
Motor Fuel Quality Program 2008 Annual Report

Prepared by

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Background

The Washington State Department of Agriculture (WSDA) is responsible for administering the state's Motor Fuel Quality Program. Statutory authority for the program is provided in Chapter 19.112 RCW. The Motor Fuel Quality Program, carried out by the department's Weights and Measures Program, tests fuels and inspects businesses marketing motor fuels at the retail, distribution, and production levels.

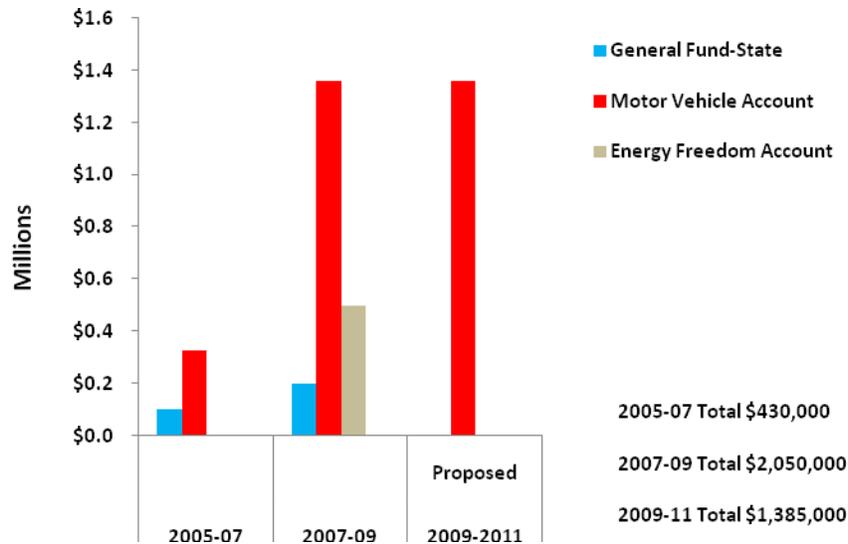
The Motor Fuel Quality Program was first implemented in 1991. Legislation enacted in 2006 (Chapter 338, Laws of 2006) expanded the program's scope to include biodiesel, biodiesel blends, and ethanol blends. The expanded program assumes a high level of biofuels monitoring initially due to the introduction of new fuels, unproven product quality, and the importance of quality to the overall success of the state's bioenergy initiative. This initiative is intended to increase production and use of alternative fuels in the state.

Program Budget

Until the 2007-09 biennium, funding for the Motor Fuel Quality Program came exclusively from the Motor Vehicle Account, with stable funding of \$305,000-\$315,000 per biennium from 1995 to 2005. With the expansion into biofuels, funding for the program increased significantly and, in the 2007-09 biennium, includes an additional \$1 million from the Motor Vehicle Account to implement biofuels quality testing, funding from the state general fund for a biofuels standards coordinator, and a one-time appropriation of \$500,000 from the Energy Freedom Account used for equipment and supplies.

The total Motor Fuel Quality Program budget increased from \$430,000 and 2.5 FTEs in the 2005-07 biennium to \$2.05 million and 5.3 FTEs for the 2007-09 biennium. The proposed 2009-11 biennium budget maintains \$1.4 million from the Motor Vehicle Account and eliminates funding from the state general fund and the Energy Freedom Account (Figure 1).

Figure 1. Motor Fuel Quality Program Biennial Budget



Motor Fuel Testing

WSDA conducts inspections of motor fuels throughout the fuel distribution system on a random and scheduled basis and in response to complaints.

Samples of gasoline, diesel, and biofuels are collected across the state. Inspectors use portable fuel analyzers and portable ethanol test kits for field tests. Samples failing field tests are sent to one of several in-state laboratories for detailed analysis. The laboratory analysis determines product compliance with motor fuel specifications of the American Society for Testing and Materials (ASTM) and confirms the fuel is meeting state and federal labeling requirements. WSDA uses the nationally approved ASTM tolerance limits and National Institute of Standards and Technology (NIST) standards to determine if a sample has passed or failed.

