

Summary and Analysis of the 2008 Nonroad Diesel Fuel Pre-Compliance Reports



Summary and Analysis of the 2008 Nonroad Diesel Fuel Pre-Compliance Reports

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

NOTICE

This technical report does not necessarily represent final EPA decisions or positions. It is intended to present technical analysis of issues using data that are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments.



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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 annually by June 1 from 2005 through 2011 under the diesel sulfur regulations. This report summarizes the results of refiners’ June 2008 pre-compliance reports.

Refiners’ and importers’ nonroad pre-compliance reports must contain estimates of total highway and NRLM 15 ppm diesel fuel and total highway and 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 and/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 2008 nonroad pre-compliance reports showed that:

- 120 refineries are planning to produce 15 ppm diesel fuel by June 1, 2014
- 20 refineries are either undecided as to their plans, or are choosing to produce only heating oil by June 1, 2014
- refiners have projected an increase in diesel fuel production from 2010 through 2014
- refiners are taking advantage of the flexibilities offered by the regulations (18 refineries said they generated early high sulfur credits in 2006 and 2007, 14 refineries plan to generate early 500 ppm credits in 2009 and 2010, small refiners are utilizing all of the options available to them)
- total highway and NRLM diesel fuel (“total diesel fuel”) production and importation in each Petroleum Administration for Defense District (PADD) is projected to grow from 2010 through 2014
- refiners project a slight decrease in expected production and importation of total diesel fuel beginning June 1, 2010, compared to the 2007 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 2007 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 were 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.

The rule includes provisions for refiners and importers to generate credits for early NRLM diesel sulfur reduction efforts. “High sulfur” credits could 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 beginning 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 criteria for qualification as an NRLM small refiner are similar to those under the Gasoline Sulfur and Highway Diesel rules. To qualify as “small”, a refiner must: 1) process NRLM diesel fuel from crude oil; 2) employ 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) have 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 gasoline sulfur standards. These small refiner options are described in more detail below.

II. Nonroad Diesel Program Overview

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. Small refiners could generate "High Sulfur" credits for producing 500 ppm NRLM diesel fuel prior to June 1, 2010. Small refiners could also generate "500 ppm" credits for producing 15 ppm NRLM diesel fuel between June 1, 2009 and June 1, 2014. These credits can be banked for future use or traded to another refiner.

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

II. Nonroad Diesel Program Overview

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 rule, the Nonroad Diesel rule did 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 used in rural areas 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, 2010¹. 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 to 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 diesel sulfur regulations require 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 (gallon) of each sulfur grade of highway and NRLM diesel fuel produced at each refinery or imported at each import facility. The volume estimates must include both fuel produced from crude oil and other sources for the periods of June 1, 2010 through December

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

III. Nonroad Pre-Compliance Reporting Requirements

- 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 (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, 2008. The information presented here will be updated with more current analyses as subsequent pre-compliance reports are received annually in 2009 through 2010.

IV. NRLM Summary Data

A. Nationwide Analysis

1. Refineries and Importers – Numbers and Production

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 (in the U.S. Virgin Islands, Aruba, and Eastern Canada) whose production is targeted to the U.S. market. We received 2008 pre-compliance reports for 129 refineries, all of which produced high and/or low sulfur diesel fuel in 2003. The 11 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 121 refineries reported they anticipate producing 15 and/or 500 ppm diesel fuel beginning June 1, 2010. The remaining 8 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.

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

Year	2010	2011	2012	2013	2014a ²	2014b
# refineries producing diesel fuel	121	121	123	122	122	120
# refineries at 100% 15 ppm	99	99	103	109	110	120
# refineries at 100% 500 ppm	6	6	4	3	3	0
# refineries with 15/500 ppm mix	16	16	16	10	9	0

