]

CASAC commented three times on the need for additional monitors in such "near-road" locations in order to monitor actual exposures of those near such peak sources. (FR 2011, pp. 54314-15). The monitors are not required to be put into place, though, until between 2015 and

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- 6870 $\mu g/m^3$) for 8 hour exposures. A level set at that point would coincide with the levels shown in the rural analysis for CO as reported in Sullivan's initial analysis (levels in the range of 4000-4500 $\mu g/m^3$). Those levels would also be considerably higher if the background monitor showing the *highest* levels were actually used instead of the much lower levels at the monitor actually chosen by Sullivan.) Those levels also need to be adjusted upward to deal with the understated queuing numbers that Sullivan conceded were used in his calculations. While conceding that error, his charts have never actually been corrected to account for that change.

[6] So, again, this is an instance, where contrary to Dr. Chase's understanding, the EPA was not required to accept CASAC's purely health-based concerns or to implement them rather than adopting a higher level due to remaining uncertainties, particularly due to those confounding effects.

[7] This again indicates that Mr. Sullivan's contention that monitoring concentrations at or very near the source of the actual pollution such as roadways (or here, the gas station) is somehow unusual or inappropriate is not correct.

2017, so again their effect will not be shown for some time to come but they certainly are expected to show higher readings than those located away from such roadways. (FR 2011, p. 54315, 54319).

IV. Prevention of Significant Deterioration ("PSD")

A. PM2.5 Rule

There was an extensive discussion in the PM2.5 rule about issues dealing with the permitting process to determine whether new major pollution sources would cause "significant deterioration" in regional air quality based on the new standard being implemented.[8] This was part of a lengthy discussion of whether and to what extent "grandfathering" for permit applications under the PSD program would be allowed. (FR 2013, pp. 3253-3259.) The PSD program (as further described below) only applies to certain "major sources" of pollution and only in areas that are currently in compliance with the standards but where there is a concern that additional sources might cause them to fall out of compliance. As part of the process, the EPA set certain levels of emission added by a particular source below which it would allow elimination of some or all of the special analytical provisions applicable to the permitting process for such new sources. The Notice stated that the EPA was retaining levels for the screening tools that it had set in 2010, but that those levels were subject to suit in *Sierra Club v EPA*, No. 10-1413 (filed in the D.C. Cir on December 17, 2010) as to whether they were protective enough and whether they truly only exempted *de minimis* additions to pollution levels as purportedly established in the 2010 rulemaking on those levels. (FR 2013, pp. 3259-61.) The Notice stated that the EPA intended to conduct additional rulemaking on whether to change those standards. (FR 2013, p. 3261.)

B. *Sierra Club* decision

Shortly after the primary PM2.5 rule issued, the DC Circuit did issue its opinion in the *Sierra Club* case, which is reported at 705 F.3d 458 (D.C. Cir. Jan. 22, 2013). The opinion notes that the EPA had concluded that its published rules on the exemptions did not provide appropriate guidance as to its actual position on the use of one type of measurement and had asked to have that portion of the Rules vacated so the EPA could engage in further rule-making. The opinion granted that request but also found that the EPA lacked the statutory authority to create the other exemption from the pre-construction monitoring otherwise required for such sources based on the claim that the estimated level of emissions would be below specified levels. (*Sierra Club*, 705 F.3d at 460).

The opinion notes that "Prevention of Significant Deterioration" ("PSD") requirements are used where pollution in a given area is below the existing air quality standard and is intended to prevent undue deterioration from those baseline levels of pollution. An "increment" is created (which is a maximum allowable increase over the baseline of existing pollution up to but not to exceed the minimum air quality standard) and the applicant must demonstrate that its operation

[8] This concern was due to the fact that the new standard would be close to or below the existing readings at background monitors, thus making it possible that the change could immediately place certain areas out of compliance and impact whether new facilities could be built.

will not cause or contribute to pollution that exceeds that increment more than once a year.[9] It must also show that its operations will not result in the overall applicable air quality standard being exceeded at any time. (*Sierra Club,* 705 F.3d at 460). The EPA has used two standards, the "Significant Impact Levels" (SILs) and "Significant Monitoring Concentrations" (SMCs) that were intended to be screening tools for operations that would have a *de minimis* effect on air quality that would allow them to avoid various requirements that would otherwise apply before they could obtain a permit. (*Sierra Club,* 705 F.3d at 461-463.)[10]