During inspections with a fuel distributor or retailer, storage tanks are dipped using a retractable pole and water detection paste to determine levels of water in the bottom of the storage tank. This test allows inspectors to ensure that businesses are in compliance with standards adopted by NIST and the National Conference of Weights and Measures.

In 2008, the Motor Fuel Quality Program identified 10 biodiesel producers, 125 fuel distributors, 26 fuel loading terminals, and more than 4,800 retailers of motor fuels in Washington. There were no ethanol producers in the state in 2008.

WSDA sampled fuels from selected producers and distributors with some visited up to four times during the year. Samples were taken at about 10 percent of the retailers. To monitor quality and

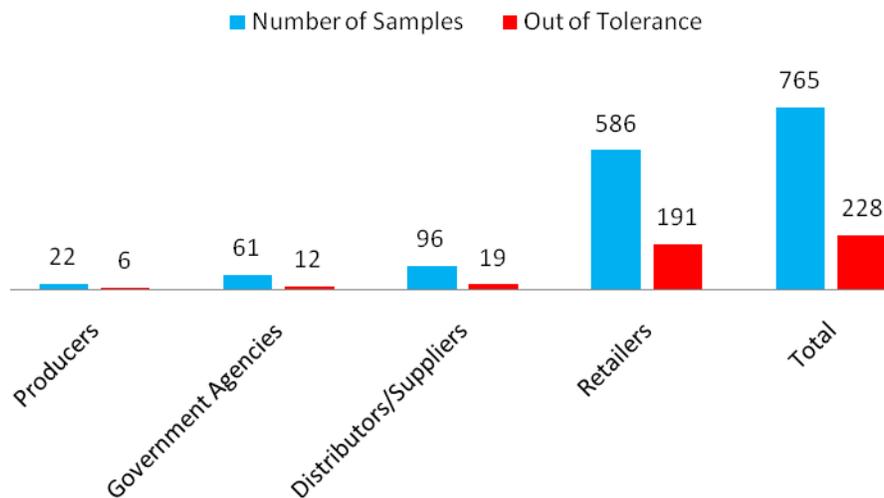
blend percentages used by the state fleet, WSDA began regular sampling of Department of Transportation fueling facilities.

Until 2006, the Motor Fuel Quality Program primarily tested grades of gasoline to see if they met octane standards. With the expansion of the program to include biofuels and the increased marketing of biofuels, a broader range of quality factors are being tested. These include:

- Blend Percent Biodiesel as Labeled
- Flash Point
- Total Glycerin
- Free Glycerin
- Water & Sediment
- Water Suspended
- Microbial Growth
- Total Sulfur
- Acid Number
- Phosphorus
- Octane Labeling
- Over 10% Ethanol

In 2008, a total of 765 samples were taken at facilities and retailers across the state with 30 percent of the samples found to have one or more quality standards out of tolerance (Figure 2). Finding a sample to be out of tolerance on an individual quality standard does not necessarily indicate a serious problem with fuel quality, however, it is important to identify and correct factors that are out of tolerance to avoid misrepresentation and possible adverse effects. The two most common problems found were the blend percent for biodiesel not as labeled and ethanol over 10 percent.

