United States Environmental Protection Agency

Office of Transportation and Air Quality

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# Summary and Analysis of the 2006 Nonroad Diesel Fuel Pre-Compliance Reports

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Assessment and Standards Division
and
Transportation and Regional Programs Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

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# I. Executive Summary

Any refiner or importer planning to produce or import nonroad, locomotive, or marine (NRLM) diesel fuel containing 15 ppm sulfur or less after June 1, 2010 is required to submit to the U.S. Environmental Protection Agency ("EPA" or "the Agency") annual pre-compliance reports. Reports are due from 2005 through 2011 by June 1 of each year under the nonroad diesel sulfur regulations. This report summarizes the results of refiners' June 2006 pre-compliance reports.

Refiners' nonroad pre-compliance reports must contain estimates of total (highway + NRLM) 15 ppm diesel fuel and total (highway + NRLM) 500 ppm diesel fuel produced or imported from June 2010 through December 2014. For those refiners and importers planning on participating in the credit trading program, the reports must contain a projection of how many credits will be generated or used by each refinery or importer. The pre-compliance reports must also contain information outlining each refinery's timeline for complying with the 15 ppm sulfur standard and provide information regarding engineering plans (e.g., design and construction), and capital commitments for making the necessary modifications to produce 15 ppm NRLM diesel fuel.

The 2006 nonroad pre-compliance reports showed that: 1) 117 refineries are planning to produce 15 ppm diesel fuel by 2014; 2) 23 refiners are either undecided as to their plans, or are choosing to remain in the high sulfur diesel market; 3) refiners have projected an increase in diesel production from 2010 through 2014; 4) refiners are taking advantage of the flexibilities offered by the regulations (23 refineries plan to generate early credits in 2006 and 2007, 9 refineries plan to generate early credits in 2009 and 2010, small refiners are utilizing all of the options available to them); 5) all diesel fuel volumes in all PADDs are projected to grow or remain constant; and 6) refiners project an increase in expected production and importation of total highway + NRLM diesel fuel ("total diesel fuel") beginning June 1, 2010, compared to the 2005 nonroad pre-compliance reports.

Many refiners have developed firmer plans to produce 15 ppm NRLM diesel fuel by June 1, 2010 than what they indicated in their 2005 pre-compliance reports, although these plans are still subject to change. EPA expects that next year's nonroad pre-compliance reports will contain more definite information on refiners' plans to produce 15 ppm NRLM diesel fuel by June 1, 2010.

# II. Nonroad Diesel Program Overview

The Nonroad Diesel final rule (69 FR 38958, June 29, 2004) contains a two-step approach to reducing the sulfur content of nonroad, locomotive, and marine (NRLM) diesel fuel from uncontrolled levels down to 15 ppm. Beginning June 1, 2007, refiners and importers are required to produce or import NRLM diesel fuel with a maximum sulfur content of 500 ppm. Beginning June 1, 2010, refiners and importers are required to produce or import nonroad (NR) diesel fuel with a maximum sulfur content of 15 ppm. Beginning June 1, 2012, refiners and importers are required to produce or import locomotive and marine (LM) diesel fuel with a maximum sulfur content of 15 ppm.

This rule includes provisions for refiners and importers to generate credits for early NRLM diesel sulfur reduction efforts. "High sulfur" credits may be generated for early production of 500 ppm NRLM diesel fuel between June 1, 2006 and June 1, 2007. Similarly, "500 ppm" credits may be generated for early production of 15 ppm NRLM diesel fuel between June 1, 2009 and June 1, 2010. "High sulfur" credits could be used to comply with the 500 ppm NRLM standard beginning June 1, 2007, while "500 ppm" credits could be used to comply with the 15 ppm NR standard beginning June 1, 2010 and the 15 ppm LM standard that begins June 1, 2012. For both high sulfur credits and 500 ppm credits, one credit is equivalent to one gallon of diesel fuel that meets the respective standard earlier than required. In addition, "high sulfur" credits can be converted into "500 ppm" credits for use in 2010 and later. NRLM sulfur credits may be transferred nationwide. No credit trading area restrictions exist such as those found in the Highway Diesel rulemaking.

**Small Refiner Flexibilities**

Additional compliance flexibilities are provided for small refiners in the nonroad diesel sulfur regulations. The definition of an NRLM small refiner is similar to the definition under the Tier 2/Gasoline Sulfur and Highway Diesel rules. A small refiner is defined as a refiner who: 1) processes NRLM diesel fuel from crude oil; 2) employs no more than 1,500 people corporate-wide, based on the average number of employees for all pay periods from January 1, 2002 to January 1, 2003; and, 3) has a corporate crude oil capacity less than or equal to 155,000 barrels per calendar day (bpcd) for 2002.

The small refiner relief options provide additional time for compliance and, for small refiners that choose to comply earlier than required with the NRLM requirements, the option of either generating diesel fuel sulfur credits or receiving a limited relaxation of their Tier 2/Gasoline Sulfur standards. These small refiner options are described in more detail below.

*Option 1 – Delay 500 ppm NRLM production*

This option allows approved small refiners to delay compliance with the NRLM diesel fuel sulfur standards as follows. Instead of a 500 ppm NRLM compliance date of June 1, 2007, small refiners have a compliance date of June 1, 2010. Production of high sulfur (greater than 500 ppm) NRLM diesel fuel from a small refiner's refinery between June 1, 2007 and June 1, 2010 is limited to 105 percent of the refinery's average NRLM diesel fuel production from 2003 through 2005.

*Option 2 – Delay 15 ppm NRLM production*

This option allows approved small refiners to delay compliance with the NRLM diesel fuel sulfur standards as follows. Instead of separate 15 ppm NR and LM compliance dates of June 1, 2010 and June 1, 2012, respectively, small refiners have a single 15 ppm NRLM compliance date of June 1, 2014. Production of 500 ppm sulfur NRLM diesel fuel from a small refiner's refinery between June 1, 2010 and June 1, 2014 is limited to 105 percent of the refinery's average NRLM diesel fuel production from 2006 through 2008.

