Public Comments & DNR Response
Guidance on Air Quality Background Concentrations

The Department received a total of 5 comments on the proposal, 3 from consulting firms, one from a corporation, and one from an environmental organization. The comments are summarized or abbreviated below followed by the associated response.

The comments received from the consulting firms requested additional data.

Comment 1:
Has WDNR set a 1-hr NOx background concentration?
Comment 2:
Can you supply the analysis that was performed to arrive at the proposed background concentrations?
Comment 3:
[C]ould [you] please provide the ambient monitor measurements which were used?

Response:
WDNR has compiled a single page table containing the monitored concentrations that were used to derive the background values. In doing so, an error in the "Low" area annual background was corrected. The correct value is 7.3 $\mu g/m^3$ (micrograms per cubic meter), lower than 7.6 $\mu g/m^3$ as listed in the draft. The data table is attached to this comment response and will be available as a stand-alone document from the WDNR web site.

WDNR will include background concentrations for the 1-hour NO_2 and 1-hour SO_2 standards once the standards are codified within Chapter NR 404 of the Wisconsin Administrative Code.

The comment from the corporation (Georgia Pacific) focused on the differences between the proposed values and the measured concentration in the Green Bay area.

Comment 4:
We [GP] support this approach to conservatively represent background concentrations in areas without monitors; however, this approach would illogically result in higher values than would otherwise be used in areas with monitors. Furthermore, we are concerned the guidance is excessively restrictive… because WDNR's approach ignores areas where representative monitors do exist, would result in higher estimates of background concentrations than EPA's guidance provides, and would preclude flexibility that current EPA guidance offers to account for seasonal variability in background concentrations.

Response:
Prior to releasing the draft guidance, WDNR reviewed the seasonal monitored concentrations utilizing the USEPA methods cited in the comment. For a variety of source types, the differences in total concentration (modeled plus background) between the seasonal background and the proposal was no more than 5%, and for good dispersing sources the total concentration was the same with either approach. Therefore WDNR determined that rather than creating new guidance on the definition of a representative monitor, it would be more efficient to update the existing methodology.

The final comment, from Clean Wisconsin, stated the proposal was inadequate to protect public health and welfare in Wisconsin.

Comment 5:
The… proposal is not adequate to protect public health and welfare for all residents of the state of Wisconsin. DNR staff needs to re-examine and revise this proposal, particularly with respect to $PM_{2.5}$ baseline concentrations. They need to do so to ensure that they are operating under assumptions and methodologies that are legally defensible, and that will allow then to fulfill their duty of protecting the public health and welfare of the citizens of Wisconsin.

Response:
As noted by Clean Wisconsin, $PM_{2.5}$ is a regional pollutant with very similar concentrations across broad distances. $PM_{2.5}$ has limited spatial variation over small distances. This means that ambient $PM_{2.5}$ concentrations can be averaged over space and time yet still be representative of local conditions. Utilizing the suggested "urbanized area" approach to geographically define areas of 'high' and 'low' background would produce discontinuities over small areas that are not representative of actual conditions.

Although Clean Wisconsin cites more than 100,000 tons per year of direct $PM_{2.5}$ emissions, the ambient concentrations in Wisconsin have steadily decreased for more than 10 years. This period overlaps the years where the existing methodology for $PM_{2.5}$ background concentration have been utilized, implying that the existing methodology is sound.

Background concentrations are only one part of the modeling analysis and a small piece of the overall permit approval process. The permit approval process is protective of the public health by demonstrating that the impact of the permit will not cause or exacerbate a violation of the ambient air standards. The NAAQS (National Ambient Air Quality Standards) are themselves set based on protecting both the general population and sensitive individuals within the general population. The existing method for calculating background, in conjunction with the most representative data and dispersion modeling techniques, provides a conservative process that supports the issuance of an air pollution control permit that is protective of public health.