The 2008 nonroad pre-compliance reports indicated that production of 15 ppm and 500 ppm total diesel fuel beginning June 1, 2010 is projected to be 4.41 million bbls/day, as shown in Table 2 below. The reported information does not allow for any distinction between highway and NRLM production. However, from EIA's weekly supply estimates (http://tonto.eia.doe.gov/dnav/pet/pet_sum_sndw_dcus_nus_w.htm), production and importation of 15 ppm and 500 ppm diesel fuel for the second annual compliance period in the highway diesel program (June 1, 2007 through May 31, 2008) averaged approximately 3.8 million bbls/day. This average production includes all highway diesel fuel and nearly all NRLM diesel fuel produced in or imported into the U.S. during the compliance period.³ Thus, by comparing total production and importation from the 2008 reports with average production from the second annual compliance period, refiners are planning to produce approximately 600 thousand bbls/day total additional 15 ppm and 500 ppm diesel fuel beginning June 1, 2010.

Table 2 and Figure 1 also illustrate that national production of 15 ppm diesel fuel is projected to increase by 249 thousand bbls/day from 2010 to 2014, to 4.56 million bbls/day. However, this projected increase is offset by a projected decrease in 500 ppm NRLM diesel fuel production of 107 thousand bbls/day from 2010 to 2014. Twenty six thousand bbls/day 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.

Projected total production should be sufficient to meet future demand of 15 ppm and 500 ppm total diesel fuel. Total demand for 15 ppm and 500 ppm diesel fuel calculated from EIA's Annual Energy Outlook (AEO) 2008 is 4.04 million bbls/day in 2010 and 4.32 million bbls/day in 2015, compared to projected total production of 4.41 million bbls/day in 2010 and 4.56 million bbls/day in 2014.⁴

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.

³ The average does not include a relatively small amount of high sulfur NRLM diesel fuel produced by small refiners and hardship refiners.

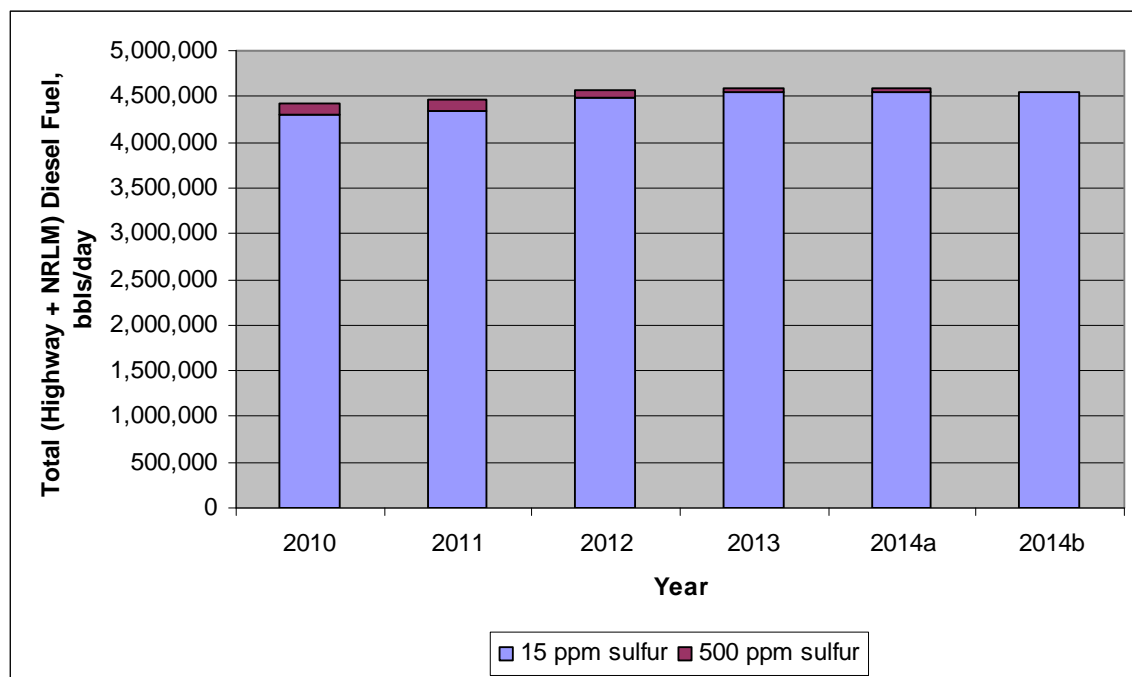
⁴ AEO 2008 projected a total distillate fuel oil demand of 4.40 million bbls/day in 2010 and 4.68 million bbls/day in 2015 (see Table A11 in <http://www.eia.doe.gov/oiaf/aeo/pdf/appa.pdf>). Both of these totals include 355 thousand bbls/day distillate fuel oil (heating oil) for residential energy consumption (see Table

