

most of their available markets have less stringent sulfur standards. Thus, there are reasons to believe that some capacity to produce 10–15 ppm diesel fuel would be available overseas at competitive prices. If these refineries were operating well below capacity, they might be willing to supply complying product at prices which only reflect incremental operating costs. This could hold prices down in areas where importing fuel is economical. However, it is unlikely that these refiners could supply sufficient volumes to hold prices down nationwide. Despite this expectation, to be conservative, in the refining cost analysis conducted earlier in this chapter, we assumed no imports of 500

ppm or 15 ppm NRLM diesel fuel. All 500 ppm and 15 ppm nonroad diesel fuel was produced by domestic refineries. This raised the average and maximum costs of 500 ppm and 15 ppm NRLM diesel fuel and increased the potential price impacts projected above beyond what would have been projected had we projected that 5–10 percent of NRLM diesel fuel would be imported at competitive prices.

*B. Cost Savings to the Existing Fleet from the Use of Low Sulfur Fuel*

We estimate that reducing fuel sulfur to 500 ppm would reduce engine wear and oil degradation to the existing nonroad diesel equipment fleet and that

a further reduction to 15 ppm sulfur would result in even greater reductions. This reduction in wear and oil degradation would provide a dollar savings to users of nonroad equipment. The cost savings would also be realized by the owners of future nonroad engines that are subject to the standards in this proposal. As discussed below, these maintenance savings have been conservatively estimated to be greater than 3 cents per gallon for the use of 15 ppm sulfur fuel when compared to the use of today's unregulated nonroad diesel fuel. A summary of the benefits of low-sulfur fuel is presented in Table V.B–1.<sup>288</sup>

TABLE V.B–1—ENGINE COMPONENTS POTENTIALLY AFFECTED BY LOWER SULFUR LEVELS IN DIESEL FUEL

1 Affected Components	Effect of Lower Sulfur	Potential Impact on Engine System
Piston Rings .....	Reduced corrosion wear .....	Extended engine life and less frequent rebuilds.
Cylinder Liners .....	Reduced corrosion wear .....	Extended engine life and less frequent rebuilds.
Oil Quality .....	Reduced deposits, reduced acid build-up, and less need for alkaline additives.	Reduce wear on piston ring and cylinder liner and less frequent oil changes.
Exhaust System (tailpipe) .....	Reduced corrosion wear .....	Less frequent part replacement.
Exhaust Gas Recirculation System.	Reduced corrosion wear .....	Less frequent part replacement.

The monetary value of these benefits over the life of the equipment will depend upon the length of time that the equipment operates on low-sulfur diesel fuel and the degree to which engine and equipment manufacturers specify new maintenance practices and the degree to which equipment operators change engine maintenance patterns to take advantage of these benefits. For equipment near the end of its life in the 2008 time frame, the benefits will be quite small. However, for equipment produced in the years immediately preceding the introduction of 500 ppm sulfur fuel, the savings would be substantial. Additional savings would be realized in 2010 when the 15 ppm sulfur fuel would be introduced.

We estimate the single largest savings would be the impact of lower sulfur fuel on oil change intervals. The draft RIA presents our analysis for the oil change interval extension which would be realized by the introduction of 500 ppm sulfur fuel in 2007, as well as the additional oil extension which would be realized with the introduction of 15 ppm sulfur nonroad diesel fuel in 2010. As explained in the draft RIA, these estimates are based on our analysis of publically available information from nonroad engine manufacturers. Due to the wide range of diesel fuel sulfur

which today's nonroad engines may see around the world, engine manufacturers specify different oil change intervals as a function of diesel sulfur levels. We have used this data as the basis for our analysis. Taken together, when compared to today's relatively high nonroad diesel fuel sulfur levels, we estimate the use of 15 ppm sulfur fuel will enable an oil change interval extension of 35 percent from today's products.

We present here a fuel cost savings attributed to the oil change interval extension in terms of a cents per gallon operating cost. We estimate that an oil change interval extension of 31 percent, as would be enabled by the use of 500 ppm sulfur fuel in 2007, results in a fuel operating costs savings of 3.0 cents per gallon for the nonroad fleet. We project an additional cost savings of 0.3 cents per gallon for the oil change interval extension which would be enabled by the use of 15 ppm sulfur beginning in 2010. Thus, for the nonroad fleet as a whole, beginning in 2010 nonroad equipment users can realize an operating cost savings of 3.3 cents per gallon compared to today's engine. This means that the end cost to the typical user for 15ppm sulfur fuel is approximately 1.5 cents per gallon (4.8 cent per gallon cost for fuel minus 3.3

cent per gallon maintenance savings). For a typical 100 horsepower nonroad engine this represents a net present value lifetime savings of more than \$500.

These savings will occur without additional new cost to the equipment owner beyond the incremental cost of the low-sulfur diesel fuel, although these savings are dependent on changes to existing maintenance schedules. Such changes seem likely given the magnitude of the savings. We have not estimated the value of the savings from the other benefits listed in Table V.B–1, and therefore we believe the 3.3 cents per gallon savings is conservative as it only accounts for the impact of low sulfur fuel on oil change intervals.

*C. Engine and Equipment Cost Impacts*

The following sections briefly discuss the various engine and equipment cost elements considered for this proposal and present the total costs we have estimated; the reader is referred to the draft RIA for a complete discussion. Estimated engine and equipment costs depend largely on both the size of the piece of equipment and its engine, and on the technology package being added to the engine to ensure compliance with the proposed standards. The wide size variation (e.g., <4 horsepower engines through >2500 horsepower engines) and

<sup>288</sup> See Heavy-duty 2007 Highway Final RIA, Chapter V.C.5, and "Study of the Effects of Reduced

Diesel Fuel Sulfur Content on Engine Wear", EPA report # 460/3–87–002, June 1987.