Control of Hazardous Air Pollutants from Mobile Sources

Summary and Analysis of Comments

United States
Environmental Protection
Agency

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

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American Chemistry Council Olefins Panel		OAR-2005-0036-0823
American Lung Association[1]	ALA	OAR-2005-0036-0868, -0365
American Petroleum Institute[2]	API	OAR-2005-0036-0366, -0367, -0884
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(Municipality of) Anchorage Department of Health and Human Services	Anchorage	OAR-2005-0036-0976
Association of International Automobile Manufacturers	AIAM	OAR-2005-0036-0973
Association of Local Air Pollution Control Officials[4]	ALAPCO	OAR-2005-0036-0836, -0378
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Chevron Corporation	Chevron	OAR-2005-0036-0847
Colonial Oil Industries, Inc.	Colonial	OAR-2005-0036-0990
Countrymark Cooperative, LLP	Countrymark	OAR-2005-0036-0471
DSD International Inc.	DSD	OAR-2005-0036-0377, -0
Energy Future Coalition	EFC	OAR-2005-0036-0840
Engine Manufacturers Association	EMA	OAR-2005-0036-0810
Environmental Defense[1]	ED	OAR-2005-0036-0868
ExxonMobil	XOM	OAR-2005-0036-0772, -1013
Flint Hills Resources, LP	FHR	OAR-2005-0036-0862
Florida Department of Environmental Protection	FL DEP	OAR-2005-0036-0770
Flying J Inc[3]	Flying J	OAR-2005-0036-0989, -1011
Giant Industries, Inc.	Giant	OAR-2005-0036-0831, -0883
Gladieux Trading & Marketing Co., L.P.	Gladieux	OAR-2005-0036-0972
Hess Corporation	Hess	OAR-2005-0036-0769
Illinois Environmental Protection Agency	IL EPA	OAR-2005-0036-0830
Independent Fuel Terminal Operators Association	IFTOA	OAR-2005-0036-1007
International Institute of Synthetic Rubber Producers	IISRP	OAR-2005-0036-0807
International Truck and Engine Corporation	International	OAR-2005-0036-0826
Lane Regional Air Protection Agency	LRAPA	OAR-2005-0036-0848
Lotus Engineering		OAR-2005-0036-1033
Manufacturers of Emission Controls Association	MECA	OAR-2005-0036-0808
Marathon Petroleum Company, LLC	MPC	OAR-2005-0036-0946, -1008

Mitsubishi Motors	Mitsubishi	OAR-2005-0036-0882
Mothers and Others for Clean Air	Mothers/Others	OAR-2005-0036-0991
National Petrochemical Refiners Association[2]	NPRA	OAR-2005-0036-0809
Natural Resources Defense Council[1]	NRDC	OAR-2005-0036-0868
New Jersey Department of Environmental Protection	NJ DEP	OAR-2005-0036-0829
New York State Department of Environmental Conservation	NY DEC	OAR-2005-0036-0722
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Northeast States for Coordinated Air Use Management	NESCAUM	OAR-2005-0036-0993, -0369
Oregon Toxics Alliance	OTA	OAR-2005-0036-0948
Oregon Department of Environmental Quality	ODEQ	OAR-2005-0036-0987
Portable Fuel Container Manufacturers Association	PFCMA	OAR-2005-0036-0819, -0365
Puget Sound Clean Air Agency	Puget Sound	OAR-2005-0036-0780
Regional Air Pollution Control Agency	RAPCA	OAR-2005-0036-0771
Sensors, Inc.	SEMTECH	OAR-2005-0036-0958
Silver Eagle Refining	Silver Eagle	OAR-2005-0036-0839
Sinclair Oil Corporation[3]	Sinclair	OAR-2005-0036-0989, -1011
Small Business Refiners' Ad-Hoc Coalition	Small Refiners	OAR-2005-0036-0686
State and Territorial Air Pollution Program Administrators[4]	STAPPA	OAR-2005-0036-0836, -0378
Sunoco, Inc.	Sunoco	OAR-2005-0036-0806
Suncor Energy (U.S.A) Inc.[3]	Suncor	OAR-2005-0036-0989, -1011
Tesoro Corporation[3]	Tesoro	OAR-2005-0036-0989, -1011
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Toyota Technical Center	Toyota	OAR-2005-0036-0773
U.S. Oil & Refining, Co.	USOR	OAR-2005-0036-0992
U.S. PIRG[1]	PIRG	OAR-2005-0036-0868
U.S. Senators (Wyden et al; Enzi et al)		
United Refining Company	United	OAR-2005-0036-0827
Vermont Air Pollution Control Division	Vermont	OAR-2005-0036-0444
Washington State Department of Ecology	WA DE	OAR-2005-0036-0950
Wisconsin Department of Natural Resources	WDNR	OAR-2005-0036-0828

1- ALA, ED, NRDC, PIRG commented together

2- API and NPRA commented together

3- Flying J, Sinclair, Suncor, and Tesoro commented together (refiners in the Rocky Mountain and Pacific Northwest regions (PADDs 4 and 5, respectively))

4- STAPPA & ALAPCO commented together

LIST OF ACRONYMS

ABT	Averaging, Banking, and Trading
AECD	Auxiliary Emission Control Device
ALVW	Adjusted Loaded Vehicle Weight
ANLL	Acute Nonlymphocytic Leukemia
AML	Acute Myelogenous Leukemia
AOD	Airway Obstructive Disease
ASPEN	Assessment System for Population Exposure Nationwide
ASTM	American Society for Testing and Materials
ATPZEV	Advanced Technology Partial Zero Emission Vehicle
ATV	All-Terrain Vehicle
bpcd	Barrels per Calendar Day
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene isomers
BWC	Best Workplaces for Commuters
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAIR	Clean Air Interstate Rule
CAMx	Comprehensive Air Quality Model with Extensions
CARB	California Air Resources Board
CASAC	Clean Air Science Advisory Committee
CBA	Cost Benefit Analysis
CCD	Combustion Chamber Deposits
CD	Criteria Document
CG	Conventional Gasoline
CIIT	Chemical Industry Institute of Technology
CLL	Chronic Lymphocytic Leukemia
CM	Complex Model
CMAQ	Community Multi-scale Air Quality
CNLL	Chronic Nonlymphocytic Leukemia
CO	Carbon Monoxide
CRC	Coordinating Research Council
CRF	Concentration-Response Functions
Cr(VI)	Hexavalent Chromium
DF	Deterioration Factor
DIS	Document Index System
DoE, DOE	U.S. Department of Energy
DRIA	Draft Regulatory Impact Analysis
E&C	Engineering and Construction
EIA	Energy Information Administration
EIA	Economic Impact Analysis
EIM	Economic Impact Model
EO	Executive Order
EPAct	Energy Policy Act
ETBE	Ethyl Tertiary Butyl Ether
EU	European Union
EVOH	Ethylene Vinyl Alcohol
FACES	Fresno Asthmatic Children's Environment Study
FCC	Fluidized Catalytic Cracking

FE	Fuel Economy
FEL	Family Emissions Limit
FEV	Forced Expiratory Volume
FFV	Flex-Fuel Vehicle
FR	Federal Register
FTP	Federal Test Procedure
FUL	Full Useful Life
FY	Fiscal Year
GVWR	Gross Vehicle Weight Rating
HAD	Health Assessment Document
HAP	Hazardous Air Pollutant
HAPEM	Hazardous Air Pollutant Exposure Model
HC	Hydrocarbon
HDPE	High Density Polyethylene
HDV	Heavy-duty Vehicle
HEI	Health Effects Institute
HI	Hazard Index
HLDTs	Heavy Light-duty Trucks
HQ	Hazard Quotient
IARC	International Agency for Research on Cancer
ICIs	Independent Commercial Importers
IM, I/M	Inspection and Maintenance
IRIS	Integrated Risk Information System
IVD	Intake Valve Deposits
LDGTs	Light-duty Gasoline Trucks
LDGVs	Light-duty Gasoline Vehicles
LDTs	Light-duty Trucks
LDVs	Light-duty Vehicles
LEV	Low Emission Vehicle
LLDT	Light Light-duty Trucks
LP	Linear Programming
LVW	Loaded Vehicle Weight
MATES-II	Multiple Air Toxics Exposure Study
MDPVs	Medium-duty Passenger Vehicles
MFV	Multi-Fueled Vehicle
MLE	Maximum Likelihood Estimate
MRADs	Minor Restricted Activity Days
MSATs	Mobile Source Air Toxics
MTBE	Methyl Tertiary Butyl Ether
MY	Model Year
NAAQS	National Ambient Air Quality Standard
NAS	National Academy of Sciences
NATA	National Air Toxics Assessment
NCER	National Center for Environmental Research
NCI	National Cancer Institute
NCI-CAPM	National Cancer Institute and Chinese Academy of Preventative Medicine
NEI	National Emissions Inventory
NERL	National Exposure Research Laboratory
NESHAP	National Emissions Standards for Hazardous Air Pollutants

NHEERL	National Health and Environmental Effects Research Laboratory
NHL	Non-Hodgkin's Lymphoma
NIOSH	National Institute for Occupational Safety and Health
NLEV	National Low Emission Vehicle
NMHC	Non-methane Hydrocarbon
NMIM	National Mobile Inventory Model
NMMAPS	National Morbidity, Mortality, and Air Pollution Study
NMOG	Non-methane Organic Gas
NOx	Oxides of Nitrogen
NPRM	Notice of Proposed Rulemaking
NRC	National Research Council
NRMRL	National Risk Management Research Laboratory
OBD	On-board Diagnostics
OMB	Office of Management and Budget
OTAQ	Office of Transportation and Air Quality
PADD	Petroleum Administration Districts for Defense
PAHs	Polycyclic Aromatic Hydrocarbons
PAMS	Photochemical Assessment Monitoring Stations
PFC	Portable Fuel Container
PFID	Port Fuel Injectors
PM	Particulate Matter
PM_{10}	Particulate Matter 10 microns in diameter or less
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or less
PoD	Point of Departure
POM	Polycyclic Organic Matter
ppbv	Parts Per Billion by Volume
ppm	Parts per Million
ppmv	Parts per Million by Volume
PZEV	Partial Zero Emission Vehicle
RADs	Restricted Activity Days
RBOB	Reformulated Blendstock for Oxygenate Blending
REL	Reference Exposure Level
RfC	Reference Concentration
RfDs	Reference Doses
RFG	Reformulated Gasoline
RFS	Renewable Fuels Standard
RIA	Regulatory Impact Analysis
RIOPA	Relationship among Indoor, Outdoor, and Personal Air
RRADs	Respiratory-related Restricted Activity Days
RVP	Reid Vapor Pressure
SAB	Science Advisory Board
SAB-HES	Science Advisory Board's Health Effects Subcommittee
SBAR Panel	Small Business Advocacy Review Panel (or, 'The Panel')
SBREFA	Small Business Regulatory Enforcement Fairness Act
SERs	Small Entity Representatives
SFTP	Supplemental Federal Test Procedures
SHED	Sealed Housing for Evaporative Determination
SI	Spark Ignition
SLAMS	State and Local Air Monitoring Stations

SO_2	Sulfur Dioxide
SOA	Secondary Organic Aerosol
SULEV	Super Ultra Low Emission Vehicle
SVMs	Small Volume Manufacturers
SwRI	Southwest Research Institute
TAME	Tertiary Amyl Methyl Ether
TEACH	Toxic Exposure Assessment – Columbia/Harvard
THC	Total Hydrocarbon
TLEV	Transitional Low Emission Vehicle
TSP	Total Suspended Particulates
ULEV	Ultra Low Emission Vehicle
ULSD	Ultra-low Sulfur Diesel
URF	Unit Risk Factor
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VSL	Value of a Statistical Life
ZEV	Zero-Emission Vehicle

1. GENERAL POSITION STATEMENTS

What We Proposed:

The following comments relate in general to the Notice of Proposed Rulemaking (NPRM). The comments in this section are not on any specific aspect of the proposed rule; rather, they are directed to the general substance of the proposal. More detailed proposal items, and their corresponding comments, can be found in later sections of this Summary and Analysis of Comments.

For more information on the proposed rule, see 71 FR 15804 (March 29, 2006): [***link to:*** *http://www.epa.gov/otaq/regs/toxics/msat-nprm-fr.pdf*].

1.1 Supports Rule

What Commenters Said:

A number of commenters expressed general support for the proposed rule. These commenters cited the air quality and health benefits that would result from its implementation and some described the air quality problems they have experienced personally and in their own communities. Some commenters also noted that they believed that the approach of addressing both the vehicles and the fuel as a "system" was necessary to achieve the greatest emission reductions. In addition, some commenters stated that they were in support of a more streamlined fuel benzene standard. As noted below in section 1.2, some commenters believed that the rule either went too far or did not go far enough. However, commenters in general stated that they support the reduction of benzene emissions.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881, 0379 (hearing)
American Lung Association OAR-2005-0036-0365 (hearing)
American Lung Association OAR-2005-0036-0868
American Petroleum Institute (API) OAR-2005-0036-0336 (hearing testimony), -0884,
DSD International Inc. OAR-2005-0036-0377, -0383
Engine Manufacturers Association (EMA) OAR-2005-0036-0810
Environmental Defense OAR-2005-0036-0868
Independent Fuel Terminal Operators Association OAR-2005-0036-1007
Lane Regional Air Protection Agency (LRAPA) OAR-2005-0036-0848, -0974
Manufacturers of Emission Controls Association (MECA) OAR-2005-0036-0808
Natural Resources Defense Council OAR-2005-0036-0868
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0369 (hearing testimony), -0993
Oregon Toxics Alliance OAR-2005-0036-0948
Portable Fuel Container Manufacturers Association (PFCMA) OAR-2005-0036-0819
Private Citizens
STAPPA/ALAPCO OAR-2005-0036-0378 (hearing testimony), -0836

Sunoco OAR-2005-0036-0806
Toyota Technical Center OAR-2005-0036-0773
U.S. PIRG OAR-2005-0036-0868

Our Response:

We appreciate the comments that these commenters provided. With the MSAT2 rule, we are finalizing standards for passenger vehicles, gasoline, and portable fuel containers (such as gas cans). These standards will significantly reduce emissions of many air toxics, such as: hydrocarbons, including benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, and naphthalene. The fuel benzene standard and hydrocarbon standards for vehicles and portable fuel containers will together reduce total emissions of air toxics by 330,000 tons in 2030, including 61,000 tons of benzene. Mobile sources were responsible for 68% of benzene emissions in 1999. As a result of this final rule, in 2030 passenger vehicles will emit nearly 45% less benzene, portable fuel containers will emit 45% less benzene, and gasoline will have 38% less benzene overall. We believe that significant air quality and health benefits will result from implementation of the MSAT2 rule.

1.2 Opposes Rule

What Commenters Said:

Rule is too stringent

In general, commenters stated that they believed that the proposed stringency was adequate or was not stringent enough.

However, some refiners (namely those that will likely be considered small refiners, and those in the Western U.S.) commented that they believe that the proposed rule is too stringent. We also received many comments from those in the refining industry who commented that the rule does not provide enough lead time for compliance with the program requirements.

We also received comments from some vehicle manufacturers which stated that the proposed requirements for vehicles will be challenging.

Rule is too costly

As stated below in the specific chapters regarding the vehicle and gasoline benzene control (Chapters 3 and 4, respectively), some of the potentially regulated entities commented negatively on the costs of the rule. Specifically, many gasoline refiners commented that the rule will be too costly given the fact that they are have been subject to other fuel regulations recently (such as the Tier 2 gasoline, Highway Diesel, Nonroad Diesel, and the upcoming Renewable Fuels Standard rules). Those in the vehicle industry commented that new testing and phase-in schedule requirements would lead to significantly increased costs for vehicle manufacturers.

Rule is too lenient

Some commenters stated that, in general, they believe that the proposal is too lenient—the rule is insufficient, does not go far enough in air toxics control, and/or provides too much lead time for regulated entities. These comments are presented in more detail in the specific chapters regarding the vehicle, gasoline benzene, and portable fuel container requirements (Chapters 3, 4, and 5, respectively), and in the air quality discussions in Chapter 2. Further, as discussed in more detail in Chapter 7, some commenters specifically argued that EPA's MSAT2 proposal falls short of meeting the requirements of Clean Air Act section 202(l).

A number of commenters stated that the Pacific Northwest has the dirtiest gasoline in the country. The commenters stated that this gasoline contains 10 times the benzene found in other oil, and that Northwest refineries have been exempted from EPA regulations that require benzene removal in other parts of the country. The commenters urged EPA to strengthen the rule to provide greater benzene reductions for this area of the country.

Letters:
Ad Hoc Coalition of Small Business Refiners OAR-2005-0036-0686
Alaska Department of Environmental Conservation, Division of Air Quality (ADEC) OAR-2005-0036-0975
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association (ALA) OAR-2005-0036-0365
American Petroleum Institute (API) OAR-2005-0036-0366, 0367
Association of International Automobile Manufacturers (AIAM) OAR-2005-0036-0973
BP OAR-2005-0036-0824, 0837
Countrymark Cooperative, LLP OAR-2005-0036-0471
Energy Future Coalition (EFC) OAR-2005-0036-0840
Engine Manufacturers Association (EMA) OAR-2005-0036-0810
Environmental Defense, Natural Resources Defense Council (NRDC), U.S. PIRG, American Lung Association (ALA) OAR-2005-0036-0868
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013
Flint Hills Resources (FHR) OAR-2005-0036-0862
Giant Industries, Inc. OAR-2005-0036-0831, -0883
Hess Corporation OAR-2005-0036-0769
Illinois EPA (IL EPA) OAR-2005-0036-0830
Lane Regional Air Protection Agency (LRAPA) OAR-2005-0036-0848
Marathon Petroleum Company LLC (MPC) OAR-2005-0036-1008
Mitsubishi Motors R&D of America OAR-2005-0036-0882
Mothers & Others for Clean Air OAR-2005-0036-0991
Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976
National Petrochemical and Refiners Association (NPRA) OAR-2005-0036-0809
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722

NESCAUM OAR-2005-0036-0993, -0369
Oregon Department of Environmental Quality (ODEQ) OAR-2005-0036-0987
Oregon Toxics Alliance (OTA) OAR-2005-0036-0948
Private Citizens *various*
Puget Sound Clean Air Agency OAR-2005-0036-0780
Silver Eagle Refining, Inc. OAR-2005-0036-0839
Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation OAR-2005-0036-0989, -1011
STAPPA/ALAPCO OAR-2005-0036-0836, -0378
TEIR Associates, Inc. OAR-2005-0036-0838, 1012
Toyota Technical Center (TTC) OAR-2005-0036-0773
United Refining Company OAR-2005-0036-0827
United States Senator Ron Wyden et al
United States Senator Michael Enzi et al
Washington State Department of Ecology OAR-2005-0036-0950
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

We continue to believe that the program that we are finalizing today is necessary, and is achievable (within the meaning of CAA section 202(l))in the time frame allowed; further, as discussed in Chapter 2, this program provides significant air quality benefits from MSAT reductions. We also believe that the lead time being offered is necessary for the manufacturing and fuel industries to be able to comply with the rule. For an in-depth description of the feasibility of the standards, please refer to Chapters 3, 4, and 5 (vehicle, gasoline benzene, and portable fuel containers, respectively) of this Summary and Analysis of Comments, and Chapters 5, 6, and 7 of the Regulatory Impact Analysis (RIA). Further, as discussed in greater detail in Chapter 7 of this document, we believe that the standards being finalized for the MSAT2 program are fully consistent with CAA section 202(l).

2. ENVIRONMENTAL/AIR QUALITY AND PUBLIC HEALTH IMPACTS

What We Proposed:

The comments in this section correspond to Sections III through V of the preamble to the proposed rule, and Chapters 1 through 3 of the Regulatory Impact Analysis. They are therefore targeted at the environmental, air quality, and public health impacts from the proposal. A summary of the comments received, as well as our response to those comments, are located below.

For the full text of comments summarized here, please refer to the public record for this rulemaking.

2.1 Public Health Issues

2.1.1 Public Health Justification and Implications for Controls

What Commenters Said:

A number of commenters stated that mobile source air toxics pose a significant risk that justifies the proposed controls, and that EPA should do even more to reduce emissions. A summary of these comments follows.

A private citizen stated that benzene causes a significant threat to human health and if it is possible to reduce the amount of benzene being released into the environment, then it should be done. The comments address the harmful side effects of benzene and six other chemicals found in gasoline. If the levels of these chemicals in gasoline were reduced, the commenter argues that there would be a significant savings in health care.

The Northeast States for Coordinated Air Use Management (NESCAUM) commented that it believes that both onroad and nonroad mobile sources such as cars, trucks, buses, construction equipment, lawn and garden equipment, snowmobiles, and boats emit pollutants that cause cancer or other adverse health effects. The commenter further stated that it believes that mobile source air toxics clearly pose a significant public health threat in the northeastern U.S. and public exposure to toxic emissions from mobile sources is a major concern to health officials and air quality regulators in the Northeast. They cite emissions inventory and air quality monitoring and modeling data indicating that 50 and 74 percent of cancer and non-cancer risk related to breathing outdoor air results from mobile source air toxics emissions. The commenter further noted that Northeast state modeling and monitoring data indicate that ambient concentrations of acetaldehyde, benzene, 1,3-butadiene, formaldehyde, acrolein, and diesel particulate matter exceed risk screening thresholds for cancer and, in some cases, non-cancer effects throughout the region. The commenter stated that a review of emissions inventory data concluded that mobile sources dominate the primary emissions for these pollutants in all Northeast states.

NESCAUM commented that it believes that additional reductions in benzene are needed because even the simplest risk assessment predicts that exposures to benzene (directly and indirectly from the use of mobile sources) are very high throughout the US. The commenter noted that it was stated in the RIA (p.3-48) that "...based on average census tract risks, the vast majority of the population experiences risks between one in a million ($1x10^{-6}$) and one in ten thousand ($1x10^{-4}$)". However, the commenter noted, the number of people experiencing risks above one in a hundred thousand ($1x10^{-5}$) increases from 214 million in 1999 to 240 million in 2030. NESCAUM commented that, based on the experiences of the Northeast states with monitoring, modeling, and controlling air toxics in the Northeast, it believes that the need for more reductions in MSAT emissions is evident. The commenter cited the example of monitoring data for Burlington, VT for 1999 which it stated documents that ambient air concentrations of benzene exceeded health benchmarks (10^{-6} cancer risk) by roughly a factor of 20. The commenter noted that, consequently, an urban-scale benzene modeling study was applied to the Burlington area for 1999. The commenter stated that this study demonstrated that annual ambient concentration impacts modeled in Burlington from motor vehicles over the whole domain were anywhere from 5 to 20 times the Vermont health standard (0.12 $\mu g/m^3$) for benzene. Seventy six percent of this modeled local source annual benzene impact was due to motor vehicle traffic.

NESCAUM also provided conclusions from recent studies of microenvironment exposure levels in the Northeast, and stated these analyses provide evidence of the need for substantial reductions in mobile source air toxic emissions. The commenter also stated that, beyond the risk quantified in the national-scale modeling in the proposal's Regulatory Impact Analysis, there are many more risks from exposure to MSAT that have not been quantified. The commenter stated that it believes this increases the urgency for additional MSAT reductions in the Northeast states.

STAPPA and ALAPCO noted that the proposal stated that 68 percent of our nation's benzene emissions come from mobile sources and that benzene will continue to be the key cancer risk driver into the future. The commenters stated that they acknowledge EPA's effort to stem this risk, but believe that more can and should be done and that they strongly urge EPA to maximize this opportunity to glean the greatest benzene reductions possible.

The Oregon Department of Environmental Quality (ODEQ) and Lane Regional Air Protection Agency (LRAPA) commented that the EPA National-scale Air Toxics Assessment (NATA) indicates that benzene is the most significant air toxic for cancer risk and that mobile sources are the major source of benzene. The commenters asserted that benzene concentrations in the Pacific Northwest have been among the highest in the nation. LRAPA further stated that it believes that the MSAT rule revisions are the greatest opportunity to reduce benzene to safe levels.

The New York State Department of Environmental Conservation (NYDEC) commented that in its study of concentrations and trends of benzene in ambient air over New York during 1990-2003, a 50 percent or more decline in mean annual concentrations of benzene was demonstrated. The commenter stated that it believes that this downward trend in benzene concentrations can be attributed partly to: 1) the adoption of the Reformulated Gasoline Program

(RFG) in 1-hr ozone non-attainment areas; and, 2) for other non-RFG sites, improvements in vehicle emissions technology and the statewide adoption of the California Low Emissions Vehicle (LEV) program. The commenter further stated that it believes that an examination of the information included in this rulemaking indicates this proposal will not provide any real meaningful reductions of MSATs in the New York City Metropolitan area over the next 24 years and the predicted cancer risk estimates will remain steady or actually increase as a result of this rulemaking. Similarly, NESCAUM stated that it believes that this rulemaking will only provide small reductions in MSAT risk in areas that currently use RFG and have adopted the California LEV program. NESCAUM stated that it believes that an examination of the information included in this rulemaking indicates that the predicted cancer risk estimates in these areas will remain steady or actually increase between now and 2030.

The New Jersey Department of Environmental Protection (NJDEP) commented that it believes that "all risk assessments" predict that exposures to benzene, attributed directly and indirectly to mobile sources are high. The commenter cited the Draft RIA (p.3-48) in describing the population exposed to various risk levels ($1x10^{-6}$ – $1x10^{-4}$) in 1999 and in 2030. NJDEP also summarized risk characterization data from the 1999 National Air Toxics Assessment and concerns about exposures attributable to attached garages and residence near major roads, commenting that the information supported the conclusion that emissions of hazardous air pollutants from mobile sources is a "very serious problem." The commenter also summarized its own analyses of 1996 NATA results, indicating that mobile sources are the predominant source of several air toxics in New Jersey.

The Wisconsin Department of Natural Resources (WDNR) commented that it believe that mobile source air toxics must be addressed in order to ensure that communities are as healthy as possible. The commenter also expressed concern about its impression that EPA is using benzene as a "the only surrogate" of mobile source air toxics in general.

Environmental Defense, the Natural Resources Defense Council (NRDC), U.S. Public Interest Research Group (PIRG), and the American Lung Association (ALA) commented that they believe that exposure to benzene presents a serious risk to human health. The commenters further stated that they believe that benzene is responsible for carcinogenic and non-carcinogenic health effects through all routes of exposure, and is found in considerable concentrations in communities throughout the United States. The commenters noted that in 1999, 68 percent of benzene emissions nationwide were from mobile sources, and stated that in the coming years they believe that mobile sources will continue to be a major source of benzene.

The Alliance of Automobile Manufacturers (Alliance) stated its support for EPA's initiative to reduce mobile source air toxics, and indicated that it understands the goal of a healthier environment

ExxonMobil and the American Petroleum Institute (API) commented that they view the health justification for the proposal as inadequate. ExxonMobil further stated that the discretion afforded EPA in CAA 202 (l) should only be exercised after an adequate health based justification. The commenters also asserted that cancer risk due to benzene from mobile sources could fall below a *de minimis* risk level before implementation of the fuels program, especially if

the lower range, or possibly even the midpoint of the range of "equally scientifically valid" unit risk estimates is used to calculate benefits.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Petroleum Institute (API) OAR-2005-0036-0884
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
Lane Regional Air Protection Agency (LRAPA) OAR-2005-0036-0848
New Jersey Department of Environmental Protection OAR-2005-0036-0829
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
NESCAUM (Northeast States for Coordinated Air Use Management) OAR-2005-0036-0993
Oregon Department of Environmental Quality (ODEQ) OAR-2005-0036-0987
STAPPA/ALAPCO OAR-2005-0036-0836
West Chester University of Pennsylvania Student OAR-2005-0036-0368
Wisconsin Department of Natural Resources (WDNR) OAR-2005-0036-0828

Our Response:

Section 202 (l) (2) requires EPA to adopt technology-based (indeed, technology-forcing) regulation of air toxics from motor vehicles to the maximum extent achievable, taking into consideration cost, energy, noise, safety, and lead time. See Sierra Club v. EPA, 325 F. 3d at 378 (section 202 (l) (2) is technology-forcing and so requires EPA to consider future advances in pollution control capability, among other factors). It is not a risk-based provision whereby the reasonableness of the rule is determined by evaluating whether some measure of risk reduction is achieved. Section 202 (l) (2) also states, however, that the rules for air toxics are to be promulgated under sections 202 (a) (1) (vehicles) and 211 (c) (1) (fuels). Both provisions contain certain risk-based condition precedents to exercise of the technology-based authority. This condition precedent is a showing that emissions (or, for fuels, emission products) "cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." We believe the information presented in the preamble and the RIA support such a judgment, and agree with the comments that concurred with this determination. We disagree with the comment that the health justification is inadequate to move forward with technology-based regulation.

While we agree that the mobile source air toxics increase the risk of health effects and that risks will remain after the rule is implemented, we believe the rule achieves the "greatest degree of emission reduction achievable through the application of technology which will be available, taking into consideration the motor vehicle standards established under section 202(a) of the Act, the availability and cost of the technology, and noise, energy and safety factors, and lead time" (Clean Air Act section 202(l)).

In response to the comment that cancer risk due to benzene from mobile sources could fall below a de minimis risk level before implementation of the fuels program , unlike other

provisions of the Clean Air Act, section 202(l)(2) does not direct EPA to set standards to eliminate or achieve a certain level of risk. Nevertheless, EPA would like to note that in setting a NESHAP (National Emission Standards for Hazardous Air Pollutants) for benzene in 1989 (FR 54, 177: 38044-38072; September 14, 1989), a de minimus risk level was not defined based on average population risk. Acceptability of risks in a population were based on the individual exposed to the maximum level. If average risks are below the one in a million level, a significant number of people in the population could still be judged to have "unacceptable" risks under the criteria set in this NESHAP.

We note that comments indicating that we are using benzene as the "only surrogate" of mobile source air toxics more generally are incorrect. The standards in this rule are expected to reduce emissions of a broad range of particulate and gaseous air toxics other than benzene.

We disagree that there will be no meaningful reductions of MSATs in the New York City metropolitan area or areas that currently use RFG and have adopted the California LEV program. The vehicle standards add cold temperature emission standards to existing requirements nationally, and these standards address lower temperatures than California's LEV standards, which extend to only 50 degrees Fahrenheit. As a result, substantial reductions in cold-temperature emissions are expected to accrue even in areas that have adopted the California LEV program, with concurrent reductions in risk. Furthermore, the portable fuel container emission standard will provide substantial reductions in MSAT emissions and exposures.

2.1.2 Benzene

What Commenters Said:

Based on material cited in Chapter 3 of the RIA, the New Jersey Department of Environmental Protection asserted that benzene may be even more potent than EPA's IRIS (Integrated Risk Information System) database suggests. In particular, the commenter noted the RIA's note that the cancer dose-response curve for benzene may be "supralinear" and that benzene metabolism may be saturated at 1ppm. The commenter noted the RIA's statement that health effects from occupational exposures to benzene have been seen below the 1ppm level.

API and ExxonMobil commented, with the endorsement of Marathon Petroleum Company, that they believe that in the proposal, EPA overstated the predicted health benefits of the rule, and as such, the benzene content standard for gasoline is not adequately justified. They first noted that while benzene is identified as a national risk driver under the 1999 NATA, predicted increases in the number of people exposed to higher risk levels are due to population growth, rather than increased benzene emissions.

API and ExxonMobil comment that EPA provided an unbalanced view of the science regarding benzene's health effects, and that benzene risks are equally if not more likely to be overestimates than underestimates. In particular, the commenters assert that EPA made several questionable or incorrect statements in discussing how its risk assessment could underestimate

benzene risk. Specifically, they suggest that EPA's following assertions are questionable or incorrect:

- EPA's mention of the possible supralinearity of benzene's dose-response function at environmental exposure levels, noting that even if one metabolic pathway saturates in the 1 ppm range, other processes of detoxification and clearance could compensate and reduce risk above that level of exposure;
- benzene's association with more than one leukemia subtype;
- that a transition from linear to saturable metabolism below 1 ppm could result in underestimation of risk;
- assertion that the National Cancer Institute (NCI) Chinese cohort study as not having undergone review under Integrated Risk Information System (IRIS) or consideration for establishing the benzene unit risk estimate.

They commented that EPA did not consider "reality checks," such as the absence of benzene health effects in populations exposed to higher concentrations than the general public, such as petroleum workers, for which they cited occupational epidemiology studies. In particular, they cited a meta-analysis of petroleum worker epidemiology studies in which relative risks for leukemia were near 1 (Wong and Raabe, 1995). They also cite the lack of consistency in epidemiologic studies of gas station attendants and vehicle mechanics. Accordingly, they asserted that the true risk for benzene induced disease from current environmental exposures could be zero, and cite EPA's use of such language in describing risk from diesel exhaust exposure.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
New Jersey Department of Environmental Protection, Division of Air Quality OAR-2005-0036-0829
Marathon Petroleum Company (MPC) OAR-2005-0036-0946

Our Response:

We disagree that the Agency provided an unbalanced view of the science regarding benzene health effects.

EPA believes that the best currently available peer-reviewed published scientific information/data sources on health effects of benzene should be used for health hazard or risk determination. EPA's preferred choice of source for this determination remains the currently available EPA IRIS values. When EPA IRIS assessments are updated, EPA uses emerging peer-reviewed scientific literature and/or other assessments in support of hazard risk determination. A brief summary of emerging science is provided below.

EPA (IRIS, 2000) concluded that "some recent evidence suggests the possibility that the low-dose curve could be supralinear since the formation of toxic metabolized plateaus above 25 ppm benzene in air. Thus, it is possible that the unit risk is underestimated if linearity is assumed

at low doses." Furthermore, EPA concluded that "there is no sufficient evidence currently to reject a linear dose-response curve for benzene in the low-dose region, nor is there sufficient evidence to demonstrate that benzene is, in fact, nonlinear in its effects." In absence of this information, EPA recommended a default approach of using a model with low-dose linearity and estimated the risk at 1 ppm ranging from $7.1x10^{-3}$ to $2.5x10^{-5}$, within which any calculated unit risk estimate would have equal scientific validity. For risks ranging from $1x10^{-4}$ to $1x10^{-7}$, the corresponding air concentrations for lifetime exposure range from 0.013 to 13.0 $\mu g/m^3$ (0.004 - 4 ppb) using the higher end of the unit risk range to 0.045 to 45.0 $\mu g/m^3$ (0.014 – 14 ppb) using the lower end of the unit risk range.

Since the revision to the IRIS assessment for benzene, additional research has been published. Commenters made note of some recent studies (e.g. Wong and Raabe, 1995; Ruston and Romaniuk, 1997; Schnatter et al, 1996; Glass et al, 2003). However, other recent studies support a supralinear dose-response relationship between exposure and cancer risk for lower exposure levels. For example, Rappaport et al. (2005) and Lin et al. (2006) characterized relationships between levels of albumin adducts of benzene metabolites in blood and the corresponding benzene exposures in benzene-exposed and control workers, after adjusting for important covariates.[1,2] The levels of reactive and hematotoxic benzene metabolites were less than proportional to benzene exposure at air concentrations in the range of 1 to 10 ppm. Another example is work by Rappaport et al., (2002), which indicates deviations from linearity beginning at approximately 1 ppm.[3] These examples would imply that linear fits of leukemia mortality among occupationally exposed workers to hundreds of ppm of benzene could possibly underestimate risks from benzene metabolites in persons exposed at lower (non-saturating) air concentrations. All of these studies will be evaluated when EPA reconsiders health risks from exposure to benzene.

The commenters also hypothesize that additional mechanisms of metabolism may mitigate risk, even if enzymes saturate at around 1 ppm. While it is always possible some unidentified metabolic pathway could impact risk, we are aware of no existing data to either refute or support this hypothesis. EPA will continue to monitor research regarding low-dose metabolism of benzene in humans.

As for the comments on the possible association of benzene with more than one leukemia subtype, it should be recognized that while most of the epidemiological studies are generally limited by confounding chemical exposures, and methodological problems, the overwhelming evidence is consistent for excess risk of leukemia across studies. It should be recognized that earlier studies are limited by a lack of information on leukemia cell types other than AML, because leukemia used to be considered a single diagnostic category for epidemiological investigation, partly because of historical nomenclature, small number of deaths by cell type, and unavailability of cell-type specific rates for comparison.

The commenters selectively cite certain epidemiological publications referring to "[e]vidence of uncertainties include inconsistent results from epidemiological studies (Ruston and Romaniuk, 1997; Schnatter et al, 1996; Glass et al, 2003),[4,5,6] "relative risk near unity" (Wong and Raabe, 1995)[7] and "Studies on CLL and benzene show equivocal results as some recent reviews have revealed" (Schnatter et al., 2005; Linet et al, 1996).[8,9] Inconsistencies

across the epidemiological studies are to be expected given the uneven power and quality of the studies with respect to their ability to provide meaningful information on the existence of cancer risks from benzene exposure. The more informative studies show increased risks of leukemia. In contrast with the commenter's view that EPA did not consider "reality checks," such as the absence of benzene health effects in occupationally exposed populations and the comment that the results of epidemiologic studies of leukemia in some worker groups are inconsistent, on the contrary, the preponderance of evidence based on epidemiological studies and case reports clearly indicates a causal relationship between occupational exposure to benzene including benzene-containing solvents and the occurrence of acute nonlymphocytic leukemia (ANLL), particularly, the myeloid cell type (acute myelogenous leukemia, AML) (Rinsky et al, 1987, 2002; Yin et al, 1996; Hayes et al, 1997).[10,11,12,13] Several of the studies also provide suggestive evidence of association between benzene exposure and non-Hodgkin's lymphoma (NHL) and multiple myeloma (Hayes et al, 1997; Rinsky et al, 1987)[10,13] and to some extent chronic nonlymphocytic leukemia (CNLL) as well as chronic lymphocytic leukemia (CLL) (Vighani and Saita, 1964; Aksoy, 1976, 1977; Infante et al, 1977; Rinsky, 1981, 1987).[10,14,15,16,17,18] Although the Pliofilm study (Rinsky et al, 1987) provided estimates of leukemia risk at high levels of benzene exposure, The NCI-CAPM (National Cancer Institute/Chinese Academy of Preventative Medicine) study (Hayes et al, 1997, 2001) extended estimates of risk to lower levels of exposure below 10 ppm.[13,19] In spite of the recognition that the NCI-CAPM study and all other retrospective investigations have limitations, the criticisms raised by Wong (1999) and Budinsky et al (1999) do not negate the findings that significantly elevated risks for lymphohematopoietic disorders occurred at substantially lower levels of benzene exposure than in the study of Rinsky et al (1987).[20,21]

Rushton and Romaniuk (1997) investigated the risk of leukemia in workers in the petroleum distribution industry who are exposed to low levels of benzene.[4] Although they reported no significant increase in the overall risk of all leukemia with higher cumulative exposure or with intensity of exposure, the authors also noted that the risk was consistently doubled in subjects employed in the industry for more than 10 years. There is a suggestion of a relation between exposure to benzene and myeloid leukemia, in particular for acute myeloid and monocytic leukemia. Risk was increased to an odds ratio (OR) of 2.8 for a cumulative exposure between 4.5 and 45 ppm-years compared with 0.5 ppm-years. The Glass et al. (2005) study suggests that benzene exposure is associated with a spectrum of hematologic neoplasms and related disorders in humans.[22] Risks for these conditions are elevated at average benzene-exposure levels of less than 10 ppm. The Glass et al. (2003) study found an excess risk of leukemia associated with cumulative benzene exposures and benzene-exposure intensities that were considerably lower than reported in previous studies.[23] They also concluded that no evidence was found of a threshold cumulative exposure below which there was no risk. A recent review of the literature of nine cohort and 13-case control studies on benzene exposure and leukemia subtypes (Schnatter et al., 2005) concluded that high and significant acute myeloid leukemia risks with positive dose-response relationships were identified across study designs.[8] Risks for CLL tended to show elevations in nested case-control studies, with possible dose-response relationships in at least two of the three studies. However, data on chronic myeloid leukemia and acute lymphocytic leukemia are sparse and inconclusive.