IV. NRLM Summary Data

As mentioned previously, 140 refineries reported to EIA that they produced low and/or high sulfur distillate fuel in 2003. Nine of these refineries either reported that they have no plans at present to produce 15 ppm diesel fuel by June 1, 2014, and eleven did not send an NRLM pre-compliance report to EPA in 2008. In 2003, these 20 refineries produced a total of 118 thousand bbls/day of diesel fuel containing less than 500 ppm sulfur, and 87 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.

Table 2.						
U.S. Aggregated Report Information						
Diesel Fuel Production 2010-2014						
Year	2010	2011	2012	2013	2014a	2014b
Total 15 ppm (highway + NRLM), bbls/day	4,308,094	4,346,837	4,487,715	4,538,350	4,539,620	4,557,232
Total 500 ppm NRLM, bbls/day	106,571	108,436	80,113	56,208	54,274	0
Total 15 ppm and 500 ppm (highway + NRLM), bbls/day	4,414,665	4,455,274	4,567,828	4,594,557	4,593,894	4,557,232 ⁵

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



A2 at <http://www.eia.doe.gov/oiaf/aeo/pdf/appa.pdf>. EPA does not require heating oil to meet either the 15 ppm or 500 ppm sulfur standard, so total demand for 15 ppm and 500 ppm diesel fuel can be calculated by subtracting heating oil demand from total distillate fuel oil demand.

⁵ Total 15 ppm and 500 ppm production decreases slightly during the last 7 months of 2014 because some refineries plan to shut down for maintenance during this time.

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 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. Eighteen refineries indicated they generated a total of 1,929 million high sulfur credits (1 credit = 1 gallon diesel fuel), mostly during the high sulfur early credit generation period from June 1, 2006 through May 31, 2007, including four refineries owned by small refiners who plan to continue generating high sulfur credits after May 31, 2007. Nine refineries indicated they planned to use a total of 2,516 million high sulfur credits from June 1, 2007 through May 31, 2010.

Fourteen refineries indicated they plan to generate a total of 1,260 million 500 ppm credits, mostly during the credit generation period from June 1, 2009 through May 31, 2010, including two refineries owned by small refiners who plan to continue generating 500 ppm credits through December 31, 2013. Four refineries indicated they planned to use a total of 406 million credits from June 1, 2010 through May 31, 2014.

Year		2006	2007	2008	2009	2010	total	
# refineries generating high sulfur credits		18	18	4	3	2		
# refineries using high sulfur credits			9	9	8	4		
High sulfur credit generation, millions		724	1,038	106	51	10	1,929	
High sulfur credit usage, millions			583	944	822	167	2,516	
Year		2009	2010	2011	2012	2013	2014	total
# refineries generating 500 ppm credits		13	14	2	2	2		
# refineries using 500 ppm credits			4	3	3	2	2	
500 ppm credit generation, millions		429	539	94	97	100		1,260
500 ppm credit usage, millions			108	167	90	29	12	406

Figures 2 and 3 illustrate cumulative projected generation and usage of high sulfur credits and 500 ppm credits by year. Although Figure 3 shows that 500 ppm credit generation significantly exceeds 500 ppm credit usage, Figure 2 shows a projected shortfall in high sulfur credits beginning in 2009. EPA has talked with refiners who had indicated in their pre-compliance reports that they planned to use more high sulfur credits than they generated, and learned that they have flexibility to use fewer high sulfur credits, if necessary. Based on our conversations with these refiners, we believe they have

sufficient flexibility to reduce their usage of high sulfur credits in order to match the available supply of high sulfur credits.