Roth, John A - DNR

From: Tom Henning <thenning@sehinc.com>
Sent: Monday, September 22, 2014 2:51 PM
To: Roth, John A - DNR
Cc: Jason Martin; Steven Plachinski
Subject: Draft Guidance on Background Concentrations

I noticed the background concentration for the 1-hr NOx standard is not included in the draft Guidance on Background Concentrations Memo. Has WDNR set a 1-Hr NOx background concentration?

Tom Henning, PE, CHMM | Senior Professional Engineer
SEH | 809 North 8th Street, Suite 205 | Sheboygan, WI 53081
920.287.0677 direct | 920.207.0721 cell | 888.908.8166 fax
www.sehinc.com
SEH—Building a Better World for All of Us™

Roth, John A - DNR

From: Seitz, David <DSeitz@trcsolutions.com>
Sent: Tuesday, September 23, 2014 10:09 AM
To: Roth, John A - DNR
Subject: RE: DRAFT Wisconsin Air Quality Background Concentration

Thanks John.

Can you supply the analysis that was performed to arrive at the proposed background concentrations?

Dave

Roth, John A - DNR

From: Steven Klafka <sklafka@wingraengineering.com>
Sent: Monday, September 29, 2014 2:09 PM
To: Roth, John A - DNR
Subject: Re: DRAFT Wisconsin Air Quality Background Concentration

On its monitoring data web site, EPA lists 21 monitors for PM2.5. Can I assume the design values from monitors in locations using the High Background were averaged together, and the remaining monitors were averaged for the Low Background?

Roth, John A - DNR wrote:

> For PM2.5 it is based on where the monitor is located relative to the geographic high and low background areas. No 2011-2013 data was excluded. And I mis-spoke before... the values are based on the 98th percentile yearly concentrations.
>
> ---
> From: Steven Klafka [sklafka@wingraengineering.com]
> Sent: Monday, September 29, 2014 1:47 PM
> To: Roth, John A - DNR
> Subject: Re: DRAFT Wisconsin Air Quality Background Concentration
>
> I was interested in the specific monitor locations which were used to create the high and low background values.
>
> Roth, John A - DNR wrote:
>
> Steve, everything that is available is contained within the memorandum. After the comment period, we will assess any response.
>
> There were no additional calculations performed on the reported design values, other than taking the spatial average.
>
> ---
> From: Steven Klafka [sklafka@wingraengineering.com<mailto:sklafka@wingraengineering.com>]
> Sent: Monday, September 29, 2014 11:32 AM
> To: Roth, John A - DNR
> Subject: Re: DRAFT Wisconsin Air Quality Background Concentration
>
> John,
>
> To help review the draft memo on background concentrations, could please provide the ambient monitor measurements which were used to calculate the high and low background concentrations for PM2.5?
>
> Thanks.
>
> Steve Klafka

Georgia-Pacific
Consumer Products

Georgia-Pacific Consumer Products LP
Green Bay Operations
1919 South Broadway
Green Bay, WI 54304
920-435-8821

VIA ELECTRONIC MAIL

October 13, 2014

Mr. John Roth
Wisconsin Department of Natural Resources
Air Management Program
101 South Webster Street
Madison, WI 53707-7921
john.roth@wisconsin.gov

Re: Comments on WDNR's Draft "Guidance on Background Concentrations" for Air Quality Modeling

Dear Mr. Roth:

Georgia-Pacific Consumer Products LP (GP) appreciates this opportunity to provide comments on the Wisconsin Department of Natural Resources (WDNR), Air Management Program's draft "Guidance on Background Concentrations" ("Guidance") for use in evaluating air quality impacts as part of air permit applications. GP operates manufacturing facilities in the state that are subject to air permitting requirements and would utilize this guidance where applicable in permitting new projects. We appreciate WDNR's commitment to setting clear expectations for regulatory air quality modeling analyses by issuing guidance that facilitates consistent evaluations. However, we are concerned that specific aspects of the draft Guidance will perhaps inadvertently – result in unreasonably high estimates of air quality impacts using an approach that is unjustifiably conservative and constrained in light of recent EPA guidance.