Regarding the comments that a description of the risk of benzene should contain a note that the risks could actually be zero, no such language is found in EPA's IRIS summary or supporting documents for benzene, and making such a statement would be highly speculative as well as unsupported by the preponderance of published literature. In contrast to compounds for which the human carcinogenicity is not known with certainty, benzene is known to be carcinogenic to humans, and environmental exposure levels are not so far below the occupational exposure levels exhibiting increased cancer risks that there is any expectation of zero cancer risk given the genotoxic properties of benzene.

For these reasons, EPA disagrees with API and others that EPA overstates the health benefits related to benzene control. However, EPA acknowledges using the upper end of the maximum likelihood range in assessing cancer risk attributable to benzene exposure. This is consistent with the way benzene risk is modeled in the National Air Toxics Assessment. It is important to note that the rule is not justified based on some (asserted) level of risk, as EPA again notes that it is reasonably interpreting section 202(l)(2) as requiring standards which are technology-based (taking into consideration cost, energy, safety and other enumerated factors, along with technical feasibility), not risk-based.

What Commenters Said:

ExxonMobil commented that because ambient concentrations of benzene lie below the reference concentration (RfC) of 30 $\mu g/m^3$, no non-cancer health effects should be discussed as possible health effects of environmental benzene exposures.

Letters:
ExxonMobil Refining & Supply Company OAR-2005-0036-0772

Our Response:

The commenter inappropriately cites only ambient concentrations of benzene as the context for discussion of non-cancer health effects. An RfC refers to a time-weighted exposure concentration, rather than an ambient concentration. As discussed in Chapter 3 of the RIA, indoor and personal breathing zone concentrations of benzene can be substantially higher than ambient concentrations. Among the studies reported in Chapter 3 are those examining indoor concentrations of benzene in homes with attached garages. In those studies, concentrations in excess of 30 ug/m^3 are not uncommon. In fact, one study from the mid-1990s reported integrated 24-hour average benzene concentrations of 364 parts per billion by volume (ppbv), which is substantially in excess of EPA's RfC.[24] Other studies of homes, particularly in Alaska, have shown 12 or 24-hour integrated concentrations in homes with attached garages over the RfC as well. While these measurements are of daily duration, the frequency with which these studies report concentrations in excess of the RfC indicates that long-term exposures above the RfC are possible.

Occupational studies of benzene concentrations discussed in Chapter 3 also indicate that among some professions, including those in the petroleum and parks management industries, work-shift averages can exceed EPA's RfC. While these occupational exposures are not within

the regulatory purview of EPA, reductions in fuel benzene concentrations are likely to reduce exposures in some of these occupations, a view which is consistent with a 2002 review publication.[25]

As such, while we do not quantify the reduction in non-cancer risk that is likely to result from this rule, we believe that it is appropriate to discuss non-cancer health effects of benzene due to the observation of indoor and personal air concentrations of benzene in excess of the RfC in the literature reviewed in Chapter 3 of the RIA.

2.1.3 Other MSATs

What Commenters Said:

NESCAUM stated that it believes that other MSATs of concern in the Northeast are formaldehyde and diesel particulate matter which would also be numbered among national priorities if the risk assessment handled them properly.

NESCAUM commented that it does not support EPA's use of the URF (unit risk factor) for formaldehyde based on dose-response data from the Chemical Industry Institute of Technology Centers for Health Research (CIIT). The commenter asserted that it believes that EPA inappropriately used a cancer potency factor for formaldehyde that may substantially underestimate cancer risks. The commenter noted that EPA stated that it did not rely on the dose-response value in the Integrated Risk Information System (IRIS) because the science is not current; however, the commenter stated that it believes that by using the CIIT formaldehyde dose-response data to develop a revised cancer URF EPA has not followed the procedures set forth in the Residual Risk Report to Congress for establishing peer-reviewed consensus dose-response information. The commenter noted that the Residual Risk Report to Congress was prepared as mandated by Section 112(f) of the Clean Air Act to provide Congress and the public with a road map of the methods to be used by EPA to assess the risk associated with emissions of HAPs which remained after the implementation of the NESHAP program. The commenter stated that it believes that one of the essential considerations in risk assessment is the evaluation of the source of the data and whether it has been peer reviewed, and it cited the Residual Risk Report to Congress (p.56) to support its comments. NESCAUM summarized EPA's process for developing IRIS assessments, and asserted that EPA did not follow this process in developing the newer URF based on CIIT's analysis. The commenter stated that it believes that the use of the CIIT formaldehyde data in the analyses for this rule undermines the IRIS review process. The NYDEC also commented on the non-peer reviewed cancer risk value for formaldehyde.

Letters:
NESCAUM OAR-2005-0036-0993
New York State Department of Environmental Conservation OAR-2005-0036-0722

Our Response:

The EPA agrees that diesel particulate matter (and diesel exhaust organic gases) are among the mobile source air toxics that pose the greatest risk to human health, and states this in the preamble and RIA.

The EPA disagrees with comments from NESCAUM and NYDEC that the use of the CIIT unit risk estimate for formaldehyde is inappropriate. EPA believes that we should use the best available sources of health effects information for risk or hazard determinations. As we have stated previously, we do not rely exclusively on IRIS values. Rather, we consider all credible and readily available assessments, as noted in the Residual Risk Report to Congress. For air toxics risk assessments, we identify pertinent toxicity or dose-response values using a default hierarchy of sources, with IRIS being the preferred source, to assist us in identifying the most scientifically appropriate benchmarks for our analyses and decisions. The IRIS process contains a peer-review process, and the resulting values represent EPA consensus. When adequate toxicity information is not available in IRIS, we consult other sources in a default hierarchy that recognizes the desirability of review and consistency with EPA risk assessment guidelines. This process ensures that we have consistent and scientifically sound assessments. Furthermore, where the IRIS assessment is relatively dated and newer peer-reviewed assessments are available, we will consider the full set of such assessments in selecting the basis for the risk assessment. In the case of formaldehyde, we have determined that the cancer potency derived using the approach developed by CIIT, which has been peer reviewed by an external review panel sponsored by EPA and the Canadian government, represents an appropriate alternative to EPA's current IRIS URE for formaldehyde. Therefore, this potency represents the best available peer-reviewed science at this time. A comprehensive reassessment of cancer risk has been initiated by EPA's IRIS program. This reassessment will include modeling analyses and endpoints (e.g., lymphohematopoietic cancer) not considered in the CIIT assessment. The revised IRIS assessment will represent the best available peer-reviewed science at the time of its completion.

What Commenters Said:

The Regional Air Pollution Control Agency (RAPCA), the NYDEC, and STAPPA/ALAPCO urged U.S. EPA to investigate the impact of MSAT metals, and the possibility of their control, as part of the rulemaking process. RAPCA and STAPPA/ALAPCO urged EPA to consider the recent Health Effects Institute Research Report. NYDEC criticized the rule's treatment of metals, and urged EPA to extend a ban on manganese to all fuel.

Letters:
Regional Air Pollution Control Agency (RAPCA) OAR-2005-0036-0771
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
STAPPA/ALAPCO OAR-2005-0036-0836

Our Response:

EPA is reviewing the results of the recent HEI (Health Effects Institute) study[26] and other studies aimed at identifying the emissions of metals from mobile sources. EPA has research projects underway and is analyzing other data to improve the understanding of metal emissions

from mobile sources. This information, as well as that provided by HEI and others will be used to inform any potential future action. EPA is also examining available data on tire and brake wear emissions.

Regarding manganese use as a fuel additive, EPA is currently generating the information needed to update an assessment of the potential human health risks related to having manganese in the national fuel supply. Clean Air Act section 211(c) provides the primary mechanism by which EPA would take actions necessary to minimize exposure to emissions of metals or other additives to diesel and gasoline.

What Commenters Said:

The NYDEC stated that it believes that other mobile source air toxics may be significantly contributing to the cancer risk (formaldehyde, naphthalene and other polycyclic aromatic hydrocarbon compounds) but the NATA assessment uses no cancer risk estimate for naphthalene and has not properly characterized the risk from polycyclic aromatic hydrocarbons (PAHs) emitted from mobile sources. Furthermore, the commenter argues that nitro-PAHs are among the most potent carcinogens known, yet are only briefly discussed in the rule. The commenter also presents a review of science and health concerns regarding nitro-PAHs, arguing that they can be formed in the engine or as a result of aftertreatment.

Letters:
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722

Our Response:

The analyses done to support this rule do quantify potential cancer risks from naphthalene, using a dose-response value developed by California EPA. EPA's risk assessment for this pollutant is currently in progress. NYDEC provided no specific comments when it asserted that EPA had not properly characterized risk from PAHs. In addition, EPA quantifies the risks associated with fifteen other PAH compounds by grouping the PAH compounds into toxicity categories using risk values primarily from California EPA. For these risk characterizations, refer to RIA Chapter 3, section 3.2.1.2. EPA is also concerned about potential adverse health effects from PAHs and nitro-PAHs, and regulations addressing emissions from highway diesel vehicles, nonroad diesel equipment, locomotives, and commercial marine vessels will substantially reduce these emissions, particularly given the high efficiency of noble metal-based wall-flow particle traps to effectively oxidize organic species including PAHs and nitro-PAHs. EPA is also participating in research to better characterize emissions of PAHs and nitro-PAHs from diesel engines. As this work progresses, EPA will be in a better position to evaluate the need for further action.

What Commenters Said:

The American Chemistry Council Olefins Panel commented that it believes potential health risks from exposures to low levels of 1,3-butadiene in ambient air are far below what is

indicated in EPA's 2002 health assessment document, and in the Office of Transportation and Air Quality's (OTAQ) proposed rule. The commenter provided a list of studies and a critique of EPA's 2002 health assessment document for 1,3-butadiene. The commenter asserted that it believes low levels of 1,3-butadiene typically found in ambient air in fact do not present significant health risks. The basis for this conclusion is that:

1) EPA based its unit risk estimate on an upper bound estimate of the point of departure (PoD) rather than on a maximum likelihood estimate.
2) EPA multiplied its cancer potency estimate by a nonstandard adjustment factor of two.
3) EPA's dose-response assessment does not account for the role of peak exposures;
4) Recent molecular epidemiology studies do not provide any evidence of cancer hazard at current workplace exposures;

Accordingly, the commenter asserted that it believes EPA's proposed rule will be more health protective than EPA has recognized. The International Institute of Synthetic Rubber Producers (IISRP) submitted comments, stating that it has reviewed and is "in full support" of the comments submitted by the American Chemistry Council Olefins Panel.

Letters:
American Chemistry Council Olefins Panel OAR-2005-0036-0823
International Institute of Synthetic Rubber Producers (IISRP) OAR-2005-0036-0807

Our Response:

EPA does not believe that its current unit risk estimate overstates potential health risks from exposure to 1,3-butadiene in the ambient air. First, EPA's use of the upper bound estimate for the PoD for the final unit risk estimate is consistent with EPA's 2005 Guidelines for Carcinogen Risk Assessment (and with the interim draft of the guidelines which was operational at the time the 1,3-butadiene assessment was finalized). This science policy established in the new Guidelines eliminates the historical inconsistency in the treatment of human and rodent data. The policy of using an upper bound estimate is not motivated by potential low-dose computational instabilities in the models applied to rodent data, as this is not even an issue under the Guidelines' two-step approach of modeling the data in the observable range to obtain a PoD and then using linear extrapolation or a non-linear approach to estimate the unit risk or a reference value for cancer. The Guidelines underwent their own external review process, and the science policies presented therein are not generally topics for which EPA seeks external comment in its chemical-specific assessments. Furthermore, EPA's risk estimates are "upper bound" because they are based on upper bound estimates from the dose-response modeling.

A commenter also questions EPA's multiplication of its cancer potency estimate by a nonstandard adjustment factor of two. EPA's use of such an adjustment factor is not unprecedented. An adjustment factor of 2 was used in EPA's vinyl chloride assessment to account for increased early-life susceptibility. In the case of 1,3-butadiene, the primary reason for the use of an adjustment factor of 2 was to account for potential risk of breast cancer in females. Females were not part of the study population in the epidemiology study which provided the basis for the cancer potency estimate, so risks for female breast cancer could not be estimated from the human data. Yet, in the rodent studies, the mammary gland was the one concordant site exhibiting 1,3-butadiene associated tumors in both mice and rats, thus there was

clearly a reason to be concerned about breast cancer risk in human females. In the external review draft, this issue was addressed qualitatively but not quantitatively, and the Science Advisory Board (SAB) recommended attempting to "quantitatively address, where possible, differences between cancer potency for the occupationally exposed and the general population", specifying females, other lifestages, and other potentially susceptible subpopulations. Because there were no chemical-specific data on early-life susceptibility and EPA's 1,3-butadiene assessment pre-dated EPA's 2005 Supplemental Guidance for Assessing Susceptibility from Early-Life Exposures to Carcinogens, which recommends the use of default age-dependent adjustment factors in the absence of chemical-specific data for carcinogens judged to operate through a mutagenic mode of action, EPA did not quantitatively address potential increased early-life susceptibility in its 1,3-butadiene risk estimates.

A commenter also argues that EPA failed to follow the SAB's recommendation that a more appropriate model for 1,3-butadiene risk would factor out the peak-exposure component. EPA did in fact consider a peak exposure analysis; however, the data on peaks were inconsistent and did not support a quantitative analysis that factored out peaks. According to the original study authors, based on their comprehensive dose-response analyses, the relationship between 1,3-butadiene peak-years and leukemia was irregular.

Finally, EPA would like to note that a recent study extended the investigation of 1,3-butadiene exposure and leukemia among synthetic rubber industry workers.[27] The results of this study strengthen the evidence for the relationship between 1,3-butadiene exposure and lymphohematopoietic cancer. This relationship was found to persist after controlling for exposure to other toxics in this work environment.

What Commenters Said:

The Alliance stated its belief that due to uncertainties in the acrolein RfC, comparisons of concentrations to the RfC are not meaningful in drawing conclusions about its public health impacts.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

We disagree with the comment that comparisons of ambient acrolein concentrations to its RfC are not meaningful. First, we do note in the RIA, when describing the hazard quotient (HQ), that:

> "[a] value of the HQ less than one indicates that the exposure is lower than the RfC and that no adverse health effects would be expected. A value of the HQ greater than one indicates that the exposure is higher than the RfC. However, because many RfCs incorporate protective assumptions in the face of uncertainty, an HQ greater than one does not necessarily suggest a likelihood of adverse effects. Furthermore, the HQ cannot be translated to a probability that adverse effects will occur and is not likely to be

proportional to risk. A HQ greater than one can best be described as indicating that a potential exists for adverse health effects."

We feel that the acrolein RfC, which is from IRIS, is sufficiently robust to allow for this level of information to be gained. Second, we note that concentrations of acrolein are such that in all years modeled, a substantial fraction of the national population is predicted to have HQs greater than one, and this holds regardless of whether the EPA RfC or California REL (Reference Exposure Level) is employed in the calculation. These factors support the identification of acrolein as an important air toxic of concern at environmental levels of exposure.

What Commenters Said:

NYDEC also commented that it is concerned that very little of the data that EPA relies upon to support its actions is verifiable. The commenter stated that it believes that rulemakings must be conducted openly, with the underlying data open to public inspection.

Letters:
New York State Department of Environmental Conservation OAR-2005-0036-0722

Our Response:

We disagree with comments that the methods and information presented in this rule are "unverifiable." All the underlying data used to support analyses in this rule are publicly available. In addition, methods and tools from the 1999 NATA, and the improvements implemented here are the best currently available for modeling exposures and risks from air toxics on a nationwide scale. Furthermore, the dose-response values used were selected using objective criteria described in the Regulatory Impact Analysis for the rule. We note that our emission inventory methods and future risk estimation techniques have been peer-reviewed and published in scholarly journals, or are "in press" and are in online prepublication versions.[28,29]

2.1.4 PM

What Commenters Said:

International Truck and Engine Corporation commented that it objects to the proposal's incomplete characterization of past findings regarding the health effects of diesel emissions. The commenter stated that EPA should refrain from making statements about the alleged health effects of "diesel exhaust" *per se*, which has no uniform or defined composition, or "diesel particulate matter and diesel exhaust organic gases," as opposed to "diesel particulate matter," which was analyzed in the 1999 National-Scale Air Toxics Assessment (NATA). The commenter stated that it believes the Agency should also clarify that the data it relied upon in reaching its prior conclusions are based solely on exposures to emissions from engines using old technology and old, high-sulfur fuel formulations. International asserted that these conclusions cannot be extended to current engines. Furthermore, the commenter stated that if the Agency intends to reiterate the 1999 NATA's "qualitative" conclusion regarding the risk of exposure to

diesel particulate matter, it should at least acknowledge the weaknesses in the underlying data, as discussed in the 2002 Health Assessment Document for Diesel Engine Exhaust. The commenter urged EPA to clarify that available evidence is inadequate to determine whether diesel emissions contribute to asthma or allergenic responses. The commenter stated that it objects to an "opaque" statement in the RIA that "[t]he RfC is not meant to say that 5 $\mu g/m^3$ provides adequate public health protection for ambient $PM_{2.5}$. In fact, there may be benefits to reducing diesel PM below 5 $\mu g/m^3$ since diesel PM is a major contributor to ambient $PM_{2.5}$." International commented that this statement unfairly targets diesel PM as a means to achieve health benefits associated with attainment of the NAAQS. International also commented that EPA should remove or clarify its statement summarizing the current Air Quality Criteria Document for Particulate Matter regarding the hypothetical link between exposure to particulate matter from gasoline and diesel engines and cancer mortality.

Letters:
International Truck and Engine Corporation (International) OAR-2005-0036-0826

Our Response:

The EPA Health Assessment Document for Diesel Engine Exhaust[30] attributes the potential carcinogenic risk from diesel emissions to whole diesel exhaust, rather than diesel PM. EPA also states the following in NATA on the potential carcinogenic risk associated with diesel exhaust:

> In this assessment, the potential risk from diesel exhaust emissions is not addressed in the same fashion that other pollutants are. This is because data are not sufficient to develop a numerical estimate of carcinogenic potency for this pollutant. However, EPA has concluded that diesel exhaust ranks with the other substances that the national-scale assessment suggests pose the greatest relative risk. First, a large number of human epidemiology studies show increased lung cancer associated with diesel exhaust. Furthermore, exposures in these epidemiology studies are in the same range as ambient exposures throughout the United States. In addition to the potential for lung cancer risk, there is a significant potential for non-cancer health effects as well, based on the contribution of diesel particulate matter to ambient levels of fine particles. Exposure to fine particles contributes to harmful respiratory and cardiovascular effects, and to premature mortality. More information on health effects associated with diesel exhaust can be found in the Health Assessment Document for Diesel Exhaust

The EPA Health Assessment Document for Diesel Engine Exhaust concludes that "long-term (chronic) inhalation exposure [to diesel exhaust] is likely to pose a lung cancer hazard to humans, as well as damage the lung in other ways depending on exposure." As stated in its Health Assessment Document, EPA concluded that available data are not sufficient to develop a confident estimate of cancer unit risk and limits EPA's ability to quantify, with confidence, the potential impact of this hazard. EPA though did develop a perspective on risk concluding "there is a reasonable potential that environmental life cancer risks from diesel exhaust may exceed 10^{-5} (one in a hundred thousand) and could be as high as 10^{-3}." EPA cannot rule out the possibility that the lower end of the risk range includes zero.

While EPA's risk assessment is based on exposure to whole diesel exhaust, in its 2000 rule EPA listed diesel particulate matter and diesel exhaust organic gases as a mobile source air toxic.[31] EPA concluded this listing was reasonable because:

1) There are several nontoxic components of diesel exhaust (e.g., water vapor, nitrogen, oxygen)
2) This listing includes the components of diesel exhaust that are likely to contribute to the cancer and noncancer hazard (with the exception of gaseous phase criteria pollutants, such as NO_x, SO_2, and CO which are subject to National Ambient Air Quality Standards)
3) The more precise listing provides Federal and State government, industry and public interest groups an ability to focus on the components of diesel exhaust that pose a potential concern for public health
4) This focus provides specific targets for emission reductions should future analysis indicate that additional controls are necessary.

In the 1999 NATA, diesel particulate matter is used as a metric for exposure to diesel particulate matter and diesel exhaust organic gases.

EPA agrees with comments that the conclusions of the diesel health assessment must be reevaluated to determine applicability to new technology engines. The EPA Health Assessment Document for Diesel Engine Exhaust states that "while EPA believes that the assessment's conclusions apply to the general use of diesel engine today, as cleaner diesel engines replace a substantial number of existing engines, the general applicability of the conclusions in this health assessment document will need to be revaluated." Language providing this clarification has been added to the Regulatory Impact Analysis. EPA and other sponsors have funded a Health Effects Institute program (Advanced Collaborative Emission Study) to characterize emissions (with the emphasis on unregulated emissions) and health effects of engines designed to meet the 2007 and 2010 standards.

In response to the comment that EPA discuss weaknesses in underlying data which form the basis of our conclusion that diesel exhaust is one of the pollutants that poses the greatest risk to human health, we would like to point out that limitations of the data are discussed in EPA's Health Assessment for Diesel exhaust, which is cited in the RIA. Readers can refer to that, but since this rule is not regulating diesel PM, such a discussion is not warranted here.

In addition, one comment above recommended that EPA remove the statement that says there may be benefits to reducing diesel PM below 5 µg/m3 since diesel PM is a major contributor to ambient $PM_{2.5}$, because it unfairly singles out diesel PM. EPA – in its recent rulemaking on $PM_{2.5}$ and also in prior rulemaking directly applicable to mobile sources – discusses and quantifies the general health benefits for reducing PM. Such benefits accrue from reduction of diesel PM as well as any other PM. The EPA Health Assessment Document for Diesel Engine Exhaust has a discussion of diesel PM and ambient PM as related to the NAAQS.

The EPA Health Assessment Document for Diesel Engine Exhaust also states that "evidence is emerging that diesel exhaust exacerbates existing allergies and asthma symptoms." These studies are discussed in the EPA Health Assessment Document for Diesel Engine Exhaust.

EPA disagrees with the comments that we should remove or clarify the statement from the PM National Ambient Air Quality Standard (NAAQS) that diesel PM and gasoline PM are important hypothesized contributors to cancer mortality associated with $PM_{2.5}$. The specific text being referred to is taken from EPA's PM Criteria Document, page 8-318:

> With regard to specific ambient fine particle constituents that may significantly contribute to the observed ambient PM-related increases in lung cancer incidence and mortality, PM components of gasoline and diesel engine exhaust represent one class of hypothesized likely important contributors. Such mobile source PM typically comprises a noticeable fraction of ambient fine particles in many urban areas, having been estimated to comprise from ~5 to 30% of ambient $PM_{2.5}$ in some U.S. urban areas (see Chapter 3). These mobile sources are reasonable candidates as contributors to ambient PM-lung cancer risks, given their being sources of known cancer-causing agents (e.g., PAHs), as are other coal-combustion and/or woodburning emission sources (at least during some seasons).[32]

What Commenters Said:

The WDNR commented that EPA should pursue research into better understanding the quantitative relationship between exposure to diesel emissions and adverse health outcomes such as cancer. The commenter asserted that diesel engine emissions may play a significant role in adverse health outcomes in communities. The WDNR suggested that EPA propose a draft cancer unit risk estimate for diesel exhaust as soon as practicable.

NESCAUM stated that it believes that the risk assessment does not acknowledge the importance of diesel particulate matter.

STAPPA and ALAPCO asserted that "diesel PM accounts for 70 percent of the risk from all air toxics," and expressed disappointment that EPA did not address diesel PM in its proposal. They comment that EPA should acknowledge the impact of diesel PM on public health and "at a minimum describe what the agency has done to reduce diesel PM and identify additional measures that can be pursued in the future."

Letters:
NESCAUM OAR-2005-0036-0993
STAPPA/ALAPCO OAR-2005-0036-0836
Wisconsin Department of Natural Resources (WDNR) OAR-2005-0036-0828

Our Response:

We agree with comments that diesel engines are important contributors to public health concerns over air toxics. We note that EPA's *Health Assessment Document for Diesel Engine Emissions* (HAD) and RIA Chapter 3 provide a comprehensive overview of health studies of diesel exhaust and traffic more generally. We agree that it would be useful if EPA were able to propose a cancer unit risk estimate for diesel exhaust. However, for several reasons outlined in the HAD and in other documents, we do not at present feel that available occupational

epidemiology or toxicology provide sufficient basis for quantification of cancer risk related to diesel exhaust or its constituents.[33,34]

While the modeling analysis in this rule does not specifically model diesel PM or diesel exhaust organic gases, EPA has made clear in a number of past and pending rules that it considers reduction of PM and other pollutants in diesel exhaust to be of high priority. The statutory requirements for this rule specifically call for achieving the greatest emission reductions achievable. In the case of diesel PM, EPA's recent regulations introducing ultra-low sulfur diesel (ULSD) and strict limits on PM emissions from on-highway and non-road diesel engines constitute the greatest emission reductions currently achievable, and no further emission reductions from the diesel engines covered by these rules are considered feasible at this time. We note that EPA has recently proposed strict emission limits on emissions from diesel engines powering locomotives and marine vessels. We also note that EPA has numerous voluntary programs dedicated to reducing air pollution from diesel vehicles, including the National Clean Diesel Campaign (www.epa.gov/cleandiesel) and the Smartway Transport Partnership (www.epa.gov/smartway). The impact of other EPA actions are discussed in Section IV of the preamble and Chapter 2 of the Regulatory Impact Analysis.

What Commenters Said:

The NJDEP cited recent research from California indicating that mobile sources may be the largest source of ultrafine particles, and that these particles may have greater potential for adverse health impacts than $PM_{2.5}$ and PM_{10}. The commenter asserted that currently employed emission control strategies to reduce particle mass may not result in corresponding reductions in ultrafine particle count. The commenter further stated that it believes that EPA should take steps to reduce particle counts when considering emission control strategies and emission standards aimed at reducing particle mass. It further called for greater research into ultrafine particle emissions and control measures.

Sensors, Inc. cited information indicating that ultrafine particles are more important than "just the PM measurements."

Letters:
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829
Sensors, Inc. (SEMTECH) OAR-2005-0036-0958

Our Response:

We agree that mobile sources are a major contributor to ambient concentrations of ultrafine particles. Work cited in EPA's heavy-duty diesel rulemaking (66 FR 5048, January 18, 2001) shows that the EPA diesel PM standards will effectively control ultrafine particles by a factor of 10 by oxidizing the volatile organic compound precursors and by an additional factor of 10 by reducing diesel fuel sulfur. Work since then continues to show that ultrafine PM is effectively controlled by the EPA diesel PM standards, particularly when viewed across

representative driving cycles.[35] The recent rulemaking for the $PM_{2.5}$ National Ambient Air Quality Standard did not set a PM standard for ultrafine PM but did tighten the 24-hour $PM_{2.5}$ standard and reaffirmed the annual $PM_{2.5}$ standard and somewhat tightened the criteria for spatial averaging. EPA is actively engaged in emissions characterization work for both diesel and gasoline PM to make sure EPA has the latest information on exhaust PM including ultrafine PM. This information will allow EPA to determine what additional PM controls are needed and move to implement them.

What Commenters Said:

NJDEP and STAPPA/ALAPCO submitted comments that EPA needs to follow through on its observation in the proposal that "gasoline exhaust is a significant source of particulate matter, contributing to the health effects observed for ambient PM," and to continue its work "to improve the understanding of PM emissions from gasoline engines, including the potential range of emissions and factors that influence emissions."

The Regional Air Pollution Control Agency (RAPCA) commented that it recommends expanded or more stringent requirements in advancing scientific understanding of PM emissions from gasoline engines.

Letters:
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829
Regional Air Pollution Control Agency (RAPCA) OAR-2005-0036-0771
STAPPA/ALAPCO OAR-2005-0036-0836

Our Response:

We agree with comments that EPA needs to follow through on concerns regarding the contribution of gasoline exhaust to particulate matter. We note that the current rule is expected to result in substantial cold temperature emission reductions of both direct and secondary PM from new gasoline vehicles. We also note that we continue to lead a multi-sponsor research program dedicated to characterizing PM emissions from a representative sample of light-duty gasoline vehicles.

2.1.5 General Issues

What Commenters Said:

NESCAUM commented that it believes that the risk assessment should not use national average exposures to represent the risk of exposure to MSAT (RIA p.3-46). The commenter stated that it believes that the risk reduction estimated in Section 3.2 of the proposal RIA (from 2.3×10^{-5} to 1.7×10^{-5}) is essentially insignificant, and that both risks round to 2×10^{-5}.

Letters:
NESCAUM OAR-2005-0036-0993

Our Response:

We disagree that national average exposures do not provide useful information. EPA uses a national average exposure to represent the impacts of air toxics on a national basis only in reporting summary statistics and trends over time in air quality, exposure, and risk. However, other statistical summaries feature prominently in our analysis. Throughout Section 3.2 of the RIA, we make use of county-level maps in multiple years to express the effects of the rule in different parts of the nation. Further, we have also calculated the population fractions exposed to different levels of risk. We note that underlying the exposure model HAPEM6 is an assumption of geographically-defined differences in ambient concentrations resulting from proximity to major roads.

Furthermore, we note that Table 3.2-15 of the RIA presents information indicating that the greatest reductions in exposure and risk accruing from this rule occur among individuals experiencing the highest levels of risk.

We disagree that rounding risk reductions eliminates their importance. Modeling done to support the final rule shows a 26% reduction in total cancer risk from MSATs from all sources between 1999 and 2030, with controls in place, and a 40% reduction in benzene from all sources.

What Commenters Said:

NESCAUM commented that it believes that EPA has not adequately considered in this proposed regulation the episodic, high-end exposures to respiratory irritants emitted from mobile sources or the cumulative impact of exposure to multiple respiratory irritants such as acetaldehyde, acrolein, formaldehyde, and diesel particulate.

Letters:
NESCAUM OAR-2005-0036-0993

Our Response:

EPA is currently limited in its ability to assess health impacts of episodic, high-end exposures to some pollutants, because of the lack of dose-response assessments for acute exposures to air toxics. Thus, EPA is developing acute reference concentrations for compounds that will be used to identify areas of potential public health risk from episodic, high exposures. The commenter is incorrect that we have not considered the cumulative impact of multiple respiratory irritants. We include an assessment of the cumulative respiratory hazard index in this rulemaking (see RIA Section 3.2.1.2.2. Exposure and Risk Trends for Air Toxics). We also note that the motor vehicle emission controls in this rule will also reduce primary emissions and secondary formation of aldehydes. As noted below, EPA's diesel emission rules for onroad and nonroad engines have made substantial contributions to reducing future diesel PM emissions.

What Commenters Said:

NYDEC claimed that while risk estimates in NATA and tools like it are based on toxicity estimates for individual chemical compounds, that the synergistic effects of the "complex mixture of MSATs" are unknown. It asserted that exposures to mixtures of MSATs may result in "a greater risk" (greater than additive toxicity), emphasizing that sensitive subpopulations such as children may be of particular concern, particularly when they live or attend school near roadways.

Letters:
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0772

Our response:

We agree that the synergistic effects (i.e., greater than additive effects) of the "complex mixture of MSATs" are not well known. We also note that antagonistic effects (i.e. less than additive) of mixture toxicities are also poorly understood. We note that we base our health conclusions as to the effects of individual MSATs on information in EPA's IRIS, and other sources where applicable. We consider toxicity of mixtures to be an area of long-term interest to EPA. We also agree that subpopulations such as children may have differential susceptibility to MSATs, both singly and in combination. Lastly, we note that the exposures of those living or otherwise spending significant quantities of time near major roadways may be elevated. Chapter 3 of the RIA discusses these concerns in greater detail.

What Commenters Said:

The NJDEP and NESCAUM commented that EPA should better assess the risks to children. This comment is in response to EPA's Supplemental Guidance for Assessing Early-Life Exposure to Carcinogens, issued by the National Center for Environmental Assessment.

Letters:
New Jersey Department of Environmental Protection (NJDEP) OAR-2005-0036-0829

Our Response:

Regarding the need to better assess health risks in children, in response to EPA's recent Supplemental Guidance for Assessing Early Life Exposure to Carcinogens,[36] EPA has not yet determined which pollutants meet the criteria for making adjustments to risks in order to better reflect risks in children. This will be done as part of the IRIS process.

What Commenters Said:

The NYDEC commented that frequently in this rulemaking, EPA claims that additional regulation cannot be undertaken because the Agency lacks sufficient or appropriate data. It asserted, however, EPA has not made sufficient efforts to obtain data. Aside from EPA's own

research, NYDEC claimed that EPA has not availed itself of a number of resources, such as the Health Effects Institute (HEI), Coordinating Research Council (CRC), and states, municipalities and their associations. EPA has also not utilized information that is (or should be) available to the Agency through reporting under Sections 202(a)(4) and 206(a)(3) of the Clean Air Act.

Letters:
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0772

Our Response:

We disagree with comments that EPA has not made sufficient efforts to obtain data relevant to this rulemaking. As noted in section I.B of the preamble of the proposal for this rule, EPA has devoted substantial resources to the Technical Analysis Plan to which we committed under the 2001 rule. Second, Chapter 3 of the RIA presents a comprehensive review of scholarly exposure and health studies of "near roadway exposure." Third, we have incorporated many of the findings of these studies into our analysis tools, including the exposure model HAPEM6. Fourth, since the 2001 rule, EPA staff (as well as others) have published a number of articles in scholarly journals that on many subjects including emissions characterization and exposure projects reflect our efforts to better characterize air pollution gradients near major roadways. We note that in performing this work, we worked closely with numerous states and metropolitan planning organizations in several regions, or obtained local transportation data directly from state or local governments. Fourth, we note that EPA's Office of Research and Development has undertaken a major initiative related to exposures occurring near roadways. Included in this effort:

- Analysis of near-roadway epidemiology studies – EPA and external researchers will assess consistencies and inconsistencies in near road epidemiological study results, including the metrics used to assign exposures for near road populations. A number of the key epidemiological studies will be re-analyzed using common exposure metrics to better estimate potential risks for populations living near roads. This work is being conducted within EPA's National Health and Environmental Effects Research Laboratory (NHEERL).
- Monitoring studies of near-roadway pollution gradients – EPA is leading a consortium of organizations, including the Federal Highway Administration, to conduct near road monitoring assessments to better evaluate the relationship of traffic operating characteristics with near road air pollution. Studies will be conducted in a minimum of three cities in the U.S. using consistent monitoring methods to assess potential geographic influences on near road air quality. This work is being led by of EPA's National Risk Management Research Laboratory (NRMRL).
- Evaluation of existing emissions and dispersion models – Data from the field studies will be used to evaluate the response and relationship of existing emissions and dispersion models. In addition, EPA researchers will be conducting wind tunnel experiments of several common roadway configurations to determine how pollutants disperse under these conditions and how existing dispersion models handle these configurations. The roadway configurations include at-grade roadways, depressed roads, elevated roads, and at-grade roads with vegetation or noise barriers. This work is being run through the National

Oceanic and Atmospheric Administration's Air Research Laboratory and EPA's National Exposure Research Laboratory (NERL).

- Characterization of infiltration of pollutants into schools – As part of the research consortium investigating near road concentration gradients, an assessment is being conducted on how these emissions infiltrate into the indoor air of schools located near major roads. This project will assess how the pollutants infiltrate, and what mitigation techniques are available to improve indoor air quality in these schools. This research is being lead by NRMRL.
- Assessment of mitigation measures – As described, wind tunnel tests will be conducted to determine if vegetation and/or noise barriers may mitigate air pollution levels in close proximity to roadways. In addition, the effects of noise barriers and vegetation will attempt to be analyzed in the field concentration gradient measurement studies.
- Health effects of near-roadway emissions – As described, re-analyses of previous epidemiological studies will provide enhanced information on the effects of traffic emissions on public health for near road populations. EPA researchers will also be determining the toxicity of PM samples collected near and far from major roadways as part of the concentration gradient measurements. This work is being conducted between NHEERL and NERL. EPA is also supporting health effects studies on traffic emissions as part of the new PM Center grants through the National Center for Environmental Research (NCER).

We also note that EPA is an active sponsor of HEI, and works closely with HEI in their research. HEI has conducted a large number of projects related to mobile source emissions (including PM, benzene, 1,3-butadiene, NO_2, and other compounds) that have been widely accepted in the scientific community and used extensively by EPA in its regulatory programs. Also, for a number of years, the automobile manufacturers submitted annual reports on their emissions characterization work related to Section 202(a)(4). This and other emissions characterization work, which taken together is actually very extensive, including that conducted by EPA and the CRC, have been used in structuring the emission models for air toxics, MOBILE 6.2.

We also note our close involvement with CRC in co-sponsoring recent joint research, including CRC's E-55/59 emissions study of heavy-duty diesel trucks and the EPA-led emission study of light duty gasoline vehicles in the Kansas City Metropolitan Area, a multi-million dollar program testing 500 gasoline vehicles for PM and other emissions, including detailed speciation of PM and VOC emissions in a subsample of vehicles.

All of these emissions characterization and health projects conducted in the past several years means that there actually was sufficient high caliber data which EPA could use in making decisions about its mobile source air toxics regulations.

What Commenters Said:

The Alliance stated that MSAT inventories are decreasing with concurrent ambient reductions. The commenter presents an analysis of air toxic emissions across model years and concentrations in several urban areas. The commenter stated two major points: 1. Air toxic

emissions are decreasing in conjunction with cleaner vehicle technology; and 2. Ambient air toxic concentrations generally fall below the EPA defined reference concentrations (RfC). To support its comments, the commenter showed figures which it stated shows reductions in various MSAT emission factors (mg/mile), based on the model year of vehicles ranging from the 1970's to 2005. The Alliance further commented that it believes that MSAT reductions will occur after 2005 due to the Tier 2 standards phase-in continuing through 2009 Model Year. The commenter presented an analysis of toxic emission factors from the calendar year 2004 light-duty gasoline vehicle fleet in comparison with a fully phased-in Tier 2 fleet in calendar year 2040, which resulted in a reduction of greater than 70% for benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein. The commenter noted that its MOBILE6.2 analysis does not factor in I/M benefits or changes in gasoline benzene content. The commenter stated that it believes that greater reductions in MSATs may be evident if more representative fleet characteristics are modeled. It also presented charts depicting trends in ambient toxics over time, showing downward trends in concentrations of individual air toxics over time.