*Option 3 - NRLM Credit Option*

An approved small refiner may choose to use the NRLM Credit Option in combination with the NRLM Delay Option. The NRLM Credit Option allows approved small refiners the opportunity to generate nonroad diesel sulfur credits for early production of compliant NRLM diesel fuel. These credits can be banked for future use or traded to another refiner. Small refiners could generate "High Sulfur" credits for producing any volume of 500 ppm NRLM diesel fuel prior to June 1, 2010. Small refiners could also generate "500 ppm" credits for producing any volume of 15 ppm NRLM diesel fuel prior to June 1, 2014.

*Option 4 - NRLM Diesel/Gasoline Compliance Option*

This option is available to small refiners that produce greater than 95 percent of their NRLM diesel fuel at the 15 ppm sulfur standard by June 1, 2006 and elect not to use the NRLM Credit Option described above. Production of 15 ppm sulfur NRLM diesel fuel from a refinery using this option must be at least 85 percent of the refinery's 2003 through 2005 baseline NRLM production. Refiners choosing this option will receive a modest relaxation in their interim gasoline sulfur standards beginning January 1, 2004. Specifically, the applicable small refiner annual average and per-gallon cap would be increased by 20 percent for the duration of the interim program. The interim program is through 2010 if the refiner elected to extend the duration of its interim gasoline sulfur standards by producing 15 ppm highway diesel fuel by June 1, 2006, and through 2007 if the refiner did not produce 15 ppm highway

diesel fuel by June 1, 2006. However, in no case may the per-gallon gasoline sulfur cap exceed 450 ppm.

**Other Flexibilities**

Unlike the Highway Diesel rulemaking, the nonroad diesel sulfur regulations do not provide any specific flexibilities for refineries located in the Geographic Phase-in Area (GPA). Refiners located in the Rocky Mountain States (ID, MT, ND, WY, UT, CO and NM) must comply with the 500 ppm and 15 ppm NRLM sulfur standards within the compliance deadlines discussed above. NRLM diesel fuel in rural areas of the state of Alaska (a GPA state in the gasoline sulfur rulemaking) is exempt from the 500 ppm NRLM diesel fuel sulfur standard beginning June 1, 2007, but must meet the 15 ppm sulfur standard beginning June 1, 2010[1]. This fuel is regulated under a special rule for Alaska which was finalized in June 2006 (71 FR 32450, June 6, 2006).

Transmix processors distill off-specification interface mixtures of petroleum products from pipeline systems into gasoline and distillate fuel and are considered refiners by EPA. Their simple refinery configuration does not make it cost effective for them install and operate a hydrotreater to reduce distillate fuel sulfur content. As a result, they have been provided with additional flexibility to comply with the diesel sulfur standards. Transmix processors may choose to continue to produce all of their highway diesel fuel to the 500 ppm sulfur standard until 2010. They may further choose to continue to produce all of their NRLM diesel fuel as high sulfur diesel fuel until June 1, 2010, all of their NRLM diesel fuel to meet the 500 ppm sulfur standard until June 1, 2014, and all of their LM diesel fuel to meet a 500 ppm sulfur limit indefinitely.

## III. Nonroad Pre-Compliance Reporting Requirements

The Nonroad Rule requires that any refiner or importer planning to produce or import 15 ppm NRLM diesel fuel after June 1, 2010 must submit annual pre-compliance reports to EPA. The first pre-compliance report was due on June 1, 2005 and subsequent reports are due annually through 2011, or until the production of 15 ppm sulfur NR and LM diesel fuel commences, whichever is later.

The pre-compliance reports must contain the following information:

1. Any changes in the refiner's or importer's basic company or facility information since registration.
2. Estimates of the average daily volumes (gallons) of each sulfur grade of highway and NRLM diesel fuel produced or imported at each refinery

[1] Rural areas are defined as areas of Alaska not served by the federal aid highway system (FAHS)

(facility). The volume estimates must include both fuel produced from crude oil and other sources for the periods of June 1, 2010 through December 31, 2010, calendar years 2011-2013, January 1, 2014 through May 31, 2014, and June 1, 2014 through December 31, 2014.

3. For refiners or importers expecting to participate in the NRLM credit program, estimates of the number of credits generated and/or used during the periods above.
4. Information on project schedule by known or projected completion date (by quarter) for each stage of the project. For example strategic planning, front-end engineering, detailed engineering and permitting, procurement and construction, and commissioning and startup.
5. Basic information regarding the selected technology pathway for compliance (e.g. conventional hydrotreating versus other technologies, revamp versus grassroots, etc.).
6. Whether capital investments have been made or are projected to be made.
7. An update of the progress in each of these areas.

We recognize that the pre-compliance reports contain preliminary information and that final decisions on desulfurization plans may not have been made in all cases as of the reporting deadline. Accordingly, the information in this summary and analysis is based on the best available refinery information as of June 1, 2006. The information presented here will be updated with more current analyses as subsequent pre-compliance reports are received annually in 2007 through 2011.

# IV. NRLM Summary Statistics

## A. Nationwide Analysis

### 1. Refineries and Importers – Numbers and Volumes

According to the Energy Information Administration (EIA), 140 refineries reported producing either high or low sulfur (or both) distillate fuels in 2003. This reported production includes data from four refiner/importers that are located outside of the continental United States (i.e., in the U.S. Virgin Islands, Puerto Rico, and Eastern Canada) whose production is targeted to the U.S. market. We received 2006 pre-compliance reports for 124 refineries, all of which produced high and/or low sulfur diesel fuel in 2003. The 16 refineries which did not send pre-compliance reports may be planning to produce high sulfur distillate fuel for the heating oil market, or may be planning to sell their high sulfur distillate fuel to other refineries that can desulfurize it.