Overview

GP understands and supports WDNR's approach to establish "high background values" and "low background values" based on population density to distinguish representative background air quality in rural and urban or industrialized areas. We recognize that this approach is essential because representative values from other locations need to be assigned to counties without monitors.

GP also understands WDNR's approach to quantifying the background value for each area based on the multi-year (i.e., three to five years) average of measured design concentrations at representative monitors in high and low background areas. We support this approach to conservatively represent background concentrations in areas without monitors; however, this approach would illogically result in higher values than would otherwise be used in areas with monitors. Furthermore, we are concerned the guidance is excessively restrictive in stating "WDNR will not consider requests for alternate background concentrations unless the source has installed an ambient monitor in an appropriate location and has a minimum of two (2) full years

of data," because WDNR's approach ignores areas where representative monitors do exist, would result in higher estimates of background concentrations than EPA's guidance provides, and would preclude flexibility that current EPA guidance offers to account for seasonal variability in background concentrations.

Application of Draft Guidance to Green Bay Area

To illustrate these concerns, GP considered how fine particulate matter (PM2.5) background concentrations would be assessed under WDNR's draft guidance compared to EPA's *Guidance for PM2.5 Permit Modeling*[1] that was finalized in May 2014 to reflect current recommendations for conducting such evaluations. GP operates manufacturing facilities in Green Bay, which is a "high background value" area that would apply concentrations of 23.6 $\mu g/m^3$ and 9.4 $\mu g/m^3$ for 24-hour and annual averaging periods, respectively, under WDNR's draft guidance.

WDNR operates a PM2.5 monitor at Green Bay East High School, which is located approximately 3.5 km away from GP's operations in Green Bay. This monitor measures ambient PM2.5 daily using the Federal Reference Method (FRM) and is indisputably robust, representative of ambient PM2.5 concentrations in the vicinity of GP's operations, and likely includes local impacts from GP's operations. Adding the measured background concentration to modeled ambient impacts is conservative because concentrations are potentially double-counted when the background is added to a modeled result. Tabulated EPA Design Values[2] for the 24-hour and annual averaging periods are 23.9 $\mu g/m^3$ and 8.8 $\mu g/m^3$, respectively, for the Green Bay East monitor, demonstrating attainment with the applicable NAAQS (35 $\mu g/m^3$ and 12.0 $\mu g/m^3$).

EPA Guidance for Annual Average Impact Analyses

For annual average PM2.5 impact analyses, EPA's 2014 guidance specifies a "First Tier" background concentration to be added to model results based on the 3-year average of the annual average monitored concentration. WDNR used this approach to define the background concentration of each monitor, but then averaged over multiple monitors to propose representative values for the high and low value areas. WDNR's proposed annual average background concentration would be 0.6 $\mu g/m^3$ *higher* than actual measurements from the Green Bay East monitor.

This overestimate for the annual averaging period is inappropriate because 0.6 $\mu g/m^3$ amounts to 5% of the 12.0 $\mu g/m^3$ NAAQS, 19% of the available margin between the measured background and 12.0 $\mu g/m^3$ NAAQS to which all modeled impacts must be added, and is "significant" in the sense that it exceeds the annual average Significant Impact Level (0.3 $\mu g/m^3$) EPA established to

---

1 EPA Memorandum from Stephen Page to Regional Air Division Directors, "Guidance for PM2.5 Permit Modeling," May 20, 2014. http://www.epa.gov/ttn/scram/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf.

2 EPA Design Values, PM2.5 (Updated August 28, 2014), http://www.epa.gov/airtrends/pdfs/PM25_DesignValues_20112013_FINAL_08_28_14.xlsx.

represent the concentration above which an impact would cause or contribute to an exceedance of the NAAQS. The use of regulatory default modeling options (i.e., assuming all sources emit simultaneously and continuously at the maximum allowable rate and adding a peak background concentration to the peak modeled concentration) results in a conservative estimate of the ambient impact relative to the stringent annual average NAAQS such that using a higher background concentration is unreasonable – especially because the proposed background value is higher by a significant amount and representative measurements from a robust, nearby monitor are available.