Figure 2. Total U.S. High Sulfur Credits

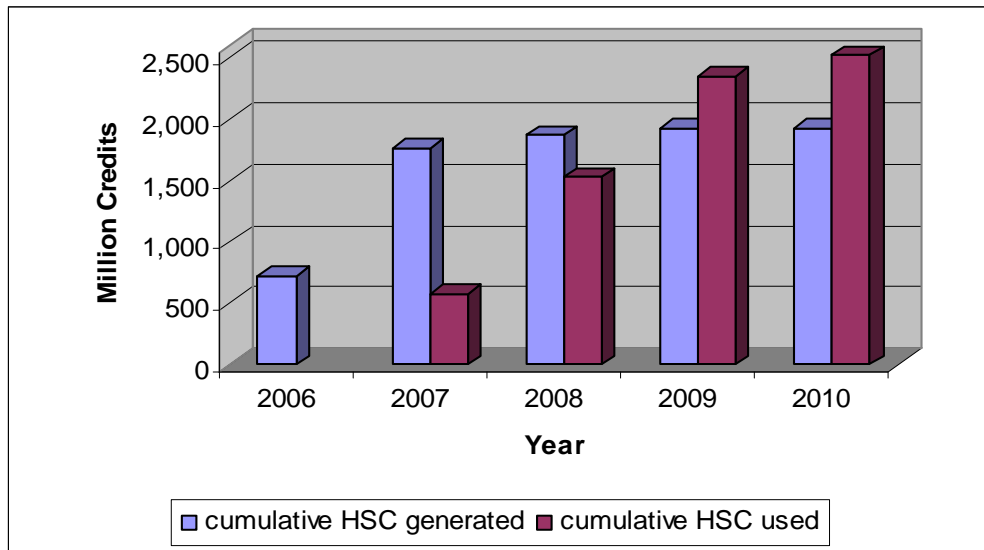
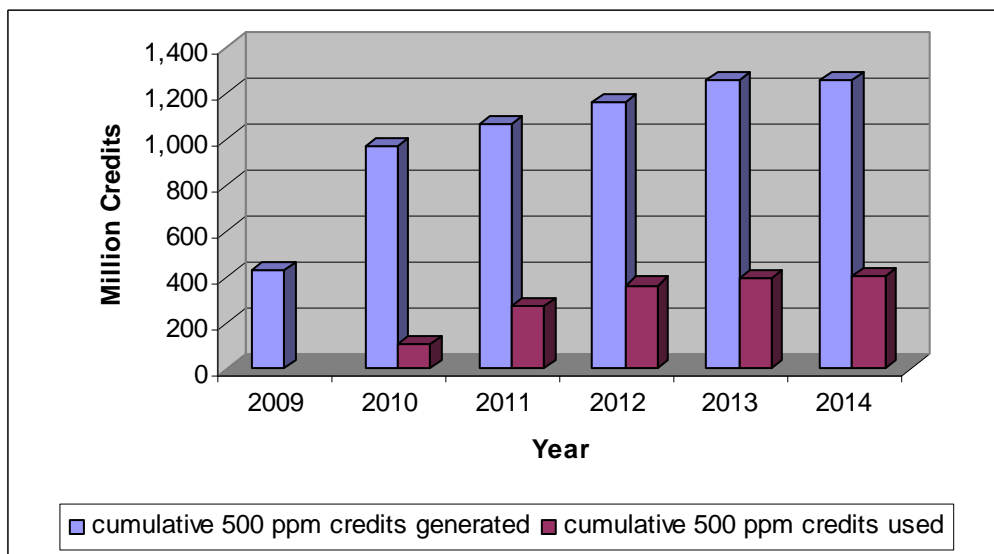


Figure 3. Total U.S. 500 ppm Credits



3. Project Scope and Timing

In addition to providing diesel fuel production 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 the 2007 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 2008 NRLM pre-compliance reports, refiners indicated they have plans to install new desulfurization capacity at 26 refineries specifically to produce 15 ppm NRLM diesel fuel. Most of these refineries are generally in the middle stages of their projects to produce 15 ppm NRLM diesel fuel. Most have completed their front-end engineering design work, have ordered long lead time equipment like reactor vessels, and are well into the detailed engineering and permitting stage.