Refiners indicated that, for most of their refineries, they have made decisions whether or not to produce 15 ppm NRLM diesel fuel. Table 1 shows that a total of 117 refineries reported they anticipate producing 15 and/or 500 ppm diesel fuel beginning June 1, 2010. The remaining 7 refineries that sent pre-compliance reports said they either

plan to produce only high sulfur distillate for the heating oil market, or are still deciding whether to produce 15 ppm NRLM diesel fuel.

**Table 1.**
**U.S. Aggregated Report Information**
**Highway and NRLM Diesel Fuel Refinery Statistics 2010-2014**

| Year | 2010 | 2011 | 2012 | 2013 | 2014a[2] | 2014b |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 117 | 117 | 117 | 117 | 117 | 117 |
| # refineries at 100% 15 ppm | 104 | 104 | 106 | 111 | 111 | 117 |
| # refineries at 100% 500 ppm | 2 | 2 | 1 | 1 | 1 | 0 |
| # refineries with 15/500 ppm mix | 11 | 11 | 10 | 5 | 5 | 0 |

The 2006 nonroad pre-compliance reports indicated that production of 15 ppm and 500 ppm total diesel fuel beginning June 1, 2010 is projected to be 4.15 million bbls/day, as shown in Table 2 below. The reported information does not allow for any distinction between highway and NRLM volume. However, the 2005 highway diesel pre-compliance reports projected that production of 15 ppm and 500 ppm highway diesel fuel from January 1, 2010 through May 31, 2010 would be 3.26 million bbls/day. Thus, by comparing the 2006 reports with the 2005 reports, the reporting refiners appear to be planning to produce approximately 890 thousand bbls/day total 15 ppm and 500 ppm NRLM diesel fuel beginning June 1, 2010.

Table 2 and Figure 1 also illustrate that production of total 15 ppm diesel fuel is projected to increase by 250 thousand bbls/day from 2010 to 2014. However, this projected increase is offset by a projected decrease in 500 ppm NRLM diesel fuel production of 110 thousand bbls/day from 2010 to 2014. Half of the projected decrease in 500 ppm production occurs by June 1, 2012 as some refiners begin producing 15 ppm sulfur LM diesel fuel. The remaining 500 ppm diesel fuel production ends by May 31, 2014, when the flexibilities for small refiners and NRLM credit use end.

As mentioned previously, 140 refineries reported to EIA that they produced low and/or high sulfur distillate fuel in 2003. Twenty three of these refineries either reported that they have no plans at present to produce 15 ppm diesel fuel, or did not send an NRLM pre-compliance report to EPA in 2006. In 2003, these 23 refineries produced a total of 97 thousand bbls/day of diesel fuel containing less than 500 ppm sulfur, and 174 thousand bbls/day of distillate fuel containing more than 500 ppm sulfur. We cannot tell at this time if or when these refineries might choose to produce 15 ppm diesel fuel, or whether they will simply choose to continue to serve the heating oil market indefinitely.

[2] Data from the pre-compliance reports is divided into two sections for 2014 throughout this report. In all tables and figures, data for the first five months of 2014 is labeled 2014a, and data for the last seven months of 2014 is labeled 2014b.

| Table 2.<br>U.S. Aggregated Report Information<br>Diesel Fuel Volume 2010-2014 | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **2010** | **2011** | **2012** | **2013** | **2014a** | **2014b** |
| Total 15 ppm (highway + NRLM), bbls/day | 4,038,441 | 4,100,439 | 4,201,618 | 4,240,251 | 4,243,655 | 4,290,045 |
| Total 500 ppm NRLM, bbls/day | 110,529 | 110,568 | 70,067 | 54,864 | 54,864 | 0 |
| 15 + 500 ppm total (highway + NRLM), bbls/day | 4,148,970 | 4,211,008 | 4,271,685 | 4,295,115 | 4,298,519 | 4,290,045[3] |