EPA Guidance for 24-hour Average Impact Analyses

For 24-hour average PM2.5 analyses, EPA's 2014 guidance specifies a "First Tier" background concentration to be added to model results based on the 3-year average of the 98th percentile 24-hour average monitored concentration. WDNR used this approach to define the background concentration of each monitor, but then averaged over multiple monitors to define representative values for the high and low value areas. WDNR's proposed 24-hour average background concentration (23.6 μg/m^3) would be 0.3 μg/m^3 *lower* than actual measurements from the Green Bay East monitor.

EPA's 2014 guidance also established a "Second Tier" background concentration for the 24-hour averaging period that accounts for seasonal variability by excluding measurements higher than the 98th percentile design concentration and selecting the maximum daily background concentration measured for each season. EPA's guidance suggests that this Second Tier approach would be routinely utilized, stating "the seasonal (or quarterly) pairing of monitored and modeled concentrations previously described in the Second Tier method should sufficiently address situations to which the impacts from primary PM2.5 emissions are not temporally correlated with background PM2.5 levels." EPA places no apparent restrictions on this method, indicating that "[a]ny monitor-model pairing approach aside from the First or Second Tier methods should be justified on a case-by-case basis in consultation with the appropriate permitting authority and the appropriate EPA Regional Office." GP evaluated daily PM2.5 measurements from the Green Bay East monitor and calculated the Second Tier quarterly PM2.5 background concentrations summarized in Table 1.

Table 1. Summary of Second Tier PM2.5 Background Concentrations Measured at Green Bay East.

Year	24-hour Average Concentration (μg/m^3)				
	Design Value	Q1	Q2	Q3	Q4
2011	26.7	26.7	23.5	25.9	25.7
2012	24.9	24.9	16.8	17.6	18.7
2013	20.0	19.6	17.7	17.4	20.0
Average	**23.9**	**23.7**	**19.3**	**20.3**	**21.5**

Although the proposed 24-hour average "high background value" (23.6 $\mu g/m^3$) is lower than the design concentration (23.9 $\mu g/m^3$) measured at the Green Bay East monitor, WDNR's guidance would unnecessarily preclude application of EPA's Second Tier method that is intended to be routinely applied if, as proposed, "WDNR will not consider requests for alternate background concentrations unless the source has installed an ambient monitor in an appropriate location and has a minimum of two (2) full years of data." The proposed constant value would be greater than three of the Second Tier quarterly values by a significant amount represented by the 24-hour Significant Impact Level of 1.2 $\mu g/m^3$. This outcome would be unreasonable because the use of regulatory default modeling options results in a conservative estimate of the ambient impact relative to the stringent 24-hour average NAAQS – especially because the proposed background value is higher by a significant amount and representative measurements from a robust, nearby monitor are available.

Summary and Recommendations

GP appreciates the clarity and consistency WDNR's proposed Guidance seeks to provide, but we are concerned that strict application of the guidance would be excessively and inappropriately conservative for the reasons described in this letter. We recommend that WDNR allow the application of current EPA guidance for PM2.5 modeling in permitting situations where representative ambient monitors exist.

Thank you very much in advance for your consideration of these comments. Please do not hesitate to contact me at 920-438-2213 to discuss questions, comments, or if any additional information is required.

Sincerely,

Robert A Bermke

Robert Bermke
Senior Environmental Engineer

October 17, 2014

TO: Kristin Hart, Section Chief for Permits & Stationary Source Modeling, Bureau of Air Management, Wisconsin Department of Natural Resources

John Roth, Air Quality Modeling Team Leader for Permits & Stationary Source Modeling, Bureau of Air Management, Wisconsin Department of Natural Resources

FROM: Tyson Cook, Director of Science and Research, Clean Wisconsin

SUBJECT: Guidance on Background Concentrations

Dear Kristin and John,

Thank you for the opportunity to comment on the Guidance on Background Concentrations memorandum from the Permit & Compliance Staff to the Stationary Source Modelling Team dated October 1, 2014. It is critical that the Wisconsin Department of Natural Resources ("DNR") is able to accurately measure and model emissions and to make sound permitting decisions. Unfortunately, the proposal laid out in that document is inadequate to protect public health and welfare in the state. This is particularly true of the proposed treatment of fine particulate matter ("$PM_{2.5}$"), given its local and regional impacts, the recent non-attainment status for some Wisconsin counties under the Clean Air Act, and the significant public health concerns related to its inhalation.