The commenter also presented analyses of trends in ambient concentrations from all monitoring data across the U.S. for several mobile source air toxics. They present information to indicate that between 1994 and 2004, ambient concentrations of benzene and 1,3-butadiene underwent significant decline. They also state that although a general trend in concentrations of formaldehyde and acetaldehyde is present, a "clear trend" could not be detected due to atmospheric chemistry and the contribution of biogenic sources to direct and secondary aldehyde formation. The do not present analyses of acrolein data because "EPA contractors concluded the acrolein data are not reliable." They note that with the exception of acrolein, ambient concentrations of ambient MSATs are below the relevant reference concentration (RfC).

The commenter also notes that a fact sheet accompanying EPA's National Air Toxics Assessment (NATA) indicated that the risk of contracting cancer of any type is one in three, while Table 3.2-6 of the proposal's RIA indicates that for 1999, the risk of cancer from on-road vehicles is estimated at 3 in 100,000. They also note that by 2020, existing control programs will make it so that only benzene exceeds the one in one million level of risk.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

We agree with comments that air toxic emission rates and ambient concentrations of most air toxics underwent significant declines in the 1990s, and we discuss these data in the rule. Also, EPA's future year inventories account for phase-in of Tier 2 vehicles, low sulfur standards and other changes in fuels, inspection and maintenance (IM) benefits, and other factors. We also agree that for most air toxics, ambient concentrations are well below the RfC, indicating that noncancer health effects from most individual air toxics are highly unlikely at ambient concentrations.

We note that while most MSATs have ambient concentrations below their respective reference concentrations, in the RIA we consider the totality of exposure from multiple

pathways. We note that among the studies discussed in Chapter 3 of the RIA, a number of studies report concentrations of benzene in indoor air and other locations that are in excess of the RfC for benzene, generally in studies examining the influence of attached garages on benzene in air. We expect the standards in this rule will substantially reduce exposures through this pathway, as well through reducing concentrations in ambient air.

We note that the risk of dying of any cancer over a lifetime results from multiple factors, including genetic, behavioral, and environmental factors, and that section 202(l)(2) is not a risk-based standard. The standards in this rule make substantial reductions in the emissions of mobile source air toxics, and we expect future cancer risks to decline as a result.

What Commenters Said:

Sensors, Inc. cited a 2006 presentation by Jean-Paul Morin of the French National Institute of Health for Health and Medical Research, in which high emission ratios of nitrogen dioxide to total oxides of nitrogen (NO_2/NOx) were associated with increased oxidative stress. The commenter urged EPA to begin examining this issue in greater detail.

Letters:
Sensors, Inc. (SEMTECH) OAR-2005-0036-0958

Our Response:

We agree with the comment regarding the importance of examining the public health consequences of the fraction of NOx emitted as NO_2. At present, EPA is in process of revising its air quality criteria document for NO_2 to account for recent studies of the species.

2.2 National-Scale Modeling

The following comments refer to the modeling approach employed in this rule for quantifying air quality, exposure, and risk changes associated with the rule.

What Commenters Said:

The NYDEC asserted that it believes that while limited, the 1999 National Air Toxics Assessment provided data that is useful in identifying air toxics of greatest concern, and the use of similar tools in this rule is important.

API commented that the air quality modeling performed for this rule is not sufficiently robust for regulatory purposes. The commenter cited text from the National Air Toxics Assessment, indicating that the "NATA assessment should not be used as the basis for developing risk assessment plans or regulations to control specific sources or pollutants." As EPA's national-scale modeling employs tools similar to those in NATA, API asserted that the limitations of the 1999 NATA are applicable for this rule. API asserted that the 1999 NATA did not undergo independent peer review. API cited an evaluation of the 1996 NATA Assessment

System for Population Exposure Nationwide (ASPEN) modeling and claimed that the best correlation (Pearson's r) between modeled and monitored results found was 0.57, applied to the Northeast. It notes the evaluation found lower correlations in other regions. On these bases, API asserted that the ASPEN is not sufficiently robust for use in regulation.

API and Marathon Petroleum Company LLC (MPC) commented that the proposal relies on 1999 NATA data, and that this source is out of date. The commenters assert that the 1999 NATA does not include the emission reduction benefits of EPA regulations that are already in place, including Phase 2 reformulated gasoline (RFG), the 2001 MSAT rule, and fuel desulfurization. API and MPC comment that the NATA should be updated with current data prior to any regulation.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
Marathon Petroleum Company (MPC) OAR-2005-0036-0946
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0772

Our Response:

We agree with NYDEC that the analytical approach employed in the 1999 NATA provides useful information for identifying toxics of greatest concern, and that the use of NATA-like tools in this rule provide important information

While the caveats that apply to the 1999 NATA do state that it should not be used as the basis for risk assessment plans or regulations to control specific sources or pollutants, the national-scale assessment results presented in the preamble and RIA of this rule are used only to provide a perspective on risk, and were not used as the basis for any regulatory decision. We would also like to note that, in this rule, we employed ASPEN and HAPEM6 to future years with appropriate emission inventories for each year. This more extensive analysis provides more information than a single year "snapshot," such as NATA. We note that the methodologies employed for this rule underwent peer review in a scholarly journal and are in press as of the publication of this rule.[37] Finally, we note that comparisons of modeled air toxic concentrations to monitor data show good agreement for benzene and acetaldehyde, but suggest that ASPEN could be underpredicting for other air toxics. These comparisons are discussed in Section 3.2.1.3 of the RIA.

We disagree with the comment that NATA 1999's lack of accounting for more recent regulations and emission changes makes the national scale modeling results in this rule outdated. As described in the RIA, we modeled emissions, air quality, exposure and risk for 1999 and a range of future years, accounting for the impacts of current and planned future programs.

What Commenters Said:

NESCAUM noted that as part of its March 2001 mobile source air toxics rulemaking, EPA identified nonroad engine emission factors as a critical area of research and committed to

data collection as part of a technical analysis plan. NESCAUM noted that EPA has since completed a number of nonroad gasoline engine emission test programs, and that these data have not been fully analyzed and incorporated into EPA's emission inventory tools. The commenter exhorted EPA to update NONROAD and NMIM to incorporate these data, and complete any needed emission testing programs and data analyses.

Letters:
NESCAUM OAR-2005-0036-0993

Our Response:

We agree with the comment on the need to incorporate emission test program data from nonroad engines into the NONROAD and NMIM (National Mobile Inventory Model) models. Section 2.3 of the Regulatory Impact Analysis discusses recent nonroad emission test programs and plans to integrate data from these programs into the NMIM model.

EPA remains committed to increasing the available emission data from nonroad engines through on-going efforts to fund testing and to leverage testing for engine emission data (criteria pollutant and MSAT) in both gasoline and diesel nonroad equipment types. In 2006, EPA initiated a nonroad pilot program to survey the population, activity, and emissions of construction-type engines with on-board testing equipment. We continue to work with industry sponsored trade and research groups, like Manufacturers of Emission Controls Association, to test the effect of various emission control devices on engines used in several classes of nonroad equipment. In-house, EPA has been testing the safety and level of emission control from various configurations of small SI engine (lawn and garden, primarily) aftertreatment control equipment. When appropriate, we will use available emission testing data to update our emission models.

2.3 Near-Road, Attached Garages, and Other Microenvironmental Exposure

2.3.1 Adequacy of Air Quality, Exposure and Risk Analysis

The following set of comments refer to methods EPA undertook in its analysis of air quality, exposure, and risk from air toxics. The comments address the adequacy of EPA's analytical approach, and highlight information regarding concentration patterns near major roadways or in vehicles.

What Commenters Said:

The NJDEP and NESCAUM noted that the primary analysis in the RIA accompanying this rule is based on a national-scale dispersion modeling study, which may be sufficient to establish that mobile source air toxics are a serious national problem, but fails to address higher exposures experienced by people living in urban centers, in homes with attached garages, and the elevated exposures of people traveling in their cars, and higher exposures experienced by persons living within 200 meters of roadways. NJDEP cited a recent publication from the RIOPA study where concentrations of some gaseous air toxics were elevated near major roadways. The

commenters stated that they believe that EPA should better assess the impact on people near roadways. The commenter stated that it believes that, in order to protect the millions of people who live in our most densely populated urban areas, EPA should better assess the impact on people near roadways.

NESCAUM expressed concerns with results from recent studies which reveal exposures that greatly exceed ambient monitored levels of mobile source air toxics in microenvironments in the Northeast. The commenter cited the following conclusions from recent studies of microenvironment exposure levels in the Northeast: 1) levels of benzene found in pedestrian and bicyclist zones were approximately 10 times higher than typical ambient levels due to vehicle exhaust; 2) $PM_{2.5}$ levels at commuter train stations in Boston were found to peak at 1,000 micrograms per cubic meter - 50 to 100 times higher than ambient levels; 3) construction workers operating post-1996 model year nonroad equipment were exposed to 8-hour $PM_{2.5}$ averages as high as 600 micrograms per cubic meter; and, 4) an additional study outside of the region found that vehicle drivers are exposed to PM and benzene levels that are 10 to 16 times higher than ambient levels. The commenter stated that it believes that, in light of the public health threat posed by mobile source air toxics, a more comprehensive evaluation of toxics risk and additional control measures is needed from EPA.

NESCAUM commented that since the publication of the MSAT1 rule, EPA has conducted personal exposure and ambient air monitoring studies in homes, schools, near roadways, vehicles and inside homes with attached garages. The commenter also noted that EPA has also worked to improve existing models, such as the HAPEM. However, despite this initial work, the commenter stated that it believes that the proposed rule does not fully address the much higher exposures experienced by people living in homes with attached garages, or by people traveling in their cars. The commenter further stated that it believes that the higher exposures experienced by people living within 200 meters of roadways have not been comprehensively addressed. The commenter noted that these issues are discussed in the RIA, but stated that it believes that the full burden on the American people has not yet been quantified. The commenter cited that HAPEM6 as an example, which incorporates near-roadway exposures, was only extended to three states, Georgia, Colorado and New York. NESCAUM commented that, since an improved version of HAPEM6 has been developed, it encourages EPA to implement the model nationwide.

Environmental Defense, NRDC, U.S. PIRG, and ALA commented that because benzene is emitted primarily by mobile sources, concentrations are elevated near major roadways, which they commented that they believe is a significant health consideration. The commenters cited a statistic that in 2003 12.6 percent of U.S. housing units were within 300 feet of a major transportation source, and further noted that EPA has cited dozens of studies showing increased benzene exposure for people who spend time on or near major roadways. The commenters noted that these groups include regular commuters and highway patrol officers, people who live near major roadways, and children who go to school near major traffic sources. Additionally, the commenters noted that people who have garages attached to their homes are exposed to elevated concentrations of benzene and other air toxics.

The Alliance commented that the prevalence of "hot spots" of mobile source air toxics in urban areas is unclear. They cited the Multiple Air Toxics Exposure Study (MATES-II) study in California's South Coast Air Basin. They noted that the study did not report differences in mass concentrations of air toxics between microscale monitors, including those located in close proximity of freeways, and fixed-site monitors. They comment that MATES-II should be viewed as one of the most complete studies examining spatial variation in ambient concentration of air toxics.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
New Jersey Department of Environmental Protection (NJDEP) OAR-2005-0036-0829
NESCAUM OAR-2005-0036-0993

Our Response:

We agree with comments that concentrations of benzene and other pollutants are elevated near major roadways. We also agree that exposures to these compounds may be elevated for people who spend considerable time traveling on or working or living near major roadways, or in proximity of other mobile sources.

We agree with the comments that HAPEM6 should be extended nationally. For this final rule, we ran HAPEM6 for the entire nation and have based subsequent risk calculations on the exposure modeling results.

We disagree with comments that our analyses fail to address exposures experienced by people living in urban centers, traveling in their cars, or living near major roadways. First, air quality, exposures, and risks in urban areas are modeled with an air quality model, ASPEN, which employs emission inputs at the census tract level of resolution. We believe that this level of detail provides sufficient representation of emission trends and resulting air quality in urban areas. Second, the HAPEM6 exposure model, and its predecessor HAPEM5, explicitly include microenvironments within vehicles, and have new approaches for calculating the time and concentration that people experience while commuting. Third, NJDEP highlighted the study in which outdoor Relationship among Indoor, Outdoor, and Personal Air (RIOPA) concentration data were shown to be elevated near major roadways. We would like to point out that the Office of Transportation and Air Quality directly funded the development of this study's geographic component, the products of which are cited in Chapter 3 of the RIA.

We agree with the comment that EPA should better assess the impact of mobile source air toxics on people living near major roadways and other mobile source-affected microenvironments. However, we disagree that we have not been sufficiently diligent in assessing the public health impacts of this phenomenon. We believe that EPA's efforts in this field have been substantial. While all risks have not been quantified, we believe that at this point, Chapter 3 of the RIA provides as much credible information regarding the nature and magnitude of these risks as is currently possible.

We agree with the comment that the MATES-II study is a valuable source of information on spatial variability of air toxics, and acknowledge the lack of significant differences between microscale and fixed ambient site monitors in that study. Three of the 14 microscale sites at which air toxics were measured in the MATES-II study were sited to monitor mobile source toxics near roadways during a four to five week period utilizing two to three samples per week. While the study did not report elevated levels at these three microscale sites over these short monitoring periods, ambient monitoring conducted at 10 sampling sites in the South Coast Air Basin during a one-year period found concentrations of mobile source related compounds such as benzene and 1,3-butadiene were generally high throughout the South Coast Air Basin. However, taken in totality, the available scholarly literature, summarized in Chapter 3, provides unequivocal evidence that concentrations of numerous air toxics, including benzene, are elevated near major roadways.

2.3.2 Attached Garages

The comments in this section refer to the influence of residential attached (integral) garages on indoor air quality.

What Commenters Said:

The Alaska Department of Environmental Conservation (ADEC) commented that homes with attached garages predominate Alaskan housing in Anchorage and Fairbanks, noting that these homes often do not have a barrier between the garage and the living area. The commenter stated that it believes that evaporative emissions of cars and gasoline containers in the garage cause high levels of benzene to permeate a home's living area. The commenter cited evidence of high indoor benzene concentrations in Alaskan homes, noting that a 1998 from Anchorage found indoor benzene concentrations in homes with attached garages exceeding concentrations in homes without attached garages by over 60 $\mu g/m^3$. ADEC also noted that in some rural areas of Alaska, residents store fuel indoors to prevent "gelling," commenting that the portable fuel container provisions of the rule will improve indoor air quality in such homes.

The Municipality of Anchorage Department of Health and Human Services (Anchorage) noted that recent studies of homes with attached garages in Anchorage have found concentrations of benzene that are substantially higher than nationwide survey data (EPA's 1980s TEAM study) of average concentrations indicate. Anchorage also refers to results of an unpublished study that employed tracer gases to determine garage air infiltration into residential living spaces in homes with attached garages. Anchorage reports that the study found that approximately 27% of air and 90% of benzene in indoor air originated in an attached garage. They also report that study results indicate that indoor air concentrations of benzene in Anchorage are much greater than outdoor air. Anchorage also reported results of a telephone survey of householders with attached garages. From the comment: "Approximately 30% stored fuel in the garage. Though cars were parked overnight in 82% of garages, 52% contained one or more snow blowers, lawn mowers, or chainsaws. Additionally, a motorcycle, ATV or similar vehicle was parked in 23% of respondents' garages." Anchorage also cited as study from Australia in which children exposed to benzene at concentrations of 6.3 parts per billion by

volume (ppbv) were eight-fold more likely to have asthma. Anchorage noted that it has released a request for proposals for a study of asthma and indoor Volatile Organic Compounds (VOCs) in Anchorage.

ADEC commented that it believes that Alaskans may be exposed to relatively greater concentrations of benzene than residents of other areas. ADEC stated its belief that given benzene's classification as a carcinogen, benzene is an important pollutant with possible public health implications. ADEC further commented that it believes that Alaskans face "a multi-faceted problem":

- winter inversions keep pollutants in the breathing space of Alaskan residents;
- winter gasoline has higher benzene levels;
- people's homes maximize exposure to their off-gassing cars in the garage.

ADEC stated that it believes that factors leading to high benzene exposure are exacerbated by Alaska's gasoline having the highest benzene content in the nation. Lastly, ADEC cited a study of 137 Anchorage homes by the Municipality of Anchorage, in which indoor benzene concentrations averaged 70.8 μg/m3 for homes with attached garages and 8.6 μg/m3 for homes without attached garages.

Letters:

Alaska Department of Environmental Conservation, Division of Air Quality (ADEC) OAR-2005-0036-0975

Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

Our Response:

We agree with the comments that homes in Alaska may have substantially higher indoor concentrations of benzene as a result of benzene concentrations inside residential attached garages. We note that the studies provided by Anchorage and ADEC have been useful contributions to our summary and analysis of air toxics exposure data. We also note that the greatest emission benefits from this rule, in percentage, will be realized in Alaska. See Chapter 2 of the RIA for details.

2.4 Emission Reductions

What Commenters Said:

NESCAUM acknowledged that formaldehyde emissions are expected to decline but stated that it believes that additional reductions in the emissions of other MSATs are needed. NESCAUM noted that in the RIA (p.3-43) several MSATs are flagged as "significant contributors to cancer risk," including 1,3-butadiene, acetaldehyde, naphthalene and hexavalent chromium. However, the commenter stated that it believes that the proposed rule did very little to lower emissions of these significant pollutants.

Letters:

American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772

Our Response:

We disagree with comments indicating that this rule does little to lower emissions of "significant pollutants" not specifically addressed in this proposal. We note that the cold temperature gasoline emission standards will reduce all VOC-based air toxics, as well as particulate matter. Chromium is a trace contaminant in mobile source emissions, and the processes leading to its emissions are not well understood. . Although engine wear, trace contamination of fuel or oil may be likely sources, existing data do no allow an apportionment of the extent to which any one process may effect emissions. In the 1999 NATA, mobile sources contributed less than 5% of the national chromium inventory and 13.4% of personal exposure concentrations. However, the emissions data underlying the mobile source inventory are very limited. Mobile source speciation fractions for Hexavalent Chromium (Cr(VI)) are based on data obtained from utility boilers and gas turbines. Given these factors, we do not consider control of mobile source Cr(VI) to be sufficiently supported by data or feasible to control at this point.

Also, contrary to several comments, we have addressed a broad range of air toxics, although the fuel standard applies to benzene only. As noted above, the motor vehicle and portable fuel container emission standards will substantially reduce emissions of many VOC species, including air toxics.

References

3. NEW LIGHT-DUTY VEHICLE STANDARDS

What We Proposed:

The comments in this section correspond to Section VI of the Notice of Proposed Rulemaking (NPRM), and therefore deal with the proposed light-duty vehicle standards. A summary of the comments received, as well as EPA's response to those comments, is located below. For the full text of comments summarized here, please refer to the docket for this rulemaking.

The MSAT NPRM proposed new cold temperature non-methane hydrocarbon (NMHC) standards for gasoline light-duty vehicles and trucks. We expected that by fully utilizing available Tier 2 hardware and software control strategies during cold temperature operation, manufacturers would be able to achieve this standard without major changes to Tier 2 vehicle designs and without the use of additional technology.

We are finalizing, as proposed, two separate sales-weighted fleet average NMHC standards: 0.3 grams/mile for vehicles at or below 6,000 pounds gross vehicle weight rating (GVWR) and 0.5 grams/mile for vehicles over 6,000 pounds, including medium-duty passenger vehicles (MDPVs). The lower weight category will consist of light-duty vehicles (LDVs) and light light-duty trucks (LLDTs). The heavier weight category will consist of heavy light-duty trucks (HLDTs) and MDPVs. NMHC emissions will be measured during the Cold Federal Test Procedure (FTP) test at 20º F, which already requires hydrocarbon measurement. The new standard does not require additional certification testing beyond what is required today with "worst case" model selection of a durability test group.

As proposed, we will begin implementing the standard in the 2010 model year (MY) for LDV/LLDTs, and MY 2012 for HLDT/MDPVs. In the first years of compliance, manufacturers must ensure that 25% of the vehicles sold in each weight category achieve compliance. Manufacturers will phase-in to 100% fleet compliance by MY 2013 for LDV/LLDTs, and MY 2015 for HLDT/MDPVs. The implementation schedule begins three model years after the Tier 2 phase-in is complete for each vehicle class.

3.1 Cold Temperature Requirements

What Commenters Said:

In its public hearing testimony, the American Lung Association (ALA) commented that it supports cold weather NMHC standards.

Northeast States for Coordinated Air Use Management (NESCAUM) noted that the NESCAUM states generally agree with the approach taken for control of cold start emissions from motor vehicles.

Toyota commented that it is encouraged by the Environmental Protection Agency's effort to reduce ambient air toxics, stating that each component of the proposed rule promises to improve and ensure sustained reductions of hazardous air pollutants (HAP) within our ambient environment. They added that the proposed cold temperature NMHC standards and evaporative emission system requirements will propel the automotive industry toward further utilization of ultra clean vehicle technology. Toyota commented that the Agency's approach to regulate mobile source air toxics through cold temperature hydrocarbon controls is both effective and logical. Toyota submitted data confirming that benzene and NMHC levels highly correlate at different temperatures, in agreement with the Agency approach of controlling benzene emissions by way of a cold temperature hydrocarbon standard.

The Manufacturers of Emission Controls Association (MECA) commented that it supports the U.S. EPA's proposed rule to reduce hazardous air pollutants from mobile sources by lowering benzene content in gasoline; reducing exhaust emissions from passenger vehicles operated at cold temperatures; and reducing emissions that evaporate from, and permeate through, portable gasoline containers.

The State of Alaska Department of Environmental Conservation (ADEC) supports the EPA proposal for cold temperature HC standards. ADEC commented that without a cold temperature standard, manufacturers would only certify vehicles emission standards at higher temperatures required by the Federal Test Procedure. With a cold temperature standard, vehicles sold in Alaska are meeting emission standards in winter and summer. Reducing these HC will help reduce production of secondary particulate, an important control for places like Fairbanks on the verge of becoming nonattainment for PM2.5.

Anchorage commented that it supports improvement in hydrocarbon emission controls at cold temperatures. The commenter stated that European application of cold temperature controls suggests that adoption of this technology may be an inexpensive means to significantly reducing exposure to air toxics in cold climates.

Letters:
American Lung Association OAR-2005-0036-0365
NESCAUM OAR-2005-0036-0993
Toyota Technical Center OAR-2005-0036-0773
Manufacturers of Emission Controls Association (MECA) OAR-2005-0036-0808
Alaska Department of Environmental Conservation, Division of Air Quality (ADEC) OAR-2005-0036-0975
Anchorage, Municipality of, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

Our Response:

The cold NMHC standards reflect the greatest achievable reductions of air toxics from motor vehicles and will achieve significant environmental benefits. Colder temperature emissions standards highlight an extremely effective opportunity to reduce air toxics by utilizing the same emission control technology presently used at warmer operating temperatures. The

standard emission testing temperatures and cycles represent validation points for the emission control approaches, but they should not be treated as the only areas of emission control optimization. Emission controls should operate effectively across all real-world conditions experienced in normal driving, including operation at temperatures outside of standard emission test temperatures.

3.1.1 Standard Level and Feasibility

What Commenters Said:

Equal Standards for Both Vehicle Weight Categories

The ALA commented that the proposed cold weather NMHC standard for HLDTs and MDPVs should contain a second phase that reduces emissions to the same standard as applies to LDVs in the future.

STAPPA/ALAPCO commented that they do not believe trucks of 6,001 pounds to 8,500 pounds GVWR and passenger vehicles up to 10,000 pounds, warrant less protective standards than vehicles of 6,000 pounds GVWR or less, with the possible exception of work trucks.

The Wisconsin Department of Natural Resources (WDNR) commented that it believes that the NMHC cold temperature standards for Light-Duty vehicles weighing above 6,000 pounds should be the same as for vehicles less than 6,000 pounds.

Different Standards for Different Weight Categories

The Alliance of Automobile Manufacturers (Alliance) commented that it supports the proposal for separate fleet average 20°F NMHC standards for vehicles up to and including 6,000 lbs. GVWR and 6,001-8,500 lbs. GVWR. The commenter stated that Light-Duty Vehicles (LDV) and Light-Duty Trucks 1&2 (LLDT ≥6,000 lbs.) generally are equipped with smaller displacement engines and may have fewer cold-temperature emissions control constraints due to engine design. The commenter stated that it is reasonable to expect improved emissions performance for these vehicles at colder temperatures based on manufacturers' ability to locate the catalytic converter and oxygen sensors closer to the engine and achieve faster warm-up times, and therefore a quicker transition to closed-loop fueling.

The Alliance noted, however, that these lighter vehicles typically have more restrictive packaging constraints which may limit optimal emission control methods and options. (The commenter noted that in some instances, hardware modifications on smaller vehicles would not be feasible due to packaging constraints underbody or within the engine compartment.) The commenter stated that, in contrast, HLDT vehicles (LDT3&4) 6,001-8,500 lbs. GVWR generally are equipped with larger displacement engines and have additional physical constraints that must be accounted for when manufacturers design emission control systems; many of these vehicles are designed for higher performance and/or utility purposes, and these differences force unique considerations which make it appropriate to consider a higher standard for vehicles in these

weight classes. The commenter stated that heavier vehicles (>6,000 lbs. GVWR), designed for utility and/or high performance, generate significant heat and exhaust temperatures. Thus, catalyst systems may need to be designed and located farther from the engine to be protected from heat damage, particularly for compliance with US06 requirements in the Supplemental Federal Test Procedure (SFTP). Also, given the location and design constraints of these catalyst systems, hydrocarbon control at cold temperatures is more difficult.

The Alliance noted that HLDT engines typically require more fuel to start and maintain idle stability at cold temperatures and quench zones are larger. The commenter also stated that the fuel required to start and idle is more than can be fully oxidized in combustion and subsequently is carried through to the tailpipe prior to the catalyst reaching operating efficiency (light-off), resulting in increased hydrocarbon emissions at cold start. The issue is compounded by the increased exhaust mass flow prior to and during catalyst light-off, due to increased engine friction at cold temperatures and higher/prolonged idle speeds. This results in increased mass emission rates relative to lighter vehicles. The Alliance believes that these are compelling reasons why the proposed 20°F NMHC standards need to scale with increasing vehicle weight. The Alliance also believes that the 6,000 lbs GVWR split point between the two fleet-average 20°F NMHC standards is also an appropriate proposal based on standard testing methodology differences. The commenter stated that Adjusted Loaded Vehicle Weight (ALVW) test weight methodology is applied to vehicles over 6,000 lbs GVWR (vs. curb weight loading for vehicles up to 6,000 lbs. GVWR), and the more severe loading method produces higher loads and consequently higher emissions on the chassis dynamometer. Lastly, the Alliance commented that the 6,000 lbs GVWR split point, combined with a sales-weighted averaging approach, also avoids unwarranted bias and provides appropriate flexibility with 20° F emissions compliance for full line vehicle manufacturers.

Level of Standards is Appropriate

Toyota stated that data submitted with its comments substantiates the ratio approach upon which the Agency predicates their proposal for a cold temperature hydrocarbon standard (see docket number OAR-2005-0036-0773.1, p.3 for Graph 1: Non-methane organic gas (NMOG) mass emissions versus MSAT emissions). The commenter noted that in its data, Vehicle 1, a Tier 2 Bin5/Ultra Low Emission Vehicle II (ULEV II), and Vehicle 2, a Tier 2 Bin 8/ULEV II, demonstrate the consistency of the ratio between air toxic and hydrocarbon emissions. Lastly, Toyota stated that it supports this strategy as a successful means of HAP control.

Standards Will Be Challenging

The Alliance commented that the proposed standards will be extremely challenging to achieve for the industry. Because the proposed standards are based on full useful life performance, vehicles will require more robust designs, must rely on adequate fuel specifications, and will need fuel quality control measures in the field. The commenter also believes that with respect to the feasibility of the standards, manufacturers face a host of competing requirements for exhaust emissions compliance. The commenter further stated that, in order to maintain acceptable combustion quality, drive quality and defroster function, some engines may not be able to employ equivalent emission control strategies at 20°F relative to what

is feasible at 75°F. The commenter also stated that EPA must ensure that it does not adopt 20°F NMHC standards that effectively increase the stringency of the current Tier 2 standards, which are still completing phase-in. Further, the commenter noted, other EPA rulemaking efforts such as the fuel economy labeling proposal, and related proposed test procedure changes, must not inadvertently increase the stringency of the proposed 20°F NMHC standards.

The Alliance commented that, with respect to development and certification, manufacturers currently must comply with FTP and SFTP requirements, at ambient temperatures between 68°F and 95°F. The commenter stated that these higher temperature standards under Tier 2 affect hardware decisions, such as catalyst location, and make it difficult to simultaneously obtain optimal performance at colder temperatures, which are encountered less often in-use. As a result of these competing requirements, the commenter noted, engineering tradeoffs are often necessary and vary depending on the class of vehicle (i.e., passenger car vs. utility truck). The commenter noted that another potential impediment to meeting 120,000 mile full useful life standards is the wide array of commercial fuel properties found in the field. The commenter stated that optimal emissions control designs are often limited by poor volatility fuels during transitional months and inadequate control of fuel additives (which are needed to maintain combustion efficiency). Consequently, calibration compromises are often needed to accommodate the wide range of fuels and provide for robust start-up and driveability at cold temperatures.

The Alliance commented that fundamental engine design and operating parameters are important determinants of the maximum potential for cold temperature emissions control. Open-loop fueling control must be used until the emissions control system reaches a sufficient temperature to allow closed-loop control and optimized fueling strategies, and maintaining acceptable combustion quality at lower temperature is an issue due to the potential for reduced lean tolerance and reduced fueling precision, and it requires a tradeoff between fueling control and spark timing.

Mitsubishi commented that it strongly disagrees with EPA's statement in the proposal "we believe our proposed standards can be met by the application of calibration and software approaches similar to those currently used at 50° F and 75° F" (71 FR 15847; col. 2). The commenter further stated that it presented EPA with information demonstrating its inability to achieve EPA's proposed Cold NMHC fleet average standard for light duty vehicle/light light duty trucks of 0.3 g/mile for certification and full useful life (FUL) with only calibration/software changes. The commenter noted that its feasibility study, based on 2005 and 2006 MY certification data and utilizing only calibration and software changes, indicated that even reaching 0.4 g/mile for FUL is extremely difficult. Based on these results, Mitsubishi believes that it will be unable to meet the proposed standard without major vehicle redesign to incorporate additional hardware such as a secondary air injection system or hydrocarbon trap or significantly alter their United States fleet mix to 100% expensive, Super Ultra Low Emission Vehicle (SULEV) certified vehicles. The commenter did not provide any data in its comments to support their feasibility concerns.

Mitsubishi further commented that in order to ensure their vehicles' driveability, calibrations for cold conditions are compromised by the worst possible case of fuel properties

(especially volatility) that are available in the U.S market and would limit the best optimizations for cold NMHC control. The commenter suggested that if EPA believes that cold NMHC reduction can be accomplished by the improvement of fuel calibration only, it requests that EPA reduce such variance of the fuel properties in the U.S. market. The commenter noted that there are other difficulties which they believe affect its ability to meet the proposed standard. The commenter stated that it has limited opportunities for compliance flexibility (i.e., trading between fleets) since it only manufacturers vehicles under 6,000 lbs. Thus, the commenter proposes that manufacturers of only light-duty vehicles should be allowed to comply with an alternative standard between the less than and greater than 6,000 pound standards.

EPA's Feasibility Study Not Appropriately Assessing Emission Capabilities

The auto industry commented that the EPA's feasibility study and assessment does little to demonstrate feasibility to meet the proposed 20° F NMHC standard. The commenter stated that the actions used by EPA were too simplistic and that the study does not even confirm the EPA premise that only calibration changes would be needed to meet the 20° F NMHC standards, as EPA decided that operation of secondary air injection was determined to be a requirement and that not all vehicles are equipped with this very costly hardware. The commenter noted that EPA disregarded standard industry calibration practices and did not attempt to validate a calibration which would satisfy driveability and customer satisfaction requirements.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association (ALA) OAR-2005-0036-0365
Mitsubishi Motors R&D of America OAR-2005-0036-0882
STAPPA/ALAPCO OAR-2005-0036-0836
Toyota Technical Center OAR-2005-0036-0773
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

While some comments indicated that vehicles over 6,000 lbs. GVWR should be required to meet the same standards as the lighter vehicles, we continue to believe that it is appropriate to have different standards for vehicles of different weights. Generally, we believe that heavier vehicles will have inherent design differences in the engine and emission control system hardware specifically to address expected customer usage and duty cycle. These design differences, including engine size and exhaust aftertreatment design may result in a much higher degree of difficulty achieving the same emission levels as vehicles not designed with similar utility capabilities.

The level of the standard for both of the weight classes was determined from analyzing certification Cold Carbon Monoxide (CO) results from many different vehicles and model years. (See Chapter 5 of the Regulatory Impact Analysis (RIA) for the analysis.) This data set included vehicles certified to Interim Non-Tier 2 and Final Tier 2 emission standards (at 75° F) and tested at different weights representing a variety of GVWRs. We observed a general trend of

increasing emission levels with increasing test weight across all available certification results. While the data set included only a limited number of Final Tier 2 vehicles certified to the over 6,000 lbs. GVWR, the data did support the engineering expectation of higher emissions with heavier vehicles. Some heavier vehicles did perform at levels approaching the lighter weight standard; however, the initial over 6,000 lbs. GVWR vehicles certified to Tier 2 standards likely represent the cleaner, less challenging vehicles which are generally the first to be phased in to the Tier 2 program. These vehicles may initially contain hardware content not typical of similar weight Tier 2 vehicles. Additionally, the feasibility test programs performed by EPA further support the level of the standard and confirm that heavier vehicles with typically larger application specific engines will have higher difficulty achieving the same emission levels as lighter and smaller engine vehicles. It is likely that extensive additional hardware beyond that required by Tier 2 would need to be added for many of these heavier models if required to meet the same emissions standards as the lighter models. However, as these heavier vehicles become Tier 2 compliant, we will continue to monitor emission levels and evaluate the appropriateness of the higher cold temperature standard.

We do not agree with the comment that vehicles over 6,000 lbs. will be tested with a more severe ALVW loading test method. With the phase-in of Tier 2, vehicles over 6,000 lbs. GVWR are required to comply with Cold CO standards using Loaded Vehicle Weight (LVW) test weights rather than ALVW test weight which is required for Non-Tier 2 vehicles. LVW is curb weight plus 300 lbs. while ALVW is the average of LVW and the typically much higher GVWR. This reduction in the test weight loading method will occur on all light duty vehicles over 6,000 lbs. GVWR by 2009 MY when 100% Tier 2 compliance is required. However, even with this change in test weight methodology, heavier vehicles will generally be tested at higher weights due to their higher curb weights and are typically equipped with larger engines and therefore remain a greater challenge for cold temperature emissions control than lighter vehicles.

One commenter indicated that they did not agree with our assessment that the proposed standards for light-duty vehicles could be met with the same calibration and software approaches currently used at 50° F and 75° F. While not all software and calibration approaches can be used at 20° F (e.g., lean start operation), we continue to believe that many of the long-established approaches are appropriate and will be highly effective. Similarly, prior to the implementation of the California 50° F NMHC requirement, many of the approaches to reduce emissions at 75° F were not used at 50° F, but later proved effective at that lower temperature. To support our position that these same controls could be used at colder temperature, our own limited feasibility test program specifically targeted using only the controls already available and practiced at 50° F and 75° F. Although this feasibility test program was limited in scope, its results indicate that these controls are highly effective at approaching and complying with the level of the new standard (consistent with engineering expectation). We continue to believe that efforts to control engine emissions and to optimize existing Tier 2 hardware generally will negate any need to incorporate SULEV or other new hardware. This is because most hardware improvements used in SULEVs (catalyst loading, oxygen sensors) are generally not immediately usable following a cold start. Therefore, compliance with the standards will necessitate optimized calibration and software controls to limit emissions produced by the engine prior to catalyst light-off.

The commenter also indicated that its own assessment based on its 2005 and 2006 MY certification data indicated their inability to achieve the new standard. However, these 2005 and 2006 MY vehicles used for the assessment do not reflect any control efforts. Some significant level of development effort would be required to fully explore existing opportunities in these models. In fact, certification results for some of this manufacturer's current vehicle offerings indicated that some specific vehicles models are close to achieving or have achieved the standard without any intentional development effort to control NMHC emissions. In addition, the design of the fleet average standards provides flexibility to manufacturers by allowing them to meet different vehicle specific standards (i.e., Family Emission Limits) to address any unique situations. Manufacturers can choose which vehicle lines to concentrate their emission reduction efforts while still achieving an overall fleet wide average.

The 0.3 g/mile fleet average standard for the vehicles below 6,000 lbs GVWR is appropriate and supported by our assessment (see Regulatory Impact Analysis). We know of no engineering basis for this standard not being technically achievable. We consequently do not accept the commenter's suggestion to adopt an alternative standard for manufacturers with a product line limited to vehicles below 6,000 lbs. GVWR. Indeed, there are nine other manufacturers with product lines exclusively below 6,000 lbs. GVWR that did not provide similar comments requesting an alternative standard.

The auto industry also stated that EPA must ensure that it does not adopt 20°F NMHC standards that effectively increase the stringency of the current Tier 2 standards. As supported by our assessment (see Chapter 5, section 5.1.2, of the RIA), we believe that level of the standard does not inadvertently increase the stringency of current Tier 2 standards by requiring new hardware for the cold standard. Several Tier 2 certified packages in our assessment already achieve emissions levels below the new standard including one manufacturer's entire vehicle product line. With respect to development and certification, the commenter noted that manufacturers currently must comply with FTP and SFTP requirements, at ambient temperatures between 68°F and 95°F. The commenter stated that these higher temperature standards under Tier 2 affect hardware decisions, such as catalyst location, and make it difficult to simultaneously obtain optimal performance at colder temperatures, which are encountered less often in-use. As a result of these competing requirements, the commenter noted, engineering tradeoffs are often necessary and vary depending on the class of vehicle (i.e., passenger car vs. utility truck). We understand the possibility of competing requirements depending on vehicle class and we believe separate fleet averages properly address these challenges. In addition, we are providing lead time and program flexibilities such as averaging to help manufacturers address issues with various models across their product lines.

While comments were submitted suggesting that potential variances in the fuel properties could affect NMHC emission levels, no supporting data was submitted substantiating any problem in the fuel pool or any vehicle emission impact. In fact, yearly fuels surveys performed by the Alliance indicate no issues in the US fuel supply during the colder months that would impact the ability to achieve these emission standards. Certain challenges may exist for some vehicle systems during certain seasonal fuel changes or other temporary situations but these situations can be managed through robust emission control approaches. We believe that some manufacturers and vehicle models are already using these robust approaches based on the

existing certification test results (see Chapter 5 of the RIA). We are providing the manufacturers with lead time necessary to evaluate and address any issues with their products.

We disagree with the auto industry comment that EPA's feasibility study and assessment does little to demonstrate feasibility to meet the proposed 20° F NMHC standard. Data to support the feasibility of complying with the 20˚ F NMHC standard includes evidence from recent model year certification emissions data submitted to EPA and a vehicle feasibility evaluation program (see Chapter 5, section 5.1.2, of the RIA). The certification data indicate many production vehicle models with emissions levels below the cold standard, which presumably (because they are production vehicles) employ thoroughly validated calibrations which would satisfy driveability and customer satisfaction requirements. The feasibility evaluation program undertaken by EPA examined the effects of making only calibration modifications to two vehicles deemed challenging due to their heavier weight.