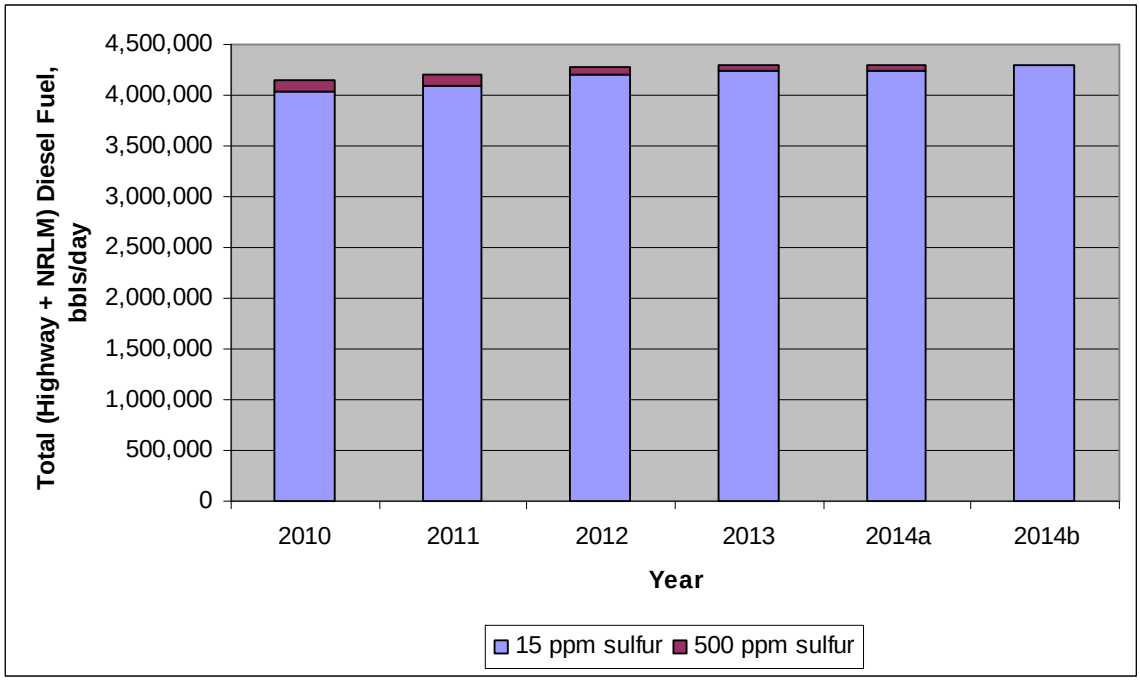



**Figure 1. Projected (Highway + NRLM) Diesel Fuel Production by Type, 2010-2014**

## 2. Projected Credit Generation and Use

Table 3 shows total reported nonroad diesel sulfur credits generated and used for each year of the nonroad diesel sulfur credit program. High sulfur credits are shown in equivalent bbls/day for the last 7 months of 2006 (refiners could not begin generating high sulfur NRLM credits until June 1, 2006), the full calendar years 2007 through 2009, and the first 5 months of 2010. 500 ppm credits are shown for the last 7 months of 2009, the full calendar years 2010 through 2013, and the first 5 months of 2014. Twenty-three

[3] Total 15 + 500 ppm production decreases slightly during the last 7 months of 2014 because some refineries plan to shut down for maintenance during this time.

refineries indicated they plan to generate 263 thousand bbls/day of high sulfur credits during the high sulfur early credit generation period from June 1, 2006 through May 31, 2007, including three refineries owned by small refiners who plan to continue generating 4 thousand bbls/day of high sulfur credits after May 31, 2007. Nine refineries indicated that they plan to use 70 thousand bbls/day of high sulfur credits in 2007, including seven refineries that plan to continue using 46 thousand bbls/day of high sulfur credits through May 31, 2010.

Nine refineries indicated they plan to generate 65 thousand bbls/day of 500 ppm credits during the credit generation period from June 1, 2009 through May 31, 2010, including three refineries owned by small refiners who plan to continue generating 7 thousand bbls/day of 500 ppm credits through December 31, 2009. One refinery indicated that it plans to use 3 thousand bbls/day of 500 ppm credits from June 1, 2010 through May 31, 2012.

**Table 3.**
**U.S. Aggregated Report Information**
**Nonroad Diesel Fuel Credits 2006-2014**

| Year | | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| # refineries generating high sulfur credits | | 23 | 23 | 3 | 3 | 2 |
| # refineries using high sulfur credits | | | 9 | 7 | 7 | 7 |
| High sulfur credit generation, bbls/day | | 263,079 | 105,415 | 3,557 | 3,557 | 3,092 |
| High sulfur credit usage, bbls/day | | | 70,371 | 46,063 | 46,047 | 46,047 |
| **Year** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** |
| # refineries generating 500 ppm credits | 9 | 9 | 3 | 3 | 3 | |
| # refineries using 500 ppm credits | | 1 | 1 | 1 | 0 | 0 |
| 500 ppm credit generation, bbls/day | 65,340 | 30,923 | 6,758 | 6,771 | 6,943 | |
| 500 ppm credit usage, bbls/day | | 3,000 | 3,000 | 1,500 | 0 | 0 |

Figures 2 and 3 illustrate cumulative projected generation and usage of high sulfur credits and 500 ppm credits by year. Both figures show that based on current plans, refiners should generate more than enough of each type of credit to meet the demand for each type of credit.