$PM_{2.5}$ air pollution is a significant cause of public health problems throughout Wisconsin and nationally. It has been shown to cause significant respiratory and cardiovascular health problems, leading to increases in both morbidity and mortality. As a result, it is critical that this pollution is properly controlled to a level below the National Ambient Air Quality Standards ("NAAQS") set by the Environmental Protection Agency ("EPA").

The NAAQS are a federally derived measurement of acceptable level of criteria pollutants, as stipulated in the Clean Air Act. The responsibility of enforcement of the Clean Air Act ("CAA") ultimately rests with individual States and their respective agencies through the formation of a State Implementation Plan. In Wisconsin, the DNR is responsible for ensuring that pollutants do not exceed the NAAQS, and the first and most critical action in maintaining $PM_{2.5}$ below the NAAQS is in the DNR's permitting process of facilities that either directly emit primary $PM_{2.5}$ emissions or chemical precursors that lead to secondary formation of $PM_{2.5}$ (such as sulfur dioxide, nitrogen oxides, volatile organic compounds, and ammonia).

Without the appropriate permits in place, based on sound monitoring and modeling methodology, there is no way for DNR to have adequate mechanism for enforcing the maintenance and/ or attainment of $PM_{2.5}$ levels below the NAAQS. The methods used and assumptions made by the DNR in establishing permitting requirements around $PM_{2.5}$ are therefore critically important to ensure compliance with the CAA, and have significant implications for the public health and welfare of the citizens of Wisconsin.

One of the key elements in making permitting decisions is to determine the "base line concentration" of air pollutants regulated under the CAA, which is defined under Wisconsin state law.[1] The base line concentration determines how much a new facility can be allowed to emit while also ensuring continued compliance with the NAAQS, or without significant deteriorating air quality in a region that is in attainment—especially those recently classified as in attainment. . Unfortunately, the DNR's proposed methodology and assumptions, which refer to base line concentration as "background concentrations" and are delineated in a memorandum from the Permit & Compliance Staff to the Stationary Source Modelling Team dated October 1, 2014 ("proposal"), are inadequate to protect the public health and welfare of the citizens of Wisconsin as intended by the CAA.

$PM_{2.5}$ is Both a Local and Regional Pollutant

The proposal would treat $PM_{2.5}$ in the same fashion as other pollutants with respect to assumed base line concentrations of $PM_{2.5}$. However, whereas pollutants such as lead are only emitted directly from facilities and are generally not widely dispersed, the source, fate, and transport of $PM_{2.5}$ is more complex. For example, while there is a significant amount of $PM_{2.5}$ that is directly emitted in the state, secondary formation of $PM_{2.5}$ is also a major contributing pathway to air concentrations. Recent research has shown that the sum contributions of secondary sulfate and secondary nitrate emissions was approximately half – ranging from 48 to 56% – of total $PM_{2.5}$ at various sites around the Midwest.[2] The direct sources of $PM_{2.5}$ emissions alone include more than 100,000 tons per year (tpy) in the state of Wisconsin.[3]

$PM_{2.5}$ also has the potential for more regional dispersion and impacts than other pollutants. This is due to both the long residence time of $PM_{2.5}$ in the atmosphere once formed or emitted, and the residence time and transport patterns of precursor emissions that lead to the secondary formation of $PM_{2.5}$. There remain significant spatial and temporal variations of $PM_{2.5}$[4], and this variability needs to be better accounted for than what the DNR is proposing as specified in the aforementioned memorandum.