All 26 refineries indicated that they would either be revamping existing hydrotreating or hydrocracking units, or installing new hydrotreating or hydrocracking units. Twenty two of these refineries indicated specific project scopes to produce 15 ppm NRLM diesel. Of those 22 refineries, 9 are planning to install a new desulfurization unit, 9 are planning to revamp an existing desulfurization unit, and 4 refineries are planning to both install at least one new desulfurization unit and revamp at least one existing desulfurization unit. The other 4 refineries did not report detailed project information.

4. Small Refiner Options

As discussed previously, the diesel sulfur 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 5 refineries. These 5 refineries produced twenty two 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 5 refineries. These 5 refineries produced twenty two thousand bbls/day high sulfur distillate fuel in 2003. (As Options 1 and 2 are not mutually exclusive, small refiners may choose both Options 1 and 2.)

IV. NRLM Summary Data

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 also 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 4 refineries. These 4 refineries produced six 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 5 refineries. These 5 refineries produced fourteen thousand bbls/day high sulfur distillate fuel in 2003.

The number of refineries owned by small refiners, and the production of high sulfur distillate fuel from these refineries in 2003, are shown below in Table 4 for each option.

Table 4.			
Intended Small Refiner Compliance Options by Number of Refineries and High Sulfur Distillate Fuel Production			
Option	Description	Number of Refineries	2003 High Sulfur Distillate Fuel Production (thousand bbls/day)
1.	Delay 500 ppm NRLM Production	5	22
2.	Delay 15 ppm NRLM Production	5	22
3.	NRLM Credit Option	4	6
4.	NRLM Diesel/Gasoline Compliance Option	5	14

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 producing diesel fuel decreases by one from 2010 to 2014, as two refineries enter the diesel fuel market in 2012, and three refineries exit by 2104. In 2010, 22 refineries are 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 June 1, 2014, all of these refineries will only be producing 15 ppm diesel fuel and/or heating oil.

IV. NRLM Summary Data

Tables 7 and 8 show, by PADD, anticipated production 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 from 2010 through 2014, projected total diesel fuel production in PADDs 1 and 3 increases by a total of 128 thousand bbls/day, while projected total diesel fuel production increases slightly in PADDs 2, 4 and 5.

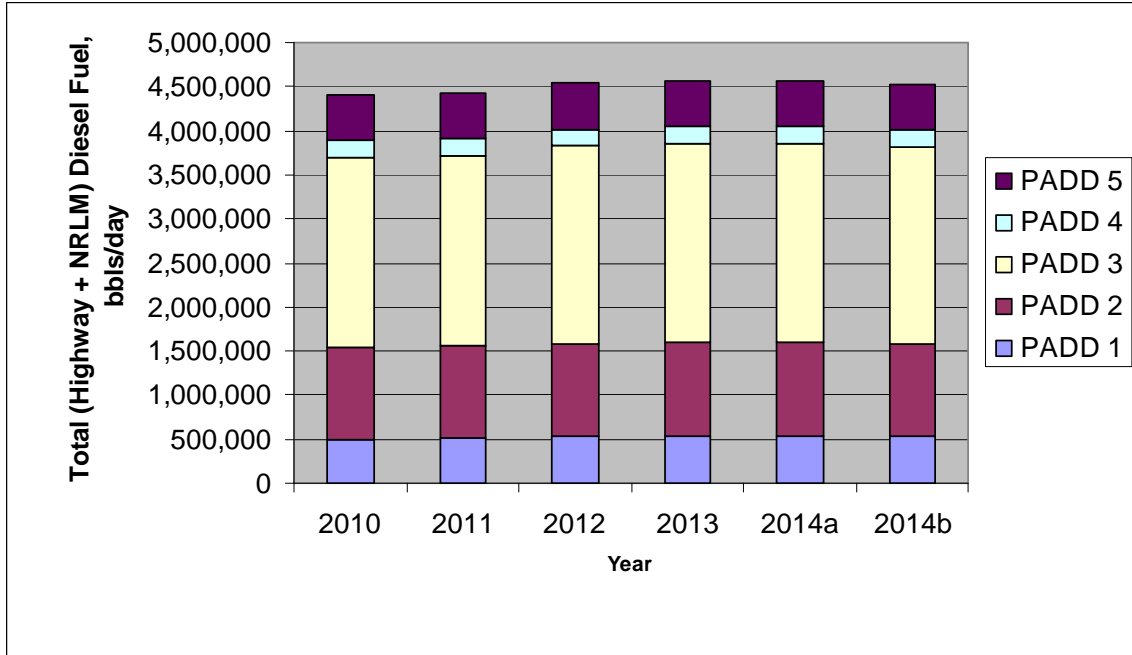
Table 5.						
Projected Number of Highway and NRLM Diesel Fuel Refineries by PADD for 2010						
PADD	1	2	3	4	5	Total U.S.
# refineries producing diesel fuel	12	26	44	14	25	121
# refineries at 100% 15 ppm	8	23	37	11	20	99
# refineries at 100% 500 ppm	0	2	3	0	1	6
# refineries with 15/500 ppm mix	4	1	4	3	4	16

