NSR Program Supplemental Discussion:

**Introduction**

DEQ proposes mostly minor changes to the rules that implement the New Source Review (NSR)[[1]](#footnote-1) program in Oregon, but the proposed rules also include a few significant changes. The minor changes include reorganizing the rules so that elements of the program are grouped together, as well as providing clarification for some of the provisions. The two significant changes include: 1) replacing the current definition of a major source in nonattainment areas with the federal definition (this change would also apply to maintenance areas); and 2) revising the procedures for demonstrating “net air quality benefit” when offsets are required for NSR actions in nonattainment and maintenance areas.

In addition to the changes identified above, DEQ proposes establishing two new designations for the air quality in a localized area. Currently, there are three designations used in the Oregon rules. *Attainment (or unclassified) areas* are areas where the air quality is below the National Ambient Air Quality Standard (NAAQS) or presumed to be below the NAAQS. *Nonattainment areas* are areas where the air quality does not meet the NAAQS and have been formally designated nonattainment by EPA. Once designated as nonattainment, an area remains designated as nonattainment until DEQ requests and EPA approves that the area be re-designated as an attainment area. The re-designation includes the development and implementation of a maintenance plan to ensure that the area will not become a nonattainment area again. Hence, DEQ rules refer to re-designated areas as *Maintenance areas*.

The new designations proposed by DEQ are “*Sustainment*” and “*Reattainment*” areas. Sustainment areas would be areas that have ambient monitoring data indicating that an area is not meeting the NAAQS or is very close to not meeting the NAAQS, but the area has not been formally designated as a nonattainment area by EPA. Reattainment areas would be areas that are currently designated as nonattainment areas, but there is sufficient ambient monitoring data indicating that the area is meeting the NAAQS. For sustainment areas, DEQ is proposing NSR rules that will help to prevent an area from becoming formally designated as a nonattainment area[[2]](#footnote-2). For reattainment areas, DEQ is proposing rules that will serve as a bridge between nonattainment and maintenance area NSR rules. For both areas, the proposed NSR rules are designed to provide incentives for new or modified sources to obtain offsets from sources (i.e., priority sources) that are considered to be significantly contributing to the air quality problems in the area. However, federal major sources (major sources, as defined by EPA) would still have to comply, at a minimum, with the NSR rules specified for the area as it is designated by EPA.

**Background**

DEQ’s New Source Review (NSR) program was approved by EPA in the early 1980’s. It is a unique program that utilizes Plant Site Emissions Limits (PSEL) and Baseline Emission Rates for regulating source emissions, as well as determining when new and modified sources are subject to NSR. Initially, sources that were operating during the baseline period of 1977 or 1978 were granted a PSEL equal to the actual emissions during the baseline period (e.g., baseline emission rate). If the source’s emissions remained at or below the baseline emission rate or did not increase by more than a significant emission rate above the baseline emission rate, the source would not be subject to NSR.

If a source requested an increase in their PSEL by more than a significant emission rate above the baseline emission rate, the source would be subject to NSR. If the increase did not involve a “major modification”, the source was required to conduct an air quality impact analysis in attainment or unclassified areas or obtain offsets and demonstrate a “net air quality benefit” in nonattainment areas[[3]](#footnote-3). If the increase involved a “major modification” in an attainment or unclassified area and the source was a federal major source[[4]](#footnote-4), the source was required to install best available control technology (BACT). If the increase involved a “major modification” in a nonattainment area and the source was a major source[[5]](#footnote-5), the source was required to install the lowest achievable emission rate (LAER) control technology. A major modification was defined as physical changes or changes in the method of operation at a source that result in accumulated emission increases equal to or more than a significant emission rate since the baseline period.

The following examples illustrate how the program works[[6]](#footnote-6):

Example 1: PSD triggered after a series of changes at a facility over a 15 year period.

Triggering pollutant: Particulate matter (significant emission rate = 25 tons/yr)

| Year | PSEL | Reason for change | Requirement(s) | Comments |
| --- | --- | --- | --- | --- |
| 1980 | 80 | ---- | None | Initial PSEL = baseline emission rate (BER) |
| 1985 | 90 | Add equipment with capacity to emit 10 tons | None | PSEL increase above BER (10 tpy) <SER |
| 1990 | 100 | Add equipment with capacity to emit 10 tons | None | PSEL increase above BER (20 tpy) <SER |
| 1995 | 110 | Modify equipment that increases capacity to emit by 10 tons | PSD: AQ analysis and BACT for equipment added in 1985 and 1990 and equipment modified in 1995 | PSEL greater than BER by more than the SER, federal major source threshold = 100 tons/yr, accumulated increase due to physical modifications (30 tpy) >SER |

Example 2: PSD triggered when PSEL increased to utilize capacity of equipment added in previous permit actions (no physical change at time of increasing PSEL).