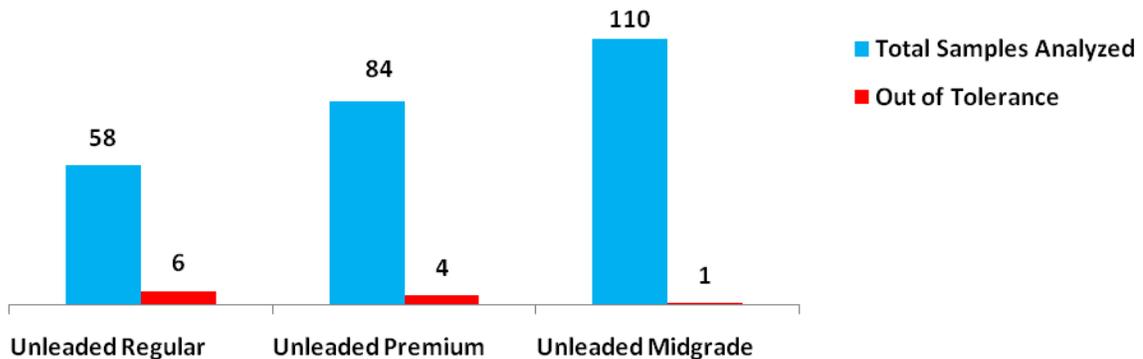
Figure 2. Motor Fuel Sampling and Compliance by Site Type, 2008



Field Testing of Compliance with Octane Standards

A total of 252 gasoline samples were analyzed in the field for percent of octane. Compliance across all grades of fuel tested was 96 percent, with compliance of 90 percent for regular, 99 percent for midgrade and 95 percent for premium (Figure 3). This level of compliance is consistent with compliance levels reported over the last ten years.

Figure 3. Compliance with Octane Standards, 2008



Laboratory Testing of Fuel Quality

A total of 544 samples were sent to laboratories for a full analysis. This included 243 gasoline/ethanol samples and 301 diesel/biodiesel samples (Figure 4).

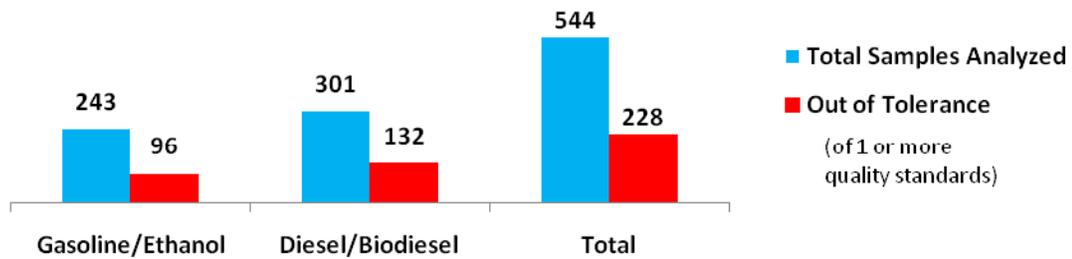
Of the 243 gasoline/ethanol samples analyzed, 40 percent were out of compliance with quality and labeling standards. The most common reason for being out of compliance was exceeding the legal maximum of 10 percent ethanol, with 20 percent of all gas samples exceeding the maximum. Any sample exceeding 10 percent ethanol was considered out of compliance, with the majority of these samples between 1 and 3 percent over tolerance. Blends of ethanol slightly over 10 percent may not be an immediate concern, but ethanol blends in excess of 10 percent can lead to decreased fuel economy and potential engine problems, in addition to violating EPA emission standards. Five percent of the samples did not meet labeled octane levels, mostly due to mislabeling. Four percent of the samples showed water and/or sediment.

Of the 301 diesel/biodiesel samples analyzed, 44 percent were out of compliance with quality and labeling standards. The most common reason for being out of compliance related to labeling, with 84 percent of the out of compliance samples not matching the biodiesel blend stated by the retailer or labeled on the dispenser. To be in compliance, B5 has to be between 4.5 percent and 5.5 percent biodiesel; B20 must be between 19 percent and 21 percent biodiesel. As distributors and manufacturers of biofuels convert from splash blending to more precise injection blending, compliance problems related to labeling not matching the blend being offered for sale are expected to decrease. Sampling results demonstrated there are a variety of biodiesel blends

offered for sale in the state, with the most common blends running between 6 and 20 percent biodiesel (Figure 5).

Four percent of the diesel/biodiesel samples showed water and/or sediment. Early concerns regarding glycerin and acid have proved to be non-issues to this point in the program’s testing of biodiesel.