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	44	14	24	120
# refineries at 100% 15 ppm	13	25	44	14	24	120
# refineries at 100% 500 ppm	0	0	0	0	0	0
# refineries with 15/500 ppm mix	0	0	0	0	0	0

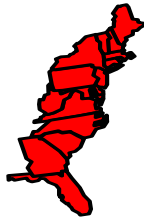
Table 7.						
Projected Production of (Highway + NRLM) Diesel Fuel by PADD for 2010						
PADD	1	2	3	4	5	Total U.S.
Total 15 ppm (highway + NRLM), bbls/day	480,001	1,028,534	2,109,397	182,569	507,592	4,308,094
Total 500 ppm (highway + NRLM), bbls/day	20,476	13,425	53,844	7,500	11,326	106,571
Total 15 ppm and 500 ppm total (highway + NRLM), bbls/day	500,478	1,041,959	2,163,242	190,069	518,918	4,414,665

Table 8.						
Projected Production 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	530,105	1,050,024	2,261,308	192,869	522,926	4,557,232
Total 500 ppm (highway + NRLM), bbls/day	0	0	0	0	0	0
Total 15 ppm and 500 ppm total (highway + NRLM), bbls/day	530,105	1,050,024	2,261,308	192,869	522,926	4,557,232

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



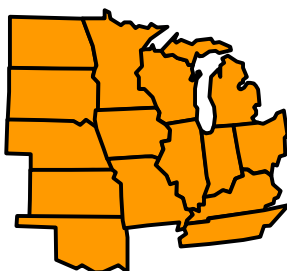
More detailed information for each PADD is shown below in Tables 9 through 13.



1. PADD 1

Reported totals for all PADD 1 refineries and importers are summarized below in Table 9. Table 9 shows that for 2010, 12 refineries anticipate producing approximately 500 thousand bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel. Eight refineries reported they intend to produce all of their diesel fuel containing 15 ppm or less of sulfur, and four refineries reported they intend to produce approximately 20 thousand bbls/day 500 ppm NRLM diesel fuel beginning in 2010. Table 9 also shows that total diesel fuel production in PADD 1 is projected to increase by approximately 30 thousand bbls/day from 2010 through 2014, including production from one refinery that enters the diesel fuel market in 2012.