Triggering pollutant: Particulate matter (significant emission rate = 25 tons/yr)

| Year | PSEL | Reason for change | Requirement(s) | Comments |
| --- | --- | --- | --- | --- |
| 1980 | 80 | ---- | None | Initial PSEL = baseline emission rate (BER) |
| 1985 | 90 | Add equipment with capacity to emit 15 tons, but only requested increase in PSEL enough to operate at anticipated need. | None | PSEL increase above BER (10 tpy) <SER |
| 1990 | 90 | Add equipment with capacity to emit 15 tons per year, remove equipment that existed in baseline period (internal netting) | None | PSEL increase above BER (10 tpy) <SER |
| 1995 | 110 | Increase PSEL to utilize capacity of equipment added in 1985 and 1990 without a current physical change | PSD: AQ analysis and BACT for equipment added in 1985 and 1990 | PSEL increase above BER (30 tpy) >SER, federal major source threshold = 100 tons/yr, accumulated increases due to physical modifications (30 tpy) >SER |

Example 3: BACT is not required as a result of utilizing existing capacity

Pollutant: Sulfur dioxide (significant emission rate = 40 tons/yr)

 Two small boilers capable of burning natural gas or oil

| Year | PSEL | Reason for change | Requirement(s) | Comments |
| --- | --- | --- | --- | --- |
| 1980 | 80 | ---- | None | Initial PSEL = baseline emission rate (BER) when mostly natural gas was burned in the boilers |
| 1985 | 300 | Utilize existing capacity, no physical change, just burn oil more hours per year | AQ analysis | PSEL increase above BER (220 tpy) >SER, but no physical changes so BACT was not required. |

Example 4: PSD triggered due to modification even though PSEL decreases.

Triggering pollutant: Sulfur dioxide (significant emission rate = 40 tons/yr)

 Two small boilers capable of burning natural gas or oil

| Year | PSEL | Reason for change | Requirement(s) | Comments |
| --- | --- | --- | --- | --- |
| 1980 | 80 | ---- | None | Initial PSEL = baseline emission rate (BER) |
| 1985 | 300 | Utilize existing capacity, no physical change, just burn oil more hours per year | AQ analysis | PSEL increase above BER (220 tpy) >SER, but no physical changes so BACT was not required |
| 1990 | 250 | Modify equipment (new burners, increase capacity, but more efficient combustion) | PSD: AQ analysis and BACT | PSEL >BER (170 tpy) by more than SER and “major modification” |

Example 5: PSD never triggered because capacity to emit decreases below baseline emission rate even though there were physical changes.

Pollutant: Particulate matter (significant emission rate = 25 tons/yr)

| Year | PSEL | Reason for change | Requirement(s) | Comments |
| --- | --- | --- | --- | --- |
| 1980 | 300 | ---- | None | Initial PSEL = baseline emission rate (BER) |
| 1985 | 300 | Replace equipment with lower emitting equipment | None | PSEL = BER, internal netting |
| 1990 | 300 | Add pollution control equipment to existing units and add another unit | None | PSEL = BER, over control and internal netting |
| 2000 | 300 | Add one piece of equipment to replace two pieces of equipment | None | PSEL = BER, internal netting |
| 2005 | 200 | Previous changes have reduced the capacity to emit | Establish 100 tons of unassigned emissions that will be reduced to the SER if not used within 5 years | PSEL<BER, “unassigned emissions” codified in rules in 2001 |

**Netting Basis:**

The original program did not have a provision for “resetting” or establishing a baseline emission rate if a source went through new source review after the baseline period. In addition, the rules allowed a source to maintain a PSEL equal to the baseline emission rate even if the source no longer had the capacity to emit at the level it had in the baseline period. In the first case, a source could be subject to NSR every time there was a one ton increase in the PSEL even though the source had recently gone through NSR. In the second case, the source could avoid going through NSR even if there were significant changes at the facility that could impact air quality.