The Sierra Club argued that the exemptions were too broad in that in areas where the air was already at or close to violating the air quality standards or an increment level, a source could push the air over the level even if its own incremental impact was below the SIL. The Sierra Club further noted that because the EPA's regulation automatically exempts a source with a proposed impact below the SIL from demonstrating it will not cause or contribute to a violation of the air quality standards, unlimited numbers of sources whose impacts are less than the SILs could cumulatively cause a violation of the NAAQS or increments. The EPA noted that its actual regulatory text gave greater freedom to monitoring agencies to review applications than the discussion it included of its regulations in its comments. That is, while the regulation flatly allowed the exemptions, the discussion thereof made clear that regulators were intended to have much greater freedom to consider special circumstances. (*Sierra Club,* 705 F.3d at 463-464). The Court granted the EPA's request to take back and reconsider those regulations and the establishment of the SILs. Until any such reconsideration was complete, the court stated that the Sierra Club's argument that the EPA did not have authority to establish SILs at all was premature. *(Sierra Club,* 705 F.3d at 464.) The court agreed, though, with the Sierra Club that the EPA did not have authority to establish SMCs at all, *Sierra Club,* 705 F.3d at 469. The Court so found, at least in part, because such an exemption would be based in large measure on cost-benefit considerations that were not part of the Clean Air Act's requirements.

New rule-making in this area has not yet been completed.

C. Rule on Pollution Standards for PSD Related to PM2.5 Emissions; Federal Register, Oct. 20, 2010 – Vol. 72, No. 202, 64864 (hereafter FR 2010A, p. x).

As described above, these PSD provisions apply only when an area is *below* the existing air quality standards and are meant to describe how new facilities can be allowed and evaluated within a context where there is not yet a violation of the air quality standards.

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[9] The "increment" is a specified portion of the current overall air quality standard. For PM2.5, for instance, where the 24-hour limit was 35 $\mu g/m^3$, the "increment" was set for most areas at 9 $\mu g/m^3$ or about 1/4 of the existing maximum. (Federal Register, Oct. 20, 2010 – Vol. 72, No. 202, 64864, 64871, hereafter "FR 2010, p. x"). This increment is an overall amount of pollution into which all new emissions must fit. See the further discussion of the underlying rule in which these standards were set below in Part III.

[10] Those levels were set at .3/1.2 $\mu g/m^3$ for the SIL and 4 $\mu g/m^3$ for a 24-hour reading the SMC. (FR 2010, p. 64866 and 64895, respectively). These are as compared to the 15/35 $\mu g/m^3$ annual/24-hour air quality standard, and the 4/9 $\mu g/m^3$ "increment" for allowable pollution expansion within the then 15/35 $\mu g/m^3$ maximum allowed pollution level. Presumably to the extent that the new rule lowers the 15 $\mu g/m^3$ standard for annual pollution to 12 $\mu g/m^3$, any new SIL (assuming any were still found appropriate) would be modified downwards by at least the same proportion; i.e., to now more than .24 $\mu g/m^3$.

At FR 2010A, p. 64872-73, the EPA explained its reading of how the PSD standards are to be set. In particular, it noted that, where the application is being considered in an area that currently meets air quality standards, the EPA is required to use review processes that balance the need to protect the environment against deterioration of air quality (within the allowed maximum limit) with the need to "insure economic growth." Thus, these PSD measures (unlike the actual air quality standards) are explicitly set with an eye towards a form of cost-benefit analysis; i.e., with the view that some loss of air quality must be accepted (even with a risk of some degree of health effects) as a way to achieve continued economic growth. The EPA stated:

> 3. The Statutory Factors Applicable Under Section 166(c)
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> The EPA interprets section 166(c) of the Act to establish eight factors to be considered in the development of PSD regulations for the pollutants covered by this provision. These eight factors included the three criteria stated in section 166(c) and the five goals and purposes identified in section 160 of the Act (which, as noted below, also cover the goals and purposes set forth in section 101). The three stated criteria in section 166(c) indicate that PSD regulations for specific pollutants should provide: (1) Specific numerical measures for evaluating permit applications; (2) a framework for stimulating improved control technology, and (3) protection of air quality values. The five goals and purposes in section 160 are incorporated into the analysis by virtue of the fourth criterion in section 166(c), which directs that EPA's pollutant specific PSD regulations ''fulfill the goals and purposes'' set forth in sections 160 and 101 of the Act. . . .
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> . . . .
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> 4. Balancing the Factors Applicable Under Section 166(c)