Table 9 PADD 1 Diesel Fuel Data: 2010-2014						
Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	12	12	13	13	13	13
# refineries at 100% 15 ppm	8	8	9	9	10	13
# refineries at 100% 500 ppm	0	0	0	0	0	0
# refineries with 15/500 ppm mix	4	4	4	4	3	0
Total 15 ppm (bbls/day)	480,001	487,929	508,806	529,629	529,629	530,105
Total 500 ppm (bbls/day)	20,476	20,476	20,476	12,476	10,476	0
Total 15 ppm and 500 ppm (bbls/day)	500,478	508,405	529,282	542,105	540,105	530,105

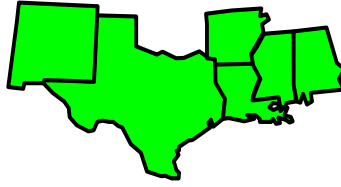


2. PADD 2

The reported totals for all PADD 2 refineries are summarized below in Table 10. Table 10 shows that for 2010, 26 refineries anticipate producing 1.04 million bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel. Twenty-three refineries reported they intend to produce all of their diesel fuel containing 15 ppm sulfur or less, and three refineries reported 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 increase very slightly from 2010 through 2014, although one refinery plans to exit the diesel market in 2014.

Table 10.
PADD 2 Diesel Fuel Data: 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	26	26	26	26	26	25
# refineries at 100% 15 ppm	23	23	23	25	25	25
# refineries at 100% 500 ppm	2	2	1	1	1	0
# refineries with 15/500 ppm mix	1	1	2	0	0	0
Total 15 ppm (bbls/day)	1,028,534	1,041,259	1,045,213	1,058,391	1,058,158	1,050,024
Total 500 ppm (bbls/day)	13,425	13,091	9,227	7,825	7,825	0
Total 15 ppm and 500 ppm (bbls/day)	1,041,959	1,054,350	1,054,439	1,066,216	1,065,983	1,050,024

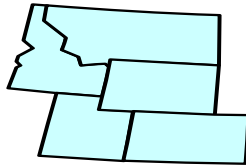


3. PADD 3

Reported totals for all PADD 3 refineries are summarized below in Table 11. Table 11 shows that 44 refineries anticipate producing 2.16 million bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel in 2010. Thirty-seven refineries reported they intend to produce all of their diesel fuel containing 15 ppm sulfur or less, and seven refineries reported they intend to produce some amount of 500 ppm diesel fuel. One refinery plans to enter the diesel fuel market in 2012, and one refinery plans to exit the diesel fuel market in 2013. Total diesel fuel production is projected to increase by 98 thousand bbls/day from 2010 through 2014.

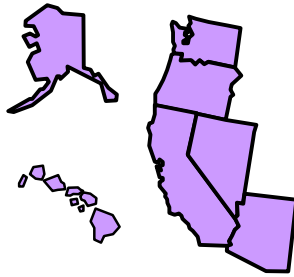
Table 11. PADD 3 Diesel Fuel Data: 2010-2014						
Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	44	44	45	44	44	44
# refineries at 100% 15 ppm	37	37	39	41	41	44
# refineries at 100% 500 ppm	3	3	2	1	1	0
# refineries with 15/500 ppm mix	4	4	4	2	2	0
Total 15 ppm (bbls/day)	2,109,397	2,125,285	2,228,880	2,242,663	2,243,878	2,261,308
Total 500 ppm (bbls/day)	53,844	55,980	42,559	30,889	30,889	0
Total 15 ppm and 500 ppm (bbls/day)	2,163,242	2,181,266	2,271,440	2,273,552	2,274,767	2,261,308

4. PADD 4



Reported totals for all PADD 4 refineries are summarized below in Table 12. Table 12 shows that 14 refineries anticipate producing 190 thousand bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel in 2010. Eleven refineries reported they intend to produce all of their diesel fuel containing 15 ppm sulfur or less, and three refineries reported 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 Data: 2010-2014						
Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	14	14	14	14	14	14
# refineries at 100% 15 ppm	11	11	11	13	13	14
# refineries at 100% 500 ppm	0	0	0	0	0	0
# refineries with 15/500 ppm mix	3	3	3	1	1	0
Total 15 ppm (bbls/day)	182,569	184,771	190,222	193,071	193,358	192,869
Total 500 ppm (bbls/day)	7,500	7,500	3,399	500	500	0
Total 15 ppm and 500 ppm (bbls/day)	190,069	192,271	193,621	193,571	193,858	192,869



5. PADD 5⁶

Reported totals for all refineries in PADD 5 are summarized below in Table 13. Table 13 shows that 25 refineries anticipate producing 519 thousand bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel in 2010. Twenty of these refineries indicated they expect to produce all of their diesel fuel containing 15 ppm sulfur or less, and five refineries reported they intend to produce some amount of 500 ppm diesel fuel. Total diesel fuel production is projected to remain relatively constant from 2010 through 2014, although one refinery plans to exit the diesel fuel market in 2014.