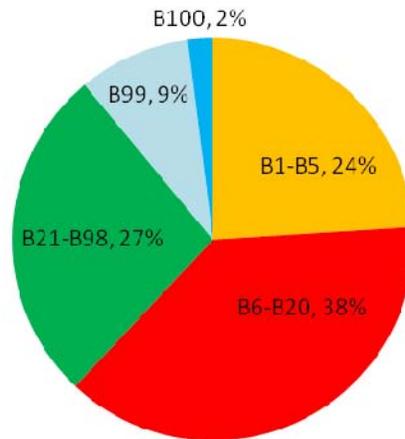
Figure 4. Motor Fuel Quality Compliance by Laboratory Analysis by Type of Fuel, 2008



All analyses and testing results are shared with the fuel’s owner, and WSDA staff conduct follow-up inspections with facilities having out-of-tolerance fuels to help them address problems. In extreme cases, where a high level of water or contamination has occurred, WSDA issues a “Stop Sale” order to the owner of the fuel and requires the problem to be corrected before any more fuel can be sold. Four “Stop Sale” orders were issued in 2008.

With the introduction of new fuels and the concerns they can create, inspectors and program staff have worked with business owners and fuel trade associations to educate them on labeling and quality standards by providing information on the handling and storage of biofuels.

Figure 5. Percentage of Biodiesel Blends Offered for Sale



B100 = 100 percent Biodiesel

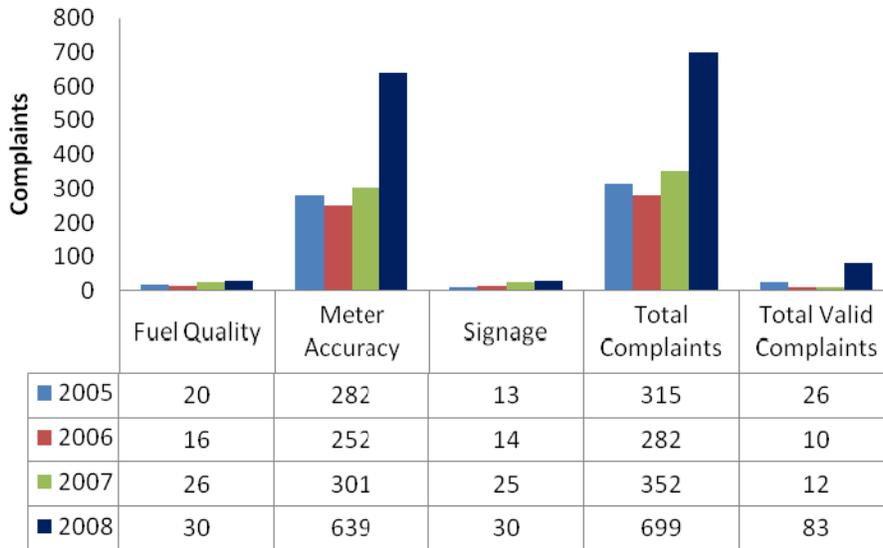
Consumer Complaints

The Motor Fuel Quality Program also responds to and investigates consumer complaints related to fuel quality, labeling, and quantity. In 2008, WSDA investigated 694 fuel complaints involving fuel quality, meter accuracy, and other concerns. This was almost double the number of complaints received in 2007 resulting in inspectors and staff dedicating 2,100 work hours and logging 30,000 miles to investigate these complaints.

The vast majority of complaints received (91 percent) were complaints on meter accuracy. Less than five percent (30 complaints) were related to fuel quality. Of these, 6 were related to biofuels, 4 to diesel, and 20 to gasoline.

About 12 percent of the complaints were found to be valid. Valid complaints were most often related to inaccurate meters. Meters found to be inaccurate were taken out of service until repairs were made and off-quality fuel was placed off sale until quality problems were resolved. Figure 6 provides the number of complaints by year and by type of complaint for the last four years.