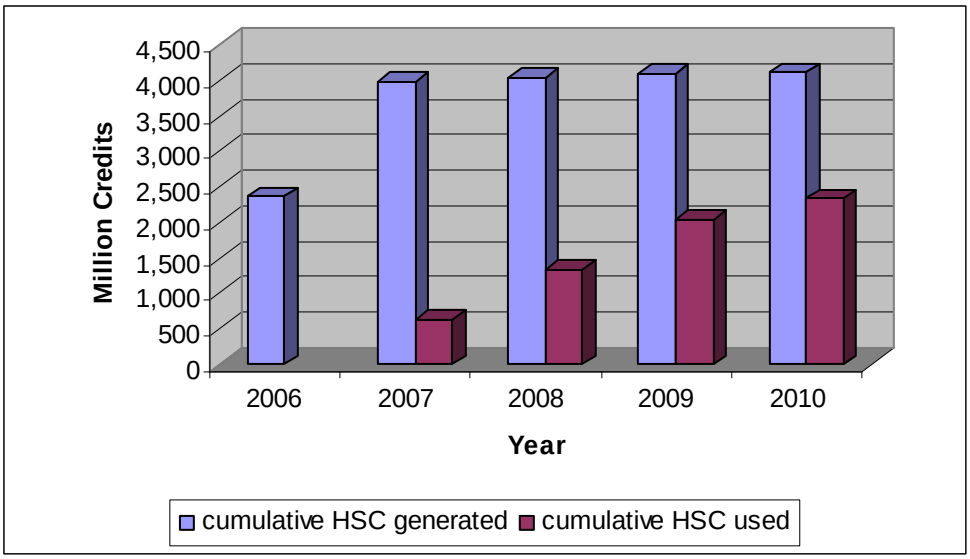



**Figure 2. Total U.S. High Sulfur Credits**

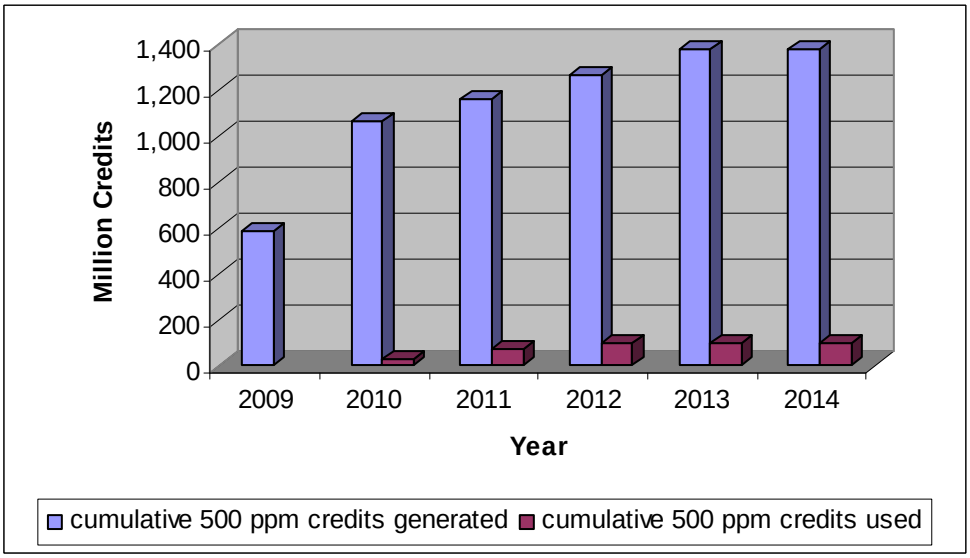



**Figure 3. Total U.S. 500 ppm Credits**

## 3. Project Scope and Timing

In addition to providing diesel fuel volume and credit projections, refineries must also include information outlining both their timeline for compliance with the 15 ppm sulfur standard and their engineering plans (e.g., design and construction) in their pre-

compliance reports. We requested that refineries report their progress according to the following five stages: 1) strategic planning, 2) planning and front-end engineering, 3) detailed engineering and permitting, 4) procurement and construction, and 5) commissioning and start-up. In last year's nonroad pre-compliance reports, most refineries indicated they were either just starting to develop their plans to produce 15 ppm NRLM diesel, or did not plan to produce any more 15 or 500 ppm diesel than indicated in their highway pre-compliance reports.

In the 2006 NRLM pre-compliance reports, it was indicated that there are plans to install new desulfurization capacity at 21 refineries specifically to produce 15 ppm NRLM diesel fuel by June 1, 2010. All of these refineries are generally in the early stages of their projects to produce 15 ppm NRLM diesel fuel. They reported that they have completed their strategic planning, and are just beginning their front-end engineering design work.

All 21 refineries indicated that they would either be revamping existing hydrotreating or hydrocracking units, or installing new hydrotreating or hydrocracking units. Thirteen of these refineries indicated specific project scopes to produce 15 ppm NRLM diesel. Of those thirteen refineries, five are planning to install a new desulfurization unit, four are planning to revamp an existing desulfurization unit, and four refineries are planning to both install at least one new desulfurization unit and revamp at least one existing desulfurization unit. The other eight refineries did not report detailed project information.

## 4. Small Refiner Options

As discussed in greater detail above, the Nonroad Diesel fuel regulations contain four options which provide qualified small refiners with flexibilities regarding production of 15 ppm NRLM diesel fuel. Option 1 allows a refinery owned by an approved small refiner to delay production of 500 ppm sulfur NRLM diesel fuel until June 1, 2010. Option 1 was chosen by six refineries. These six refineries produced 35 thousand bbls/day high sulfur distillate fuel in 2003.

Option 2 allows a refinery owned by an approved small refiner to delay production of 15 ppm NRLM diesel fuel until June 1, 2014. Option 2 was chosen by six refineries. These six refineries produced 24 thousand bbls/day high sulfur distillate fuel in 2003. (As Options 1 and 2 are not mutually exclusive, there are some small refiners that chose both Options 1 and 2.)

Option 3 allows a small refiner utilizing Option 1 to generate credits for any 500 ppm sulfur NRLM diesel fuel produced between June 1, 2006 and May 31, 2010, and/or allows a small refiner utilizing Option 2 to generate credits for any 15 ppm sulfur NRLM diesel fuel produced between June 1, 2009 and December 31, 2013. Option 3 was

chosen by six refineries. These six refineries produced 24 thousand bbls/day high sulfur distillate fuel in 2003.

Lastly, Option 4 allows a refinery owned by a small refiner the ability to increase its gasoline sulfur standards by 20 percent, provided that the refinery begins producing 15 ppm NRLM on June 1, 2006 and the refinery's 15 ppm NRLM production is at least 85 percent of the refinery's NRLM baseline production. Option 4 was chosen by five refineries. These five refineries produced 48 thousand bbls/day high sulfur distillate fuel in 2003.

The volumes reported by refineries regarding the small refiner options, and the number of refineries by option chosen, are shown in Table 4 below.

**Table 4.**
**Intended Small Refiner Compliance Options by Number of Refineries and High Sulfur Distillate Fuel Production Capacity**

| Option | Description | Number of Refineries | 2003 High Sulfur Distillate Fuel Production (thousand bbls/day) |
|---|---|---|---|
| 1. | Delay 500 ppm NRLM Production | 6 | 35 |
| 2. | Delay 15 ppm NRLM Production | 6 | 24 |
| 3. | NRLM Credit Option | 6 | 24 |
| 4. | NRLM Diesel/Gasoline Compliance Option | 5 | 48 |

## B. PADD Analysis

This section presents information specific to each PADD. Tables 5 and 6 show, by PADD, the number of refineries producing 15 and/or 500 ppm diesel fuel for 2010 (from June 1 through December 31) and 2014 (from June 1 through December 31). The total number of refineries remains constant at 117 from 2010 to 2014. In 2010, thirteen refineries are still using flexibilities in the rules (producing 500 ppm LM diesel fuel, producing 500 ppm NR diesel fuel using NRLM credits, small refiner flexibilities) to produce some or all 500 ppm diesel fuel. However, by 2014 all of these refineries will be producing only 15 ppm diesel fuel.

Tables 7 and 8 show, by PADD, anticipated production rates of 15 ppm and 500 ppm total diesel fuel for 2010 (from June 1 through December 31) and 2014 (from June 1 through December 31), and Figure 4 illustrates the average anticipated production of 15 ppm and 500 ppm total diesel fuel by PADD from June 1, 2010 through December 31, 2014. Tables 7 and 8 show that the projected total diesel fuel production in PADDs 3 and 5 increases by 115 thousand bbls/day, and 22 thousand bbls/day, respectively, while projected total diesel fuel production remains nearly constant in PADDs 1, 2, and 4.

More detailed information for each PADD is shown below in Tables 9 through 13.