The Proposed Background Levels Are Not Appropriate

The proposal would assign one of two statistically averaged values for assumed base line concentrations of $PM_{2.5}$ based on the location of a proposed facility relative to population centers. While the methodology for the derivation of the High Value ("HV") and Low Value ("LV") numbers (9.4 and 7.6 $\mu g/m^3$ for annual concentrations, and 23.6 and 19.8 $\mu g/m^3$ for 24-hour concentrations) appears

[1] Wisconsin State Statute §285.01(11): "Base line concentration" means concentration in the atmosphere of an air contaminant which exists in an area at the time of the first application to the U.S. environmental protection agency for a prevention of significant deterioration permit under 42 USC §7475 or the first application for an air pollution control permit under §285.60 for a major source located in an attainment area, whichever occurs first, less any contribution from stationary sources identified in 42 USC §7479 (4).

[2] Buzcu-Guven B, et al. 2007. Analysis and apportionment of organic carbon and fine particulate sources at multiple sites in the Midwestern United States. J Air& Waste Mgmt Assoc 57: 606-619.

[3] US EPA. "State and County Emission Summaries: Wisconsin." Accessed May, 2014 from: http://www.epa.gov

[4] See, e.g. Eeftens M, et al. 2012. Spatial variation of PM2.5, PM10, PM2.5 absorbance and PMcoarse concentrations between and within 20 European study areas and the relationship with NO2 – Results of the ESCAPE project. Atmospheric Environment 62: 303–317.

adequate, those HV and LV numbers for annual and 24-hour background concentrations are then inappropriately applied in the proposal.

The use of HV and LV numbers derived by the DNR are only appropriate for use when there is no other data available that would demonstrate background concentrations in exceedance of those values. They are completely inappropriate for use in areas where there is readily available data showing that base line concentrations are above the assumed HV or LV in an area. For example, this is the case in Waukesha County where air monitoring data clearly shows background levels of $PM_{2.5}$ to be in excess of the values to be assumed under the proposal.

The DNR is required by federal law to have legally enforceable procedures in place to determine if sources will cause or contribute to violations of the $PM_{2.5}$ NAAQS. Under the current proposal's methodology, which uses assumed values in place of directly measured monitoring data, the DNR cannot adequately make those determinations.

The Proposed Methodology Does Not Protect Public Health and Welfare

The proposal makes arbitrary cutoffs for the application of HV or LV background concentrations, based on the incorporated limits of large cities and villages. While there is some validity to treating densely populated regions of the state differently from sparsely populated regions of the state, the arbitrary lines drawn by city limits are not an appropriate metric. Air pollution knows no boundaries, and simply because it may be coming from a facility on the side of a road in an "unincorporated" jurisdiction, it does not mean that it will not affect people in an "incorporated" jurisdiction on the other side of that road. To better protect residents, there needs to be a setback distance from population centers for which the HV background concentrations still apply.

Furthermore, the geographical lines that make up incorporated areas are not determined based on population, but on a political jurisdiction. That jurisdiction is itself determined by number of political factors – such as the level of services provided to individuals. As a result, they do not always reflect the population centers represented by "urbanized areas" and "urban clusters" distinguished by the U.S. Census Bureau.

Indeed, analysis of data from the U.S. Census Bureau shows that, while there were just over two million Wisconsinites in the areas designated to use HV background concentrations by the DNR, there are well over three million Wisconsinites living in urbanized areas or urban clusters of over 25,000 individuals (the cutoff chosen by DNR). This means that even if all of the DNR's other assumptions were appropriate, the proposal would fail to adequately protect over one million people in the state. If the cutoff was lowered to urbanized areas with 20,000 individuals, that number approaches two million.

The Proposed Methodology is Especially Troubling in Counties Recently Gaining Attainment Status

As recently as last year, Milwaukee, Waukesha, and Racine Counties were designated as being in "nonattainment" of the NAAQS by the EPA. This means that air quality in those counties was chronically in excess of the limits set for the protection of public health and welfare. Recently however, the EPA agreed to re-designate those counties as now being in attainment, based on a petition by the DNR.