Figure 6. Fuel-Related Complaints by Type, 2005-2008



Education and Outreach

A key component of the Motor Fuel Quality Program is education and outreach to assist retailers, distributors, manufacturers, and consumers of motor fuel with quality and labeling issues. In 2008, the program responded to about 360 fuel-related inquiries. Additionally, the program provided over 2,500 labels to fuel retailers to help them meet state and federal labeling requirements for fuel containing ethanol and biodiesel. The program also developed and distributed handouts to retailers and fuel trade associations on labeling requirements, fuel storage tank maintenance, and federal and state quality requirements.

The Biofuels Technical Work Group, established by WSDA in 2006, now consists of over 55 members including fuel industry representatives, consumers, government representatives and other stakeholders. The work group met six times in 2008 to discuss fuel quality issues. The group assisted the program in developing standards, establishing testing procedures, and discussing new and emerging renewable fuels.

In addition to monitoring and sampling biofuels, WSDA has identified and worked with state and local agencies, port districts, and local school districts that are using or considering using biofuels to help them develop internal quality assurance policies and procedures. The Motor Fuel Quality Program is serving as a resource for questions on storage, vehicle maintenance, labeling, and quality assurance procedures. One example is working with Department of Transportation maintenance facilities managers on quality issues they experienced when they started receiving deliveries of gasoline containing ethanol.

Focus for 2009

The introduction of ethanol into the fuel distribution system has created some quality concerns as ethanol has a tendency to absorb moisture. With our moist climate and some retail storage tanks not prepared for this new fuel mixture, the Motor Fuel Quality Program continues to see water contamination of motor fuels as the number one quality issue. With the anticipation that most gasoline will be blended with 10 percent ethanol by mid-2009, the program expects suspended water to remain a concern. One of the priorities for the program will be to continue its emphasis on inspections for water in storage tanks, and sampling and testing for suspended water in fuels. Another focus will be on fuel that exceeds the legal maximum of 10 percent ethanol. The program will continue its education and outreach to retailers on best management practices for the storage and dispensing of biofuels and ethanol-blended gasoline.

Mislabeled fuel products was also a concern in 2008 as retailers and distributors transitioned from conventional fuels to biofuels and ethanol-blended fuels. Mislabeled motor fuels can cause consumers to purchase fuel that may cause engine problems and void warranties. WSDA will continue to educate and, when necessary, take enforcement action to help ensure fuel dispensers and fuel invoices are correctly labeled and the fuel type identified.

The program has received numerous inquiries on the availability of non-ethanol fuels to use in older engines, aircraft engines, and marine applications. The program will continue to work with the fuel industry to identify this concern and options available for supply of non-ethanol fuels.

Conclusion

The Motor Fuel Quality Program provides regulatory oversight to the approximately 4.2 billion gallons of gasoline, taxable diesel, and biofuels sold to Washington motorists at more than 4,800 business locations through more than 50,000 fuel dispensers.

In 2008, Washington experienced many changes in motor fuels, including a major increase in the amount of ethanol in the distribution system. Ethanol made up 4 to 5 percent of gasoline sales early in the year and reached 9 to 10 percent at the end of the year.

The introduction and increased sales of ethanol as well as biodiesel in the state has resulted in violations of labeling requirements and increased levels of entrained water in motor fuels. There have also been some issues with these blended fuels having a cleaning effect on fuel storage tanks.

The Motor Fuel Quality Program is working to support and encourage the successful use of all motor fuels through testing, monitoring, and technical assistance activities. The fuel industry is facing many changes with the introduction of ethanol, biofuels, and renewable fuels. Sampling and testing results show a continued need to monitor fuel quality throughout the fuel distribution system and to educate both consumers and marketers of motor fuels on the state and federal requirements for quality and labeling of motor fuels. WSDA is committed to providing an appropriate and effective level of industry oversight to help ensure that fuel products purchased by Washington consumers are as represented in both quantity and quality.