In the case of the first feasibility vehicle, equipped with secondary air injection, we acknowledge that not all vehicles are equipped with this hardware. We also recognize that this first feasibility vehicle study does not constitute a production calibration and that additional development effort would be needed to achieve manufacturer functional objectives for cold starts. We recognize that significant development efforts are needed to prove out control strategies and are providing the lead time necessary for these development efforts. However, this test program demonstrates that in the case of this typical secondary air injection equipped vehicle, additional emission reduction opportunities exist by activating at cold temperatures the hardware already employed on the vehicle. The second feasibility vehicle demonstrates emission reduction opportunities with calibration changes only. For the second feasibility vehicle, testing was performed using a production calibration which would satisfy driveability and customer satisfaction requirements. These calibrations are already used in a production vehicle sold in Europe. Also, the second vehicle was selected because it is a heavier weight vehicle in the lighter weight class. In both cases, the feasibility testing clearly showed significant emissions reductions are achievable through calibration alone at cold temperatures. Given the lead time provided in the final rule, we believe manufacturers have ample time to further develop calibrations that meet the full range of driveability and customer satisfaction requirements.

3.1.2 Tailpipe Standards over All Cycles

What Commenters Said:

Control MSATs Over All Drive Cycles

The New Jersey Department of Environmental Protection (NJDEP) commented that although it supports adoption of the proposed cold temperature exhaust emission standards, it believes that EPA must look beyond technologies to reduce emissions during cold start modes to technologies that reduce MSAT emissions under all driving modes.

Benzene-specific Standards Necessary

The New York Department of Environmental Conservation (NYDEC) commented that EPA has not considered tailpipe standards for benzene (or any other mobile source air toxics such as acetaldehyde and polycyclic aromatic hydrocarbons) for any class of vehicle or engine in this rulemaking. NYDEC commented that it believes that EPA depends on the incorrect assumption that all hydrocarbon species react similarly in catalytic converters and that regulations targeting hydrocarbons reduce the emissions of all species equally (and based on this assumption, EPA claims that regulation of vehicle and engine hydrocarbon emissions is sufficient to control the (non-evaporative) toxic emissions of vehicles and engines). The commenter stated that it is "well known that different classes of hydrocarbons react at different rates in catalytic converters." The commenter further stated that it is well documented that benzene can be produced in automotive catalytic converters. The commenter stated that it can find no evidence that EPA even acknowledges the fact that catalytic converters can make benzene, much less considered it in developing this rule. The commenter then noted that it conducted its own study to evaluate the production of benzene in catalytic converters, using a 2005 passenger car from its own fleet and sampling and analytical methods adapted from EPA's Photochemical Assessment Monitoring Stations (PAMS) program. The commenter noted that exhaust was sampled before and after the main catalytic converter, which is not exactly the situation tested in the literature (because their test vehicle was equipped with more recent technology, specifically close-coupled pre-catalysts upstream of both sample locations; thus, the before-catalyst sample is not engine-out). In its comments, the commenter provided detailed information on how the study was performed, assumptions made, and the results of the study.

Lastly, the NYDEC commented that EPA cannot simply assume that other programs will protect the public from tailpipe benzene emissions. The commenter further commented that EPA cannot meet the mandate of section 202(l)(2) of the Clean Air Act (which requires EPA to regulate benzene emissions to obtain the "greatest degree of emissions reduction achievable") without any analysis, particularly when existing emissions control devices (catalytic converters) produce additional benzene under common operating conditions. The commenter believes that explicit tailpipe benzene standards must be promulgated.

Letters:
New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829
New York State Department of Environmental Conservation (NY DEC) OAR-2005-0036-0722

Our Response:

We believe that NMHC standards are an effective method of significantly reducing benzene and many air toxics levels in the exhaust as supported by the MSAT EPA test programs (see Regulatory Impact Analysis, Chapter 5). These programs confirmed that under the current cold start emission drive cycles, benzene levels closely correlate with NMHC levels and a reduction in NMHC will result in proportional reductions in benzene and other toxics. All current data suggests that the overwhelming majority of toxics from Tier 2 vehicles are emitted immediately following the cold start. While commenters suggested that toxics are also created or released during other operating modes, data is limited, especially for Tier 2 vehicles regarding

toxics formation across the catalyst during specific operating conditions (i.e., rich hot operation). Additionally, the areas of operation described in the comments where formation is expected to occur (i.e., over 81 miles per hour) represent a small fraction of vehicle miles traveled(VMT).

As indicated by the commenter, toxics formation in the engine and catalytic converter is a complicated issue that can be influenced by many factors not yet fully understood. The limited data provided by the commenter warrants further investigation to determine the mechanisms for benzene formation. However, we must evaluate the issue in the context of SFTP compliant Tier 2 vehicles, which will likely perform differently than the older vehicles included in the test data referenced by the commenter. Further, the operating conditions that result in possible toxics formation may not be demonstrated in current test procedures, thus requiring investigation beyond the current test cycles (e.g., operation at sustained high-loads even more severe than US06 cycle). Therefore, an assessment of tailpipe benzene emissions would need to be accompanied by an evaluation of the drive-cycle conditions that generates the conditions for benzene formation. Thus, we plan to undertake a more in-depth investigation to understand the potential mechanisms for toxics formation and the vehicle operating conditions under which such toxics may be formed.

3.1.2.1 PM-specific Standards

What Commenters Said:

The ALA, NESCAUM, and the NJDEP commented that there is a need for the establishment of particulate standards for gasoline passenger vehicles.

The Alliance commented that in addition to hydrocarbon reductions, it believes that the Agency provided considerable discussion on the co-benefits of particulate matter (PM) and ozone reductions. The Alliance commented that it agrees that PM emissions from mobile sources have steadily decreased as manufacturers comply with stringent federal exhaust emission standards. Additionally, the commenter stated that the proposed vehicle regulations should directionally reduce PM emissions from Tier 2 vehicles. Furthermore, the commenter believes that the reduction in volatile organic compounds (VOCs) will reduce the potential for secondary atmospheric formation of fine PM. However, the commenter stated that even though PM will be directionally reduced, it does not believe that PM from Tier 2 vehicles is an issue at the cold temperature conditions which are the subject of this proposed rulemaking. The commenter noted a feasibility study that EPA commissioned and stated that, according to the study, PM averages for all of the vehicles tested at 20°F were at or below the existing 75°F certification standards. The commenter believes that this indicates that PM is currently controlled adequately at cold temperatures, and with the proposed hydrocarbon standards leading to potential further decreases in PM, it would be inappropriate for EPA to consider the regulation of PM at cold temperatures.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association (ALA) OAR-2005-0036-0365
New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829

Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993, -0369

Our Response:

Our findings regarding PM levels during colder operation indicated that temperature appears to be an important factor for direct PM, similar to NMHC findings. While the PM averages for all of the vehicles tested at 20°F were at or below the existing 75°F certification standards, the levels were unexpectedly high compared with PM emissions at 75°F and these relatively low mileage vehicles were approaching or exceeding the Tier 2 PM standards. The cold temperature vehicle standards are being established to control MSATs under CAA 202(l) and PM reductions are a coincidental benefit. We will continue to fully investigate direct PM from gasoline engines, including the possible need for future cold PM standards as well as PM control under other operating modes.

3.1.2.2 Standards Do Not Account For Testing Requirements in Fuel Economy Label Standard

What Commenters Said:

The commenter noted that the proposed heater/defroster change to the fuel economy labeling requirements is a major change and will impact the existing Cold CO standards, the proposed 20°F NMHC standards, and the proposed Fuel Economy Labeling procedures. The commenter further stated that this test procedure change would be most appropriately addressed as a separate rulemaking initiated only after more extensive research is completed. The commenter believes that EPA needs to take into consideration the effect of heater/defroster activation on the 20°F NMHC standards proposed in the MSAT rule, and defer any test procedure changes until a thorough analysis of heater and/or defroster use and related emission impacts has been performed. The Alliance noted that the data EPA collected come from EPA's two feasibility studies, one conducted internally and the other conducted by Southwest Research Institute (SwRI), and that these two studies show conflicting results. The commenter noted that SwRI's results on the gasoline vehicle demonstrate a decrease in hydrocarbon emissions with heater/defroster use, while the Agency's in-house study shows an increase; thus, the commenter believes that more extensive study of this issue is needed.

Letters:
Alliance of Automobile Manufacturers (Alliance), OAR-2005-0036-0881
American Lung Association (ALA), OAR-2005-0036-0365
New York Department of Environmental Conservation, OAR-2005-0036-0722
New Jersey Department of Environmental Protection, Division of Air Quality, OAR-2005-0036-0829

Our Response:

Regarding new testing requirements under the Fuel Economy (FE) Labeling final rule, we do not believe there are any emissions issues related to use of the heater/defroster during the cold FTP test.[1] In the FE rule, we specifically structured the heater/defroster protocol to reflect real-world operation, (i.e., delay heater/defroster operation until 2 minutes into the test) which also has the effect of mitigating any emissions impact during start-up. EPA testing, including a vehicle feasibility demonstration (see Chapter 5, section 5.1.2.2, of the RIA) which followed the protocol, indicates that emission levels are not affected by the new testing requirements. Nevertheless, the FE rule gives manufacturers until the 2011 model year before heater/defroster use is required. We believe this allows sufficient lead time to investigate any potential emissions impacts.

3.1.3 Harmonizing with California LEV II Standards

What Commenters Said:

Harmonize with California LEV II

NESCAUM commented that California has finalized more stringent tailpipe HC emissions standards that EPA could adopt nationally.

The NJDEP commented that technologies exist today and are being utilized by automobile manufacturers for compliance with California's Low Emission Vehicle II (LEV II) exhaust and evaporative emission standards that reduce MSAT emissions under all driving modes. NJ DEP believes that EPA should consider adoption of exhaust and evaporative emission standards equivalent to or beyond California's Low Emission Vehicle (LEV) II standards.

The NJDEP also commented that it does not believe that Tier 2 exhaust and evaporative emission standards represent the greatest emission reductions achievable. EPA should consider adoption of exhaust and evaporative emission standards equivalent to or beyond the LEV II standards. For example, the Partial Zero Emission Vehicle (PZEV) and Advanced Technology PZEV (ATPZEV) exhaust and zero evaporative emission standards would achieve significant MSAT emission reductions beyond the lowest emitting of the federal Tier-2 emission standards. NESCAUM has estimated the LEV II exhaust and evaporative emission standards would yield a 23% reduction in air toxic emissions (benzene, 1,3 butadiene, formaldehyde and acetaldehyde were included in the analysis), on average for the states of New York, Massachusetts, and Vermont (states that had adopted the LEV program at the time of the study) relative to the federal Tier 2 evaporative and exhaust emission standards (Source: "California Low Emission Vehicle Program in the Northeast, NESCAUM, March, 2004).

The NJDEP commented that the MSAT reduction benefits can be attributed to several of the key requirements of the LEV II program including: the LEV II program's declining non-

[1] "Fuel Economy Labeling of Motor Vehicles; Revisions to Improve Calculation of Fuel Economy Estimates," Final Rule, 71 FR 77872, December 27, 2006.

methane organic gas (NMOG) fleet average requirement; the PZEV, ATPZEV and ZEV exhaust emission standards and durability requirements; and the zero evaporative emission standard applicable to PZEVs and ATPZEVs.

The NJDEP also commented that New Jersey has adopted the LEV standards for vehicles delivered for sale in New Jersey on and after January 1, 2009. EPA should consider adoption of analogous exhaust and evaporative emission standards on a national basis to achieve additional MSAT reductions beyond those resulting from the proposed cold temperature emission standards. Such harmonization with California's most stringent emission standards would also simplify compliance for the automobile manufacturers with the vehicle emission standards across the nation.

Do Not Harmonize with California LEV II

The Alliance commented that the Tier 2 program provides comprehensive and extensive emissions reductions from mobile sources and noted that these standards have yet to fully phase-in and the fleet has yet to turn over for these vehicles. The commenter believes that setting more stringent Tier 2 NMOG standards, such as those adopted by California in its LEV II programs, would not provide any meaningful emissions benefits. The commenter believes that Tier 2 emission standards, in conjunction with the proposed 20°F NMHC standards and LEV II evaporative standards, will reduce further the inventory differences between programs. The Alliance commented that it maintains support of the federal Tier 2 program and the large emission benefits it affords. Lastly, the commenter stated that, for the reasons EPA cited in the preamble, coupled with the fact that LEV II provides no meaningful reductions compared to Tier 2, it agrees with EPA's conclusion that no changes should be made to the Tier 2 program.

Letters:
NESCAUM OAR-2005-0036-0993
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829

Our Response:

We continue to believe, for reasons discussed below, that it would not be appropriate to adopt more stringent tailpipe standards under normal test conditions beyond those contained in Tier 2. It is possible that a future evaluation could result in EPA reconsidering the option of harmonizing the Tier 2 program with California's LEV-II program or otherwise seeking emission reductions beyond those of the Tier 2 program and those being finalized today.[2]

Section 202(l)(2) requires EPA to adopt regulations that contain standards which reflect the greatest degree of emissions reductions achievable through the application of technology that will be available, taking into consideration existing motor vehicle standards, the availability and

[2] See Sierra Club v. EPA, 325 F. 3d at 380 (EPA can reasonably determine that no further reductions in MSATs are presently achievable due to uncertainties created by other recently promulgated regulatory provisions applicable to the same vehicles).

costs of the technology, and noise, energy and safety factors. The cold temperature NMHC program finalized today is appropriate under section 202(l)(2) as a near-term control: that is, a control that can be implemented relatively soon and without disruption to the existing vehicle emissions control program. We did not propose additional long-term controls (i.e., controls that require longer lead time to implement) because we lack the information necessary to assess their appropriateness. We believe it will be important to address the appropriateness of further MSAT controls in the context of compliance with other significant vehicle emissions regulations (discussed below).

In the late 1990's both the EPA and the California Air Resources Board finalized new and technologically challenging light-duty vehicle/truck emission control programs. The EPA Tier 2 program focuses on reducing NOx emissions from the light-duty fleet. In contrast, the California LEV-II program focuses primarily on reducing hydrocarbons by tightening the light-duty NMOG standards.[3] Both programs will require the use of hardware and emission control strategies not used in the fleet under previously existing programs. Both programs will achieve significant reductions in emissions. Taken as a whole, the Tier 2 program presents the manufacturers with significant engineering challenges in the coming years. Manufacturers must bring essentially all passenger vehicles under the same emission control program regardless of their size, weight, and application. The Tier 2 program represents a comprehensive, integrated package of exhaust, evaporative, and fuel quality standards which will achieve significant reductions in NMHC, NOx, and PM emissions from all light-duty vehicles in the program. These reductions will include significant reductions in MSATs. Emission control in the Tier 2 program will be based on the widespread implementation of advanced catalyst and related control system technology. The standards are very stringent and will require manufacturers to make full use of nearly all available emission control technologies.

Today, the Tier 2 program remains in its phase-in. Cars and lighter trucks will be fully phased into the program with the 2007 model year, and the heavier trucks won't be fully entered into the program until the 2009 model year. Even though the lighter vehicles will be fully phased in by 2007, we expect the characteristics of this segment of the fleet to remain in a state of transition at least through 2009, because manufacturers will be making adjustments to their fleets as the larger trucks phase in. The Tier 2 program is designed to enable vehicles certified to the LEV-II program to cross over to the federal Tier 2 program. At this point in time, however, it is difficult to predict the degree to which this will occur. The fleet-wide NMOG levels of the Tier 2 program will ultimately be affected by the manner in which LEV-II vehicles are certified within the Tier 2 bin structure, and vice versa. We intend to carefully assess these two programs as they evolve and periodically evaluate the relative emission reductions and the integration of the two programs.

Today's final rule addresses toxics emissions from vehicles operating at cold temperatures. The technology to achieve these new standards is already available and we project that compliance will not be costly. However, we do not believe that we could reasonably propose further controls at this time. There is enough uncertainty regarding the interaction of

[3] NMOG includes emissions of nonmethane hydrocarbons plus all other nonmethane organic air pollutants (for example, aldehydes), which are ozone precursors. For gasoline and diesel vehicles, NMHC and NMOG emissions levels are very similar.

the Tier 2 and LEV-II programs to make it difficult to evaluate today what might be achievable in the future. Depending on the assumptions one makes, the LEV-II and Tier 2 programs may or may not achieve very similar NMOG emission levels. Therefore, the eventual Tier 2 baseline technologies and emissions upon which new standards would necessarily be based are not known today. Additionally, we believe it is important for manufacturers to focus in the near term on developing and implementing robust technological responses to the Tier 2 program without the distraction or disruption that could result from changing the program in the midst of its phase-in. We believe that it may be feasible in the longer term to seek additional emission reductions from the base Tier 2 program, and the next several years will allow an evaluation based on facts rather than assumptions.

Additionally, adopting the LEV II emission standards would likely not result in reductions in MSAT emissions under all driving modes, contrary to the commenter's assertion. As evidenced by the need to adopt cold temperature standards, emission controls on vehicles certified to stringent levels at 75° F may not guarantee proportional reductions at all driving conditions. LEVII standards do not contain requirements below 50°F. The past SFTP rulemaking resulted in standards that were established to address unique driving conditions that were not captured with a more stringent 75° F standard. As such, establishing emission standards for other driving modes, including cold temperature, as we have done in this rule, will result in the largest reductions in MSAT emissions.

The summary and analysis of comments concerning harmonizing with the evaporative standards of LEVII is contained in section 3.2 below.

3.1.4 Timing and Phase-in

What Commenters Said:

Timing Should Be Accelerated

NESCAUM commented that, given the fact that the controls require only calibration and software changes and not hardware changes, they encourage EPA to establish an earlier program start date than the dates proposed.

Timing and Phase-In Are Appropriate

The Alliance commented that the relative stringency of 20°F NMHC standards will increase incremental development workload and facility needs exponentially. The commenter stated that an appropriate phase-in approach is critical to avoid a front-loaded phase-in or one of short duration, which could further magnify the workload burden in the short-term; the commenter believes that even the current proposed phase-in creates a significant impact on facility capacity needs over a relatively short time period, affecting each manufacturer to a different degree. The commenter also stated that a manufacturer's testing capacity should be utilized steadily in order to prevent "vacant/orphan" facilities at end of phase-in; an aggressive phase-in requirement would create an unnecessary cost burden for manufacturers. The

commenter further stated that the proposed rule recognizes these cost issues and provides sufficient mechanisms for phase-in flexibility in an attempt to partially mitigate these costs.

The Alternative Phase-In Requires More Flexibility

The Alliance noted that the alternative phase-in program outlined by the Agency in this rulemaking emphasizes the ability to bring in additional products meeting the 20ºF NMHC standard under accelerated timing, and that the alternative phase-in schedules are especially attractive for the flexibility afforded the manufacturer. However, the Alliance commented that the additional stipulation regarding the initial years of product phase-in significantly curtails the necessary flexibility. Further, the Alliance stated, even if a manufacturer introduces a significant volume of products meeting this standard early, in 2008 and 2009, there is a possibility of debit generation as early as 2010 despite accelerated compliance efforts on the part of the manufacturer. To avoid limiting the flexibility of its alternative phase-in program and diminishing the incentive to strive for early compliance, the Alliance recommends that EPA amend the proposal and fully align with the alternative phase-in schedule as outlined in Title 13, California (CA) code of Regulations Section 1961 (b)(2) without additional constraints (which effectively eliminates any "early-year" phase-in requirements of an alternative phase-in).

Nissan Motor Company, Ltd (Nissan) commented that it understands EPA's desire to reduce mobile source air toxics (MSAT), and that several elements of the proposed MSAT rule can be implemented within the timetable set forth in the proposed rule. However, the commenter believes that the proposals for regulating vehicle tailpipe NMHC at low temperatures appear to require powertrain hardware changes and increased development and laboratory facility burden that cannot be accommodated within the time-table in the NPRM.

In its comments, Nissan suggested a modification to the phase-in provisions for HLDT/MDPV which it believes could produce a demonstrable benefit for EPA. The commenter believes that the purported relief offered by the phase-in schedule of 25%/50%/75%/100% is not useable or effective for any manufacturer of a narrow range of HLDT/MDPV engines and truck lines; the commenter believes that the three intermediate phase-in rates mentioned in the proposed rule offer no actual leveling of burden.

Nissan commented that it currently has only one engine configuration (5.6L V8) and only one vehicle platform in the HLDT/MDPV class, and that such a structure means the manufacturer could implement at only one rate (i.e., 100%). The commenter noted that it plans to pull-ahead its full implementation date to model year 2013; the second year of the phase-in. The commenter believes that its targeted 0%/100%/100%/100% phase-in schedule would provide a significant incremental environmental benefit. However, it believes that another provision in the proposed rule inhibits its ability to deliver that benefit; the provision that states "In addition, manufacturers electing to use an alternate phase-in schedule & must ensure that the sum of products is at least 100% for model years and 2012 and earlier for HLDT/MDPVs." The commenter notes that even though it plans to fully (100%) implement low temperature control for HLDT/MDPV in 2013 (when the phase-in requirement is only 50%) the "sum of products and at least 100%" provision obviates its early full implementation schedule and eliminates a net benefit from its early full implementation. The commenter thinks that the provision could be

improved, to create mutual benefits, in the following ways:

A. In § 86.1811-10(g)(4)(ii), EPA could simply eliminate the "sum of products ... at least 100% provision, or
B. In §86.1811-10(g)(4)(ii), EPA could modify the "sum of products ... at least 100% requirement to apply to 2013 and earlier, or
C. In §86.1811-10(g)(4)(ii), EPA could allow manufacturers to begin implementation on any schedule that produces a net benefit to EPA, which would be validated by the manufacturer exceeding the "500% phase-in product" requirement for the phase-in period (for example, 525% total), or
D. EPA could move implementation of the low temperature requirement to the 2013 model year for HLDT/MDPV.

Nissan commented that its "Proposal C" above would create flexibility only in the first year of the phase-in schedule while requiring much higher implementation rates in years 2 and 3, and would also pull-ahead 100% compliance by one model year. The commenter stated that this net benefit would also attenuate burden for manufacturers of narrow HLDT/MDPV offerings which is the original intent of the phase-in provision.

Nissan also commented that it believes that the proposed implementation time-table and the inflexibility of the proposed phase-in rules will cause a short-term spike in its facilities development and testing burden. The commenter does not believe that forced investment to cover this transitory spike is an efficient use of limited capital and resources, and suggests the following modifications to the MSAT program:

A. Modify the phase-in compliance calculation method as discussed in 1.C above, and
B. Modify the less-than 100% phase in period from 3 years to 4 years. For example, adopt a nominal phase-in of 20%/40%/60%/80%/100%.

The commenter believes that taken together, these two steps can significantly smooth the burden on facilities, development and testing resources and provide for more efficient implementation.

Mitsubishi Motors (Mitsubishi) commented that it is an Intermediate Volume Manufacturer, and as such has a limited number of vehicle lines and therefore the percentage that needs to be phased-in for a given year affects a much larger portion of their product offerings. The commenter stated that this leads to challenges where it could become very costly and quite difficult to complete enough development work fast enough for compliance (and notes that a large increase in the workload would result in facility expenses proportionately greater than those of the full line manufacturers). The commenter stated that it agrees with the AAM facility expense calculations, except that real estate costs are much higher at their research and development facility in Japan. Therefore, the commenter stated, merely finding a location and constructing such a facility will be very costly and time consuming, and will significantly delay its ability to effectively implement the major vehicle redesign required to meet the proposed standard. Mitsubishi concluded by stating that it believes that additional phase-in time should be allowed to provide enough time to construct new development facilities.

Letters:
Alliance of Automobile Manufacturers (Alliance), OAR-2005-0036-0881

Mitsubishi Motors R&D of America (Mitsubishi), OAR-2005-0036-0882
NESCAUM, OAR-2005-0036-0993
Nissan Technical Center North America (Nissan), OAR-2005-0036-0825

Our Response:

We believe that the finalized start date and phase-in schedule will achieve the greatest amount of emissions reductions in the shortest feasible amount of time. EPA must consider lead time in determining the greatest degree of emission reduction achievable under section 202(l) of the Clean Air Act. Also, for vehicles above 6,000 GVWR, section 202(a) of the Act requires that four years of lead time be provided to manufacturers. We believe that lead time and a phase-in schedule is needed to allow manufacturers to develop compliant vehicles without significant disruptions in the product development cycles. The three-year period between completion of the Tier 2 phase-in and the start of the new cold NMHC standard should provide vehicle manufacturers sufficient lead time to design their compliance strategies and to determine the product development plans necessary to meet the new standards.

We recognize that the new cold temperature standards we are finalizing could represent a significant new challenge for manufacturers and development time will be needed. The issue of NMHC control at cold temperatures was not anticipated by many entities, and research and development to address the issue is consequently at a rudimentary stage. Lead time is therefore necessary before requiring compliance to be demonstrated. While certification will only require one vehicle model of a durability group to be tested, manufacturers must do development on all vehicle combinations to ensure full compliance within the durability test group. A phase-in is needed because manufacturers must develop control strategies for several vehicle lines. Since manufacturers cannot be expected to implement the standard over their entire product line in 2010, we believe a phase-in allows the program to begin sooner than would otherwise be feasible.

The lead time and phase-in are also needed to address facilities issues. Manufacturers raised concerns that a rapid phase-in schedule would lead to a significant increase in the demand for their cold testing facilities, which could necessitate substantial capital investment in new cold test facilities to meet development needs. This is because manufacturers would need to use their cold testing facilities not only for certification but also for vehicle development. Durability test groups may be large and diverse and therefore require significant development effort and cold test facility usage for each model. If vehicle development is compressed into a narrow time window, significant numbers of new facilities would be needed. Manufacturers were also concerned that investment in new test facilities would be stranded at the completion of the initial development and phase-in period.

We took these concerns into consideration when drafting our proposed rule and are finalizing the start date and phase-in as proposed because we continue to believe they address these issues adequately. Our finalized phase-in period accommodates test facilities and work load concerns by distributing these fleet phase-in percentage requirements over a four-year period for each vehicle weight category (six years total). The staggered start dates for the phase-in schedule between the two weight categories should further alleviate manufacturers' burden

regarding construction of new test facilities. We recognize that some manufacturers may still determine that upgrades to their current cold facility are needed to handle increased workload, or that additional shifts must be added to their facility work schedules that are not in place today. The lead time and the four-year phase-in period provide needed time for vehicle manufacturers to develop a compliance schedule that does not significantly interfere with their future product plans.

We have revised the terms of the optional alternative phase-in, in response to public comment. We proposed alternative phase-in schedules for both the LDV/LLDT and HLDT/MDPV weight categories to provide manufacturer flexibility and to encourage early emissions benefits. These alternative schedules included "early-year" provisions to ensure an adequate number of vehicles achieved compliance during the initial years of an alternative phase-in. Specifically, a manufacturer who adopts an alternative phase-in must ensure that the "Anticipated Phase-In × Year" factors in the alternative phase-in equation sum to at least 100% for 2010 and earlier model year LDV/LLDTs, and 2012 and earlier model year HLDT/MDPVs. Commenters were concerned these provisions would create significant hardship, especially for limited-line manufacturers who produce only a narrow range of car lines. (For example, a manufacturer who only sells one configuration in the HLDT/MDPV category would not have the option of certifying only 25% of these vehicles in 2012. To meet our proposed criteria, that manufacturer would have to ensure that the model is fully compliant in 2013; i.e., 100% of their HLDTs/MDPVs. This would eliminate any flexibility for these manufacturers, as noted in comments.

To address these legitimate concerns, we are providing an option that would eliminate the early-year provision for HLDT/MDPV manufacturers as long as their full phase-in is accelerated. As proposed, manufacturers may still apply for an alternative phase-in option in which the equation sum to at least 500%, including an "early-year" provision meeting 100% criteria. However, in response to comments, we are also allowing another alternative phase-in option in which the equation must be at least 600% for HLDTs/MDPVs, without any early-year provision. We believe this will still yield environmental benefits as quickly as possible, while not putting an unreasonable burden on limited-line manufacturers of HLDTs/MDPVs. Manufacturers with limited HLDT/MDPV product offerings will still achieve 100 percent phase-in of the HLDTs/MDPVs before the end of the phase-in schedule in 2015.

Regarding the early-year provisions for LDV/LLDTs, we believe that the proposed early-year requirements provide emissions benefits without unreasonably burdening manufacturers who elect to adopt an alternative phase-in. Manufactures of LDV/LLDTs typically produce a wider variety of configurations in the lower weight category than in the HLDT/MDPV category, thus have more flexibility within the LDV/LLDT category to meet a fleet-average standard. Furthermore, LDV/LLDTs as a group face fewer technological hurdles as do the heavier vehicles. Therefore, we will retain the early year requirements for the alternative phase-in for LDV/LLDTs.

3.1.5 Credits

3.1.5.1 Use of Credits

What Commenters Said:

ALA commented that it opposes the use of credits generated by over-compliance by a manufacturer in one weight class toward meeting a manufacturer's obligation in a heavier or lighter weight class.

The Alliance commented that the availability of credits for early or accelerated efforts to introduce compliant vehicles provides a mechanism for manufacturers to offer products meeting the 20ºF NMHC standard earlier than mandatory and allows customers the opportunity to purchase these vehicles, and that this alternative phase-in structure allowed for early vehicle introduction under both the Tier 2 and California's LEV II programs.

Letters:
American Lung Association (ALA) OAR-2005-0036-0365
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

EPA views the use of credits generated in one weight class toward meeting obligations in a different weight class, and the other averaging, banking, and trading (ABT) provisions, as important elements in setting emission standards reflecting the greatest degree of emission reduction achievable, considering factors including cost and lead time. If there are vehicles that will be particularly costly or have a particular challenge coming into compliance with the standard, the ABT program allows a manufacturer to adjust the compliance schedule accordingly, without special delays or exceptions having to be written into the rule. This is an important flexibility especially given the current uncertainty regarding optimal technology strategies for any given vehicle line. In addition, ABT allows us to consider a more stringent emission standard than might otherwise be achievable under the Clean Air Act, since ABT reduces the cost and improves the technological feasibility of achieving the standard. By enhancing the technological feasibility and cost-effectiveness of the new standard, ABT allows the standard to be attainable earlier than might otherwise be possible.

3.1.5.2 Credits from a Voluntary HDV Program

What Commenters Said:

ALA commented that it opposes the creation of NMHC credits applicable to other vehicle categories from reductions achieved by HDVs.

Letters:
American Lung Association OAR-2005-0036-0365

Our Response:

Our proposal sought comment on voluntary approaches where manufacturers could earn credits by including heavy-duty gasoline vehicles in the program. The ALA's was the only comment responding to this solicitation. Due to insufficient data on such a program's ramifications, as well as the lack of support, we are not including a heavy-duty standard or credit program at this time.

3.1.5.3 Credits and the Family Emission Limit (FEL) Structure

What Commenters Said:

The Association of International Automobile Manufacturers commented that it supports EPA providing the provision that allows manufacturers to optionally certify using Family Emission Limits; however, as described in the proposal, rounding would be required to one decimal place, which would significantly limit manufacturers' ability to use FELs and make it very difficult to earn credits. The commenter recommends that EPA instead allow rounding to two decimal places in order to allow the flexibility which the commenter believes EPA intended with this provision.

Letters:
Association of International Automobile Manufacturers (AIAM) OAR-2005-0036-0973

Our Response:

We believe that rounding FELs to one decimal place is consistent with the one-decimal place standard, simplifies calculations, and will neither help nor hinder the generation of credits. The net effect of rounding the FEL to one decimal place is that some test groups may round down to the FEL, thus promoting the generation of credits. Conversely, some test groups may have to round up to the next FEL, thus potentially limiting credit generation.

3.1.5.4 Cold NMCH Credits and the Tier II Program

What Commenters Said:

ALA commented that it opposes the use of cold NMHC credits to offset deficits in compliance with any portion of the Tier II requirements.

Letters:
American Lung Association OAR-2005-0036-0365

Our Response:

With regard to cold NMHC credits, EPA does not support the use of these credits to offset Tier II compliance deficits, and in fact specifically prohibited in the proposed regulations the use of cold NMHC credits to offset any deficits other than those generated with respect to the cold NMHC standard [§86.1864-10(o)(7)(i)]. The cold NMHC and Tier 2 programs will operate independently of one another in terms of both FEL and credit determination. These provisions are not changing for the final rule, and we will therefore maintain the prohibition of using cold NMHC credits for any other program.

3.1.6 Vehicle Applicability

What Commenters Said:

Proposal Captures Appropriate Vehicles

The Alliance commented that gasoline vehicles account for the vast majority of vehicle miles traveled in the light duty fleet, and it believes that EPA has appropriately focused its 20°F standards on gasoline-fueled vehicles. The commenter noted that applying this standard to the gasoline LDV/LLDT/HLDT/MDPV vehicle classes will capture all but a very small percentage of the air toxics emissions of the light-duty on-road fleet. In addition, the commenter noted that there are restrictions on the availability of emissions testing facilities as well as a lack of current data on which to base a 20°F standard for other classes and categories of vehicles. The commenter further stated that there currently are no cold temperature test fuel specifications for diesel or for alternative fuels, nor are there any specified testing procedures established for alternative fuel vehicles. For all of these reasons, the Alliance stated that it agrees that 20°F standards should not be established for diesels and alternative fuel vehicles.

International Truck and Engine Corporation (International) commented that it supports EPA's decision not to establish cold-temperature non-methane hydrocarbon (NMHC) emissions standards for diesel vehicles. The commenter believes that such standards are unnecessary, as diesel vehicles meeting current emissions standards already have near-zero NMHC emissions as a result of recent rulemakings, and that such emissions should not increase appreciably at low temperatures.

International also commented that even when operated at low temperatures, diesel vehicles are unlikely to generate elevated hydrocarbon emissions. The commenter specifically noted that diesel particulate filters reduce hydrocarbon emissions by physically trapping them so, unlike the 3-way catalysts used in gasoline engines, there is no temperature threshold that must be reached in order for such filters to be effective in reducing NMHC emissions. The commenter stated that as a result, the substantial reductions in NMHC emissions from new diesel emissions are likely to carry over to operation at cold temperatures.

Proposal Should Apply to Additional Vehicles

ALA commented that the cold NMHC standards must be fuel-neutral. ALA believes that the following issues must be addressed: application of a cold weather hydrocarbon emissions

standard to Heavy-Duty passenger vehicles, diesel passenger vehicles, alternative fuel vehicles and flexible fuel vehicles. The commenter believes that the proposal exempts diesel, alternative fuel, and flexible fuel vehicles from the cold weather NMHC standards based on a lack of data; the commenter does not believe that EPA has presented any data to indicate whether the emissions from these vehicles are higher, lower, or the same as the gasoline vehicle subject to the proposed regulations. The commenter further stated that it believes that EPA must commit to exercising its authority to gather the needed data and establishing cold weather NMHC standards for diesel, alternative fuel vehicles and flex-fuel vehicles (FFVs) or explain why such standards are not needed; and further stated that developing standards for both these categories of vehicles should be a priority. The commenter stated that it sees no technical reason why FFVs would not be required to certify to the applicable cold NMHC standard for both E-85 and gasoline in the near future. Lastly, the commenter stated that it believes that EPA should establish cold weather standards for heavy-duty vehicles (HDVs).

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association OAR-2005-0036-0365
International Truck and Engine Corporation (International) OAR-2005-0036-0826

Our Response:

A comprehensive assessment of appropriate standards for diesel vehicles will require a significant amount of investigation and analysis of issues such as feasibility and costs. While we have significant amounts of data on which to base our final standards for light-duty gasoline vehicles, we have very little data for light-duty diesels. Currently, diesel vehicles are not subject to the cold CO standard, so there is very limited data available on diesel cold temperature emissions. Also, many manufacturers are currently in the process of developing diesel product offerings and the cold temperature performance of these vehicles cannot yet be evaluated.

There are sound engineering reasons, however, to expect cold NMHC emissions for diesel vehicles to be as low as or even lower than the finalized standards. This is because diesel engines operate with leaner air-fuel mixtures compared to gasoline engines. Therefore diesels have lower engine-out NMHC emissions due to the abundance of oxygen and more complete combustion. A very limited amount of confidential manufacturer-furnished information is consistent with this engineering hypothesis. Therefore, at this time, we are not finalizing cold NMHC standards for light-duty diesel vehicles. We will continue to evaluate data for these vehicles as they enter the fleet and will reconsider the need for standards. Specifically, we have finalized cold temperature FTP testing for diesels as part of the Fuel Economy Labeling rulemaking, including NMHC measurement.[4] These testing data will allow us to assess diesel NMHC certification levels over time. Meanwhile, postponing the promulgation of this cold temperature NMHC rule would postpone the benefits we can achieve much sooner by limiting the rule to gasoline vehicles. Therefore, the rule will not apply to diesel vehicles at this time.

[4] "Fuel Economy Labeling of Motor Vehicles; Revisions to Improve Calculation of Fuel Economy Estimates," Final Rule, 71 FR 77872, December 27, 2006.

In addition, while FFVs are currently required to certify at 20° F while operating on gasoline, there is no cold testing requirement for these vehicles while operating on the alternative fuel at 20° F. There are little data upon which to evaluate NMHC emissions when operating on alternative fuels at cold temperatures. There are also many issues that must be resolved before we are able to establish a cold temperature standard for FFVs when run on E85 (E70 at cold temperatures). These include feasibility (i.e., levels that are technically achievable), cost, test procedures, test fuel specifications and the appropriate form of the standard. For example, because much of the VOC emissions from FFVs operating on the high ethanol blends at cold temperatures is unburned ethanol on the start, we may need to consider whether higher NMHC level would be justified or whether an NMHC minus ethanol standard would have merit. Also, from a toxics perspective, FFVs operating on E85 will have a different toxics profile due to the shift in fuel from mostly gasoline composing of different compounds to mostly ethanol, a single compound.

Between the proposed rule and today's final rule, we conducted an initial emissions testing program on a limited number of FFVs operated on several blends of gasoline and ethanol at normal test temperatures and 20° F.[5] These vehicles were tested on summer gasoline and E85 under normal test temperatures and on winter gasoline and E70[6] at 20° F. At 20° F, HC emissions were significantly higher with E70 fuel than with gasoline, with the HC emissions largely consisting of unburned ethanol generated during the cold start. The reason for the elevated HC emission levels is that during cold starts, ethanol, which is an MSAT, does not readily burn in the combustion chamber due to its higher boiling point (approximately 180° F). FFVs must start on the gasoline portion of the alternative fuel, which can compose as little as 15% of the alternative fuel. Ethanol emissions are further increased at colder temperatures because the lower engine start temperature will require an increasing amount of the fuel mixture to start the vehicle and subsequently more unburned ethanol can escape the combustion process. However, the testing also indicates significantly lower benzene emission levels for FFVs when operating on the high ethanol blends. Benzene was approximately 65% lower on E85 and approximately 30% lower on E70 compared to the levels when run on gasoline. Acetaldehyde emissions are significantly higher with E85 relative to emissions from gasoline-fueled vehicles, since it is a byproduct of partial (i.e., incomplete) ethanol combustion. In addition, some other VOC-based toxics emissions were generally lower with the vehicles running on E85 and E70 compared with gasoline.