**Table 5.**
**Projected Number of Highway and NRLM Diesel Fuel Refineries by PADD for 2010**

| PADD | 1 | 2 | 3 | 4 | 5 | Total U.S. |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 13 | 25 | 42 | 14 | 23 | 117 |
| # refineries at 100% 15 ppm | 12 | 22 | 37 | 12 | 21 | 104 |
| # refineries at 100% 500 ppm | 0 | 0 | 2 | 0 | 0 | 2 |
| # refineries with 15/500 ppm mix | 1 | 3 | 3 | 2 | 2 | 11 |

**Table 6.**
**Projected Number of Highway and NRLM Diesel Fuel Refineries by PADD for 2014b**

| PADD | 1 | 2 | 3 | 4 | 5 | Total U.S. |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 13 | 25 | 42 | 14 | 23 | 117 |
| # refineries at 100% 15 ppm | 13 | 25 | 42 | 14 | 23 | 117 |
| # refineries at 100% 500 ppm | 0 | 0 | 0 | 0 | 0 | 0 |
| # refineries with 15/500 ppm mix | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 7.**
**Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2010**

| PADD | 1 | 2 | 3 | 4 | 5 | Total U.S. |
|---|---|---|---|---|---|---|
| Total 15 ppm (highway + NRLM), bbls/day | 461,843 | 1,001,381 | 1,920,020 | 166,439 | 488,758 | 4,038,441 |
| Total 500 ppm (highway + NRLM), bbls/day | 71 | 9,936 | 78,920 | 14,054 | 7,548 | 110,529 |
| 15 + 500 ppm total (highway + NRLM), bbls/day | 461,915 | 1,011,317 | 1,998,940 | 180,492 | 496,306 | 4,148,970 |

**Table 8.**
**Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2014b**

| PADD | 1 | 2 | 3 | 4 | 5 | Total U.S. |
|---|---|---|---|---|---|---|
| Total 15 ppm (highway + NRLM), bbls/day | 465,822 | 1,006,079 | 2,113,326 | 186,615 | 518,202 | 4,290,045 |
| Total 500 ppm (highway + NRLM), bbls/day | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 + 500 ppm total (highway + NRLM), bbls/day | 465,822 | 1,006,079 | 2,113,326 | 186,615 | 518,202 | 4,290,045 |

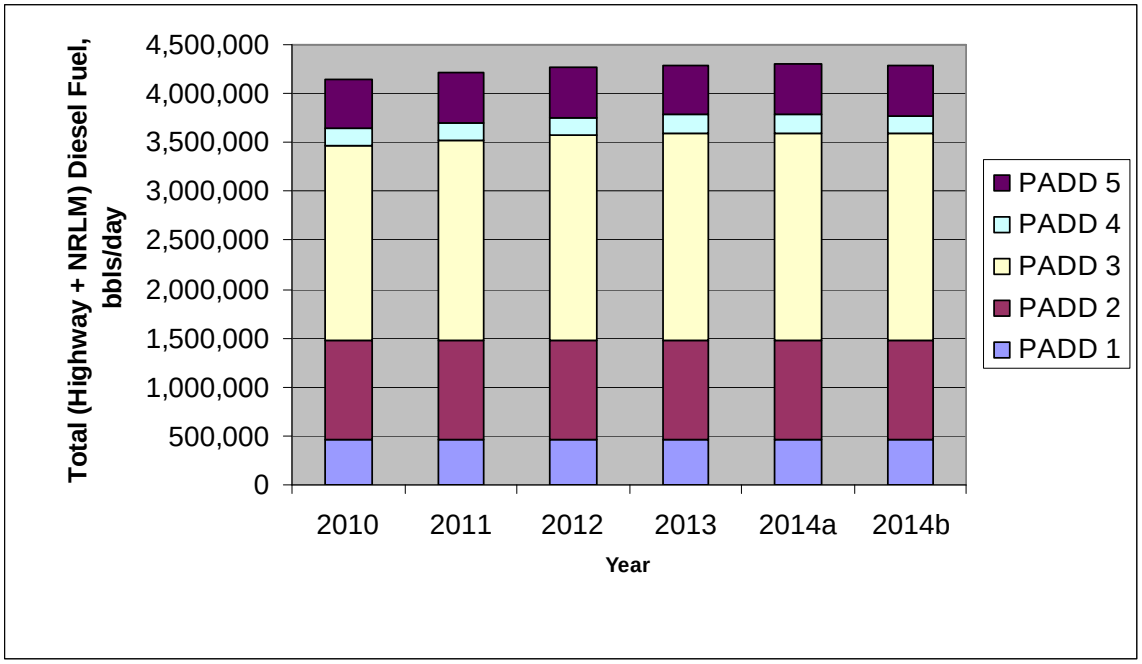


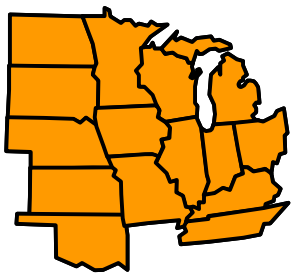

**Figure 4. Projected (Highway + NRLM) Diesel Fuel Production by PADD, 2010-2014**

## 1. PADD 1

Reported totals for all PADD 1 refineries and importers are summarized below in Table 9. Table 9 shows that for 2010, 13 refineries anticipate producing 462 thousand bbls/day of 15 ppm + 500 ppm sulfur total diesel fuel. Twelve refineries reported that they intend to produce 100 percent of their diesel fuel at 15 ppm or less of sulfur, and one refinery reported they intend to produce a small amount of 500 ppm NRLM diesel fuel through May, 2014. Table 9 also shows that total diesel fuel production in PADD 1 is projected to increase slightly from 2010 to 2014.