In the late 1990’s, DEQ developed through guidance the concept of a “netting basis” as a way to reset or establish a baseline once a source goes through NSR. This concept was codified in the rules in 2001 and included provisions for addressing sources that had PSELs well above their capacity to emit by classifying the unneeded PSEL as unassigned emissions. If not used within a 5 year period, the unassigned emissions greater than the significant emission rate for the pollutant would be removed from the PSEL and netting basis.

DEQ also clarified in the 2001 rule changes that the prevention of significant deterioration (PSD) provisions of the NSR program only applied to “federal major sources” (e.g., sources with the potential to emit a criteria pollutant greater than 100 tons per year for 28 listed source categories and 250 tons per year for all other sources). Prior to 2001, a source with PTE between the significant emission rate and the federal major source level was subject to “state” PSD, which required an air quality impact analysis, but did not require BACT. The rule changes in 2001 did not affect the stringency of the program because sources with PTE between the SER and federal major source levels are still required to conduct an air quality impact analysis or obtain offsets under the PSEL rules.

In this rulemaking, DEQ is providing clarification for the definition of a “major modification” to be consistent with the rule changes made in 2001 when the concept of the “netting basis” was codified. Prior to 2001, the definition referred to the “baseline period” for determining emission increases due to physical changes and changes in the method of operation. In 2001, the definition was revised by referring to either the baseline period or “the last new source review” action for the source. The intent being that future increases would be compared to the most recent netting basis established for the source. DEQ proposes removing reference to the baseline period and most recent NSR action and use the most recent netting basis for determining increases due to physical changes or changes in the method of operation.

This change provides clarification, but is also necessary in order to implement the NSR program for fine particulate matter (PM2.5), which became a regulated pollutant in 2011. PM2.5 is a fraction of total particulate matter (PM) and course particulate matter (PM10), which both have baseline periods of 1977/1978, so DEQ did not established a separate baseline period for PM2.5. However, due to the number of years between the baseline period and when PM2.5 became a regulated pollutant and the likelihood that most sources are configured differently now than in the baseline period, DEQ did not believe it was appropriate to establish a baseline emission rate for PM2.5. In most cases, it would be impracticable to obtain the information from 1977/1978 to establish the baseline emission rate. Therefore, the 2011 rules required that a “netting basis” be established for PM2.5, but not a baseline emission rate. The rules specified that the initial netting basis for PM2.5 is the PM2.5 fraction of the PM10 netting basis in effect on May 1, 2011. Using this approach, the netting basis for PM2.5 reflects the current configuration of the facility, as well as all previous PM10 permitting decisions. As a result, moving forward, it is only necessary to compare emissions increases due to future changes at a source to the netting basis and not the baseline period.

The netting basis is established for each NSR pollutant emitted from a source. Some sources have a netting basis of zero because they either did not exist in the baseline period or never went through NSR. For sources that have a netting basis, the netting basis is either equal to the baseline emission rate or was established in a previous NSR action. For PM2.5, the initial netting basis is established relative to the PM10 netting basis in effect on May 1, 2011.

**Major Source Definition for Nonattainment and Maintenance Areas:**

As discussed above, the major source level in nonattainment and maintenance areas is currently defined in DEQ rules as the *significant emission rate (SER)* for the nonattainment or maintenance area pollutant. DEQ is proposing to change the major source level to the federal major source level, which is 100 tons per year for the nonattainment areas in Oregon[[7]](#footnote-7). This change allows DEQ to establish rules for minor sources that will provide incentives to address the sources of air pollution in areas with air quality problems, but still maintain the minimum requirements of the federal program for federal major sources.

The federal program for nonattainment areas requires new or modified major sources obtain at least 1:1[[8]](#footnote-8) offsets for the emission increases associated with the project. DEQ’s proposed rules would require 1.2:1[[9]](#footnote-9) offsets, except that the ratio may be reduced to 1:1 if some of the offsets come from the sources that are contributing to the air quality problems in the area. For minor sources, DEQ’s proposed rules would require 1:1 offsets, except that the ratio may be reduced to 0.5:1[[10]](#footnote-10) if some or all of the offsets come from the sources that are contributing to the air quality problems in the area. Currently, there are two nonattainment areas in Oregon. Both areas are nonattainment for PM2.5. The significant emission rate for PM2.5 is 10 tons per year. DEQ has determined through monitoring and modeling that the most significant source of fine particulate emissions that are contributing to the air quality problems in these areas are residential wood heating devices. By raising the major source level to 100 tons per year, there will be more incentive for minor sources to obtain offsets from residential wood heating devices. Typically, wood-stoves have very small emissions relative to industrial sources, but due to the plume characteristics (low velocity and low temperature), the smoke from residential wood heating devices has a significant impact in residential areas; especially during periods of air stagnation and inversions.