The assumption in the proposal that the counties recently in nonattainment became instantly on par with the rest of the state is clearly wrong, however. The air quality did not change with re-designation, but has been slowly improving over the years. Instead, the fact that they have only just been granted attainment status belies the underlying challenges in those areas.

Assuming, as the proposal does, the same background concentrations in re-designated counties as in other places in the state would result in a reduced level of stringency for air permits, and would be a step in the wrong direction. The proposal would significantly lessen protections on the health and welfare of individuals in Milwaukee, Waukesha, and Racine Counties, and could easily result in those counties returning to a "non-attainment" status.

Specific Recommendations:

The current (local-scale) methodology needs to be expanded to be adequately protective of public health. Additionally, background concentrations assumed should recognize the direct and indirect formation pathways and corresponding both local and regional impacts of PM2.5. This should take the form of setting assumed background concentrations on both local (based on urbanized areas) and regional (based on counties) scales.

We recommend that changes be made to the proposal to ensure that the public health and welfare of the citizens of Wisconsin is adequately protected, including:

1) **Correct the Determination of Locally High Background Areas**
   - **a.** The threshold for determining whether the HV background concentrations apply should be reduced to 20,000 individuals to better protect public health.
     Included using DNR methodology would be Caledonia (2012 population 24,930) and Watertown (2012 population 24,076)
   - **b.** There is no technical justification for limiting the consideration of high background areas to incorporated places. Instead, urbanized areas and urban clusters as defined by the U.S. Census Bureau should be considered.
     This would include the addition of the urban areas of Wisconsin Rapids (2010 population 29,169); Burlington (2010 population 23,534); Watertown (2010 population 23,347); Fort Atkinson (2010 population 21,105); and Mukwonago (2010 population 20,255)
   - **c.** High background areas should include the entirety of an urbanized area or urban cluster with population above a population threshold, as well as any incorporated areas or Census

Designated Places that are part of an urbanized area or urban cluster with population above the threshold.
For example, the Madison urbanized area includes the currently excluded places of Verona, Cross Plains, Waunakee, DeForest, Cottage Grove, Stoughton

d. To account for pollution transport toward populated areas, HV background concentrations should be assumed for any facilities proposed to be sited within 5 miles of urbanized areas or clusters above the population threshold.

2) Include a Determination of Regionally High Background Areas

a. Where facilities are proposed outside of the 5-mile buffer surrounding urbanized areas or urban clusters, assumed background values should be the greater of (1) the maximum design value of corresponding to a monitor in a given county, or (2) the HV determined using DNR proposed methodology.

b. To prevent back-sliding into non-attainment, all areas in counties designated as non-attainment within the last 5 years (here, Milwaukee, Waukesha, and Racine counties) should use the greater of (1) the maximum design value of corresponding to a monitor in a given county, or (2) the HV determined using DNR proposed methodology.

c. Areas outside of designated urbanized areas or urban clusters, but within counties that have significant annual direct sources of PM 2.5 should use design values corresponding to the greater of (1) the highest monitor design value in the county; or (2) [the HV determined using DNR proposed methodology] OR [the average of monitor design values in those counties].
Using a 200 ton direct $PM_{2.5}$ emissions cutoff (based on 2011 data) in Wisconsin would yield:

		County Design Value	
County	***Criteria***	***Annual***	***24 Hour***
Columbia	*Direct Emissions: 1,775 lbs*	*HV*	*HV*
Wood	*Direct Emissions: 830*	*HV*	*HV*
Milwaukee	*Previous Non-Attainment; Direct Emissions: 638*	*10.8*	*27*
Marathon	*Direct Emissions: 424*	*HV*	*HV*
Sheboygan	*Direct Emissions: 403*	*HV*	*HV*
Ozaukee	*Direct Emissions: 394*	*HV*	*HV*
Outagamie	*Direct Emissions: 384*	*HV*	*HV*
Brown	*Direct Emissions: 274*	*HV*	*HV*
Portage	*Direct Emissions: 255*	*HV*	*HV*
Grant	*Direct Emissions: 242*	*9.5*	*21*
Ashland	*Direct Emissions: 240*	*HV*	*HV*
Racine	*Previous Non-Attainment*	*HV*	*HV*
Waukesha	*Previous Non-Attainment*	*10.8*	*27*

3) **Correct the Determination of Background Concentrations**

a. Where monitors are present within urbanized areas, the background concentrations should be based on the greater of (1) the background concentrations corresponding to the highest monitor design value – which is in keeping with the methodology used by the EPA to determine design values for counties, or (2) the HV determined using DNR proposed methodology.