**Table 9**
**PADD 1 Diesel Fuel Statistics 2010-2014**

| Year | 2010 | 2011 | 2012 | 2013 | 2014a | 2014b |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 13 | 13 | 13 | 13 | 13 | 13 |
| # refineries at 100% 15 ppm | 12 | 12 | 12 | 12 | 12 | 13 |
| # refineries at 100% 500 ppm | 0 | 0 | 0 | 0 | 0 | 0 |
| # refineries with 15/500 ppm mix | 1 | 1 | 1 | 1 | 1 | 0 |
| Total 15 ppm (bbls/day) | 461,843 | 461,811 | 465,805 | 465,822 | 465,520 | 465,822 |
| Total 500 ppm (bbls/day) | 71 | 71 | 71 | 71 | 71 | 0 |
| Total 15 + 500 ppm (bbls/day) | 461,915 | 461,883 | 465,877 | 465,894 | 465,591 | 465,822 |

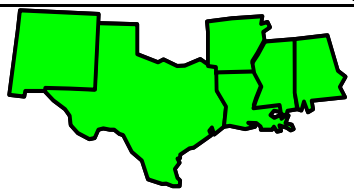


## 2. PADD 2

The reported totals for all PADD 2 refineries are summarized below in Table 10. Table 10 shows that for 2010, 25 refineries anticipate producing 1.01 million bbls/day of 15 ppm + 500 ppm sulfur total diesel fuel. Twenty two refineries reported that they intend to produce 100 percent of their diesel fuel at or below 15 ppm sulfur, and three refineries reported that they intend to produce a small amount of 500 ppm sulfur diesel fuel. Table 10 also shows that total diesel fuel production in PADD 2 is projected to remain essentially constant from 2010 through 2014.

**Table 10.**
**PADD 2 Diesel Fuel Statistics 2010-2014**

| Year | 2010 | 2011 | 2012 | 2013 | 2014a | 2014b |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 25 | 25 | 25 | 25 | 25 | 25 |
| # refineries at 100% 15 ppm | 22 | 22 | 22 | 23 | 23 | 25 |
| # refineries at 100% 500 ppm | 0 | 0 | 0 | 0 | 0 | 0 |
| # refineries with 15/500 ppm mix | 3 | 3 | 3 | 2 | 2 | 0 |
| Total 15 ppm (bbls/day) | 1,001,381 | 1,007,568 | 1,007,234 | 1,008,865 | 1,009,852 | 1,006,079 |
| Total 500 ppm (bbls/day) | 9,936 | 9,936 | 9,634 | 9,420 | 9,420 | 0 |
| Total 15 + 500 ppm (bbls/day) | 1,011,317 | 1,017,505 | 1,016,867 | 1,018,285 | 1,019,272 | 1,006,079 |

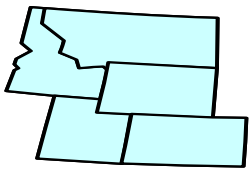


## 3. PADD 3

Reported totals for all PADD 3 refineries are summarized below in Table 11. Table 11 shows that 42 refineries anticipate producing 2.0 million bbls/day of 15 ppm and 500 ppm sulfur total diesel fuel in 2010. Thirty seven refineries reported they intend to produce 100 percent of their diesel fuel at or below 15 ppm, and five refineries reported that they intend to produce some amount of 500 ppm diesel fuel.

**Table 11.**
**PADD 3 Diesel Fuel Statistics 2010-2014**

| Year | 2010 | 2011 | 2012 | 2013 | 2014a | 2014b |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 42 | 42 | 42 | 42 | 42 | 42 |
| # refineries at 100% 15 ppm | 37 | 37 | 38 | 40 | 40 | 42 |
| # refineries at 100% 500 ppm | 2 | 2 | 1 | 1 | 1 | 0 |
| # refineries with 15/500 ppm mix | 3 | 3 | 3 | 1 | 1 | 0 |
| Total 15 ppm (bbls/day) | 1,920,020 | 1,958,460 | 2,042,068 | 2,066,399 | 2,068,501 | 2,113,326 |
| Total 500 ppm (bbls/day) | 78,920 | 78,920 | 52,656 | 44,825 | 44,825 | 0 |
| Total 15 + 500 ppm (bbls/day) | 1,998,940 | 2,037,380 | 2,094,724 | 2,111,224 | 2,113,326 | 2,113,326 |

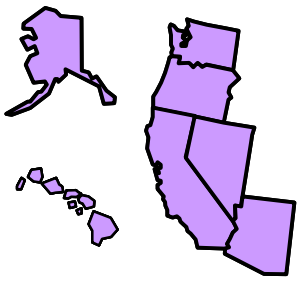


## 4. PADD 4

Reported totals for all PADD 4 refineries are summarized below in Table 12. Table 12 shows that 14 refineries anticipate producing 180 thousand bbls/day 15 ppm and 500 ppm sulfur total diesel fuel in 2010. Twelve refineries reported that they intend to produce 100 percent of their diesel fuel with 15 ppm or less of sulfur and two refineries reported that they intend to produce some amount of 500 ppm diesel fuel. Table 12 also shows that the projected total diesel fuel production in PADD 4 remains relatively constant from 2010 through 2014.

**Table 12.**
**PADD 4 Diesel Fuel Statistics 2010-2014**

| Year | 2010 | 2011 | 2012 | 2013 | 2014a | 2014b |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 14 | 14 | 14 | 14 | 14 | 14 |
| # refineries at 100% 15 ppm | 12 | 12 | 12 | 14 | 14 | 14 |
| # refineries at 100% 500 ppm | 0 | 0 | 0 | 0 | 0 | 0 |
| # refineries with 15/500 ppm mix | 2 | 2 | 2 | 0 | 0 | 0 |
| Total 15 ppm (bbls/day) | 166,439 | 168,842 | 175,753 | 186,486 | 187,104 | 186,615 |
| Total 500 ppm (bbls/day) | 14,054 | 14,093 | 7,158 | 0 | 0 | 0 |
| Total 15 + 500 ppm (bbls/day) | 180,492 | 182,934 | 182,911 | 186,486 | 187,104 | 186,615 |



## 5. PADD 5[4]

Reported totals for all refineries in PADD 5 are summarized below in Table 13. Table 13 shows that 23 refineries anticipate producing 496 thousand bbls/day 15 ppm and 500 ppm sulfur total diesel fuel in 2010. Twenty one of these refineries indicated that they expect to produce 100 percent of their diesel fuel with 15 ppm sulfur or less, and two refineries reported that they intend to produce some amount of 500 ppm diesel fuel. Table 13 also shows that the projected total diesel fuel production in PADD 5 increases by 22 thousand bbls/day from 2010 through 2014.