**Net Air Quality Benefit**

In addition to the offset requirements, DEQ rules currently have very prescriptive requirements for demonstrating the net air quality benefit associated with the offsets. The federal program includes reference to “net air quality benefit” but does not proved specific criteria for demonstrating net air quality benefit. Presumably, the net air quality benefit associated with offsets under the federal program is determined on a case-by-case qualitative rather than quantitative basis. DEQ has reviewed other state programs approved by EPA and found that most programs rely merely on offsets for the demonstration of net air quality benefit.

DEQ’s rules currently have two criteria for determining whether offsets provide net air quality benefit. Both rely on modeling. The first criterion is that the offsets must reduce the proposed source’s impacts at a majority of the receptors. The second criteria is that the source’s emissions along with the required offsets will result in impacts less than the significant impact level (SIL) at all receptors within the nonattainment area. These two criteria were established in 2001 and were never fully evaluated before they were adopted. As it turns out, DEQ has found that these two criteria are virtually impossible to meet because emissions from different locations do not impact the same receptors. In order to satisfy the criteria, the offsets would have to come from almost the same location as the proposed project.

Since adoption, meeting the requirements of net air quality benefit has not been an issue for sources that triggered NSR/PSD because all of the proposed sources were located in attainment or unclassified areas and did not significantly impact air quality in a designated nonattainment or maintenance area. Therefore, these sources did not have to meet the requirements of net air quality benefit.

In 2009, a source located in a nonattainment area wanted to expand but couldn’t meet the second part of the net air quality benefit test because the offsets were from a different part of the nonattainment area. Legislation was passed to redefine net air quality benefit for small scale local energy projects as a result. Recently this rule was applied to a new business in a nonattainment area that was essentially co-located with the existing business that provided the offsets. Because the businesses were co-located, they were able to show that modeled impacts resulted in less than a significant impact level increase at all modeled receptors. If the businesses had not been co-located, this requirement would have been impossible to meet because of meteorological conditions and different topography.

Upon further review of the federal rules, as well as other state programs, DEQ does not believe the nonattainment NSR rules were intended to prevent new sources from being built in nonattainment areas if the source’s emissions are offset by emission reductions from other sources within the area. In addition, DEQ does not believe that the criteria established in 2001 can be met. On the other hand, DEQ does not believe that offsets by themselves are a sufficient demonstration of net air quality benefit. Even though the emissions from a proposed project may be fully offset so that there is no net increase in emissions within the nonattainment area, the impacts of the source’s emissions could adversely affect specific areas within the nonattainment area.

Therefore, DEQ proposes modifying the criteria for demonstrating net air quality benefit as follows:

1. Obtain offsets in accordance with the provisions discussed above, which provide incentives for obtaining offsets from the priority sources; and
2. Conduct modeling that:
	1. Demonstrates that the source’s impacts without taking into consideration any offsets are less than the significant impact level at all receptors within the designated area; or
	2. Demonstrates that the source’s impacts without taking into consideration any offsets are less than the significant impact level at receptors in the neighborhood of the monitoring site used for the designation of the area; and
	3. Demonstrates that the source’s impacts after subtracting offsets from priority source’s plus the impacts from all other emission increases (including contemporaneous offsets) and decreases since the area was designated are less than 10% of NAAQS[[11]](#footnote-11) at all other receptors within the designated area.

DEQ believes that the demonstrations above will ensure that the air quality in a designated area will not get worse as a result of new or modified sources; and, in most cases, will improve the air quality; especially if the proposed source obtains offsets from other priority sources within the designated area.