Other fuels such as methanol and natural gas pose similar uncertainty. As in the case of diesels, it will take time to gain an understanding of these other technologies in sufficient detail to support a rulemaking, which delays the benefits that may be achieved now by limiting the rule to gasoline vehicles. Therefore, as proposed, we are not finalizing a cold NMHC testing requirement for FFVs or alternative fuel vehicles under this final rulemaking. We will continue to investigate these other technologies.

Finally, as with diesel and FFVs, we lack relevant data upon which to establish a cold

[5] "Flex Fuel Vehicles (FFVs) VOC/PM Cold Temperature Characterization When Operating on Ethanol (E10, E70, E85)" February, 2007

[6] E70 is a fuel mixture consisting of 70% ethanol and 30% gasoline typical of a winter blend of an ethanol based alternative fuel.

NMHC standard HDVs. Also like diesel and FFVs, a comprehensive assessment of appropriate standards would require a significant amount of investigation and analysis. Such an investigation of HDVs would postpone the promulgation of this rule, which would postpone the benefits we can achieve much sooner by limiting the rule to gasoline LDV/LLDT/HLDT/MDPVs. Therefore, the rule will not include HDVs at this time.

3.1.7 Interim In-Use Standard

What Commenters Said:

Nissan commented that it understands and accepts EPA's desire to phase-out the interim in-use standards; however, it believes that the 0.1g/mi increment is insufficient, given the current (low) level of experience with factors influencing variability of low temperature performance. The commenter noted a study of some 77°F in-use standards which indicated that a 0.1 gpm increment may be insufficient to address possible variability during the phase-in years of this new standard. The commenter offered (as a precedent for such an increment) information regarding the LEV2-SULEV standard when it was adopted. The commenter noted that it was accepted that early implementation contains an inherent risk for misestimating factors affecting in-use variability, so the SULEV rule addressed those factors by setting a higher interim in-use standard for a limited period of time. Nissan suggests that EPA take a similar approach for this new low-temperature NMHC standard.

Nissan also commented that the finding of feasibility for the low temperature NMHC controls tends to be based, in part, on data from low odometer vehicles. The commenter believes that it may not fully reflect in-use variability at higher odometer. The commenter also stated that it believes that test data used to assess feasibility may not account for certain emerging technologies. Nissan believes that an interim in-use standard that does not accommodate these facts means that manufacturers could be inadvertently penalized for early introduction of the leading-edge and fuel-saving technology.

Nissan summarized its comments by reiterating its desire that EPA reconsider interim in-use standards and allow an increment greater than 0.1 gpm for a limited time; stating that it believes that such a targeted standard could influence the earlier implementation of the standard for some models. Nissan further stated that if manufacturers are more confident about in-use compliance, they may be able to pull-ahead some models that would otherwise be delayed because of concern over the narrow margin of the current in-use standard.

Letters:
Nissan Technical Center North America (Nissan) OAR-2005-0036-0825

Our Response:

We did not receive any data that supported Nissan's assertion, nor any indication of an acceptable increase beyond the 0.1 g/mi increment. Furthermore, no other manufacturers commented on this provision. We believe the 0.1 g/mi increment is sufficient and that anything

greater may result in a reduction of emission control. A larger increment may provide incentive for manufacturers to starting reducing their compliance margins, which is not the intent of the provision.

3.1.8 Interaction with Tier 2 Standards

What Commenters Said:

ALA commented that it is not clear whether this compliance structure will conflict or interfere with compliance of other Tier 2 standards. The ALA added that compliance and enforceability are made even more complicated by the proposal of an alternative phase-in schedule. ALA urges EPA to consider this matter more carefully before finalizing the FEL structure, and the alternative phase-in schedule in the final rule.

Letters:
American Lung Association (ALA) OAR-2005-0036-0365

Our Response:

The cold NMHC and Tier 2 programs will operate independently of one another in terms of the following: FEL determination for cold NMHC compliance, selection of compliance bins for Tier 2, credits, compliance, and enforcement. A test group's cold NMHC FEL selected by a manufacturer for the cold NMHC program will not dictate any specific Tier 2 bin for the same test group. Conversely, a manufacturer's selection of the Tier 2 bin for a test group will not determine the FEL established by the manufacturer for cold temperature standard test group. Credits earned with the ABT program for the cold NMHC program are not interchangeable with the NOx credits of the Tier 2 program. Because of the independent nature of the programs, the overlap of the Tier 2 phase-in with the cold NMHC alternative phase-in will not pose complications in terms of compliance and enforcement.

3.1.9 Intermediate Temperature Control and Determination of Defeat Devices

What Commenters Said:

The Alliance commented that the linear interpolation line used to determine emission control at ambient temperatures between 25° F and 68° F is inappropriately stringent. EPA proposed that the guideline for NMHC emission congruity across the intermediate temperature range be the linear interpolation between the NMHC FEL at 25° F and the Tier 2 NMOG standard to which the vehicle was certified at 68° F. The Alliance recommended that EPA develop the linear interpolation based on the FEL "pass limit" at 20° F, instead of the actual FEL itself.

The Alliance commented it is not appropriate to state that a "vehicle will automatically be considered to be equipped with a defeat device without further investigation" if the intermediate

temperature MHC emission level is greater than the 20° F FEL pass limit. The Alliance provided suggested modified language, and recommended that a similar modification be made for the corresponding CO language in this section.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

Based on the Alliance's comments, we have revised the regulations with respect to cold NMHC congruity at ambient temperatures between 20° F and 68° F. Instead of basing the linear interpolation on the FEL at 25° F, we will instead use the FEL "pass limit" at 20° F, per the Alliance's recommendation. For example, if a test group certifies to an FEL of 0.4 g/mi, then the linear interpolation would be based on a line drawn from the FEL pass limit of 0.449 g/mi at 20° F to the applicable Tier 2 NMOG standard at 68° F.

In addition, we have revised the language regarding the presence of a defeat device when the intermediate temperature NMHC emission level is greater than the 20° F FEL pass limit. Instead of "automatically" considering such a test result as indicative of a defeat device, the language will now read "…the vehicle will be presumed to have a defeat device unless the manufacturer provides evidence to EPA's satisfaction that the cause of the test result in question is not due to a defeat device." Though the Alliance recommended that we apply a similar change to the language regarding cold CO controls, such a revision is beyond the scope of the present rulemaking.

3.2 Evaporative Emissions Standards

3.2.1 Level/Feasibility

What Commenters Said:

ALA, in its hearing testimony, commented that it fully supports these proposed standards.

Anchorage commented that it supports the expansion and codification of standards to reduce these emissions both in ambient air and from vehicles parked in attached garages.

NYDEC commented that it is pleased that EPA has decided to modify the motor vehicle evaporative standards to harmonize with the California standards. The commenter noted that as tailpipe emissions continue to decline, evaporative emissions are an ever increasing fraction of their inventory, and a significant contributor to air toxics; it believes that full harmonization will benefit air quality, as well as benefiting motor vehicle owners and operators.

WDNR commented that it believes that all vehicles should meet the proposed evaporative standard for Light Duty Vehicles of 0.5 grams of hydrocarbon on the "3 day diurnal plus hot soak test" and 0.65 grams of hydrocarbon on the "supplemental 2 day diurnal plus hot soak test."

STAPPA and ALAPCO commented that they are disappointed that EPA did not propose to take more meaningful action to address evaporative emissions, such as nationwide adoption of California's Partial Zero-Emission Vehicle (PZEV) evaporative standards. The commenters further urged the Agency to commit in the final rule to pursue actions to achieve additional evaporative emission reductions in the future.

In addition, NESCAUM commented that California has finalized evaporative emissions standards for PZEVs that are significantly more stringent for light-duty vehicles than the federal Tier 2 standards, and the California Air Resources Board estimates that the additional per-vehicle cost for a PZEV evaporative system is approximately $10.2. The commenter believes that EPA should explore the introduction of a similar standard for some vehicles.

Also, NJDEP commented that EPA should look beyond simply the proposed harmonization of the Federal evaporative emission standards with California's standards and consider adoption of California's zero evaporative emission standards (since this harmonization would only occur for the less stringent of the LEV II program's evaporative emission standards). The commenter believes that EPA should evaluate adoption of a zero evaporative standard for federal Tier-2 certified vehicles; noting that the zero evaporative emission standard technology exists today and is being used on over 35 different models of 2006 model year vehicles certified under the LEV II program rules (Source- www.cleanvehicles.gov).

The Alliance commented that it supports the Agency's goal of aligning the federal evaporative standards with the existing LEV II evaporative standards, but noted that field data on these systems is limited, and ensuring in-use compliance with the LEV II standard over the broader range of fuels and conditions encountered nationwide will be very challenging. The commenter noted that granting additional flexibility to implement these requirements will ensure the earliest implementation of the proposed requirements; the commenter further noted that meeting the LEV II evaporative standards can be achieved more effectively if greater flexibility in the certification process is provided to manufacturers (which would allow the option to use either California or Federal test procedures for evaporative certification purposes). The commenter also stated that the ability to complete development and certification is critically dependent upon the flexibility both EPA and California provide in evaporative testing, and therefore recommends EPA allow certification compliance to LEV II standards through either Federal or California evaporative testing procedures without pre-approval.

The Alliance commented that it agrees with EPA's conclusion that it would be inappropriate to propose tighter evaporative emission standards than the LEV II standards at this time. The commenter noted that PZEVs have been limited to a small fraction of the car and light-duty truck fleet, has not been proven feasible across the light-duty fleet, it is significantly more costly to meet the PZEV evaporative emission standard due to the significant changes needed to the evaporative emission control system and the fuel system, and the emission benefits of the PZEV evaporative emission standard are minimal.

Lotus Engineering expressed that it has in its client base some very small vehicle manufacturers, with sales less than a 100 total vehicles and 50 vehicles per year in the U.S.

Some of these small volume manufacturers (SVMs) want to introduce models into the 45 states in the U.S. subject to EPA Tier 2 standards, and delay the introduction of models into the LEV II states. The difference in the Tier 2 to LEV II standards is almost a 50 percent reduction, and this difference is further exacerbated by an increased assigned deterioration factor (DF) from California -- increased stringency of 36 percent for the 2-day test and 70 percent for the 3-day test (compared to those assigned DFs from EPA).

In addition, Lotus Engineering indicated that large manufacturers have the resources to test and demonstrate their own fleet DFs. Even accepting that these fleets have both steel and plastic tanks, the large manufacturers have successfully demonstrated 0 gram DFs. The SVMs do not have this opportunity, and if the proposed harmonization of the Tier 2 and LEV II evaporative emission standards were to be established, SVMs would need a less aggressive assigned DF. SVMs should benefit from an assumption of a 0 DF unless there are technical reasons to suggest otherwise.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association OAR-2005-0036-0365
Lotus Engineering OAR-2005-0036-1033
Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976
NESCAUM OAR-2005-0036-0993
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829
New York Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
STAPPA/ALAPCO OAR-2005-0036-0836
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

Comments expressed by ALA, Anchorage, NYDEC, WDNR, and the Alliance support the adoption of the new evaporative emission standards, which harmonize with California's LEV II standards. Vehicles sold in all 50 states will now be required to meet the same numeric standard. However, we believe the LEV II standards were essentially equivalent to the current Tier 2 standards because of differences in testing requirements between the two programs (see section V.C.5 in the rule, *Existing Differences Between California and Federal Evaporative Emission Test Procedures)*, and thus, vehicles contain the same evaporative emission control hardware for the two programs. (As discussed in the rule, this view is supported by manufacturers and by current industry practices.) We expect that manufacturers will continue to produce 50-state evaporative systems, and this rule will codify (i.e., lock in) the approach manufacturers have already indicated they are taking for 50-state evaporative systems.

In regard to the STAPPA/ALAPCO, NESCAUM, NJDEP, and Alliance comments related to more stringent evaporative standards (or California's PZEV evaporative emissions

standards), we have decided not to set more stringent PZEV-equivalent evaporative standards at this time. The limited PZEV vehicles available today require additional evaporative emissions technology or hardware (e.g., modifications to fuel tank and secondary canister) beyond what will be needed for vehicles meeting the new standards that we are adopting today. As we described in the proposed rule, at this time, we need to better understand the evaporative system modifications (i.e., technology, costs, lead time, etc.) potentially needed across the vehicle fleet to meet PZEV-level standards before we can fully evaluate whether it is feasible to consider more stringent standards. For example, at this point we cannot determine whether the PZEV technologies could be used fleet-wide or on only a limited set of vehicles. Thus, in the near term, we lack any of the information necessary to determine if further reductions are feasible, and if they could be achievable considering cost, energy and safety issues. Moreover, sufficient new information or data was not provided from commenters on the proposed rule to close these gaps in our understanding. However, we intend to consider more stringent evaporative emission standards in the future.

In response to the comments of Lotus Engineering, it is important to note that we are finalizing flexibility provisions for SVMs. The final rule allows SVMs a two-year delay to comply with the new evaporative standards. For a model year 2009 start date for LDVs and LLDTs, SVMs will be permitted to comply with the standards beginning in model year 2011. For a model year 2010 implementation date for HLDTs and MDPVs, SVMs will be allowed to meet the standards in model year 2012. Also, under the hardship provisions established in this rule, SVMs can apply for an additional 2 years -- beyond the above delay in the start date -- to comply with the new standards. (Before we grant hardship relief, one of the criteria is that the applicant must include evidence that the noncompliance will occur despite their best efforts.) With this extra lead time, the SVMs would be able to utilize proven evaporative emission hardware from large volume manufacturers (lowest permeation materials, etc.). In addition, it is likely that the assigned DFs will be revised before the start date of the new standards, since they are based on the 70^{th} percentile of DFs from large volume manufactures (DFs would likely decrease due to completion of phase-in of Tier 2 standards, etc.).

In addition, we support the Alliance comments to allow federal certification to the new standards through California evaporative testing results without obtaining advance approval. Since we are harmonizing federal evaporative standards with the LEV II evaporative emission standards in this rule, we believe that for the new standards it is unnecessary to continue to require this advance approval for California results. Thus, we are finalizing provisions that would allow certification to the new evaporative emission standards in accordance with California test conditions and test procedures without pre-approval from EPA.

3.2.2 Timing

What Commenters Said:

The Alliance commented that EPA must independently consider the stringency of LEV II standards relative to the emissions control capability of multi-fueled vehicles (MFVs) in setting the timetable for LEV II evaporative emissions standards for these vehicles. The commenter

noted that, in addressing the timing for compliance of gasoline-fueled vehicles to California's LEV II evaporative emissions standards, EPA based its timetable for implementing the new standards on two key factors: 1) that manufacturers already voluntarily equip federally-certified vehicles with LEV II evaporative systems hardware, so most manufacturers have experience with these systems; and 2) the Federal in-use environment may raise unique issues 'the broad range of climates and road conditions across the U.S. can potentially be more severe than in California' which necessitates unique considerations in the transition to LEV II in-use standards federally. The commenter noted that the Agency recognizes that the in-use factors are a significant factor in meeting LEV II evaporative standards over a vehicle's full useful life, and further commented that when proposing the adoption of LEV II evaporative standards for MFVs, the same two factors that guided the adoption of the standards for gasoline-fueled vehicles are critically important considerations. The commenter believes that, in this case, differences between the fuels lead to a different conclusion regarding a reasonable implementation schedule for MFVs; thus, the commenter believes that these considerations need to be addressed independently and not as an extension of adopting LEV II standards for gasoline vehicles. The commenter offered 'evidence' of these differences, noting that of the Alliance members currently marketing MFVs, only one manufacturer has any models certified for sale in California where they are subject to the LEV II evaporative standards.

The Alliance commented that for many manufacturers of MFVs, the new LEV II evaporative standards are a more stringent requirement being contemplated for these vehicles for the first time, unlike gasoline vehicles in which case it is not EPA's intention to impose additional stringency but rather to codify what is already in place. The commenter noted that for most manufacturers of MFVs, there is currently no demonstrated capability to meet the LEV II evaporative certification standard from which to begin planning compliance to the standard. The commenter stated that it believes that this alters the starting point for EPA's rulemaking, as applicable to MFVs, relative to the starting point for regulating gasoline vehicle evaporative emissions (where existing systems demonstrate capability to meet the LEV II evaporative certification standard). The commenter stated that it believes that this alone justifies a separate timetable for adopting the lower LEV II evaporative standards for MFVs, which it noted that the Agency recognized in the proposal. The commenter noted, however, that as interest in alternative fuels heightens due to energy supply issues, manufacturers are suddenly contemplating widespread introduction of flexible fuel models across entire product lines. The commenter believes that these new developments justify reconsideration by the Agency of the general lead-time requirements.

In particular, the Alliance requests the following revisions to the proposed LEV II evaporative standards for MFVs (*See docket number 0881.1, p. 30 for Table 2: Proposed Phase-in Schedule for LEV II Evaporative Standards for Multi-Fueled Vehicles by Model Year*):

1. Combine the LDV/LLDT and HLDT/MDPV fleets for the purposes of compliance planning flexibility.
2. Implement a phase-in of this combined fleet to the LEV II evaporative standard beginning in 2013.
3. Allow a 3-year phase-in of 30/60/100% based on the combined fleet.

The Alliance provided the following technical rationale:

1. Under the current proposal, 2012 will see an implementation of the LEV II evaporative in-use standards for gasoline models, using lessons learned from field experience gained on systems certified to the LEV II standards from 2009 for LDVs/LLDTs and 2010 for HLDTs/MDPVs. The commenter believes that these in-use lessons learned can be applied to the MFV product beginning the next model year, to the extent they apply; where MFV evaporative emission control systems must be robust enough to control hydrocarbon emissions to near-zero levels from fuels ranging from zero to 85% ethanol, there can be overlap between operating conditions and consequently some similarity of field data. This field data can be leveraged, and this encourages a seamless progression of the LEV II evaporative certification and in-use standards from gasoline vehicles in 2012 to MFVs in 2013.

2. The commenter stated that model renewals provide the most cost-effective and advantageous timing for introduction of new emissions capability to meet LEV II evaporative standards. The commenter noted that some manufacturers currently plan model renewals for multiple vehicle lines in the window of the three model years from 2013 to 2015. The commenter believes that providing a 3-year phase-in for MFVs provides greater opportunities for scheduled model renewals to coincide with implementation points for LEV II evaporative standards for these vehicles; planning, engineering, and development activities necessary to comply with these new standards can be incorporated into the model redesign activities.

3. The commenter stated that it believes that combining the LDV/LLDT fleet with the HLDT/MDPV fleet for the purpose of complying with the phase-in requirements of this new standard for MFVs gives manufacturers greater flexibility in managing the timing of any necessary redesigns of evaporative emission control system architecture and technology. The commenter noted that more product lines would be in the pool of vehicles requiring phase-in, which would allow more choice in how to stage the phase-in. The commenter believes this is especially important if manufacturers opt to take advantage of certification to LEV II evaporative standards to offer an MFV package as a 50-state package, which must then also simultaneously satisfy California's LEV II exhaust emission standards and the additional complexity of NMOG compliance plans, which are sales-volume based.

4. The commenter stated that it believes that a 3-year phase-in to the LEV II evaporative standards for MFVs will allow better application of in-use experience gained on those packages phased-in earlier to those packages phased-in later-- thereby shortening the overall timetable for full implementation of the new standards relative to what would otherwise be necessary.

The Alliance commented that the MFV portion of the light-duty on-road fleet is currently a small fraction of the total light-duty fleet, and that while this is expected to increase, it is still projected to be a small fraction through the proposed phase-in period. The commenter stated that it believes that the incremental effect of providing a 3-year phase-in of MFV LEV II evaporative

standards will not materially affect the contribution of the light-duty fleet to the air toxics inventories.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

We believe that many of the concerns expressed by manufacturers supporting additional lead time for MFVs are valid. Most manufacturers have less experience meeting the new standards on the non-gasoline portion of MFVs (or FFVs) compared to gasoline vehicles. Different from what we proposed, the new standards will apply beginning in model year 2012 with a three-year phase-in, 30/60/100 percent, for LDVs/LLDTs and HLDTs/MDPVs grouped together (see the below table for the phase-in schedule). Although auto manufacturers requested a start date of 2013 for a combined fleet, we believe the additional flexibilities we are providing (three-year phase-in and grouping LDVs/LLDTs and HLDTs/MDPVs together) is sufficient flexibility for the production of MFVs. There is enough time between now and the implementation dates or phase-in schedule (2012 through 2014) for manufacturers to coordinate model renewals with the introduction of broader product offerings of MFVs.

Phase-in Schedule for Non-Gasoline Portion of MFVs: Evaporative Emission Standards*

Vehicle GVWR (Category)	2012	2013	2014
≤ 6000 lbs (LDVs/LLDTs) and > 6000lbs (HLDTs and MDPVs)	30%	60%	100%

*Phase-in schedules are grouped together for LDVs/LLDTs and HLDTs/MDPVs.

As described in section V.C.4 of the rulemaking (*In-Use Evaporative Emission Standards*), the existing Tier 2 evaporative emission standards will apply in-use for the first three model years after an evaporative family is first certified to the new standards, but similar interim in-use provisions will not apply to the non-gasoline portion of MFVs. We believe that three to five additional years to prepare vehicles (or evaporative families) to meet the certification standards, and to simultaneously make vehicle adjustments from the federal in-use experience of other vehicles (including those that are not MFVs) is sufficient to resolve any issues for MFVs. Therefore, according to the phase-in schedule above for a combined fleet (for non-gasoline portion of MFVs), the evaporative emission standards will apply both for certification and in-use beginning in 2012 for LDVs/LLDTs and HLDTs/MDPVs.

3.2.3 Other

3.2.3.1 On-Board Diagnostics and Evaporative Emissions Standards

What Commenters Said:

WDNR questioned whether or not, with regard to evaporative emissions standards, vehicles with On-Board Diagnostic II (OBD II) systems would require recalibration by the manufacturer of the evaporative monitor in the OBD II system to ensure that the evaporative emission standards that are chosen in adopted rule are met. The commenter also questioned whether or not manufacturers would have some identification for the new vehicles that meet the standard, noting that individual State and local agencies will not have the capability to identify these new certified vehicles in an OBD II emissions testing program. In addition, the commenter asked how the use of ethanol added fuel (E10 or E85) would affect the certified recalibration standard for the evaporative monitor in the OBD II system in new vehicles.

Letters:
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

We believe some additional context is needed in regard to OBD II requirements. OBD II monitors for vapor leaks (0.040 inches or 1 millimeter is the EPA leak monitor requirement; a vacuum or pressure check of the evaporative system is performed to test for leaks) and equipment malfunctions of the evaporative emissions system. Therefore, the OBD II system would not have to be recalibrated for the new evaporative emission standards. Moreover, the OBD II system will operate the same regardless of fuel type, and thus, E10 or E85 fuels (E10 is fuel that is 10 percent ethanol and 90 percent gasoline, and E85 is fuel that is 85 percent ethanol and 15 percent gasoline) will not impact the OBD II system monitoring for evaporative emission leaks. As for identification of the new vehicles meeting the promulgated standards, we have a vehicle certification database on EPA's website at www.epa.gov/cfeis.htm, and in this database the public would be able to identify the evaporative emissions data for new vehicles. (This database includes a document index system (DIS), and it contains a summary of the certification test data on a report, which is commonly called the "summary sheet.")

3.2.3.2 Compliance During Phase-in Period

What Commenters Said:

WDNR questioned who will be responsible for ensuring that the standards are being complied with during the phase-in.

Letters:
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

EPA has compliance and enforcement staff that are responsible for ensuring that manufacturers meet the standards according to the phase-in schedules. In addition,

manufacturers are required to perform in-use, 2-day evaporative emission tests on one low-mileage vehicle and one high-mileage vehicle in each certified evaporative family. (Low-mileage vehicles are typically one year old with approximately 10,000 to 20,000 miles. High-mileage vehicles are typically three to four years old with a minimum of 50,000 miles.)

3.2.3.3 Cold-temperature Testing for Compliance Assurance

What Commenters Said:

Anchorage recommended cold-temperature testing of running and evaporative emissions to ensure controls are working as designed.

Letters:
Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

Our Response:

It is important to note that evaporative emissions are much less at cold temperatures. EPA's evaporative emission test procedures correspond to in-use vehicle operation in ozone-prone summertime conditions -- hot weather (March 24, 1993; 58 FR 16002). See also section 202(k) of the Clean Air Act – *Evaporative Emissions*.

4. GASOLINE BENZENE PROGRAM

What We Proposed:

The comments in this chapter correspond to Section VII of the NPRM and relate to our proposed gasoline benzene control program. A summary of the comments received, as well as our response to those comments, are presented for each issue. For the full text of comments summarized here, please refer to the public record for this rulemaking.

4.1 Standards

4.1.1 Benzene Standards

4.1.1.1 Average Standard of 0.62 Vol% Is Not Stringent Enough

What Commenters Said:

Many commenters supported a more stringent average benzene standard than the proposed standard of 0.62 vol%. Most of these commenters supported an average standard of 0.52 vol%; one commenter suggested a standard between 0.62 vol% (the current average benzene level for RFG) and 0.41 vol% (the lowest individual refinery level in 2003). These commenters gave two main reasons for a more stringent standard: 1) that a more stringent standard is feasible, and 2) a more stringent standard could be achieved at a reasonable cost.

Comments supporting the feasibility of a more stringent standard pointed out that a number of refineries are producing gasoline today with benzene content well below the proposed average standard. Several commenters argued that the average standard should be sufficiently stringent that all refineries, especially those with higher benzene levels, would be required to use similar technologies and achieve similarly low levels. Some of these commenters point to EPA's analysis showing that a standard as low as 0.52 vol% would be feasible from a strictly technological standpoint. One commenter, the New York Department of Environmental Conservation, stated its belief that because gasoline in the New York metropolitan area is already low compared to other parts of the country, the proposed average standard would not likely result in further reductions in that area.

Regarding cost, several commenters observed that EPA's analysis showed that while a much more stringent standard of 0.52 vol% would increase average costs by more than a factor of two, the resulting average costs per gallon would still be less than were projected for the gasoline sulfur program, which EPA considered reasonable in that instance.

Our Response:

While many of the comments on the level of the average standard discuss technological feasibility and cost separately, we believe that the statute requires us to

consider these factors together (see Sierra Club v. EPA, 325 F. 3d at 378).[7] In the proposal, we considered a range of levels for the average benzene standard, taking into account technological feasibility as well as cost and the other enumerated statutory factors. We have reassessed the level of the standard in light of these factors, and have concluded that the proposed level of 0.62 vol% is the appropriate level for the average standard, because it achieves the greatest achievable emission reductions through the application of technology that will be available, considering cost, energy, safety, and lead time.

In the proposal, EPA described in detail what we believe would be the consequences to the overall goals of the program of average standards of different stringencies (see 71 FR 15866-67). These anticipated consequences relate in large part to how we believe refiners would respond to the benzene averaging and benzene credit trading provisions that were integral to the proposed program. For the final rule, we have reassessed how we believe refiners would respond to different average standards. We continue to believe that increasing the stringency of the average benzene standard could have the effect of reducing the number of benzene credits generated, since fewer refineries are likely to take actions to reduce benzene further than required by the standard. At the same time, a more stringent standard would increase the need for more technologically challenged refineries to purchase credits. Directionally, we showed at proposal that a more stringent average standard would increase costs for these refineries. This is because credits may be less available and/or less affordable as an alternative to immediate capital investment, and investment in relatively expensive benzene saturation equipment would be necessary for a greater number of refiners that could not comply with credits alone. For the final rule, we specifically considered a level of 0.50 vol% for the average standard, which we expect would require all refineries to install the most expensive benzene control technologies (either benzene saturation or benzene extraction). We concluded that this level would clearly not be feasible, considering cost. In a related analysis, we also showed that if, contrary to our expectations, credits were not easily available as a compliance option, there are several refineries for which it may be technologically feasible to reach benzene levels below 0.62 vol%, but only at costs far greater than for most other refineries.[8]

The commenters supporting a more stringent average benzene standard did not provide data or analysis to address the potential negative effects of different standards

[7] "[P]etitioners point out that section 202 (l) (2) is 'technology-forcing,' so that the agency must consider future advances in pollution control capability. This is not disputed, but doesn't take petitioners far. The statute also intends the agency to consider many factors other than pure technological capability, such as costs, lead time, safety, noise and energy. And its language does not resolve how the Administrator should weigh all these factors in the process of finding the 'greatest emission reduction achievable.'"

[8] It is true that the final rule contains a hardship provision which could apply to individual refineries facing extreme economic or other hardship in meeting the benzene standards. However, the existence of this provision does not mean that EPA can reasonably adopt more stringent standards assuming that refineries may obtain some type of hardship waiver. The hardship provision is designed to accommodate those rare situations where, contrary to predictions now, a refiner faces unusual circumstances resulting in extreme hardship affecting its ability to comply. If grant of hardship relief from the benzene standards became a norm rather than an exception, EPA doubts that the standard would reflect "maximum emissions reductions achievable" since demonstrably the standard would not be being achieved by many refineries.

that we presented in the proposal, especially in the context of the proposed ABT program. Many comments that supported a more stringent standard pointed to average costs projected in the proposal that are higher than for the proposed standard, but are not large on a per-gallon basis compared to other EPA fuel programs. However, even assuming that it is relevant here to consider per-gallon costs for removal of sulfur in other rulemakings,[9] these commenters did not address the wide range of compliance costs for individual refineries that we discuss in the proposal (see Chapter 9 of the RIA). It is critical to recognize that as more stringent average standards are considered, the costs for individual technologically-challenged refineries tend to become very high. This potential for high costs at more stringent average standards exists if, as we expect, the ABT program functions as it is designed to; if the ABT program functions less efficiently than projected, the costs for some individual refineries could be higher still.

As noted above, we believe that there are increasingly significant issues of cost and technological feasibility for a variety of refineries as average standards below 0.62 vol% are considered. We remain convinced that an average standard of 0.50 vol% would clearly not be a feasible nationwide program, considering cost, since so many more refineries would need to use the highest-cost benzene control technologies. As at proposal, EPA continues to believe that setting an average standard more stringent than 0.62 vol% would necessarily begin to create the serious issues we identified for a standard of 0.50 vol%. Yet, as our updated analyses continue to show, these concerns do not appear to be significant at a level of 0.62 vol%. We therefore continue to believe that an average standard of 0.62 vol%, in the context of the ABT program, will maximize the benzene reduction nationwide, will minimize the likelihood of refineries experiencing extreme costs, and will reasonably distribute costs nationwide among refineries.

The NY DEC is correct in highlighting that some areas of the country already have such low benzene levels that the opportunity or further control is more limited. However, although current benzene levels in some areas are indeed lower than 0.62 vol%, this does not mean that all refiners and importers in those areas have fully implemented all of their benzene control potential. We believe based on our refinery modeling that the ABT program will create incentives for refiners in all areas to consider further benzene reductions, to generate credits to use at other of its refineries or to sell. A strong market for benzene as a petrochemical feedstock may well provide additional incentive for extracting additional benzene at some refineries. Thus, although some refiners in some areas may choose not to reduce benzene further under the final benzene control program, we think it is likely that an overall reduction in gasoline benzene levels will result in all areas of the country.

We are thus finalizing the 0.62 vol% standard as proposed. We believe that this average benzene standard of 0.62, in the context of the associated ABT program and the

[9] See Sierra Club v. EPA, 353 F. 3d 970, 986 (D.C. Cir. 2004) ("[t]his court has adopted an 'every tub on its own bottom' approach to EPA's setting of standards pursuant to the CAA, under which the adequacy of the underlying justification offered by the agency is the pertinent factor – not what the agency did on a different record concerning a different industry")

1.3 vol% maximum average standard, achieves the greatest reductions achievable, taking into account cost and the other statutory factors in CAA 202(l)(2).

4.1.1.2 Average Standard of 0.62 Vol% Is Too Stringent

What Commenters Said:

Several commenters, all of which are refining companies, commented that they believe that the 0.62 vol% average benzene standard would create serious financial and technical burdens on them and that a less stringent standard should be adopted. The Ad Hoc Coalition of Small Refiners indicated that it was not clear that it will be possible for all of its members to produce market-grade gasoline that meets a 0.62 vol% standard. Two individual refiners commented that it may not be possible for them to meet 0.62 vol%, even using benzene saturation equipment.

Several other refiners made statements that while technologically feasible, the proposed standard would create various technical challenges at their refineries. These refiners mentioned the need for additional capital investment; the inability to pursue benzene extraction as a control option due to lack of proximity to benzene chemical markets; challenges in recovering octane value; the lack of corresponding economic benefit to benzene related improvements; and the challenge of less hydrogen production when controlling benzene. In addition, one company that imports gasoline indicated that a standard of 0.62 vol% may limit the volume of imported gasoline, increase its cost, and adversely affect importers, suggesting that a standard of 1.0 vol% would be more appropriate.

Our Response:

The commenters stating that the 0.62 vol% average standard is too stringent did not address or did not give sufficient emphasis to the fact that no refiner will be required to produce gasoline at the 0.62 vol% level. Even with the addition of the 1.3 vol% maximum average standard, the ABT program will allow refiners that produce gasoline at levels of 1.3 vol% or less to be able to comply with the 0.62 vol% standard by using credits. By combining operational changes, capital equipment, and the use of credits, we believe all refineries will be able to comply with the average standard (and the maximum average standard) within the time available. Should these assumptions prove unfounded, and an individual refiner demonstrates extreme hardship in meeting either of the benzene standards, relief via a hardship variance is available on a case-by-case basis (see section 80.1335). Moreover, if a small refiner demonstrates that the ABT program is not functioning as expected and meeting the 0.62 vol% standard via credits creates extreme hardship (e.g., sufficient credits are for some reason not available or are prohibitively expensive), the refiner may apply for case-by-case hardship relief under section 80.1343.

We do not believe that the technical issues raised by the commenters warrant a change in the proposed average standard. We agree that each of the circumstances

presented by the commenters is likely to occur, and we account for them in our modeling and discuss them in the preamble (section VI) or in the RIA (Chapter 6). We believe that such circumstances will rarely if ever cause extreme hardship, especially since refiners must physically produce gasoline only at a 1.3 vol% level or less, not a 0.62 vol% level.

Regarding the comment about negative impacts of the proposed program on the importing of gasoline, we agree that the cost of imported gasoline will rise with the cost of gasoline refined domestically. However, the requirements of the program are essentially identical for both refiners and importers, and we expect that the relative positions in the market between refiners and importers will not change substantially.

4.1.1.3 The Proposed Program Would Affect Geographic Equity in Gasoline Benzene Levels

What Commenters Said:

Several commenters state that the proposed program would maintain or create inequities in gasoline benzene levels from one part of the country to the other, stating or implying that the program should reduce or eliminate such inequities. These commenters attribute these inequities to the nature of the 0.62 vol% standard as an average, which through trading of credits that will occur under the ABT program will allow for variations in gasoline benzene levels across the country. Especially in the absence of an upper limit on benzene, these commenters are concerned that benzene levels in some areas will not be reduced, or may increase, including areas that currently have the highest benzene levels. Some of these commenters specifically indicated that certain areas would have what they believe to be unacceptably high gasoline benzene levels after the proposed program was implemented. One commenter believes that the program should reduce benzene levels to the lowest levels achievable nationally, regionally, and locally.

Our Response:

Our updated analysis shows that with the 0.62 vol% average standard and the maximum average benzene standard of 1.3 vol%, benzene levels will be reduced very significantly in all parts of the country. However, a degree of variation will continue to exist, due to the wide variety of refinery configurations, crude oil supplies, and approaches to benzene control, among other factors. This remaining variation is clearly legally permissible, because we do not read CAA section 202(l)(2) as requiring uniform gasoline benzene levels in each area of the country, since the standard is to be technology-based considering costs and other factors which vary considerably by region and by refinery. On the other hand, the maximum average standard will have the appropriate effect of directionally providing a greater degree of geographic uniformity of gasoline benzene levels and these levels remain feasible achievable considering cost and the other enumerated factors. The program adopted here achieves both national and regional reductions by means of a national standard resulting in greatest aggregate emissions reductions (the annual average standard with ABT), plus a maximum average

standard to assure optimization of reductions in all areas. It is reasonable to adopt these standards together here, given the rather large initial disparities in initial benzene levels across fuel regions. Seeking some degree of geographic uniformity in gasoline benzene levels is within the Administrator's discretion, given that section 202 (l) (2) does not specify whether maximum achievable reductions are to be achieved nationally, regionally, or both. The effect of the program on geographic variability in benzene levels is discussed in section VI of the preamble and Chapter 9 of the RIA.

4.1.1.4 Consideration of an Upper Limit Benzene Standard

What Commenters Said:

Several individual refiners and representatives of refiners supported the proposed program's approach of an average standard without a separate upper limit standard. Generally, these commenters supported a program without either a per-gallon cap standard or a maximum average standard, although some of them indicated that a per-gallon cap standard would be more problematic than a maximum average standard. None of these commenters provided analysis or data about the potential effects if an upper limit standard were added.

The Ad Hoc Coalition of Small Business Refiners expressed serious concern about the addition of a maximum average standard. They stated that with a maximum average standard of 1.3 vol%, at least several small refiners would be required to install capital equipment at very significant cost. They maintained that including a maximum average standard creates no additional benzene reduction while increasing compliance costs (citing EPA's analysis at proposal in support). Again citing analysis from the proposed rule, they maintained that including a maximum average would simply shift emission reductions from one region of the country to another, again in their view, imposing costs without any emission reduction benefit. Finally, they advanced the legal argument that imposition of a 1.3 vol% maximum average without consideration of the costs on each refinery violates section 202(l) of the Act, which requires EPA to take costs into consideration in determining maximum degree of emission reduction achievable. They urged EPA not to implement a maximum average standard, and, if it did, to include provisions to allow small refiners to comply with the standard using credits. They suggested alternatives for how such a provision might be structured, either by restricting credits used to meet the 1.3 vol% standard to the PADD in which the refiner is located, or discounting credits used to meet the 1.3 vol% standard.

Most comments from state and local air pollution agencies, environmental/public health organizations, and private citizens supported the addition of an upper limit standard. Several commenters supported a per-gallon benzene cap. Others supported a maximum average standard. Most of the commenters supporting a maximum average standard, including joint comments from four U.S. Senators from the northwest U.S., specified a value of 1.3 vol%, and one commenter supported a maximum average standard of 0.78 vol%. These commenters referred to EPA's analyses of these levels in

the proposal, and did not present any additional analytical support. Finally, we received similar comments from approximately 1,000 individual citizens who generally supported an upper limit. These commenters gave two primary reasons for their support of upper limit standards: that an upper limit would provide more certainty that most refineries would reduce benzene levels and would not increase them, and that variations in benzene levels would be reduced or eliminated. Most of these commenters also pointed to EPA's NPRM analysis showing that the estimated average industry-wide costs of adding an upper limit standard would not be large.