**Table 13.**
**PADD 5 Diesel Fuel Statistics 2010-2014**

| Year | 2010 | 2011 | 2012 | 2013 | 2014a | 2014b |
|---|---|---|---|---|---|---|
| # refineries producing diesel fuel | 23 | 23 | 23 | 23 | 23 | 23 |
| # refineries at 100% 15 ppm | 21 | 21 | 22 | 22 | 22 | 23 |
| # refineries at 100% 500 ppm | 0 | 0 | 0 | 0 | 0 | 0 |
| # refineries with 15/500 ppm mix | 2 | 2 | 1 | 1 | 1 | 0 |
| Total 15 ppm (bbls/day) | 488,758 | 503,758 | 510,758 | 512,678 | 512,678 | 518,202 |
| Total 500 ppm (bbls/day) | 7,548 | 7,548 | 548 | 548 | 548 | 0 |
| Total 15 + 500 ppm (bbls/day) | 496,306 | 511,306 | 511,306 | 513,226 | 513,226 | 518,202 |

[4] Alaska refineries are included in this analysis

## C. Comparison of 2005 and 2006 NRLM Pre-Compliance Reports

Total production of 15 ppm and 500 ppm diesel fuel increased significantly in the 2006 NRLM pre-compliance reports, compared to the 2005 NRLM pre-compliance reports. Table 14 shows the projected volumes of 15 ppm and 500 ppm diesel fuel from the 2005 and 2006 NRLM pre-compliance reports for 2010 (in bbls/day, from June 1 to December 31). Total reported production of diesel fuel in the 2006 reports was 472 thousand bbls/day greater than total reported production in the 2005 reports. Several refineries in each PADD reported increases in anticipated production, most significantly in PADDs 1, 2 and 3.

**Table 14.**
**Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2010**

| PADD | 1 | 2 | 3 | 4 | 5 | Total U.S. |
|---|---|---|---|---|---|---|
| ***2005 NRLM reports*** | | | | | | |
| Total 15 ppm, bbls/day | 300,822 | 866,782 | 1,700,533 | 149,667 | 470,176 | 3,487,980 |
| Total 500 ppm, bbls/day | 71 | 1,083 | 173,265 | 11,510 | 3,100 | 189,029 |
| Total (15 + 500) ppm , bbls/day | 300,893 | 867,865 | 1,873,798 | 161,176 | 473,276 | 3,677,008 |
| ***2006 NRLM reports*** | | | | | | |
| Total 15 ppm, bbls/day | 461,843 | 1,001,381 | 1,920,020 | 166,439 | 488,758 | 4,038,441 |
| Total 500 ppm, bbls/day | 71 | 9,936 | 78,920 | 14,054 | 7,548 | 110,529 |
| Total (15 + 500) ppm , bbls/day | 461,915 | 1,011,317 | 1,998,940 | 180,492 | 496,306 | 4,148,970 |
| Increase in reported production, bbls/day | 161,021 | 143,452 | 125,143 | 19,316 | 23,030 | 471,962 |

## IV. NRLM Summary Statistics

Table 15 shows the projected volumes of 15 and 500 ppm diesel fuel from the 2005 and 2006 NRLM pre-compliance reports for 2014 (from January 1 to May 31). Total reported production of diesel fuel in the 2006 reports was 676 thousand bbls/day greater than the total reported production in the 2005 reports. Several refineries in each PADD reported increases in anticipated production, most significantly in PADDs 1, 2 and 3. This includes one PADD 3 NRLM refinery which reported in 2005 that it was not planning to produce any 15 ppm diesel fuel after May, 2012, but is now planning to begin producing 15 ppm diesel fuel in 2012.

**Table 15.**
**Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2014a**

| PADD | 1 | 2 | 3 | 4 | 5 | Total U.S. |
|---|---|---|---|---|---|---|
| ***2005 NRLM reports*** | | | | | | |
| Total 15 ppm, bbls/day | 364,589 | 875,424 | 1,709,876 | 158,722 | 485,176 | 3,593,787 |
| Total 500 ppm, bbls/day | 71 | 0 | 27,461 | 767 | 100 | 28,399 |
| Total (15 + 500) ppm , bbls/day | 364,661 | 875,424 | 1,737,338 | 159,489 | 485,276 | 3,622,187 |
| ***2006 NRLM reports*** | | | | | | |
| Total 15 ppm, bbls/day | 465,520 | 1,009,852 | 2,068,501 | 187,104 | 512,678 | 4,243,655 |
| Total 500 ppm, bbls/day | 71 | 9,420 | 44,825 | 0 | 548 | 54,864 |
| Total (15 + 500) ppm , bbls/day | 465,591 | 1,019,272 | 2,113,326 | 187,104 | 513,226 | 4,298,519 |
| Increase in reported production, bbls/day | 100,931 | 143,848 | 375,989 | 27,615 | 27,950 | 676,333 |

# Appendix - List of Acronyms

| | |
|---|---|
| bbls/day | *barrels per day* |
| bpcd | *barrels per calendar day* |
| EIA | *Energy Information Administration* |
| EPA (or, “the Agency”) | *U.S. Environmental Protection Agency* |
| FR | *Federal Register* |
| LM | *Locomotive and Marine* |
| NR | *Nonroad* |
| NRLM | *Nonroad, Locomotive, and Marine* |
| PADD | *Petroleum Administrative Districts for Defense* |
| ppm | *parts-per-million* |
| ULSD | *Ultra Low Sulfur Diesel* |