Table 13. PADD 5 Diesel Fuel Data: 2010-2014						
Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	25	25	25	25	25	24
# refineries at 100% 15 ppm	20	20	21	21	21	24
# refineries at 100% 500 ppm	1	1	1	1	1	0
# refineries with 15/500 ppm mix	4	4	3	3	3	0
Total 15 ppm (bbls/day)	507,592	507,593	514,595	514,596	514,598	522,926
Total 500 ppm (bbls/day)	11,326	11,388	4,452	4,517	4,583	0
Total 15 ppm and 500 ppm (bbls/day)	518,918	518,982	519,047	519,113	519,181	522,926

⁶ Alaska refineries are included in this analysis

C. Comparison of 2007 and 2008 NRLM Pre-Compliance Reports

Total reported production of 15 ppm and 500 ppm diesel fuel in the 2008 pre-compliance reports changed very little, compared to the 2007 pre-compliance reports. Table 14 shows the projected production of 15 ppm and 500 ppm diesel fuel from the 2007 and 2008 pre-compliance reports for 2010 (from June 1 to December 31). Total production of diesel fuel from the 2008 reports was fourteen thousand bbls/day less than total production from the 2007 reports. A large decrease in reported production for PADD 1 was mostly offset by increases in reported production for all remaining PADDs.

Table 14.						
Projected Production of (Highway + NRLM) Diesel Fuel by PADD for 2010						
PADD	1	2	3	4	5	Total U.S.
2007 NRLM reports						
Total 15 ppm, bbls/day	562,357	1,026,871	2,056,162	181,784	496,094	4,323,268
Total 500 ppm, bbls/day	267	6,207	81,355	6,500	11,326	105,656
Total 15 ppm and 500 ppm , bbls/day	562,624	1,033,078	2,137,518	188,284	507,420	4,428,924
2008 NRLM reports						
Total 15 ppm, bbls/day	480,001	1,028,534	2,109,397	182,569	507,592	4,308,094
Total 500 ppm, bbls/day	20,476	13,425	53,844	7,500	11,326	106,571
Total 15 ppm and 500 ppm , bbls/day	500,478	1,041,959	2,163,242	190,069	518,918	4,414,665
Change in reported production, bbls/day	-62,147	8,880	25,724	1,785	11,498	-14,259

Table 15 shows the projected production of 15 and 500 ppm diesel fuel from the 2007 and 2008 pre-compliance reports for 2014 (from June 1 to December 31). Total production of diesel fuel from the 2008 reports was five thousand bbls/day greater than the total production from the 2007 reports. A large decrease in reported production for PADD 1 was offset by increases in reported production for all remaining PADDs, primarily PADD 3.

IV. NRLM Summary Data

Table 15.						
Projected Production of (Highway + NRLM) Diesel Fuel by PADD for 2014b						
PADD	1	2	3	4	5	Total U.S.
2007 NRLM reports						
Total 15 ppm, bbls/day	607,820	1,035,090	2,194,391	192,084	522,571	4,551,957
Total 500 ppm, bbls/day	0	0	0	0	0	0
Total 15 ppm and 500 ppm , bbls/day	607,820	1,035,090	2,194,391	192,084	522,571	4,551,957
2008 NRLM reports						
Total 15 ppm, bbls/day	530,105	1,050,024	2,261,308	192,869	522,926	4,557,232
Total 500 ppm, bbls/day	0	0	0	0	0	0
Total 15 ppm and 500 ppm , bbls/day	530,105	1,050,024	2,261,308	192,869	522,926	4,557,232
Change in reported production, bbls/day	-77,715	14,934	66,917	785	355	5,275

Appendix - List of Acronyms

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