Our Response:

Upper Limit Benzene Standard

In the proposal, we considered the implications of an upper limit on the actual level of benzene in the gasoline that refiners produce (as opposed to the level achieved using credits) (see 71 FR 15868-69.) We considered an upper limit both in the form of a per-gallon benzene cap and a limit on the average of actual benzene in gasoline produced by a refinery ("maximum average standard"). Of these two approaches, we recognized that a per-gallon cap would be the more rigid. If every batch needed to meet the cap, there would be no opportunity to offset benzene spikes with lower-benzene production at other times. Even during times of normal operation, our review of refinery batch data indicated that unavoidable wide swings commonly occur in the benzene content of gasoline batches, even for refineries that have relatively low benzene levels on average. A per-gallon cap could result in refiners halting gasoline production during short-term shut-downs of benzene control equipment or in other temporary excursions in benzene levels. Unless a per-gallon limit were generous enough or included case-by-case exceptions (eroding the possible benefit of the cap), many refiners would likely need to implement much deeper and more costly reductions in benzene than would otherwise be necessary, simply to protect against such fluctuations. For some refiners, we tentatively concluded, a cap could make complying with the program prohibitively expensive.

The other option on which we solicited comment, a maximum average standard, would be more flexible. A maximum average standard would limit the average benzene content of the actual production at each refinery over the course of the year, regardless of the extent to which credits may have been used to comply with the 0.62 vol% average standard. Thus, a maximum average standard would allow for short-term benzene fluctuations as long as the annual average benzene level of actual production was less than that upper limit.

After evaluating the results of our updated refinery analysis and considering all of the comments, we now believe that the program should include a maximum average benzene standard set at an appropriate level. The maximum average standard has the strong advantage of ensuring that the benzene content of gasoline produced by each refinery (or imported by each importer) will average no higher than that level, regardless of the use of credits, providing greater assurance that actual in-use benzene reductions more clearly reflect our modeled projections which form the basis for this rule. At the

same time, the maximum average standard avoids the serious drawbacks of a per-gallon cap.

As explained in section VI.A.1.d of the preamble to the final rule, while we have used all information available to us, our modeling cannot predict with high confidence each individual refinery's actions and how benzene trading will occur in all cases. Thus, although our analysis at proposal indicated widespread reductions in gasoline benzene levels in all fuel regions (notwithstanding that any individual refinery could avoid benzene reductions through credit purchases), we cannot dismiss with high confidence the possibility voiced in the comments that significant disparities in gasoline benzene levels will remain. Consequently, we are adding an upper limit to the 0.62% average standard in order to provide greater assurance that the benzene emission reductions we project, including their uniform distribution, are actually achieved. By selection of an appropriate level for the maximum average, the program will achieve these important benefits with a very small impact on the program's overall cost.

We have chosen a level of 1.3 vol% for the maximum average standard. We believe this level represents a reasonable balance between the additional cost and increased confidence in the occurrence of expected gasoline benzene reductions in all fuel regions. Implementing an upper limit below 1.3 vol% would increase the number of refineries needing to install the most expensive benzene reduction equipment, thus diminishing the flexibility of the ABT program and increasing the cost of the program. Conversely, an upper limit above 1.3 vol% would have only limited effectiveness in ensuring that the modeled benzene gasoline levels are achieved in the long term. .

We carefully considered the comments of small refiners regarding a maximum average standard. We do not accept the position that a maximum average standard imposes costs without emission reduction benefits. As stated in response 4.1.1.3 and the preamble to the final rule, the maximum average requirement assures that predicted reductions in gasoline benzene levels across all PADDs will in fact occur. As further stated, this assures that maximum achievable reductions will occur both nationally and regionally, a reasonable objective. We also no longer believe that the effect of a maximum average cap will be merely to redistribute benzene gasoline levels. We tentatively reached that conclusion at proposal based on refinery-by-refinery modeling that among other things assumed a precisely linear response between the level of standards and the volume of credits generated. This assumption is not a given, since (among other things) refineries may in fact decide to overcomply with the annual average standard for reasons other than credit generation, such as assuring a compliance safety margin. More generally, we now believe that the predicted offsetting effects are too small relative to the accuracy of the predictive model for us to have certainty they will occur.

Small refiners further argued that EPA has ignored costs to each refinery in adopting the maximum average standard, and that this violates the requirement in section 202(l)(2) to consider costs in determining maximum emissions reductions achievable. The statute does not specify how costs are to be considered, and so does not require

refiner-by-refiner cost determinations. Our approach to considering cost in this rule is well within the ample discretion the statute affords. We considered costs to the refining industry overall and on an aggregate cost per gallon of gasoline basis, and conducted the same analysis on a PADD by PADD, and refiner-by-refiner basis. As explained in detail in chapters 9 and 14 of the final RIA, although not every refiner will incur the same cost impacts under the rule, we believe that the overall costs of complying with the rule are reasonable. As explained in those same sections, we believe that the rule is also technically feasible at reasonable cost for all refiners. In addition, if economic impacts on individual refiners are more severe than expected, the rule includes safety valve provisions whereby refiners can obtain relief by demonstrating significant economic hardship.

Several commenters supported an upper limit standard as a way of reducing the variation in benzene levels that currently exist across the country. We agree that reducing gasoline benzene levels on both a national and regional basis is a reasonable objective, as discussed in section 4.1.1.3 above, and further agree that implementing the overall program (including the maximum average standard) will have the effect of reducing variability in gasoline benzene levels, as also discussed in that response.

We discuss in more detail our rationale for adding a maximum average standard, and for our selection of the level of 1.3 vol% for that standard, in section VI of the preamble for this final rule.

Letters relating to Section 4.1.1:

Ad Hoc Coalition of Small Business Refiners OAR-2005-0036-0686
Alaska Department of Environmental Conservation, Division of Air Quality (ADEC) OAR-2005-0036-0975
American Lung Association OAR-2005-0036-0365 (Hearing testimony)
(Municipality of) Anchorage, Department of Health and Human Services OAR-2005-0036-0976
Citizen comments OAR-2005-0036-1019 (generally representative of approximately 1,000n citizen comment letters)
Colonial Oil Industries, Inc. OAR-2005-0036-0990
Countrymark Cooperative, LLP OAR-2005-0036-0471
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
Lane Regional Air Protection Agency (LRAPA) OAR-2005-0036-0848
Marathon Petroleum Company LLC OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
New York Department of Environmental Conservation OAR-2005-0036-0722
NESCAUM OAR-2005-0036-0993
Oregon Department of Environmental Quality (OR DEQ) OAR-2005-0036-0987
Oregon Toxics Alliance (OTA) OAR-2005-0036-0948

Private Citizen OAR-2005-0036-0368
Puget Sound Clean Air Agency OAR-2005-0036-0780
Silver Eagle Refining, Inc. OAR-2005-0036-0839
Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation OAR-2005-0036-0989
STAPPA/ALAPCO OAR-2005-0036-0836
United Refining Company OAR-2005-0036-0827
U.S. Senator Ron Wyden et al
Washington State Department of Ecology OAR-2005-0036-0950.1
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR)OAR-2005-0036-0828

4.1.2 Consideration of Other Fuel Controls

4.1.2.2 Consideration of a Total Toxics Performance Standard

What Commenters Said:

Several commenters, primarily individual refining companies and organizations representing refining companies, supported the proposed benzene control approach of focusing on gasoline benzene content rather than on total toxics emissions. Generally, they stated that the proposed benzene content standard would result in the same toxics emissions benefits (since refiners would meet a toxics standard through benzene control anyway), and they support the simplification in gasoline toxics regulation that the proposed program would represent.

On the other hand, many commenters supported an MSAT program that includes a total toxics standard, either in addition to or instead of an average benzene standard. In general, these comments express concern that the lack of a total toxics performance standard could allow refiners to increase other MSATs even while reducing benzene. One commenter pointed out that EPA made similar arguments in support of the MSAT1 program.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
American Petroleum Institute (API) and National Petrochemical and Refiners Association (NPRA) OAR-2005-0036-1015
BP Products North America Inc. OAR-2005-0036-0824
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
Independent Fuel Terminal Operators Association OAR-2005-0036-1007
Marathon Petroleum Company LLC OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
NESCAUM OAR-2005-0036-0993

Puget Sound Clean Air Agency OAR-2005-0036-0780
Regional Air Pollution Control Agency (RAPCA) OAR-2005-0036-0771
Sunoco, Inc. OAR-2005-0036-0806
United Refining Company OAR-2005-0036-0827
Washington State Department of Ecology OAR-2005-0036-0950
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

For several reasons, we continue to believe that a benzene-only standard is superior to a toxics emissions performance standard as a means of achieving the greatest emission reductions of mobile source air toxics under section 202(l). First, because controlling benzene is much more cost-effective than controlling emissions of other MSATs, refiners historically have preferentially reduced benzene under the MSAT1 and other air toxics control programs. This is despite the theoretical flexibility that refiners have under a toxics performance standard to change other fuel parameters instead of benzene. Thus, even if we were to express the proposed standard as a total air toxics performance standard, we would expect the outcome to be the same – refiners would reduce benzene content and leave unchanged the levels of other MSATs. Many industry commenters confirmed this point in their comments on the proposed rule.

Second, even with, or as a result of, this fuel benzene control, we do not expect refiners to actively modify their refinery operations such that increases will occur in emissions of the other MSATs currently controlled under the existing toxics performance standards. These other MSATs are acetaldehyde, formaldehyde, POM, and 1,3-butadiene, and they are all affected to varying degrees by VOC emissions control. VOC emissions are generally decreasing due to the gasoline sulfur controls recently phased in along with more stringent vehicle controls under the Tier 2 program, as well as the vehicle controls being finalized under this program (see section V of the preamble). In combination, these changes are expected to decrease VOC-based MSAT emissions substantially.

The one MSAT likely to increase in the future is acetaldehyde. The proposed Renewable Fuels Standard (RFS) Program[10] ensures that ethanol use will increase, and thus acetaldehyde as well, since that MSAT is directly and substantially affected by ethanol use. Acetaldehyde emissions are currently increasing (and formaldehyde emissions decreasing) due to the substitution of ethanol for MTBE in RFG as a result of state MTBE bans. Any action that refiners could take to offset the total toxics increase as a result of acetaldehyde increasing would be through benzene control, which we are already requiring to be controlled to the maximum extent achievable. The EPAct, which charged EPA with developing the RFS program, also requires an evaluation of that Act's impacts on air quality. Any future control of acetaldehyde emissions will be based primarily on the results of that study, a draft of which is required by the EPAct to be

[10] 71 FR 55552, September 22, 2006.

completed in 2009. EPA thus believes it is premature to act on this issue until we determine a course of future action reflecting the EPAct study.

With the exception of acetaldehyde, the benzene control program will ensure the certainty of additional reduction in MSAT emissions, and other MSAT emissions are unlikely to increase under this program. We therefore believe that regulatory controls and the associated paperwork and other administrative costs for these other MSATs, including a total toxics standard, are not necessary. A toxics emissions performance standard that would effectively achieve the same level of MSAT reduction would just be more costly and complex. We see no justification for the added complexity, paperwork, and other administrative costs of a total toxics standard. For all of these reasons, we believe a standard in the form of a benzene content standard will produce more certain environmental results with less complexity than a toxics emissions performance standard, and we are therefore finalizing only a benzene content standard.

As one commenter pointed out, this conclusion is different from that reached in the MSAT1 final rule (66 FR 17230, March 29, 2001)**.** However, there are several reasons for a different decision here. First we have gained much more experience in witnessing refiner actions and behavior following the implementation of the MSAT1 standard (notably their reliance on benzene reductions to satisfy the MSAT1 standard). Second, several changes to the fuel pool have occurred which constrain the ability of refiners to adjust toxics performance in ways other than changing benzene content, most notably the removal of both MTBE and sulfur from gasoline. Third, the MSAT2 standards require significant reductions in MSAT levels, whereas the MSAT1 standards were merely meant to maintain existing performance. To reduce toxics, it is clear that benzene is now a refiner's only viable option, and a benzene-only standard is thus the most effective regulatory approach.

4.1.2.2 Consideration of Regulation of Other MSATs

What Commenters Said:

In addition to comments expressing concern that MSATs other than benzene might increase in the absence of a toxics performance standard (see previous section), some commenters urged specific regulatory action to reduce some of these MSATs. One commenter advocated adoption of key parameters of California's Reformulated Gasoline III specifications (aromatics content, olefins content, and sulfur). Various commenters expressed concern about e 1,3-butadiene, acrolein, acetaldehyde, and formaldehyde. Another commenter believes that it is premature to limit MSAT regulation to benzene alone, and encouraged EPA to specifically remain open to prompt further regulation of other MSATs if future changes to gasoline parameters do not address them. The commenter provided naphthalene and gasoline PM as potential examples. Another commenter encouraged EPA to continue to develop comprehensive data on toxics emissions from Tier 2 vehicles so that greater confidence can be placed in analyses performed using the Complex Model.

One commenter specifically supported EPA's decision not to propose further control of POM, 1,3-butadiene, formaldehyde, acetaldehyde, and gasoline aromatics content.

Letters:
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
Marathon Petroleum Company LLC OAR-2005-0036-1008
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
Puget Sound Clean Air Agency OAR-2005-0036-0780
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

In the previous section and in section VI of the preamble, we lay out our reasons for believing that the final program (without a toxics performance standard) will not result in increases in MSATs other than benzene. This same reasoning supports our conclusion that further regulation of any of these MSATs is not appropriate at this time. The Agency remains open to any new information that might indicate that future regulatory action on other MSATs is warranted. Moreover, as indicated in the previous response, EPA will specifically consider the effect of acetaldehyde emission as part of the study mandated by the EPAct.

As the one commenter stated, current emission models would suggest that California gasoline may provide somewhat greater toxics performance than the benzene standard we are finalizing. However, considering the limited data on new technology vehicles with which to quantify these emission reductions, and the far greater cost of such fuel changes, we do not believe such requirements would be appropriate at this time.

4.1.2.3 Control of Aromatics

What Commenters Said:

Several commenters specifically stated that aromatics in gasoline (other than benzene) should be targeted for control in this rule. Most of these commenters pointed to the fact that toluene and xylene (some also mentioned ethyl benzene) are also considered MSATs and their content in gasoline should be reduced. Some commenters also mentioned the connection between aromatics and secondary (atmospherically formed) PM. Two commenters, the Energy Future Coalition (EFC) and TEIR Associates, compiled several existing studies and expressed their belief that replacing aromatics can be broadly replaced with ethyl tertiary butyl ether (ETBE), an ether produced from ethanol. API and NPRA responded to the EFC and TEIR comments with supplemental

comments that countered several points. These organizations also raised concerns about potential groundwater contamination from ETBE, as has occurred with the ether MTBE.

Other commenters, mostly from the refining industry, oppose new controls on gasoline aromatics at this time, generally agreeing with EPA that it is not yet clear that such controls would be cost-effective.

Letters:
American Petroleum Institute (API) and National Petrochemical and Refiners Association (NPRA) OAR-2005-0036-1015
Energy Future Coalition OAR-2005-0036-0840
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
Mothers & Others for Clean Air OAR-2005-0036-0991
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
New York Department of Environmental Conservation OAR-2005-0036-0722
NESCAUM (Northeast States for Coordinated Air Use Management) OAR-2005-0036-0993
TEIR Associates, Inc OAR-2005-0036-0838
TEIR Associates, Inc. OAR-2005-0036-1012

Our Response:

EPA considered the potential for additional aromatics control as a part of the proposed rule (see 71 FR 15864). We have considered the issue further in light of the public comments. For the following reasons, we continue to believe that additional aromatics control (beyond the benzene control of this rule and beyond the reduction in gasoline aromatics that we believe will occur without further action) is unwarranted at this time. We will continue to investigate this area, as described below and in section VI of the preamble.

We note first that regardless of specific regulatory action to control aromatics, the increased use of ethanol in response to current market forces and federal and state policies (including the RFS program) will contribute to lower aromatics levels. This will occur for two reasons. First, ethanol has historically been blended downstream of refineries, either as a "splash blend" or as a "match blend." In a splash blend, the ethanol is mixed with finished gasoline. In a match blend, refiners prepare a special subgrade of gasoline that, when blended with ethanol, becomes finished gasoline. In recent years, match blending has increased as refiners have been producing RFG with ethanol, and it is expected to increase even more as ethanol use expands. A splash blend will reduce aromatics by about 3 vol% by simple dilution.[11] A match blend will reduce aromatics by about 5 vol%.[12] With ethanol use expected to more than double, we expect a significant

[11] If the aromatics content of a gallon of gasoline is 30 vol%, adding 10% ethanol dilutes the aromatic content to about 27 vol%.

[12] Section 2.2 "Effects of Ethanol and MTBE on Gasoline Fuel Properties" in the Renewable Fuel Standard Program: Draft Regulatory Impact Analysis, September, 2006.

reduction in aromatics levels. Second, with all of this ethanol there will be excess octane in the gasoline pool. Thus, not only will increased ethanol use decrease aromatics concentrations through dilution, but refiners will make the economic decision to use ethanol to reduce or avoid producing aromatics for the purpose of increasing octane.

Because of differences in how refiners will respond to the rapid increase in ethanol use, it would be difficult to determine an appropriate level for an aromatics standard at this time. The gasoline market is going through an historic transition now due to the removal of MTBE, some portion of the MTBE production volume being converted to other high octane blendstock production, the growth of ethanol use, and the rise in crude oil prices. Consequently, it is difficult to reliably project a baseline level for the aromatics pool with any confidence. This is compounded by a great deal of uncertainty in knowing how much of the market ethanol will capture. Projections by EIA are significantly higher now than just a few months ago, and Presidential and Congressional proposals could easily result in 100% of gasoline being blended with ethanol. Second, aromatics levels vary dramatically across refineries based on a number of factors, including refinery configuration and complexity, access to other high octane feedstocks, access to the chemicals market, crude sources, and premium grade versus regular grade production volumes. Third, without knowing with some certainty the range of aromatics contents of refineries' gasoline, we cannot determine the greatest degree of emission reduction achievable, and also cannot make reasonable estimates regarding cost, lead time, safety, energy impacts, etc. As a result, at this time we would not be able to determine an appropriate or meaningful aromatics standard.

For the purpose of reducing total toxics emissions, fuel benzene control is far more cost-effective than control of total aromatics, for a number of reasons. As we explained in the proposal, reducing the content of other aromatics in gasoline is much less effective in reducing benzene emissions than reducing fuel benzene content. Based on the Complex Model, [13] roughly 20 times greater reduction in total aromatics content is needed to achieve the same benzene emission reduction a is achieved by a fuel benzene reductions. At the same time, to broaden the program to control other aromatics would result in a significant octane loss that would be difficult and costly to replace. While we have not yet conducted a thorough refinery modeling evaluation, based on existing refinery and market information the alternative sources of octane (other than ethanol) appear to be of limited supply and would be of limited effectiveness in replacing the octane lost from any fuel aromatics reductions. Furthermore, as noted above, the uncertainty in the extent to which ethanol will penetrate the market makes it difficult to project the potential replacement of aromatics with ethanol. Any significant reduction in aromatics would also affect the gasoline and diesel sulfur reduction programs because hydrogen, which is used in the desulfurization.

[13] Total toxics emissions are as calculated by the Complex Model. This model is the tool used to determine compliance with the toxics emissions controls in the RFG, Anti-dumping, and MSAT1 programs. Cost estimates for aromatics control and analysis of relative benzene emissions with control of aromatics and benzene are found in Regulation of Fuels and Fuel Additives; Standards for Reformulated and Conventional Gasoline; Final rule, Table VI-A6 of the Regulatory Impact Analysis, February 16, 1994.

Reducing aromatics would also raise other environmental concerns that would need to be addressed in any regulation. Actions available to refineries for replacing octane, including adding ethanol, can increase other MSATs, as mentioned above. In addition, some commenters encouraged the use of the ether derived from ethanol, ETBE, to make up octane. Any regulatory action that required or was based on the use of ETBE would likely raise issues of potential groundwater contamination given the groundwater contamination caused by the use of the chemically similar MTBE.

There may be compelling reasons to consider aromatics control in the future, especially regarding reduction in secondary $PM_{2.5}$ emissions, where evidence supports a role for aromatics in secondary $PM_{2.5}$ formation.[14] Unfortunately, there are limitations in both primary and secondary PM science and modeling tools that limit our present ability to quantitatively predict what would happen for a given fuel control. Thus, at this point, we do not feel that the existing body of information and analytical tools provide a sufficient basis to determine if further fuel aromatics control is warranted. However, we do feel that additional research is very important. Test programs and analyses are planned to address primary PM issues, including those examining the role of aromatics. Also, more work is underway on how fuel aromatics, including toluene, affect secondary PM formation, and how aromatics control should be incorporated into air quality predictive models.[15]

In summary, we believe that aromatics levels will be falling even without an aromatics standard, and aromatics control will need to be evaluated in the context of what might be possible beyond what will occur through the expanded use of ethanol. In addition, any additional control would be costly and raise a number of other issues which need further investigation before EPA could responsibly initiate such a control effort. Thus, we have concluded that additional aromatics control for MSAT purposes is not warranted at this time.

4.1.2.4 Gasoline Sulfur, RVP, and Other Fuel Properties

What Commenters Said:

Petroleum industry comments related to sulfur control generally expressed the position that additional control would require expensive upgrades to billions of dollars worth of equipment just installed for the 30 ppm sulfur standard, and yet would not produce any significant toxics reductions. Auto industry comments suggest that measurable emission reductions in HC and MSAT emissions could be had by lowering gasoline sulfur below 10 ppm, and Toyota submitted a small amount of data to support this. Comments from state and local governments and environmental/public interest groups state that EPA has a duty to require the greatest emissions control achievable, and that lower sulfur gasoline is achievable since the state of California has a more stringent standard. These comments also state that EPA's analysis of the benefits of low sulfur

[14] See Chapter 1 in the RIA for more on current studies on this subject.
[15] See Chapter 1 in the RIA for more on current studies on this subject.

gasoline were inadequate, and echo the auto industry comments that low sulfur gasoline will reduce HC and MSAT emissions. There were also comments stating that EPA had not considered distillation parameters and increased detergency as viable ways to reduce hydrocarbon emissions, in turn reducing emissions of MSATs.

Comments specifically related to more stringent gasoline volatility control came only from the petroleum industry, and highlighted negative impacts on gasoline supply that could result. The commenters explained that any additional butanes and pentanes removed during the summer season would likely exceed refiners' ability to store and re-blend the material back into winter gasoline due to volatility limits on winter gasoline. One commenter also supported the position that further volatility control would not reduce MSAT emissions to a significant extent.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Petroleum Institute (API)
American Lung Association OAR-2005-0036-0365 (hearing testimony)
Countrymark Cooperative, LLP OAR-2005-0036-0471
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
Independent Fuel Terminal Operators Association (IFTOA) OAR-2005-0036-1007
Nissan Technical Center North America (Nissan) OAR-2005-0036-0825
Toyota Technical Center (TTC) OAR-2005-0036-0773

Our Response:

At the time of the proposal, we did not have adequate data to fully evaluate additional gasoline sulfur reduction or further volatility control as MSAT reduction strategies (and the data submitted by Toyota consisted of a very small number of tests). Since the proposal, we have completed a small fuel effects test program in cooperation with several automakers to help evaluate the usefulness of fuel property changes as emission controls on Tier 2 vehicles. These data suggest that reducing gasoline sulfur to a level of 6 ppm would bring reductions in regulated criteria pollutants, but not in total toxics as defined by the Complex Model. The data also suggest that reducing gasoline volatility from 9 to 7 RVP under normal testing conditions (75°F) may actually increase exhaust emissions of several air toxics. The test program did not examine the impacts of fuel volatility on evaporative emissions. We will be using this and other data as it becomes available to consider future action on further gasoline sulfur control. More details on the test program and its results are available in Section 6.11 of the RIA.

For MSAT control programs, the Clean Air Act requires EPA to consider technological feasibility as well as cost and other factors. We believe there would be significant costs in requiring another large step down in sulfur below the recently implemented standard of 30 ppm, costs far greater than those associated with incrementally more stringent average benzene standards, which we concluded in this rule would be unreasonable. While we can not rule out further action on gasoline sulfur levels

in the future, much more testing and analysis would be required before EPA would propose such action. Furthermore, refineries are in the process of implementing the gasoline sulfur control standards associated with the Tier 2 program, the on-highway diesel rule, and the nonroad diesel rule. EPA considers it unreasonable to potentially interfere with the implementation of these important standards by adopting another desulfurization standard to apply in much the same time frame (see Sierra Club, 325 F. 3d at 380). Until EPA can more fully evaluate the real-world impacts of these rules on refineries, it is unreasonable to adopt a further standard for gasoline sulfur.

4.1.2.5 Diesel Fuel

What Commenters Said:

One group of commenters stated in joint comments that they believe that EPA needs to do more to protect human health and the environment from the effects of diesel exhaust emissions. While they specifically mention actions to accelerate the introduction of cleaner diesel engines, they do not suggest any additional changes to diesel fuel. Some commenters noted that polyaromatic hydrocarbons (PAHs) and nitro-PAHs are a particularly harmful component of diesel exhaust, and support control of these emissions either directly or through control of PAH content in diesel fuel. Another commenter, a refiner, states that further diesel fuel controls are not warranted.

Letters:
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
ExxonMobil Refining & Supply Company (XOM) OAR-2005-0036-0772
International Truck and Engine Corporation (International) OAR-2005-0036-0826
Marathon Petroleum Company LLC OAR-2005-0036-1008
New York State Department of Environmental Conservation OAR-2005-0036-0722

Our Response:

EPA did not propose additional controls on diesel exhaust emissions or diesel fuel for MSAT control. We believe that existing EPA regulations for highway and nonroad diesels will achieve the greatest reductions currently achievable in MSAT emissions from diesel engines. The actions refiners are taking to produce ultra-low sulfur diesel fuel (15 ppm sulfur) are expected to reduce the PAH content in diesel fuel.[16] In addition, available data indicate that the advent of exhaust emission controls on diesel engines under the recent diesel programs will reduce exhaust PAH, regardless of any changes to diesel fuel. As the content of PAHs in the fuel as well as the amount emitted in engine exhaust decreases, emissions of nitro-PAHs will also decrease due to decreases in the precursor PAH emissions.

[16] Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel – Final Rule, Section 5.9.4 of the Regulatory Impact Analysis, June 29, 2004.

EPA will continue to monitor MSAT issues related to diesel engines and fuel. For example, there is a large program from the Health Effects Institute (HEI) just starting to characterize regulated and unregulated emissions (and their health effects) from engines meeting the 2007 and 2010 emission standards, including measurement of many PAH and nitro-PAH compounds.[17] This project has numerous sponsors, including EPA.

In conclusion, existing diesel regulations will reduce PAH (and nitro-PAH) emissions. At this time, we are not aware of further diesel fuel controls that could significantly affect MSAT emissions and commenters did not offer specific information to the contrary. Consequently, we have focused our fuel-related MSAT action on gasoline benzene, as proposed, while continuing our efforts to better quantify the reductions in PAH (and nitro-PAH) emissions from diesel engines meeting the 2007 and 2010 standards.

4.2 Implementation Issues

4.2.1 Replacement of Existing Standards

What Commenters Said:

A number of commenters supported the proposal to consolidate and simplify the regulatory provisions by using the Tier 2/Gasoline Sulfur rules as the sole regulatory mechanism for implementing the RFG and anti-dumping NOx requirements, and the proposed benzene rule as the sole regulatory mechanism for implementing the RFG and anti-dumping toxics requirements. In addition, in light of the proposed benzene standard, some commenters stated their support for the elimination of the MSAT1 requirements, and for avoiding adjusting the RFG MSAT1 baselines as required by EPAct absent a more stringent toxics program. Several commenters added that they believe this proposal is an excellent example of reducing the regulatory burden by removing regulations that are no longer needed because of changed circumstances. Some commenters pointed out that the Agency has the opportunity to reduce the considerable compliance and enforcement burden placed on it, as well as on the industry. At least one commenter noted that these rule simplifications will not result in any environmental degradation, and another noted that the removal of requirements made obsolete by instituting the MSAT2 program will reduce the chances that this additional requirement will further constrain gasoline production.

Other commenters stated that they do not believe that EPA should revoke the MSAT1 anti-backsliding and anti-dumping provisions, and urged EPA to retain the RFG and anti-dumping NOx performance standards rather than rely on the federal gasoline sulfur program. One of these commenters stated that EPA's justification for this proposed action was too brief, and that in any event such action is not appropriate for this MSAT-related rulemaking.

[17] Advanced Collaborative Emission Study, Health Effects Institute, Cambridge, MA.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0366, 0367
BP OAR-2005-0036-0824, 0837
Chevron Corporation (Chevron) OAR-2005-0036-0847
ExxonMobil OAR-2005-0036-0772, -1013
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
Marathon Petroleum Company, LLC (MPC) OAR-2005-0036-1008
National Petrochemical Refiners Association (NPRA) OAR-2005-0036-0809
New York State Department of Environmental Conservation (NY DEC) OAR-2005-0036-0722
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993, -0369
Regional Air Pollution Control Agency (RAPCA) OAR-2005-0036-0771
STAPPA/ALAPCO OAR-2005-0036-0836, -0378

Our Response:

A detailed discussion of how the toxics and NOx requirements for CG and RFG will be met under the MSAT2 program is provided in Chapter 6.12 of the RIA for this rulemaking. Based on analysis of gasoline batch data from recent years as well as our projections of what refiners will be doing to comply with MSAT2, we believe compliance with MSAT2 will reduce air toxics emissions significantly below the MSAT1 baselines as well as below the RFG and anti-dumping toxics requirements. Therefore, these existing regulatory programs will effectively be superseded and become redundant. Since we believe that the benzene program will be significantly more stringent than the existing programs, we are waiving the requirements for demonstration of compliance with previous air toxics programs.

We also believe that the Gasoline Sulfur/Tier 2 program is reducing NOx emissions to a significantly greater degree than are the NOx performance standards for RFG and CG. Gasoline sulfur has the largest impact on NOx emissions in modern vehicles equipped with three-way exhaust catalysts -- now comprising more than 95% of the gasoline fleet -- under the Complex Model used to certify fuel to the NOx standards. Therefore the reduction of gasoline sulfur to 30 ppm average nationwide is causing all gasoline to far exceed the NOx emission performance standards required under the RFG and anti-dumping programs. Given this fact, we believe that the existing regulations have become unnecessary, and we believe that it is appropriate to take action to simplify our regulations to waive requirements for demonstration of compliance with the NOx performance standards for RFG and CG.

In response to the comment about the appropriateness of taking action relating to the sulfur control program in the context of this MSAT-related rule, we disagree. We believe that taking this action is necessary and appropriate now as we are making corresponding changes to the regulations for air toxics performance standards. Initiating a separate rulemaking action for this limited purpose at a later date would be inefficient for EPA and for stakeholders.

4.2.2 Batch by Batch Testing

What Commenters Said:

Several commenters stated that they oppose the requirement to test each batch of conventional gasoline for benzene. These commenters believe every-batch testing will involve unnecessary time and record keeping and will create an unnecessary financial burden for small refiners and blenders. They state that they would prefer to test monthly composite samples since the standard is an annual average and there is no per gallon benzene limit. These commenters also stated that they support the proposed ability for refiners (and importers) to release conventional gasoline prior to getting the results of any benzene testing, because with annual average compliance, there will generally be time to account for off-spec gasoline before the end of the annual reporting period, and thus there is no need to delay deliveries while waiting for test results.

Letters:
Caribbean Petroleum OAR-2005-0036-1010
Colonial Oil Industries, Inc. (Colonial) OAR-2005-0036-0990
Gladieux Trading & Marketing Co., L.P. (Gladieux) OAR-2005-0036-0972
U.S. Oil & Refining, Co. (USOR) OAR-2005-0036-0992

Our Response:

We proposed to require every-batch sampling for CG benzene under this program, (see 71 FR 15893). RFG already is every-batch tested, and the results must be available before the batch leaves the refinery to support effective enforcement of RFG's 1.3 vol% benzene per gallon cap. For CG, we are concerned about the potential for benzene-rich blendstocks to be added downstream, since the new program does not have any downstream testing or reporting requirements. Requiring every-batch testing for CG will allow for closer monitoring of the movement of high benzene streams, and we will be able to better discern if high benzene batches originated at the refinery, or downstream. With composite testing, it would be significantly more difficult to determine the source of any high benzene gasoline found downstream. Thus, we see every-batch testing for all gasoline as a necessary part of the gasoline benzene program.

For CG, every-batch sampling is already required for gasoline sulfur, and will be well under way for small refiners by the time small refiners are required to comply with the benzene program requirements. Thus, there may be a small incremental cost for additional benzene testing for those refiners that currently determine CG benzene levels from a composite sample. However, we do not believe that these additional costs will be large; commenters that raised the issue of this potential additional cost did not provide any data or analytical support for this concern. We are finalizing every-batch benzene testing for all gasoline.

As we proposed, we are not requiring that the results for CG be available before the batch leaves the refinery, for the reasons given by the commenters.

4.2.3 Reporting, Recordkeeping, Surveys

What Commenters Said:

Several commenters stated that if the Agency deletes MSAT1, RFG NOx and toxics, and anti-dumping NOx and toxics, as proposed, then gasoline batch testing, reporting and recordkeeping regulations must be revised. The commenters stated that they believe that EPA may continue to require sulfur and benzene content testing, reporting and recordkeeping for every gasoline batch, but that there would be no regulatory purpose to continue testing, reporting and recordkeeping for RVP, distillation, olefins, oxygen, and aromatics for CG and for winter RFG. They believe that RVP, distillation, olefins, oxygen and aromatics would only have a regulatory purpose for RFG summer VOC regulatory compliance.

In addition, some of these commenters stated that the RFG NOx and toxics retail survey regulations must be revised. The commenters suggested that, if the MSAT2 benzene standard is effective beginning in 2011, the RFG toxics retail compliance surveys should be discontinued after 2010 because there would not be a RFG toxics emissions standard to "ratchet" down in case of a failure. Similarly, commenters stated that RFG NOx retail compliance surveys should be discontinued because there would not be a RFG NOx emissions standard to ratchet down in case of a failure. These commenters noted that in 2010, the RFG Survey Association will submit a plan for 2011 for EPA approval that excludes toxics, and that the RFG Survey Association will submit a plan for 2007 for EPA approval that excludes NOx.

Letters:
American Lung Association (ALA) OAR-2005-0036-0365 (hearing comments)
Marathon Petroleum Company, LLC (MPC) OAR-2005-0036-1008
National Petrochemical Refiners Association (NPRA) OAR-2005-0036-0809

Our Response:

In the proposal we stated that certain reporting and recordkeeping requirements would be modified or eliminated because of the benzene standard. Compliance with the RFG and anti-dumping toxics standards will be achieved through the benzene control program. In addition, compliance with the RFG and anti-dumping NOx standards will be achieved through the gasoline sulfur program. Because compliance with the toxics and NOx requirements will be achieved through other programs, many of the reporting and recordkeeping requirements are being streamlined by the final rule. However, sampling, testing, and reporting of all of the current fuel parameters will continue to be required. This benzene control program is merely the means by which compliance with the RFG and anti-dumping controls is being measured; the individual rules are still in effect. EPA

is obligated to continue to monitor how refiners comply (through fuel composition changes) and how other toxics emissions may be affected by the benzene and gasoline sulfur rules. The Agency's authority to collect information on the fuel parameters that affect the toxics (and NOx) control programs also remains. Continued collection of all of the fuel parameters will facilitate future toxics evaluation activities.

Commenters also suggested eliminating the toxics and NOx retail surveys that are currently carried out for RFG because there would not be RFG toxics or NOx emissions standards to "ratchet" down in case of a failure because the toxics and NOx requirements were being met by the gasoline benzene and sulfur programs. A discussion of the origin of the RFG survey program is included in Chapter 6.12 of the RIA. The surveys use fuel parameters of RFG sampled from retail stations to estimate VOC, NOx, and toxics emissions. There are also fuel benzene and oxygen content surveys. If a survey is "failed," meaning that the survey shows the fuel to be out of compliance, the requirements are "ratcheted down" and gasoline sent to the area must meet a more stringent standard. Because we are finalizing, as proposed, provisions that make the gasoline sulfur program the sole regulatory mechanism used to implement gasoline NOx requirements, and the benzene control program the sole regulatory mechanism used to implement the toxics requirements of RFG[18] and anti-dumping, we agree that the NOx and toxics surveys are no longer needed, and are no longer required.

4.2.4 Accounting for Downstream Oxygenates

What Commenters Said:

Several commenters stated that the current regulatory option to include downstream oxygenate addition in RFG, anti-dumping and MSAT1 compliance calculations should be retained in the MSAT2 program, especially considering the expanding use of ethanol due to the Renewable Fuel Standard in the EPAct. Commenters further noted that since ethanol serves as a diluent, much the way that MTBE has historically, allowing the inclusion of downstream ethanol addition to be included in the calculation is justified.

Another commenter said that it believes that allowing the use of oxygenates in the compliance formula may enable some small refiners to comply with the 0.62 vol% benzene standard. The commenter also noted that since Congress required the increased use of ethanol in gasoline in EPAct, EPA should promote the use of ethanol and other oxygenates whenever possible.

Letters:
Countrymark Cooperative, LLP OAR-2005-0036-0471
ExxonMobil OAR-2005-0036-0772, -1013
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
National Petrochemical Refiners Association (NPRA) OAR-2005-0036-0809

[18] The 1.3 vol% per gallon cap on RFG benzene remains.

Our Response:

We are allowing ethanol added downstream of a refinery to be included in a refinery's benzene calculation for all purposes under MSAT2. The refinery would be required to meet requirements specified in the RFG and anti-dumping regulations, as applicable, regarding documentation, agreements with the oxygenate blender, etc. We believe that adding ethanol and complying with other fuel requirements, e.g., the Energy Policy Act and related regulations, are part of the refinery's business as usual and are reasonable to permit as a part of this program.

4.2.5 Pre-emption

What Commenters Said:

One commenter stated that this rulemaking as proposed would remove the option of independent state regulation of gasoline benzene content from the state's list of potential tools for addressing air quality. The commenter stated that it believes that an option for state regulation should be preserved.

Other commenters noted that no state or political subdivision, other than California, may adopt a benzene content, exhaust toxics, or total toxics standard for gasoline that is different from the federal standard without requesting a waiver. Commenters cited statements from several rules where the Agency acknowledged this fact. The commenter noted that waivers cannot be granted by EPA because state benzene and toxics standards for gasoline are not necessary to achieve a NAAQS.

Many commenters also noted that because the regulations will affect virtually all of the gasoline in the United States, and since gasoline produced in one area is often distributed to other areas, federal rules should preempt State action to avoid potentially conflicting regulations.

Letters:
Marathon Petroleum Company, LLC (MPC) OAR-2005-0036-1008
National Petrochemical Refiners Association (NPRA) OAR-2005-0036-0809
Wisconsin Department of Natural Resources (WDNR) OAR-2005-0036-0828

Our Response:

In the NPRM, we stated that authority for the gasoline benzene program comes from the Clean Air Act, specifically section 211(c), which includes a preemption of state fuel programs in section 211(c)(4). [71 FR 15871] We believe that we are thus required to preempt any state (except for California) from further regulating benzene in those areas. The nationwide benzene program finalized today therefore preempts all states

(except California which is exempt from preemption under 211(c)) from regulating gasoline benzene content.