**New Violation of NAAQS**

OAR 340-202-0050(2) provides general authority for DEQ to prohibit construction of a new or modified source if the source would singularly cause or contribute to a violation of a NAAQS. DEQ has added this requirement to the NSR rules for each designated area. The proposed rules also include a provision that new and modified sources cannot cause or contribute to a *new* violation of a NAAQS. DEQ interprets this requirement as follows:

For areas where the background concentration is above the NAAQS: A new or modified source can’t cause or contribute to a new violation because the area is already violating the NAAQS. In this case, the rules are intended to improve the air quality in the general area; or, at least, prevent the air quality from getting worse as a result of the proposed new or modified source by requiring offsets and:

* Using SIL to show that the source will not make the air quality worse in the neighborhood around the monitoring site(s).
* Using 10% of NAAQS to show that a source (plus competing sources) will not make the air quality worse in all other areas of the designated area. (This is analogous to the PSD increment, but using 10% of the NAAQS is more protective. The PSD increment was established to “prevent significant deterioration” in attainment areas. That same concept is appropriate for any airshed.)

For areas with background within an SIL of the standard: The source could cause or contribute to a “new” violation. Federal major sources are required to demonstrate that their impact when added to the background does not cause a violation of the standard. This analysis needs to include the impacts of other sources if they are not included in the background monitoring data. The analysis would also account for offsets (e.g., emission reductions as a result of the project). Minor sources may either satisfy the requirement as specified above or obtain offsets and demonstrate net air quality benefit as required for sources locating in nonattainment areas.

For areas with background less than the SIL below the standard: The source could cause or contribute to a “new” violation if the source’s impacts are greater than the SIL. The PSD analysis is required to show that a source will not cause or contribute to a violation of the standard; or for sustainment areas, a source must obtain offsets and:

* Use SIL to show that the source will not make the air quality worse in the neighborhood area around the monitoring site(s).
* Use 10% of NAAQS to show that a source (plus competing sources) will not make the air quality worse in all other areas of the designated area. (This is analogous to the PSD increment, but using 10% of the NAAQS is more protective. The PSD increment was established to “prevent significant deterioration” in attainment areas. That same concept is appropriate for any airshed.)
1. As used in this discussion document, “NSR” is an umbrella term for the prevention of significant deterioration (PSD), non-attainment, and maintenance area programs. PSD applies to sources locating in areas that are in attainment with the NAAQS or otherwise not classified. Nonattainment NSR applies to sources locating in areas that are designated as nonattainment for the nonattainment pollutant only. Maintenance NSR applies to sources locating in maintenance areas for the maintenance pollutant only. Maintenance areas are areas of the state that were previously designated as nonattainment for a pollutant and have been redesignated to attainment. Designations and redesignations are actions that must be reviewed and approved by Oregon’s Environmental Quality Commission and EPA. [↑](#footnote-ref-1)
2. Intended as a tool for EPA’s PM Advance Program [↑](#footnote-ref-2)
3. Current rules include a hybrid approach for Maintenance Areas. [↑](#footnote-ref-3)
4. A federal major source is a source that has the potential to emit 100 tons or more per year of an NSR regulated pollutant if the source is within one of 28 source categories listed in the rules or 250 tons or more per year of an NSR regulated pollutant if the source is not within one of the 28 source categories listed in the rules. [↑](#footnote-ref-4)
5. A major source is a source that has the potential to emit an NSR regulated pollutant at or above the significant emission rate for the pollutant. The significant emission rates for each NSR regulated pollutant are defined in the rules. For example, the significant emission rate for particulate matter (PM) is 25 tons per year and for sulfur dioxide (SO2), the significant emission rate is 40 tons per year. [↑](#footnote-ref-5)
6. PM and SO2 are used in these examples because they were the only two pollutants regulated under the NSR program when it was first approved in the early 1980’s. [↑](#footnote-ref-6)
7. EPA and DEQ rules include lower thresholds, depending on the severity of the nonattainment area classification. [↑](#footnote-ref-7)
8. EPA establishes higher ratios for ozone precursors, depending on the severity of the ozone non-attainment area. DEQ does not propose any changes to the ozone precursor ratios that are in the current rules. [↑](#footnote-ref-8)
9. DEQ’s current rules require 1:1 offsets. [↑](#footnote-ref-9)
10. EPA rules do not require offsets for minor sources. [↑](#footnote-ref-10)
11. This is analogous to the PSD increment, but using 10% of the NAAQS is more protective than the Class II PSD increments. The PSD increment was established to “prevent significant deterioration” in attainment areas. That same concept is appropriate for any airshed. [↑](#footnote-ref-11)