Applying this methodology in Wisconsin would yield:

	2011-2013 Annual Design Value (µg/m3)	***2011-2013 24-hr Design Value (µg/m3)***
Milwaukee UA	*10.8*	*27*
Madison UA	*9.7*	*25*
La Crosse UA	*HV*	*HV*
Appleton UA	*HV*	*HV*
Green Bay UA	*HV*	*HV*
Kenosha UA	*HV*	*HV*

Conclusion

The DNR Permit & Compliance Staff's proposal is not adequate to protect public health and welfare for all residents of the state of Wisconsin. DNR staff needs to re-examine and revise this proposal, particularly with respect to $PM_{2.5}$ base line concentrations. They need to do so to ensure that they are operating under assumptions and methodologies that are legally defensible, and that will allow them to fulfil their duty of protecting the public health and welfare of the citizens of Wisconsin. The recommendations proposed here are not meant to be an exhaustive list of steps that the DNR should take, but rather they are meant to assist the DNR in their re-examination and revision of their proposal.

Sincerely,

Tyson Cook
Director of Science and Research, Clean Wisconsin

$PM_{2.5}$ Monitor Values for WDNR Revised Background Concentrations – December 2014

NAME	ID	High/Low	2011	98th	Ann		2012	98th	Ann		2013	98th	Ann
Bad River	55-003-0010-1	L		17.1	5.4			17.7	5.4			16	4.7
Green Bay	55-009-0005-1	H		26.7	10			24.9	8.7			20	7.6
Madison East	55-025-0041-1	H						20.4	9.4			19	8.3
Madison Well #6	55-025-0047-1	H		26.7	10.3			26.7	9.4			22.8	9.3
Horicon	55-027-0001-1	L		25.7	9.4			26.3	8.9			18.1	7.9
Eau Claire	55-035-0014-1	L						22.6	8.1			19.5	7.3
Potawatomi	55-041-0007-1	L						22.7	5.3			16.6	4.9
Potosi	55-043-0009-1	L		23.4	10.4			21.8	9.1			18.8	8.9
Chiwaukee	55-059-0019-1	H						25.5	9.4			22	8.7
La Crosse	55-063-0012-1	H						22	8.2			18.1	8.3
MKE Health Ctr	55-079-0010-2	H		27	10.8			30.4	10.7			24.1	9.9
MKE DNR SER	55-079-0026-1	H		21.3	10.1			24.6	9.9			21.2	8.7
MKE College Av	55-079-0058-1	H						27.3	10.5			19.2	8.8
MKE Fire Dept	55-079-0099-1	H						30.2	9.9			20.7	9
Appleton	55-087-0009-1	H		22.4	9.3			24.7	8.6			22	8
Harrington Beach	55-089-0009-1	L		22.3	9.2			19.9	8.9			19.5	7.2
Devils Lake	55-111-0007-1	L		24	9.2			22.7	8.4			15.7	7
Perkinstown	55-119-8001-1	L		19.8	7.8			24.2	7.5			17.1	6.4
Trout Lake	55-125-0001-1	L		16.9	6.3			13.4	5.3			14.4	4.6
Waukesha	55-133-0027-2	H		25.3	11.9			20.9	10.5			24.5	10

24 Hour High	**(28 values)**	**23.6**
24 Hour Low	**(25 values)**	**19.8**
Annual High	**(28 values)**	**9.4**
Annual Low	**(25 values)**	**7.3**