4.2.6 Treatment of Transmix

What Commenters Said:

One commenter stated that it supports EPA's proposal to omit transmix processors from the benzene standard because they have no control over the benzene in the transmix streams they receive and typically are too small to invest in benzene extraction or treatment equipment that may or may not be needed. This commenter believes that the benzene in the gasoline they receive as feedstock would have been accounted for at its point of production.

The commenter stated that it believes that EPA indicated that if outside blending components are added to transmix-derived gasoline, the final blend should be subject to the new standard. The commenter stated that since benzene in the transmix-derived gasoline would have been accounted for at its production point, EPA should consider requiring only the outside material added to the transmix-derived gasoline meet the new standard and not the completed blend. The commenter further stated that it believes that the product transfer document that the transmix processor receives for the blending component could indicate the benzene level of the product, thus allowing the transmix processor to blend the material in without having to invest in testing equipment that it otherwise would not need.

Letters:
Gladieux Trading & Marketing Co., L.P. (Gladieux)OAR-2005-0036-0972

Our Response:

We had proposed that transmix processors would be subject to the benzene standard if they add gasoline blending components to the gasoline produced from transmix (see 71 FR 15891). We agree with the comment that only the blending component added to the gasoline produced from transmix should be subject to the standard, for the reasons stated by the commenter, and we are finalizing this provision. Thus transmix processors are not subject to the benzene standard unless they add other blendstocks to the gasoline produced from transmix. If they do this, they will only be subject to the benzene requirement for the blendstock added, not for the entire blend (transmix plus blendstock). This is consistent with the treatment of transmix in other EPA gasoline programs.

4.2.7 Exemptions for U.S. Territories

What Commenters Said:

ExxonMobil commented that it believes that U.S. Pacific territories should be exempt from the MSAT2 requirements. The commenter noted that when EPA promulgated MSAT1, the Agency exempted the Pacific territories of Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands (at §80.820(d)), but the MSAT2 proposal does not appear to exempt these territories. The commenter noted that EPA has been exempting these territories from most of the fuel specification requirements imposed on the mainland U.S. since their source of gasoline supply is altogether different, and the environmental issues not as prevalent. The commenter stated that it believes that EPA should exempt these territories from the MSAT2 requirements, as was done for MSAT1, Highway and Nonroad diesel, and Tier 2 Gasoline.

Letters:
ExxonMobil OAR-2005-0036-0772, -1013

Our Response:

As discussed further in section VI.B.1 of the preamble to the final rule, gasoline produced for use in the American territories of Guam, the Northern Mariana Islands, and American Samoa is not subject to the gasoline benzene standards. Gasoline produced for use in these areas is currently exempt from the MSAT1 standards, and for the same reasons we discussed in the MSAT1 final rule (66 FR 17253, March 29, 2001), we are exempting gasoline produced for use in these areas from this rule.

4.3 Lead Time for Compliance

What Commenters Said:

Many commenters stated that they believe that the January 1, 2011 start date is reasonable. Some commenters, however, asked that EPA give serious consideration to earlier implementation. Some of these commenters noted that Canada implemented controls on gasoline benzene (including a per-gallon cap) 18 months after rule adoption. Some also suggested that increases in renewable fuel use could expedite compliance with the MSAT2 standards by several years. The Municipality of Anchorage urged EPA to speed the implementation of benzene limits in gasoline supplied in Alaska.

On the other hand, many other commenters stated that EPA should provide a full four years of lead time for refiners and importers to comply with the standard, as in past regulatory programs. These commenters stated that they believe that the lead time provided by the proposed rule would create difficulties and urged that, if the rule is to be finalized in February 2007, the program start date should be January 1, 2012 to allow for a full four years of lead time. A few stated that they would support a compliance date that is exactly four years after the effective date of the final rule. The four years are needed for the concept reviews, design, engineering, permitting and construction of refinery facilities necessary for compliance. They believe that an effective date any

earlier than this would put undue time pressure on the industry and would not allow sufficient time for optimally developing and integrating the changes required to meet the benzene standard. Some of these commenters pointed to other overlapping regulatory programs as a reason to extend the leadtime.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0366, 0367
(Municipality of) Anchorage Department of Health and Human Services Anchorage OAR-2005-0036-0976
BP OAR-2005-0036-0824, 0837
Environmental Defense, NRDC, U.S. PIRG, ALA OAR-2005-0036-0868
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
Independent Fuel Terminal Operators Association (IFTOA) OAR-2005-0036-1007
Marathon Petroleum Company LLC OAR-2005-0036-1008
National Petrochemical Refiners Association (NPRA) OAR-2005-0036-0809
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
NESCAUM OAR-2005-0036-0993
STAPPA/ALAPCO OAR-2005-0036-0836

Our Response:

Section 202(l)(2) requires that we consider lead time in adopting any fuel control for MSATs. We proposed that refiners and importers meet the 0.62 vol% average benzene standard beginning January 1, 2011 (January 1, 2015 for small refiners). This date was based on the industry experience that most of the technological approaches that we believe refiners will apply – rerouting of benzene precursors around the reformer and use of an existing isomerization unit – will take less than two years. The more capital intensive approaches – saturation and extraction – generally take two to three years to complete. The January 1, 2011 date provides nearly four years of lead time. We believe this is an appropriate amount of lead time, even taking into account that other fuel control programs (notably the Nonroad Diesel program) will be implemented in the same time frame.

Some commenters supported earlier start dates, referring in some cases to the experience of Canada in regulating gasoline benzene. However, these comments failed to acknowledge the less stringent Canadian standard (0.95 vol%) which naturally takes less lead time to implement. No commenter provided information that challenged our assessments of the technical lead time for the range of benzene control approaches that will be implemented. Given that the technologies that need to be used to comply with this standard all require less time than the lead time available, we continue to believe that a January 1, 2011 start date is appropriate. Furthermore, an important aspect of the design of this program as proposed is the recognition that not all of the benzene reduction would occur at once. As discussed in detail in section VI.A.2.b of the preamble, we

expect that individual refiners will use the ABT program to schedule their benzene control expenditures in the most efficient way, using the early credit and standard credit provisions. This will essentially create a gradual phasing-in of the reductions in gasoline benzene content, beginning well before the initial compliance date of January 1, 2011 and spreading out industry-wide compliance activities over several years. Therefore, we are finalizing a start date of January 1, 2011 for the average standard, as proposed.

4.4 Costs

4.4.1 General

What Commenters Said:

The American Petroleum Institute (API) commented that it believes that EPA underestimated capital and total costs of the proposed gasoline benzene standard. The commenter noted that EPA estimates a total capital cost for its proposed 0.62 vol% standard with ABT program to be $500 million (in 2003 dollars). API commented, however, that it believes that the capital costs will be considerably higher - by a factor of 3 – and it pointed to an estimate made by Baker and O'Brien's of $1, 476 million (in 2006 dollars) [page 43]. A refiner asserted that capital costs would be 2 – 3 times greater than EPA's estimates based on their experience installing benzene control technology. Another refiner said that its own capital cost estimate for complying with the proposed benzene control standard could reach $250 million for its refineries which comprise about 6% of the U.S. gasoline pool, which suggests that the EPA capital cost estimate was understated by a factor of 3 - 4.

API further commented that in the EPA-estimated costs (capital and operating) for a 0.62 volume percent benzene average proposed standard, no compliance margin was assumed, nor was the degree of likely ABT program market efficiencies assessed. The commenter stated that it believes that this alone could lead to an understatement of the proposed program costs and impacts. The commenter noted that the API Baker and O'Brien report has incorporated provisions for these aspects by modeling at 0.60 volume percent and assuming a 10 volume percent unused credit balance for compliance margins and market place trading efficiencies.

API further commented that the analogous Baker and O'Brien cost curve (see first figure on page 46 of the Baker and O'Brien report) also suggests that a portion of the gasoline pool can meet the 0.62 volume percent benzene target at little or no cost, but significantly less than 50 volume percent of the pool. The commenter also stated that the Baker and O'Brien curve indicates tail end costs (i.e., costs to refineries at the tail end of the cost distribution curve) in the range of 4 to 7 cents per gallon. Other reasons cited include EPA's underestimating of benzene control costs, include grossly underestimating the costs for the highest cost refiners, and that more than half of refiners would incur no cost at all.

API noted that EPA's refinery linear programming cost LP modeling used 2000 as the base year, and only 4.3 billion gallons of ethanol were assumed in 2010. The commenter stated that it believes that these two key variables may impact the quality of the assessment made by EPA. API further commented that the natural gas and crude oil prices that were taken from the EIA/AEO 2005 (e.g., as stated on page 922 of Chapter 9 of the RIA), crude oil prices were assumed to be $27 per barrel for the EPA study.

One commenter stated that it believes that EPA's estimate of the additional cost of the new benzene standard of an average of 0.13 cents per gallon has been underestimated. It estimates that its after-tax costs will be as high as 0.30 cents per gallon.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0366, 0367
ExxonMobil OAR-2005-0036-0772, -1013
Marathon Petroleum Company, LLC (MPC) OAR-2005-0036-1008

Our Response:

Several commenters stated that our capital and overall cost estimates are too low, submitting their own cost study as support. In Section 9.7 of Chapter 9 of the final RIA, we summarize the methodology and final costs of the oil industry's cost study of the proposed gasoline benzene program. That section of the final RIA compares the methodology and cost results of the industry cost analysis to our final rule cost analysis, highlighting the differences between our two studies and our basis for projecting lower costs than are projected in the industry study.

The cost analysis conducted by API estimated an aggregate capital cost of 1,476 million dollars while in the proposed rulemaking we reported that the refining industry would need to invest 500 million dollars in new capital costs. In the draft RIA for the proposed rule, we acknowledged that our capital cost estimates did not include any capital costs for octane recovery and additional hydrogen production, although we committed to estimate them and include them as part of our final rule cost estimates.

For our final rule cost analysis, we reviewed our capital cost estimates that serve as inputs for our refinery modeling analysis. In many cases we updated our capital cost estimates to reflect the most recent data available, capturing the recent run-up in capital costs that has occurred as capital costs have increased faster than inflation. We also estimated the capital costs associated with octane recovery and additional hydrogen demand that is estimated to occur due to the application of the benzene control technologies. Our capital cost estimate for our final rule benzene program is 1,100 million dollars.

Our new capital cost estimate is still lower than API's capital cost estimate and we identified four reasons why. First, API modeled a more stringent benzene annual average standard than required in our final benzene standard. API modeled the cost for a

0.60 vol% average benzene standard as opposed to our final rule benzene program which requires that refiners comply with a 0.62 vol% annual average benzene standard. The more stringent average benzene standard modeled by API would require that some refiners invest in a more expensive benzene control technology, thus raising the estimated capital cost. This difference between our two studies is offsite slightly by our adoption of a 1.3 vol% maximum average benzene standard. However, as indicated by our cost comparison summarized in Chapter 9 of the RIA, the maximum average standard adds much less to the cost than the more stringent average benzene standard.

The second reason the oil industry's cost study estimates higher capital costs is an assumption that refiners would hold on to a substantial amount of credits, and therefore overcomply significantly with the 0.62 vol% average standard. As a result of this assumption, the average benzene level estimated by their cost study was 0.56 vol% benzene (which is much lower than the average benzene standard that they modeled), resulting in higher capital costs. The ABT and other provisions provided by the benzene program is expected to reduce the need for refiners to store up extra credits; as a result we believe refiners are likely to target complying with the 0.62 vol% average benzene standard instead of significantly lower benzene levels. Thus, any deeper benzene reductions would be unnecessary.

The third reason why the oil industry cost analysis estimated higher capital costs is that it assumed that when a refiner put in a benzene extraction unit, it would install a unit which would also extract xylene and toluene (called BTX extraction), which significantly increases the capital costs associated with extraction. We considered making a similar assumption when we began our process for estimating the costs for benzene control, but a vendor of benzene extraction technology advised against such an assumption. The vendor said that most refiners would only put into place the necessary capital for benzene extraction because so much new xylene extraction capacity is being installed overseas, and toluene is a less desirable aromatic compound. In any case, if a refiner were to elect to extract aromatic compounds other than benzene, it would not be a cost of this rule, but would instead be based on a refiner's desire to begin participating, or to further participate, in those markets.

The fourth reason for the oil industry's higher capital cost estimates is that the study used very high offsite factors[19] and also added a contingency factor for their capital costs. Based on actual offsite cost information from an engineering and construction

[19] Onsite costs are for the primary unit including the distillation column, heat exchangers, pumps, heaters, piping, valves and instrumentation. Offsite costs are for administration and control buildings, cooling tower, electrical substation and switchgear, water and waste treatment facilities, feedstock and product storage and loading and offloading, spare equipment kept onsite and catalysts. Normally refiners estimate offsite costs for each project which can vary from zero to a factor several times greater than the onsite costs. For national fuel control programs, cost estimation is averaged and a factor is used to indicate the fraction that offsite costs comprise of onsite costs. This factor is applied for all the technologies requiring capital investment and is expressed as a single onsite and offsite capital cost estimate.

company, offsite costs range from 10 to 80 percent of the onsite costs,[20] yet API consistently assumed an offsite factor at the highest end of this range. In addition to their capital cost estimate, their analysis adds a 15 percent contingency cost factor. However, contingency cost factors are usually reserved for cost estimates with a high degree of uncertainty. Because the capital costs associated with these benzene control technologies are so well known, it is inappropriate to tack on a contingency cost factor here.. Thus, we believe that the use of high offsite factors and contingency factors overestimates capital costs.

Our higher capital costs contributed to increasing our per-gallon costs, but our per-gallon costs also increased for other reasons. For our final rule cost analysis, we assumed a higher crude oil price of $47 per barrel instead of the $27 per barrel crude oil price used for the proposed rule. The projected natural gas prices are also higher for the final rule cost analysis compared to those used for the proposed rule cost analysis. One commenter stated that our LP modeling used 2000 as the base year, and only 4.3 billion gallons of ethanol were assumed in 2010. The commenter stated that it believes that these two key variables may impact the quality of our cost assessment. For our final rule analysis, we estimated costs based on 9.6 billion gallons of ethanol entering the gasoline pool. Unlike the oil industry cost analysis, our octane costs take into account this large volume of ethanol in the gasoline pool. Our LP refinery model still uses the year 2000 as the base year. However, the LP refinery cost model was primarily used to generate octane recovery and hydrogen supply costs. Our refinery-by-refinery cost model, which is the prime tool used for estimating the costs of our program, was updated for our final rule analysis to be calibrated against year 2004 gasoline volumes and gasoline benzene levels.

All these changes, along with others, resulted in our per-gallon benzene control costs increasing by about a factor of two compared to the benzene control costs estimated for the proposed rule.[21] Consistent with the comments, the highest modeled costs of compliance in each PADD for our final rule cost analysis, which now includes a 1.3 vol% maximum average standard, were also in the 4 to 6 cents per gallon range, although we discussed a benzene control strategy which we did not model that would mean much lower benzene control costs in practice (see section 9.6.1 of Chapter 9 of the RIA). In addition, we conservatively estimated costs for reformate extraction although refineries may extract benzene without regard for the rule's requirements due to rising benzene demand by the petrochemical industry. Thus, both our cost studies may tend to overestimate compliance costs for some refineries.

Commenters from the oil industry also stated that our proposed cost analysis estimated too high a percentage of refineries that could comply with the benzene program at no cost. Our final rule cost analysis shows that less than 40 percent of the oil industry

[20] Rees, Conway, Senior Process Director, Fluor; Technical Session: Considerations when Revamping for ULSD, Hydroprocessing Principles and Practices, National Petrochemical and Refiners Association Question and Answer Forum, October 2006.

[21] About 20 percent, or 0.03 cents per gallon, of the higher cost we are reporting for the final rule is attributed to the addition of the 1.3 vol% maximum average benzene standard.

can comply with no or less than zero cost, which seems consistent with the API cost study.

One commenter stated that it believes that EPA's estimate of the additional cost of the annual average benzene standard of an average of 0.13 cents per gallon has been underestimated because it estimates that its after-tax costs will be as high as 0.30 cents per gallon. We presented the before-tax per-gallon costs averaged over only the refineries which are projected to take steps to reduce their benzene levels, which is 0.40 cents per gallon. This 0.40 cents per gallon cost is higher than that estimated by the commenter, and if we had expressed the costs on an after-tax basis, our costs would be higher still. However, no conclusion can be reached by this comparison since our average per-gallon cost is determined by the average costs for many diverse refineries and we do not know what benzene control technologies that the commenter assumed for its comments.

4.4.2 Reporting of Costs

What Commenters Said:

The Alaska Department of Environmental Conservation (ADEC) commented that it would appreciate any more specific information from EPA about cost impacts expected from this rule.

Letters:
Alaska Department of Environmental Conservation (ADEC) OAR-2005-0036-0975

The commenter stated that it would appreciate any more specific information from EPA about cost impacts expected from this rule. In Chapter 9 of the preamble and in Chapter 9 of the draft RIA for the proposed rule, detailed benzene control cost estimates were provided for the proposed fully phased-in benzene program as well as other benzene programs considered. Also the cost input information was provided in Chapter 9 of the draft RIA for specific benzene control technologies. The cost impact to refiners and consumers was estimated by the Economic Impact Analysis (EIA) as summarized in Chapter IX of the preamble and Chapter 13 of the RIA.

For the final rulemaking, updated, detailed cost estimates are provided for the final benzene program in Chapter 9 of the preamble and Chapter 9 of the final RIA. The cost estimates were updated from those in the proposed rule to reflect more recent capital cost information, more recent projections for utility prices, crude oil prices, benzene prices and to model the final benzene program which includes a 1.3 maximum average standard. The EIA estimates the costs to refiners and consumers in Chapters IX of the preamble and Chapter 13 of the RIA.

4.5 Refinery Modeling

What Commenters Said:

The commenter noted that proposed rule is entirely dependent on modeled predictions to achieve its reduction goals, with a broad, flexible ABT program and a minimal program for monitoring and enforcing compliance. The commenter stated that it believes that, if refiners do not act as the model predicts or if conditions change, the benzene reductions may not occur in the manner and to the degree predicted by the model.

API also commented that it believes that EPA presumed a large number of facilities will install benzene extraction units or revamp their existing extraction units. While this is a low cost approach, the commenter noted, it keys on an overoptimistic presumption that there will be full utilization and need of the extracted components in the world market. API commented that it believes that greater utilization of benzene saturation and isomerization strategies will be taken to preserve supplies.

Lastly, the commenter stated that it believes that EPA failed to recognize that the public cost of environmental programs is not the average cost across the entire industry but the incremental cost that must be paid to acquire the final increment of gasoline supply; the commenter further noted that even using EPA's low cost estimates, this incremental cost is 10 times the average cost projected by the Agency modeling.

Letters:
American Lung Association (ALA) OAR-2005-0036-0365 (hearing comments)
American Petroleum Institute (API) OAR-2005-0036-0366, 0367
Marathon Petroleum Company, LLC (MPC) OAR-2005-0036-1008

Our Response:

One commenter stated that it believes that EPA presumed a large number of facilities will install benzene extraction units or will revamp their existing extraction units. While this is a low cost approach, the commenter noted, it keys on an overoptimistic presumption that there will be full utilization and need of the extracted components in the world market. The commenter went on to say that it believes that greater utilization of benzene saturation and isomerization strategies will be taken to preserve gasoline supplies. Our final rule analysis projects a lower reliance on benzene extraction than the proposed rule analysis. However this change in the expected use of benzene extraction is more due to the higher extraction capital costs estimated for the final rule analysis compared to the proposed rule analysis than any issues associated with benzene supply. Also, as we pointed out in the energy and supply discussion of the RIA and in section 4.8 of this response to comment document, the sale of the volume of benzene into the petrochemical market, which likely will phase in over time because of the ABT program, may occur independently of this rule's requirements based on the projected increased benzene demand from the petrochemical sector over this same time

period. Moreover, as further explained in that response, even if the amount of benzene extraction occurring in this time frame is more than the petrochemical market can absorb, rather than there being a large decrease in benzene price due to oversupply, we would expect that the marginal cost benzene producers would reduce their benzene production. These marginal cost benzene producers are those which convert toluene into benzene. They would be expected to reduce benzene production and return the toluene back to the gasoline pool. This toluene reentering the gasoline pool would make up for a part, or even all, of the volume and octane of the newly extracted benzene. Thus, under either of these scenarios, we expect only a very small or perhaps no impact on supply by increased benzene extraction due to this benzene program.

One commenter stated that it believes that EPA failed to recognize that the public cost of environmental programs is not the average cost across the entire industry but the incremental cost that must be paid to acquire the final increment of gasoline supply. The commenter further noted that even using EPA's low cost estimates, this incremental cost is 10 times the average cost projected by the Agency modeling. We disagree with the assertion that the cost of our environmental programs is the marginal cost of meeting the benzene control program, which essentially reflects the cost of the most expensive refinery to comply. Often, the price of gasoline is estimated to increase based on the marginal cost of the highest cost producer. However, using this sort of analysis to estimate social costs would be incorrect because it would reflect a certain amount of transfer payment from the consumer to the oil industry. We estimate societal costs of our rulemakings by the cost of installing and operating benzene control technologies across the industry, not the last increment of control.

4.6 Refinery-Specific Impacts

What Commenters Said:

Flint Hills Resources noted that it operates refineries that do not have ready access to chemical markets, which it believes essentially eliminates the choice of a benzene extraction strategy that could provide an acceptable return on capital invested.

Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation commented that the cost model in Table IX.A-2 projects PADD 4 and 5 refineries investing in control technology only to reach an average benzene level of about 1.0 volume percent, not the proposed 0.62 volume percent standard. The commenters further stated that model assumes western refineries would enter 2011 out-of-compliance with the new standard and rely on benzene credits to make up the difference. The commenters stated that they believe that the model does not factor in a price for these credits in the cost estimate. Thus, the commenters believe that the compliance cost estimates for PADDs 4 and 5 are greatly understated. Lastly, the commenters noted that they believe that the model's assumption of western refineries using benzene credits to achieve the 0.62 standard is premised on large uncertainties; namely, that benzene credits

would be widely available at a price more affordable than compliance. (*See p.3 of Docket Number 0989 for table*.)

United Refining Company (United) commented that while any reduction in benzene is onerous, United would face significant technical difficulties and costs in meeting a benzene standard less than one percent by volume because, at a minimum, a new unit would be required to convert naturally occurring benzene and benzene produced by the fluid catalytic cracking (FCC) unit into cyclohexane (or other chemicals) with no corresponding economic benefits.

United noted that its benzene is currently averaging 1.50 percent in regular and 3.25 percent in premium gasoline. The commenter further noted that a major source of benzene at its refinery is reformate followed by gasoline produced at the FCC unit. The commenter noted two strategies that it could use for benzene reduction: 1) minimize benzene precursors going to the reformer, and 2) eliminate the benzene after it is formed. The commenter stated that it believes that to reduce benzene in the entire gasoline pool to levels below one percent, it would likely be forced to implement both strategies. Further, the commenter stated, in addition to capital costs, the new unit and existing unit modifications will increase operating costs and affect other properties of the gasoline pool. The commenter gave the example that it would reduce the amount of hydrogen available from the reformer unit, and this hydrogen is required to hydrotreat diesel fuel and gasoline to comply with the various low sulfur fuel restrictions, and it would substantially decrease the octane number in the gasoline currently produced.

Silver Eagle Refining commented that it operates two small "niche" refineries, and that the majority of its gasoline is produced by catalytic reforming and thus the benzene content of its finished gasoline ranges from 2.5 to 4.6 percent. The commenter stated that it does not endorse EPA's proposed gasoline benzene standard of 0.62 percent for technical and economic reasons. Technically, the commenter stated, a unit capable of saturating and converting benzene into other products (such as cyclohexane) may not provide enough reduction of benzene to meet EPA's proposed standard. The commenter also stated that converting benzene into cyclohexane will likely reduce the octane of its gasoline pool. Lastly, the commenter stated that replacement of the lost octane will be difficult due to the small "niche" configuration of its two refineries.

MPC stated that refineries may not implement benzene content reduction strategies as the proposed rule predicted, and that it does not have confidence that the Agency has made correct compliance cost estimates for every refinery. The commenter stated that it believes that the MSAT2 program places a very large burden on the credit trading program, and it believes that it is unreasonable to assume that every refiner seeking benzene content credits will always find affordable credits.

<u>Letters:</u>
Flint Hills Resources, LP (FHR) OAR-2005-0036-0862
Marathon Petroleum Company, LLC (MPC) OAR-2005-0036-1008

Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation OAR-2005-0036-0989
Silver Eagle Refining, Inc. OAR-2005-0036-0839
United Refining Company OAR-2005-0036-0827

Our Response:

One commenter expressed concerned that benzene extraction is not available to them because they are not on the Gulf Coast, nor are they on the East Coast, and this takes away a means to reduce their benzene levels that provides a return on investment. We conservatively estimated that refiners who are not located near to the benzene petrochemical markets would use other means to comply with the benzene program besides benzene extraction. However, refiners outside the Gulf and East Coasts may find it economical to transport a benzene rich stream to these regions for extraction. The feasibility and estimated cost of benzene control is based on the use of four different benzene control technologies that reduce benzene levels in the reformer or which reduce the benzene levels of reformate, the product stream of the reformer. While this does include extraction, our cost analysis projects that many refineries will use benzene control strategies other than extraction. Thus, the estimated cost of this benzene program, which was found to be reasonable, is based on refineries using a mix of benzene control technologies.

Another commenter stated that they may have to reduce the benzene levels of the naphtha produced by the fluidized catalytic cracker to reduce the benzene level of its gasoline below 1.0 vol%. Our feasibility and cost analysis shows that all refineries could comply with the 1.3 vol% benzene maximum average standard by using benzene saturation, although many may be able to achieve the maximum average standard at a lower cost using other lower cost reformer-based benzene control technologies. Once below the maximum average standard, the refinery can use credits to comply with the 0.62 vol% average benzene standard. If the refiner did not want to rely on credits to comply with the 0.62 average benzene standard, it could further control benzene from its reformer by applying benzene extraction or saturation. Our feasibility analysis projects that only eight refineries would not be able to achieve the 0.62 vol% average standard even after applying saturation or extraction to their reformate stream. These eight refineries would be able to reduce their gasoline benzene levels below the average standard by reducing the benzene levels in other benzene-containing gasoline blendstocks through distillation that would channel the benzene into their reformate benzene treating unit. Based on some estimates of benzene control costs for these other benzene containing gasoline blendstocks (see section 6.4.2 of Chapter 6 of the RIA), we believe that the costs would be acceptable for refiners to reduce the benzene levels of these other gasoline blendstocks.

Several commenters expressed concern that credits may not be available. Due to the range in benzene control costs among refiners, and the extensive flexibility in the program to generate trade and use credits, we have every reason to believe that refiners will freely use the ABT program to realize its cost savings. This means that credits will

be widely available. Furthermore, we committed ourselves to review the ability of the credit market to provide credits just after the program begins in 2011 and we will be monitoring the early credit market through the pre-compliance reports. If the economic conditions are somehow different over the next several years than that estimated for our refinery cost study (i.e., higher crude oil costs) as one commenter suggested, the ABT program will allow refiners to alter their benzene control choices to comply with the benzene program at the lowest cost. The benzene program is designed so that the refining industry will achieve 0.62 vol% benzene on average at lowest cost regardless of how feedstock prices, product prices or other conditions affecting refiners may change. (The final rule also includes a hardship provision specific to small refiners, providing potential relief upon a showing that the refiner could only meet the annual average standard through purchase of credits, but that credits are unavailable for practical or economic reasons.)

One commenter said that our cost analysis could be underestimating costs if refiners end up generating or using credits less freely. We recognize that this is an uncertainty in our cost modeling. Conversely, our cost analysis may be overstating costs if some refineries, particularly large refineries, are able and choose to reduce the benzene levels of other gasoline blendstocks, such as light straight run naphtha, light hydrocrackate, and light coker naphtha, and by doing so generate more credits which can be traded to other refineries which find it more cost-effective to purchase credits rather than to reduce the gasoline benzene levels of its own refineries. Thus, our cost analysis inherently contains some uncertainty with potentially higher or lower costs, and potentially higher and lower regional benzene levels, than that which we have estimated. It would be difficult to conduct any uncertainty analysis because of the very large number of potential uncertainties that could affect the cost of compliance.

Several commenters stated that the costs for benzene control are likely to be high for them and that EPA likely underestimated their costs because it did not factor in the purchasing price for credits. Our cost analysis estimates the nationwide costs to comply with the benzene program based on the projected actions taken by individual refiners to bring the nation into compliance. The ABT program allows for benzene reductions that can be achieved more cost-effectively by some refiners who choose to overcomply with the average benzene standard to be transferred to other parties through the sale of credits. Those refiners who would find it more costly to achieve the same benzene reductions can save in their compliance costs by purchasing those credits. Thus there will be a significant cost savings to the nation. Our cost analysis does not attempt to determine what the costs will be for each individual company after credit trading, and even if we had it would not be appropriate to report such results. While we did not estimate the price of a credit due to the uncertainties involved, because the credits will be generated principally by refiners with low costs for reducing their benzene levels, it is likely that the price of a credit will be much lower than the benzene reduction costs for the refineries faced with high benzene control costs and who will be the most interested in purchasing credits.

A couple commenters stated that reducing benzene will reduce their hydrogen supply and reduce the octane of their gasoline pool. When we modeled the application of the various benzene control strategies across the industry to achieve the reductions in gasoline benzene content to estimate costs, we also modeled the cost of making up reductions in both octane and hydrogen supply (see section 9.1.4.1 of Chapter 9 of the RIA). Individual refiners will bear different costs. However, despite the added cost for making up lost octane and hydrogen or making additional hydrogen available for saturating benzene, the costs incurred were considered to be reasonable (see section A.1 of Chapter VI of the preamble).

4.7 Averaging, Banking, and Trading (ABT) Program

We proposed a nationwide averaging, banking, and trading (ABT) program that would allow refineries and importers to use benzene credits generated or obtained to meet the 0.62 vol% annual average benzene standard in 2011 and beyond (2015 and beyond for small refiners). We are finalizing a very similar program with the addition of a 1.3 vol% maximum average standard that becomes effective July 1, 2012 (July 1, 2016 for small refiners). The 1.3 vol% standard must be met based on actual refinery benzene levels, essentially placing a "ceiling" on credit use. While the 1.3 vol% maximum average standard imposes a limitation on credit use, we believe that the ABT program we are finalizing still offers much of the intended compliance flexibility, and accordingly, that the comments presented below are still relevant.

4.7.1 Early Credit Generation

4.7.1.1 Trigger Point

We proposed a ten percent (10%) reduction trigger point for early credits to ensure that changes in gasoline benzene levels result from real refinery process improvements (71 FR 15875).

What Commenters Said:

We received comments supporting the proposed 10% reduction trigger point as an appropriate mechanism for guarding against "windfall" early credit generation..

We also received comment that the early credit trigger point should not apply to refiners whose early credit baseline is at or below the 0.62 vol% standard. The commenter argued that this restriction penalizes companies who have provided the health benefits of low-content benzene to the communities they serve in advance of this rule. They believe it will be difficult for refiners who currently meet the standard to significantly reduce benzene levels further and that they should be allowed to generate early credits if their average benzene levels are below baseline levels without the trigger point restriction.

Letters:

American Lung Association OAR-2005-0036-0868, OAR-2005-0036-0365
Flint Hills Resources OAR-2005-0036-0862

Our Response:

As described in more detail in the preamble to the proposed rule (71 FR 15875), we believe that a 10% reduction trigger point is appropriate and necessary to prevent windfall early credit generation. We disagree that refineries already at or below 0.62 vol% benzene should be excluded from having to meet the early credit trigger point for this very reason. We acknowledge that it could be more difficult for refineries with already low benzene levels to make additional reductions. However, refineries with gasoline benzene levels at or below 0.62 vol% do not have as much need for early credits (compared to refineries above the standard) since they are less likely to need additional lead time to comply with the standard.

4.7.1.2 Imported Gasoline

We proposed that importers would not be permitted to generate early credits for several reasons described in more detail in the proposal (71 FR 15874).

What Commenters Said:

The Independent Fuel Terminal Operators Association (IFTOA) objected to the EPA's rationale for excluding importers. IFTOA commented that because importers have to meet the same benzene standard as refiners, they should be entitled to earn the same early credits if their imports result in a net reduction in benzene emissions. They pointed out that the importer is competing with the domestic refiner who will have the advantage of including credits in his pricing and that the benzene rule should not place importers at a competitive disadvantage. They also noted that importers do not simply redistribute reduced-benzene product from one importer to another to obtain an unwarranted benefit. According to IFTOA, importers understand the value of the product, particularly when credits may be generated, and price their cargo accordingly. The commenter stated that the economic incentive to move imports from one baseline to another is offset by the premiums paid. Finally, IFTOA pointed out that the ultra-low sulfur diesel program allows both refiners and importers to generate early credits. They believe that the early credit provision of the diesel sulfur program is a valid precedent for the gasoline benzene program, and that EPA should encourage importers to obtain cleaner gasoline as soon as possible.

Letters:
Independent Fuel Terminal Operators Association (IFTOA) OAR-2005-0036-1007

Our Response:

While raising important issues and concerns, the commenters failed to address the Agency's overarching rationale behind excluding importers from generating early credits under the ABT program. Given the fluid nature of many importer operations, it would be difficult to verify that a "net reduction in benzene emissions" actually occurred in exchange for early benzene credits.

First, it would be difficult to set a "baseline" or reference point from which to measure early benzene reductions. Although an importer may have imported gasoline into the U.S. during the 2004-2005 baseline period, the average benzene content of the imported gasoline may not necessarily be representative of their usual cargo.

Likewise, a reduction in an importer's average gasoline benzene content may not necessarily be representative of a benzene reduction made at the foreign refinery level. Because of their variable operations, importers could potentially redistribute the importation of foreign gasoline to generate early credits without the overall pool of imported gasoline becoming incrementally cleaner. For example, say from January 1, 2004 to December 31, 2005 Importer A brought gasoline into the U.S. with an average benzene content of 1.50 vol%. During the same time period, Importer B imported gasoline that contained 1.00 vol% benzene on average. Beginning in June 2007, Importer B could begin transferring/selling its 1.00 vol% gasoline to Importer A for importation into the U.S. Consequently, Importer A could generate early credits based on the difference in benzene content (1.50 – 1.00 = 0.50 vol%) divided by 100 and multiplied by the volume of the imports (credits expressed in gallons of benzene). This would result in "windfall" early credits being generated with no net benzene emission reduction value. While the same gaming potential theoretically exists among refiners (although it would be low given our knowledge of the refining industry and our prohibition against refiners generating early credits for simply transferring gasoline/blendstocks from one refinery to another), we believe that the importer potential is much greater based on their ability to select which cargos they import into the U.S., their respective volumes, etc.

Finally, we only allowed importers to participate in the ULSD early credit program because it was a fundamentally different program than the one adopted in this rule. There was not an issue with establishing accurate sulfur baselines and/or verifying sulfur reductions because early credit generation was simply based off of producing/importing 15 ppm diesel fuel earlier than required. Since early credit generation was not tied to individual refinery/importer sulfur levels or reductions but rather to making compliant diesel fuel available sooner, importers and refineries alike could participate in the early credit program.

In addition to the reasons mentioned above, importers do not have the same need for early credits since they are not responsible for making investments in benzene control technology and thus will not need additional lead time to comply with the standard. Accordingly, we are finalizing the proposed early credit program which continues to exclude importers from participating. However, foreign refiners with individual refinery baselines established under § 80.910(d) who imported gasoline into the U.S. in 2004-2005 are eligible to generate early credits.

4.7.1.3 Blendstock Trading

In the proposal, we prohibited refiners from moving gasoline and gasoline blendstock streams from one refinery to another in order to generate early credits because this type of transaction would result in artificial credits with no associated emission reduction value. If traded and used towards compliance, these artificial credits could negatively impact the benefits of the program. We considered basing credit generation for multi-refinery refiners on corporate benzene baselines instead of individual refinery baselines, but determined that this could hinder credit generation. If a valid reduction was made at one refinery and an unrelated expansion occurred at another facility during this time, the credits earned based on a corporate baseline could be reduced to zero. As a result, we proposed to validate early credits based on existing reporting requirements (e.g., batch reports and pre-compliance reporting data) and sought comment on our approach (71 FR 15875).

What Commenters Said:

We received comments that refiners typically trade blending components between refiners to maximize production while minimizing cost. Further, that any discouragement to these normal transactions could hinder efficient optimum gasoline production. The commenters concluded that such companies should not be prohibited from generating early credits.

Letters:
Caribbean Petroleum Corporation OAR-2005-0036-1010
Colonial Oil Industries OAR-2005-0036-0990
U.S. Oil & Refining Co. OAR-2005-0036-0992

Our Response:

We recognize that many refiners trade blending components between refineries to maximize gasoline production while minimizing cost. As a result, we are not prohibiting these types of normal refinery activities, nor are we prohibiting such refineries from participating in the early credit program. We are simply requiring that, in order to be eligible to generate early credits, refineries make real operational changes and/or improvements in benzene control technology to reduce gasoline benzene levels. In most cases, moving gasoline blendstocks from one refinery to another does not result in a net benzene reduction (one refinery gets "cleaner" at the expense of another getting "dirtier"). Accordingly, refineries that lower their benzene levels exclusively through blendstock trading (no additional qualifying reductions) are not eligible to generate early credits under the ABT program. An exception exists for refineries that transfer benzene-rich reformate streams for processing at other refineries with qualifying post-treatment capabilities, e.g., extraction or benzene saturation units. Under this scenario, the transferring refinery would be eligible to generate early credits because a real operational

change to reduce gasoline benzene levels has been made. The regulations at § 80.1275 have been modified to more clearly reflect our intended early credit eligibility provisions, and specifically address blendstock trading.

4.7.1.7 Limiting Credit Generation to Refineries Processing Crude Oil

In § 80.1270(a)(2), we proposed that early credits could be generated only by refiners that "produce gasoline by processing crude oil through refinery processing units." The intent was to limit early credit generation to those entities that would typically have to make refinery processing changes to reduce benzene levels and meet 10% early credit trigger point.

What Commenters Said:

We received several comments that the provision at § 80.1270(a)(2) limits early credit generation and should be clarified to include refiners who process "intermediate feedstocks" as well as crude oil through refinery processing units.

Letters:
Hess Corporation OAR-2005-0036-0769
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809
Exxon Mobil OAR-2005-0036-0772, OAR-2005-0036-1013
Marathon Petroleum Company, LLC. OAR-2005-0036-1008

Our Response:

We agree that refineries producing gasoline from intermediate feedstocks would also have to make process improvements to reduce gasoline benzene levels. Furthermore, we agree that such refineries should be eligible to generate credits for making early gasoline benzene reductions. As a result, the early credit provision at § 80.1270(a)(2) has been modified to include refineries which process intermediate feedstocks through refinery processing units.

4.7.2 Standard Credit Generation

We proposed that standard benzene credits could be generated by any refinery or importer that overcomplies with the 0.62 vol% gasoline benzene standard on an annual average basis in 2011 and beyond (71 FR 15872).