While the eight factors in section 166(c) are generally complementary, there are circumstances where some of the objectives may be in conflict with each other. In these situations, some degree of balance or accommodation is inherent in the requirement to establish regulations that satisfy all of these factors. As first discussed in our 2005 NO_2 increments rulemaking (70 FR 59582 at 59587), *we believe this balancing test derives primarily from the third goal and purpose set forth in section 160: To insure economic growth consistent with the preservation of existing clean air resources. . . .*

> One commenter claimed that EPA ''incorrectly and repeatedly asserts'' that a goal of section 160 of the Act is to insure economic growth. The commenter claimed that neither section 160 nor section 101 of the Act uses language to support a goal of promoting or maximizing opportunities for economic growth.
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> . . . .
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> The language in section 160(3) provides that one of the purposes of the PSD program is ''to insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources.'' . . . We disagree [with the commenter]; the phrasing used by Congress is ''to insure that economic growth will occur.'' Thus, we believe the plain language of the statute supports EPA's

> reading that *section 160(3) requires a balancing of the goals of (1) economic growth and (2) preservation of existing clean air resources.* (Emphases added.)

The fact that the standards used in evaluating PSD will inherently allow a degree of deterioration of air quality is noted later: "The fact that economic growth in an area must occur *within a defined amount of allowable air quality deterioration* should logically lead to the application of improved pollution control technology as the amount of deterioration increases, and should not be regarded as an incidental consequence." (FR 2010A, p. 64875).

In setting the level for an SIL, which is defined as a level below which the pollution effects can be disregarded as *de minimis*, the EPA noted that:

> "[O]ur longstanding policy has been that when a source has a *de minimis* impact on an existing air quality problem, that source should not necessarily be required to bear the burden of addressing its small contribution to a problem caused primarily by other sources. However, notwithstanding the existence of a SIL, *permitting authorities should determine when it may be appropriate to conclude that even a de minimis impact will 'cause or contribute' to an air quality problem and to seek remedial action from the proposed new source or modification*." (Emphasis added.) (FR 2010A, p. 64892.)

The EPA further noted that one overall concern in setting a SIL, was to take into account that relatively small sources might only use up a portion of the overall region's "increment," as the effects created by a given source would be spread out across the entire monitoring area. It further described how the screening mechanism was intended to look at that overall regional effect, not whether there might be a localized effect from the source that the state authorities believed was sufficient to cause health concerns. (FR 2010A, p. 64893-94). (Notably, of course, these sources at issue are the major pollution sources that typically use tall smoke stacks to disperse the emitted pollution over a wide area, thereby reducing the effect on any given area and only adding a small amount to each point in the entire region. The proposed station here will not benefit from the dilutive effects of using smokestack technology.)

For that reason, the EPA reiterated that, in rejecting a commenter's recommendation for further limits on the use of SILs:

> "[W]e earlier provided an example of when it might be appropriate to require a modified source to mitigate its contribution to a violation of a NAAQS or increment even when the predicted ambient impact of the proposed emissions increase would result in what is normally considered to be *de minimis.* In addition, we have historically cautioned states that the use of a SIL may not be appropriate when a substantial portion of any NAAQS or increment is known to be consumed. We have indicated elsewhere in this preamble that states are not required to adopt the SILs for PM2.5 in this final rule. At their discretion they may choose not to rely on SILs to screen applicants or they may establish more stringent values." (FR 2010, p. 64894.)

That flexibility in the use of SILs and cautions about when their use might be inappropriate that was stated in the EPA commentary was not, however, reflected in the actual final rules. It was on that basis that, when the Sierra Club challenged the actual rules, the EPA conceded that they were not appropriately worded and asked to have them returned for further work. As well, as noted above, after the EPA decided to reduce the levels for the actual air quality standards, it also indicated that it intended to revisit the SILs for that reason as well. Accordingly, at this point, there is no SIL applicable to PM2.5 emissions and none will likely be forthcoming for some time. Even when or if one is adopted, it will surely include the same cautions as before that the determination as to whether a major source will have an excessive effect on the overall air quality of the region is not dispositive of whether the regulatory authorities should take into account localized effects from a particular source.