What Commenters Said:

Several commenters stated that the proposed ABT program is an appropriate phase-in mechanism for the benzene standard but that the credit trading program should not continue indefinitely. The commenters' main concern was that without a sunset date,

areas with elevated benzene levels would never see real reductions because refineries in those areas would rely on credits indefinitely.

Letters:
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993, -0369
Alaska Department of Environmental Conservation (ADEC) OAR-2005-0036-0975
Oregon Department of Environmental Quality (ODEC) OAR-2005-0036-0987

Our Response:

We are finalizing the standard credit program as proposed. As highlighted in Preamble Section VI, the ABT program was an integral component in setting the benzene standard. Without the ABT program (namely the ongoing standard credit program), the 0.62 vol% standard would not be feasible considering cost and other factors. Further, we believe that the 1.3 vol% maximum average standard we are finalizing alleviates any concerns related to prolonged elevated benzene levels as a result of the ABT program (and is a more direct means of addressing those concerns than truncating the flexibilities and efficiencies associated with the ABT program).

4.7.3 Early Credit Life

We proposed that early credits must be used towards compliance within three years of the start of the program; otherwise they would expire and become invalid. In addition, we proposed that early credits generated by and/or traded to small refiners would have an additional two years of credit life (71 FR 15837).

What Commenters Said:

One commenter suggested that EPA should lengthen the early credit use period to four years to encourage the generation of early credits. Another commenter recommended a six-year early credit life and suggested that EPA discount the value of early credits after the first three compliance years (i.e., 0.75 * value of remaining early credits in year 4, 0.5 * value of remaining unused early credits in year 5, 0.25 * value of remaining unused early credits in year 6, and early credits could not be used after compliance year 6). The commenter believes that such a discounting schedule would provide further incentives to use early MSAT2 credits in the first three compliance years or to trade them before their value declines.

Letters:
Marathon Petroleum Company, LLC. OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809

Our Response:

We are finalizing a three-year early credit life. We believe that three years is a sufficient amount of time to trade/obtain and use early credits towards compliance. The three-year early credit life we are finalizing is longer (and more flexible) than the early credit life promulgated in the gasoline sulfur rulemaking (two years). Further, we do not believe there is significant benefit to providing an even longer early credit life – beyond three years (with or without a discounting schedule). A longer credit life would simply increase the recordkeeping burden associated with this rule and prolong implementation of the 0.62 vol% standard.

In addition, we are not finalizing the two-year credit life extension proposed for early credits generated by and/or traded to small refiners. By staggering early credit usage periods (non-small refiners may use early credits from 2011-2013, small refiners may use early credits form 2015-2013), no early credits may be used towards compliance with the 2014 year. We believe that this break in early credit usage will be a valuable mechanism for funneling surplus early credits facing expiration to small refiners in need. Therefore, providing an additional credit life extension for early credits traded to small refiners is unnecessary.

4.7.4 Standard Credit Life

We proposed that standard credits must be used within five years from the year they were generated (regardless of when/if they are traded). To increase the certainty that standard credits would be available to small refiners, we proposed that standard credits generated by and/or traded to small refiners would have an additional two years of credit life (71 FR 15873).

What Commenters Said:

We received many comments supporting the proposed five-year standard credit life provision.

Letters:
Caribbean Petroleum Corporation OAR-2005-0036-1010
Colonial Oil Industries OAR-2005-0036-0990
Gladieux Trading & Marketing Co., LP OAR-2005-0036-0972
Marathon Petroleum Company, LLC. OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809
U.S. Oil & Refining Co. OAR-2005-0036-0992

Our Response:

Since we did not receive any adverse comments and continue to believe that a five-year standard credit life strikes a balance between program flexibility and enforceability, we are finalizing the proposed five-year standard credit-life provision.

We are also finalizing the two-year standard credit life extension for small refiners. However, we are revising the proposed provision such that, in order to be eligible for the two-year credit life extension, standard credits must be "traded to and ultimately used by" small refiners. We excluded credits generated by small refiners because refiners generating and using their own standard credits do not need additional credit life to increase the certainty that credits would be available. In addition, we added the provision that standard credits must be ultimately used by small refiners to obtain the two-year credit life extension. Credits traded to a small refiner then traded again to a non-small refiner are ineligible for the credit life extension because this would not increase the certainty that credits would be available to small refiners.

4.7.4.1 Credit Life Extension for Small Refiners

To encourage credit trading to small refiners, we proposed that credit life could be extended by two years for early credits and/or standard credits generated by or traded to approved small refiners (71 FR 15873).

What Commenters Said:

We received comment that the ABT program should provide for extended life of credits generated by small refiners or sold to small refiners. The commenter subsequently goes on to recommend unlimited credit life for credits used by small refiners (addressed below in S&A Section 4.7.5).

Letters:
Countrymark Cooperative, LLP OAR-2005-0036-0471

Our Response:

We are finalizing a modified version of the proposed two-year credit life extension for credits generated by or traded to small refiners. As discussed above in Sections 4.7.3 and 4.7.4, to be consistent with the intent of the provision we have clarified that the two-year credit life extension only applies to standard credits traded to and ultimately used by small refiners.

4.7.4.2 Conflict with 5-Year Statute of Limitations

Under the proposed program, standard credits would have a seven-year life if generated by or traded to small refiners. In the proposal, EPA expressed concern that extending credit life beyond the five-year statute of limitations in the Clean Air Act could create significant enforceability problems. Consequently, we sought comment on provisions that could be included in the regulations to address the enforceability concerns surrounding the extended credit life for small refiner standard credits (71 FR 15873).

What Commenters Said:

The Ad Hoc Coalition of Small Refiners commented that enforceability issues could be addressed in spite of the statute of limitations with a relatively simple approach. They suggested that EPA suspend the right to participate in the credit program to any small refiner that abuses the system. Suspensions could be for a definite time period for first or second violations working up to indefinite suspension if the transgressions are repeated. The Ad Hoc Coalition of Small Refiners concludes that such an approach would address the problem and only punish the wrong-doer(s), if any.

Letters:
Ad Hoc Coalition of Small Refiners OAR-2005-0036-0686

Our Response:

We are finalizing a five-year standard credit life plus a two-year credit life extension for standard credits traded to and ultimately used by small refiners. This could result in a total seven-year standard credit life in certain situations, which could potentially conflict with the five-year statute of limitations. However, EPA need not wait seven years to bring an enforcement action. Enforcement concerns can be mitigated by proactive procedures including: reviewing and processing compliance reports in a timely fashion and understanding which refineries' average benzene levels are above and below the 0.62 vol% standard and thus, which have the potential to be credit users and generators. By investigating questionable credit activities as soon as possible we believe we will be able to take any necessary enforcement action within the five-year statute of limitations period.

4.7.5 Consideration of Unlimited Credit Life

As discussed above, we proposed finite credit life for both early and standard credits. However, in the proposal we acknowledged that there could be some benefits associated with unlimited credit life. Specifically, that unlimited credit life could potentially enhance credit generation and also allow refiners to maintain an ongoing supply of credits in the event of an emergency. However, we also emphasized that unlimited credit life could pose serious enforcement issues. Accordingly, we sought comment on how unlimited credit life could be beneficial to the program and how associated recordkeeping and enforcement issues could be mitigated. We also sought comment on different ways to structure the program (e.g., EPA managing the credit market) that would allow for unlimited credit life (71 FR 15873).

What Commenters Said:

We received several comments supporting the Agency's proposal not to manage credit trading but rather to allow trading with minimal restrictions. However, we also received a comment supporting unlimited credit life. The commenter highlighted that

credit generation is an environmental plus and credit use is an environmental negative. The commenter added that unlimited credit life would likely promote credit generation and discourage excessive use in response to credits facing expiration. The commenter believes that credits with unlimited life would likely be stored and used only when the economic value of their use exceeds their market value. The commenter concluded that all credits should have indefinite life in order to maximize their economic value. Another commenter added that credits generated by or traded to small refiners should have unlimited life.

Letters:
Marathon Petroleum Company, LLC. OAR-2005-0036-1008
National Petrochemicals & Refiners Association (NPRA) OAR-2005-0036-0809
Ad Hoc Coalition of Small Refiners OAR-2005-0036-0686
Countrymark Cooperative, LLP OAR-2005-0036-0471

Our Response:

While we acknowledge that there could be some benefits associated with unlimited credit life, we believe that they are outweighed by the potential negatives. First, although unlimited credit life could allow refiners and importers to maintain an ongoing supply of credits in the event of an emergency, it could also encourage hoarding of credits. And if credits were not traded, this would force refineries with more expensive control technologies (who would otherwise rely on credits) to comply with the annual average standard through technological means likely increasing the overall cost of the program. Second, if credits could be used for an indefinite amount of time, credit records would have to be maintained indefinitely – posing a recordkeeping burden. Third, allowing unlimited credit life could make it difficult for EPA to verify compliance with the standard. Even if credit records were maintained indefinitely, the fluid nature of the refining industry could result in enforcement difficulties. For example, if a refiner used credits that were severely dated towards compliance (permissible under a program with unlimited credit life), EPA could experience difficulties tracking down the generator to verify that the credits were indeed properly generated. During the extended intervening period, the generator could have gone out of business or company ownership could have changed several times making it difficult to find or follow a paper trail. For all these reasons, we believe that the disadvantages of unlimited credit life outweigh the potential benefits and thus are finalizing finite credit life for both early and standard credits (including credits generated/used by small refiners).

4.7.6 Credit Trading Provisions

4.7.6.1 Nationwide Trading Allowance

We proposed a nationwide ABT program that would allow refineries and importers to use benzene credits generated or obtained under the ABT program to meet the 0.62 vol% annual average benzene standard in 2011 and beyond (71 FR 15872).

What Commenters Said:

We received a number of comments supporting the proposed ABT program containing no geographic restrictions on credit trading. The commenters believe that the proposed nationwide ABT program will provide maximum flexibility and cost effectiveness, as well as minimize any adverse supply impacts.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0366, OAR-2005-0036-0367
Marathon Petroleum Company, LLC. OAR-2005-0036-1008
National Petroleum & Refiners Association (NPRA) OAR-2005-0036-0809
BP Products North American Inc. OAR-2005-0036-0824, OAR-2005-0036-0837
ExxonMobil OAR-2005-0036-0772, OAR-2005-0036-1013
Flint Hills Resources OAR-2005-0036-0862

Our Response:

As proposed, we are finalizing a nationwide ABT program that does not impose any geographic restrictions on credit trading. Credits may be traded nationwide between refiners or importers as well as within companies to meet the 0.62 vol% national average benzene standard. Early and standard benzene credits may also be used interchangeably towards compliance as permitted by their respective credit life provisions. We believe that restricting credit trading could reduce refiners' incentive to generate credits and hinder trading essential to this program. In addition, as highlighted in Preamble Section VI, the nationwide aspect of the ABT program was an integral component in setting the benzene standard. Without such a program, the 0.62 vol% standard would not be feasible considering cost and other factors.

4.7.6.2 Number of Trades

We proposed that credits must be transferred directly from the refiner or importer generating them to the party that intends to use them for compliance purposes. This ensures that the parties purchasing them are better able to assess the likelihood that the credits are valid. An exception exists where a credit generator transfers credits to a refiner or importer who inadvertently cannot use all the credits. In this case, the credits can be transferred a second time to another refiner or importer. After the second trade, the credits must be used or terminated. In the proposal, we requested comment on whether more than two trades should be allowed – specifically, whether three or four trades were more appropriate and/or more beneficial to the program (71 FR 15876).

What Commenters Said:

We received comments supporting a maximum number of two trades as well as comments suggesting the ability to trade credits up to four times before credits would have to be terminated.

Letters:
Caribbean Petroleum Corporation OAR-2005-0036-1010
Colonial Oil Industries OAR-2005-0036-0990
Gladieux Trading & Marketing Co., LP OAR-2005-0036-0972
U.S. Oil & Refining Co. OAR-2005-0036-0992
American Lung Association OAR-2005-0036-0868, OAR-2005-0036-0365

Our Response:

The commenters suggesting four trades did not provide any rationale supporting the need for an additional number of trades. They did not address how the additional flexibility would be beneficial to the program nor did they address how the added flexibility would outweigh the enforcement concerns. As a result, we are finalizing a maximum number of two trades. Not only is this provision consistent with other fuel rulemakings, we believe it strikes a balance between flexibility and enforceability. Allowing more than one trade provides for a "safety valve" in the event that credits obtained cannot be used within the credit life provisions. Allowing the fewest number of trades ensures that both credit purchasers and EPA are better able to assess the validity of credits.

4.7.6.3 Credit Brokering/Ownership

We proposed no prohibitions against brokers facilitating the transfer of credits from one party to another. Any person can act as a credit broker, regardless of whether such person is a refiner or importer, although no credit "ownership" transfers to the broker. This prohibition on outside parties taking ownership of credits was promulgated in response to problems encountered during the unleaded gasoline program and has since appeared in subsequent fuels rulemakings. To reevaluate potential stakeholder interest in removing this prohibition, EPA sought comment on this provision in the proposal -- specifically, whether there were potential benefits to allowing other parties to take ownership of credits and how such a program would be enforced (71 FR 15876).

What Commenters Said:

We received comments from several companies all supporting the prohibition against brokers taking ownership of credits.

Letters:
Caribbean Petroleum Corporation OAR-2005-0036-1010
Colonial Oil Industries OAR-2005-0036-0990
Gladieux Trading & Marketing Co., LP OAR-2005-0036-0972
U.S. Oil & Refining Co. OAR-2005-0036-0992

Our Response:

Since we did not receive any adverse comments, we continue to believe that our existing prohibition on outside parties taking ownership of credits is appropriate. As such, we are finalizing the proposed program where brokers can facilitate credit transfers but not take "ownership" of credits. Not only is this provision consistent with other ABT programs for mobile sources and their fuels, it is sufficiently flexible while preserving adequate means for enforcement.

4.7.7 Exclusion of California Gasoline from ABT Program

Despite the fact that California gasoline is not covered by this program, EPA sought comment on whether and how credits could be generated based on California gasoline benzene reductions and applied toward non-California gasoline compliance (71 FR 15873).

What Commenters Said:

One commenter agreed with our proposal and opposed credits being generated on behalf of California gasoline benzene reductions for use outside of California. Another commenter responded that California refineries should be allowed to participate in the ABT program. .

Letters:
Marathon Petroleum Company, LLC. OAR-2005-0036-1008
American Lung Association OAR-2005-0036-0868, OAR-2005-0036-0365

Our Response:

The commenter supporting the inclusion of California refineries did not provide any rationale why California gasoline specifically should be included in the ABT program. As a result, we are finalizing the proposed program which excludes California gasoline. As described below, we believe that including California gasoline in the ABT program would be a rigorous task with very few benefits.

First, we do not currently receive batch reports for California gasoline under the existing RFG/Anti-Dumping reporting requirements. Therefore, in order for credits to be generated (based on baseline benzene reductions) California gasoline refineries would first need to provide EPA with the appropriate 2004-2005 batch reports in order to establish individual refinery benzene baselines. Additionally, these refineries would need to provide EPA with such reports in the future (in addition to the CARB compliance reports/information required under the California Phase 3 Reformulated Gasoline (CaRFG3) Program). On the other hand, if we allowed credits to be generated for overcomplying with the 0.62 vol% standard (as opposed to making reductions from an individual benzene baseline), this would mostly likely result in windfall credit generation. As of 2004, California gasoline benzene levels were already around 0.62 vol% on

average (based on data provided to EPA by CARB). As a result, contrary to the intent of the program, most California gasoline refineries would be eligible to generate credits for doing nothing at all. For these reasons, we are finalizing the proposed ABT provision which excludes California gasoline from generating credits.

4.8 Effects on Fuel and/or Energy Supply, Distribution, and Use

4.8.1 Energy Impacts

What Commenters Said:

The American Petroleum Institute (API) commented that Draft RIA Table 9.610 characterizes estimated changes in energy use resulting from the (proposed) rule as small, but the commenter noted that the change is positive—i.e., more energy is needed to accomplish the same fuel delivery.

ExxonMobil, NPRA, and MPC commented that they believe that proposed MSAT2 standards are a significant energy action, and that EPA has incorrectly stated that the rule is not a "significant energy action" (per EO 123211). They further stated that they do not agree with EPA's belief that the reduced volume (about 23,500 b/d) of reformate available for gasoline production due to MSAT2 will be made up through other processes with little or no net reduction in gasoline production. The commenters stated that they do not accept the assumption that this volume reduction can be replaced easily.

NPRA and Marathon Petroleum Company also commented that EPA projected that the annual aggregate costs associated with the rule will be $185.5 million in 2011 (and higher after 2011); based on these cost projections, the commenter stated that it believes the program is a significant energy action because is exceeds $100 million (per section 3(f) of E.O. 12866).

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
Marathon Petroleum Company LLC OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809

Our Response:

Several commenters expressed their view that the benzene control program will have a major adverse impact on energy supply. In its guidance document to Executive Order numbered 13211, the Office of Management and Budget (OMB) defined specific criteria for determining whether any rulemaking has a significant adverse effect on energy supply, distribution and use. We identified three significant adverse impact criteria contained in the OMB guidance document which could be relevant. The first criteria relates to electricity demand. OMB's guidance document to EO 13211 states that

a regulatory action has caused a significant adverse effect on energy if the supply of electricity is reduced by a billion kilowatt hours per year. As estimated by our contractor using its linear programming refinery model (which estimate we have analyzed and agree with), the benzene reductions required by the final rule should result in less than 290 million kilowatt-hours per year of additional electricity demand.[22] This demand would result from the application of benzene control equipment and other refinery changes associated with gasoline benzene control. This additional demand for electricity is below the trigger of 1 billion kilowatt-hours per year of electricity identified in the OMB guidance document that would be considered a significant impact on electricity supply.

OMB's guidance document to EO 13211 also states that a regulatory action has caused a significant adverse effect on energy if natural gas supply is impacted by 25 million standard cubic feet per year, which equates to about 25 billion BTUs per year. Based on the linear program modeling work cited above, our final benzene control program is expected to cause an additional demand of 5.5 billion BTUs per year of natural gas, which is lower than the trigger of 25 billion BTUs per year that would define a significant impact on natural gas supply.

Based on OMB's guidance document, the last potential trigger for how this rulemaking could cause a significant adverse effect on energy supply, distribution and use relates to decreases in fuel supply. Several commenters raised this as an issue related to EO 13211, while others raised it as a more general issue. OMB's guidance document to EO 13211 states that a regulatory action has caused a significant adverse effect on energy if the supply of fuel is decreased by 4,000 barrels per day. In this case we interpret the term fuel to mean gasoline.

Compliance with the benzene standards in the rule will not automatically reduce gasoline supply. Refineries which are able to meet the standards through benzene saturation, for example, will not incur any volumetric reductions in gasoline production. Gasoline production would be decreased only at refineries utilizing benzene extraction (i.e. reformate extraction), since removing benzene from the gasoline pool via extraction reduces the overall volume of gasoline. We in fact project that refineries will extract an additional 12,500 barrels of benzene per day, or 192 million gallons per year, in the course of complying with the fully phased-in benzene control program.[23] This is equivalent to about 13,375 barrels per day of gasoline (or about 0.1 percent of U.S. gasoline production) when the higher energy density of benzene is taken into account.

At first blush, this appears to exceed the significant adverse effect threshold. However, we believe that the net effect of the rule on gasoline supply will be far less, potentially zero, and will not exceed the 4000 barrels of fuel supply threshold. This is because we expect the increase in extraction of benzene from gasoline to occur with or

[22] Kolb, Jeff, Abt Associates, Estimated Changes in Energy Use, LP Refinery Model Output provided to EPA under contract WA 0-01, EP-C-06-094, December 27, 2006.
[23] Kolb, Jeff, Abt Associates, Estimated Changes in Energy Use, LP Refinery Model Output provided to EPA under contract WA 0-01, EP-C-06-094, December 27, 2006.

without the final benzene control program. Using Chemical Market Associates Incorporated's (CMAI) estimate of a 2.4 percent annual growth in benzene demand, we expect that U.S. demand for benzene will increase by 600 million gallons from 2007 to 2015, the years that the final benzene control program is expected to phase-in. Assuming as is reasonable that reformate extraction continues to supply about 40 percent of the total benzene supply,[24] then reformate extraction is expected to supply about 250 million gallons additional benzene over the eight year benzene program phase-in period. This exceeds the amount of reformate extraction that we project would occur for refiners using benzene extraction to comply with the gasoline benzene standards in this rule, provided, as is reasonable, that the benzene extraction occurs throughout the entire phase-in period. Only in the highly unlikely event that all refiners projected to use benzene extraction to comply with the final benzene control program install extraction equipment in a single year would the increased benzene supply exceed projected benzene demand (by a factor of roughly two times the yearly increase in total benzene demand), potentially raising issues of reduction in gasoline supply under the Executive Order.[25]

Even under this unlikely scenario of all the projected benzene extraction occurring in a single year, the benzene market would likely adjust to rebalance both the benzene market and the gasoline supply. Selective toluene disproportionation and toluene hydrodealkylation are higher cost benzene production technologies that contributed about 290 million gallons per year of benzene to the U.S. petrochemical market in the year 2002. If there were to be a drastically increased volume of benzene extraction from refineries, there would likely be correspondingly less use of these two marginal, higher cost benzene production processes which would rebalance the benzene supply/demand market. Assuming (reasonably) that these two benzene production processes temporally reduce their output to rebalance benzene supply, the feedstock toluene would presumably stay in the gasoline pool essentially negating the potential impact that reducing benzene from gasoline supply would otherwise cause. We therefore do not see gasoline volumes being significantly reduced as a result of benzene extraction occurring as a result of requirements of this rule.[26]

We thus do not accept the comments that this rule would have a significant adverse impact on energy supply, distribution, or use for purposes of the Executive

[24] This is a reasonable assumption because the contribution of reformate extraction to the total supply of benzene in North America has remained fairly constant from 1998 to 2002, the years that CMAI provides benzene supply data in their Benzene report.

[25] Increased benzene extraction for compliance as modeled by the cost analysis is likely to phase in over the entire phase in period of the benzene program because of the implementation nature of the various benzene extraction projects. Of the total 16 extraction units expected to be revamped or newly installed by refiners complying with the benzene program, 13 of them are revamps. Because revamp projects are extremely variable in nature with a similar variation in cost, they can be completed over a time period which ranges from almost immediately to 4 or even 5 more years our for more complex revamps. The 3 grassroots extraction units will likely be installed the latest of all the benzene extraction projects because they require extensive installs, both for onsite and offsite capital. Thus these projected benzene extraction units will be installed throughout the phase-in period.

[26] We conservatively did not reduce our program cost estimates due to any of the modeled benzene extraction occurring in the baseline, nor did we reduce our cost estimate based on any toluene reentering the gasoline pool from reduced benzene formation from toluene feedstocks.

Order, or for purposes of our consideration of energy issues required by section 202 (l) (2) of the Act. In this regard, we note further that we do not believe that there will be any reduction (and there may be an increase) in fuel supply from the rule's vehicle standards, and that the standards for portable fuel containers will result in significant fuel savings by reducing evaporative losses (estimated to be about 66 million gallons of gasoline savings per year in 2014).

One commenter stated that this rulemaking has a significant impact on gasoline supply because it exceeds $100 million per year cost threshold of EO 12866. However, EO 12866 sets a trigger which determines whether a rulemaking has a significant economic impact, but that does not also indicate that a rulemaking has a significant impact on energy supply. For that analysis, we rely on the criteria for EO 13211, as just discussed above.

4.8.2 Impacts on Gasoline Supply

What Commenters Said:

The New York Department of Environmental Conservation commented that it believes that a reduction in gasoline benzene is good, but raises the question of how the lost volume will be made up and whether the volume of other undesirable constituents will increase.

At the public hearing, the National Petrochemical and Refiners Association (NPRA) also commented that, in proposing new standards for fuel formulations or any other rules affecting refinery and/or petrochemical facilities, the Agency needs to be aware of the total impact these programs may have on fuel supply.

NPRA and Marathon Petroleum Company (MPC) commented that they believe that the Agency should re-evaluate the rule's potential impacts on gasoline supply. The commenters further stated that they do not agree with the Agency's optimistic projections that the net effect of the MSAT2 program on gasoline supplies will be potentially zero. They stated that they also do not agree with the statements that the proposed ABT program with the 0.62 vol% benzene level is feasible, would be met without extreme economic consequences, and that all refineries would be able to comply. The commenters noted that, in response to the benzene standards, they believe that refineries could choose to close, reduce gasoline production, or export more gasoline, all of which could adversely affect gasoline supplies. The commenters further stated that they believe that finalization of the rule as proposed could result in lower gasoline imports if importers do not wish to incur the additional expense of purchasing credits from domestic refineries.

The commenters also stated that they believe that gasoline supplies will also be adversely affected if the rule results in reduced gasoline imports. The commenters noted that the lower benzene level may limit gasoline imports into the U.S. from areas that do

not have gasoline benzene controls, such as Central and South America and the Caribbean. The commenters suggested that EPA consider whether such import restrictions will have an adverse impact on US gasoline markets.

NPRA and Marathon Petroleum Company also commented that they believe that the rule would have an adverse effect on domestic gasoline supplies if refineries closed, reduced gasoline production, and/or exported more gasoline. The commenter further stated that refineries may not implement benzene content reduction strategies as the proposed rule predicted, and that it does not have confidence that the Agency has estimated correctly for every refinery.

Letters:
Marathon Petroleum Company LLC OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809
New York State Department of Environmental Conservation OAR-2005-0036-0722

Our Response:

The commenters expressed their concern that the new benzene program could create a regulatory hurdle that will result in less gasoline being imported into the U.S. After reviewing the benzene levels of imported gasoline and considering the flexibility of our benzene program, we don't think that imported gasoline volumes will be affected significantly. About half of imported gasoline is imported into the RFG market which already requires lower benzene levels. A review of the benzene levels of imported gasoline reveals that it averages 0.75 vol% benzene, which is substantially lower than the roughly 1.0 vol% current national average benzene level for U.S. gasoline. Even assuming that foreign refiners will not be willing to further reduce their gasoline benzene levels, if their gasoline benzene levels are above 0.62 vol% benzene, they could continue to import gasoline that exceeds the 0.62 vol% benzene standard and purchase credits. Only 0.5% of imported gasoline's volume exceeds the 1.3 maximum average benzene standard and is at risk of being rejected from the U.S. gasoline market. Even this higher benzene gasoline could continue to be brought into the U.S. if the importers balance this higher benzene gasoline with gasoline which contains less than 1.3 vol% benzene resulting in a combined gasoline pool which averages less than 1.3 vol% benzene.

Two commenters stated that gasoline supply could be impacted adversely if some refiners closed as a result of the benzene program. Based on the flexibilities provided by the benzene program, we do not project any closures in our detailed economic analysis found in chapter 9 of the RIA. The ABT program provides several flexibilities, such as the availability of credits or deficit carry-forward, which will help to reduce the cost of compliance with the annual average gasoline benzene standard. For smaller refineries that our modeling estimates would be faced with potentially high costs to comply with the 1.3 maximum average standard, we believe that there are other lower cost means for these refineries to reduce their benzene levels which are not captured by our refinery cost modeling (see section 9.6.1 of Chapter 9 of the RIA). Finally, the final rule provides

numerous exemption opportunities for refiners that can demonstrate that the rule causes them extreme hardship that leaves refineries many alternatives to closure.

Finally, one commenter asked whether the decrease in gasoline benzene content will cause the content of other undesirable constituents in gasoline to increase. We do not project this to be the case. Some of the benzene control technologies (notably benzene saturation) chemically convert the benzene to cyclohexane, a petroleum compound not known to be a human carcinogen. Most of the benzene reducing technologies will cause a small decrease in the octane level of the treated gasoline. This octane loss will likely be made up by the addition of ethanol, since ethanol has become the constituent of choice for increasing the octane of the gasoline pool. See section VI.A.1.b.i of the preamble to the final rule.

4.8.3 Other

What Commenters Said:

Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation commented that they believe that a further economic disadvantage PADD 4 and 5 refineries face with benzene control is the distance from, and lack of access to, benzene markets. The commenters stated that they believe this may be one reason why many Gulf Coast refineries manufacture gasoline with benzene levels lower than the nation at large; and conversely, PADD 4 and 5 refineries that rail benzene to petrochemical plants in the Gulf Coast region pay a high transportation penalty to sell benzene to these facilities.

MPC commented that it believes that, due to the wide range of starting points, compliance costs will be low for some refineries and higher for others. The commenter stated that it believes that the variability in the selection of benzene control strategies (as predicted in the proposed rule's refinery cost model) depends on existing equipment at the refinery, proximity to the petrochemical market, and estimated benzene reduction technology costs compared to the cost of buying a credit. However, the commenter noted, it was assumed in the proposal that all refineries will choose to either make the necessary investments or will purchase credits—the commenter stated that it believes that EPA made no attempt to identify these refineries or their cumulative volume impact on the US gasoline pool.

ExxonMobil commented that it believes that EPA should estimate the potential adverse impact the proposal will have on criteria pollutants and CO_2 emissions at refineries.

Letters:
ExxonMobil Refining & Supply Company OAR-2005-0036-0772
Marathon Petroleum Company LLC OAR-2005-0036-1008

Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation OAR-2005-0036-0989

Our Response:

Several commenters commented about the cost of compliance for refineries in PADDs 4 and 5, particularly about the economic inability to use benzene extraction as a benzene control technology. We agree that the refiners in PADDs 4 and 5 are unlikely to have the ability to use extraction to reduce benzene levels at their refineries due to lack of access to benzene markets without disproportionate transport costs. Our modeling is in fact consistent with this belief. Also these refineries tend to have higher starting benzene levels and poorer economies in scale (they are smaller refineries) resulting in higher compliance costs for the refineries in these PADDs. For this reason, our modeling projects that several refineries in PADDs 4 and 5 will rely on the ABT program to purchase credits, reducing their overall cost of complying with the annual average benzene standard.

One commenter stated that there is a wide range in compliance strategies as well as compliance costs, as identified in the regulatory documents. However, the commenter stated that we did not identify which refineries will take what benzene control steps, nor did we attempt to identify the impact on gasoline supply. Addressing the first comment, our refinery-by-refinery analysis is built in part upon confidential business information, and our projections of the steps they might take to reduce their benzene levels are considered sensitive information. Therefore, we cannot reveal our refinery-by-refinery projections of which refineries take what steps to reduce their benzene levels, although we did report the projected use of benzene control technologies more generally. As for the second comment, as described above in our response to comment 4.8.1, we do not believe that there will be a net impact on gasoline supply due to benzene extraction used by U.S. refiners when complying with this rulemaking. We further concluded in our response to comment 4.8.2 that imports are not expected to decrease due to the rule's requirements. In sum, we don't expect any significant decrease in gasoline supply caused by fuel (or other) requirements of the rule.

One commenter stated that EPA should estimate the emissions increases in CO_2 and criteria pollutants at refineries caused by the benzene program. The analysis conducted by our contractor to estimate the energy and supply impacts of the benzene program provided detailed estimates of the fuel and electricity consumed at refineries in reducing the benzene levels of gasoline.[27] We used these fuel and electricity demand estimates along with emission factors for carbon dioxide and criteria pollutants to derive emission estimates for carbon dioxide and criteria pollutants at refineries.

The national increase in fuel demand, which is assumed to be natural gas, associated with application of benzene control technologies is 16 trillion BTUs per year which includes the natural gas used in furnaces and steam generation. Of that 16 trillion,

[27] Kolb, Jeff, Abt Associates, Estimated Changes in Energy Use, LP Refinery Model Output provided to EPA under contract WA 0-01, EP-C-06-094, December 27, 2006.

9.8 trillion BTUs per year comprises feedstocks for the production of hydrogen (the relevance of which is discussed below). Additional energy demand and emissions occur through the consumption of electricity. Electricity demand is estimated to increase by 731 kilowatt-hours. Electricity is equivalent to 3400 BTUs per kilowatt-hour and electricity generation is estimated to be about 37 percent efficient. Thus, electricity generation is responsible for about 0.06 trillion BTUs per year of additional energy consumption.

To estimate the emissions of carbon dioxide and criteria pollutants at refineries we used emission factors for deriving the emissions from the increased demand for natural gas and electricity. The emission factors that we used are the criteria emission factors for a gasoline hydrotreater provided to us by Mobil Oil.[28] Since the natural gas used for hydrogen production was consumed as a feedstock and not burned, we did not use that part of the natural gas consumption to derive criteria emission estimates, although we did consider it along with the rest of the natural gas and electricity consumption for carbon dioxide emissions.

The emission factors for the use of energy are summarized in the Table below. The NOx emission factor is expressed as a range. The lower value reflects the emissions from the use of ultra-low NOx burners, while the upper number reflects the emissions of conventional burners. The rest of the criteria emissions are estimated based on single point estimates for their emission factors. The emission factor for carbon dioxide is estimated from the combustion of an equal blend of natural gas and liquid petroleum gas, which represents the combustion of refinery gas. The combustion of this blend in refinery fuel is estimated to yield 143,000 lbs of CO_2 per billion BTU of fuel consumed. We assume that electricity has the same emission factors as refinery fuel gas, which is very simplistic. Electricity can be generated from coal, fuel oil, natural gas, nuclear, hydroelectric and other renewable energy sources. All these energy sources can contribute to higher and lower emission levels of pollutants than that assumed based on refinery fuel gas, so using the criteria pollutant emission factors of refinery fuel gas may be roughly representative as well. The small amount of total energy consumed from the generation of electricity means that the uncertainty around the emissions associated from electricity production will have little impact on the emissions estimates.

Summary of Emission Factors and Refinery Emissions Attributed to the Benzene Program

	Emission Factors (lbs per Billion BTU)	Change in 2012 Emissions (tons/yr)
CO_2	143,000	1,145,000
NOx	35 – 140	108 – 433
VOC	25	77
CO	35	108

[28] While units which reduce gasoline benzene levels are different from those that desulfurize gasoline, the primary units that use energy, including furnaces and boilers, are very similar. Thus, the emission factors derived for gasoline desulfurization units can be applied to benzene reducing technologies.

Particulate	3.0	9
SOx	13	40

The table shows that CO_2 emissions at refineries are estimated to increase by a little more than a million tons per year, and the refinery criteria emissions are estimated to increase within a range of 9 to 430 tons per year.

4.9 Small Refiner and Other Hardship Provisions

4.9.1 Small Refiner Provisions

4.9.1.1 Support for Small Refiner Provisions

What Commenters Said:

We received several comments supporting provisions for small refiners in the MSAT2 rule, especially the four-year period of additional lead-time. The commenters noted that they believe that this provision is very important because small refiners generally lack the resources available to large companies and require additional time to acquire capital and complete equipment modifications.

The Ad Hoc Coalition of Small Business Refiners (Small Refiners) further commented that they agree with EPA's rationale for providing small refiner provisions and stated that they believe EPA expressed well the special needs of small refiners.

Some commenters suggested that EPA allow less stringent or alternate standards indefinitely for small refiners. One commenter stated that it believes the cost to meet the proposed 0.62 vol% benzene standard will be inordinate, and that a loss of marketable gasoline due to benzene reduction would cause it to incur significant economic hardship. The commenter suggested that provisions such as delayed compliance, and those that will either allow small refiners to meet alternate benzene standards or contain a credit program that will make compliance economically possible, should be part of the final rule. Another commenter stated that small refiners are still concerned about the impact of this regulation on their long term viability; and that while the amount of gasoline that small refiners produce is not large, it is critical both to supply and price. The commenter thus stated that it believes this warrants a relaxing of the benzene requirements for small refiners (an action it believes would not impact the MSAT2 program), and further requested that EPA reevaluate whether a 0.62% benzene level for small refiners actually makes sense, considering that small refiners are located all over the United States and the amount of small-refiner-produced gasoline consumed in any given area is minimal.

In addition, Countrymark commented that it believes that the regulation should contain a provision for individual hardship relief for small refiners on a long-term basis if they are unable to reduce the benzene level required by the regulations. The commenter

noted that it is possible that a small refiner could install benzene removal equipment and still need to purchase credits; that the purchase of credits would be so costly that it could not compete in the gasoline market; or that a small refiner still could not comply even if it was financially able to install the removal equipment. Countrymark commented that, in either case, it believes such a refiner should be allowed to continue to operate at a higher benzene level until it is possible for it to obtain equipment that would be effective or the credit costs reduced. The commenter suggested that in such cases of hardship, EPA should consider whatever action is necessary to allow the small refiner to continue to produce gasoline. The commenter further stated that it believes it is important for EPA to recognize the need to keep every small refiner a viable producer of gasoline for the market.

Letters:
Ad Hoc Coalition of Small Business Refiners OAR-2005-0036-0686
Caribbean Petroleum Corporation OAR-2005-0036-1010
Countrymark Cooperative, LLP OAR-2005-0036-0471
Silver Eagle Refining, Inc. OAR-2005-0036-0839
U.S. Oil & Refining Company OAR-2005-0036-0992

Our Response:

As stated in the preamble to the final rule, we are finalizing many of the provisions that were proposed which were specific to small refiners. We believe that small refiners generally have greater difficulty than larger companies (including those large companies that own small-capacity refineries) in raising capital for investing in benzene control equipment. We also believe that small refiners are likely to have more difficulty in competing for engineering resources and completing construction of the needed benzene control (and any necessary octane recovery) equipment in time to meet the required standards. We have chosen to finalize a four-year period of additional lead time for small refiners, until January 1, 2015 to comply with the 0.62 vol% annual average benzene standard. This amount of lead time was supported by all commenters on the issue. We are also finalizing 4 years of additional lead time, until July 1, 2016, for small refiners to meet the 1.3 vol% refinery maximum average benzene standard. As discussed more fully below, we are also finalizing a review of the ABT program after the first year of the program. The four-year lead time period will provide small refiners with nearly three years of lead time following the review to complete any necessary capital projects.

We do not agree with the comment that small refiners, as a class, should simply not be subject to the benzene standards in the rule. As shown in chapters 9 and 14 of the RIA, as well as in the preamble to the final rule, small refiners can achieve the standards adopted in the rule. Exempting small refiners as a class would therefore result in a fuel program that did not obtain the greatest emission reductions of toxics achievable from motor vehicle fuels. We believe that individual small refineries incurring extreme economic hardship as a result of the rule may be eligible for some type of hardship waiver, as explained below. Any such relief, however, would be on a case-by-case basis

reflecting the refiner's situation after making good faith efforts to comply, and should not (and legally cannot) be adopted now for the entire class of small refiners.

We do accept the comment that it is possible that for some small refiners, compliance with the 0.62 vol% annual average standard through purchase of credits may prove to be infeasible and have added an additional hardship provision to the final rule to accommodate such a possibility. As discussed in more detail in section VI.A.3.a.iii of the preamble to the final rule, we are finalizing an additional hardship provision exclusively for approved small refiners to cover the case of a small refiner for which compliance with the 0.62 vol% annual average standard would be feasible only through the purchase of credits, but for whom the purchase of credits is not practically or economically feasible. This hardship provision will only be available following the ABT program review, as the most accurate information to assess credit availability and the workings of the credit market are necessary to evaluate this type of claim of hardship. Hardship relief under this provision will only be afforded to a small refiner on a case-by-case basis, and must be based on a showing by the refiner of the practical or economic difficulty in acquiring credits for compliance with the 0.62 vol% benzene standard. Hardship relief under this provision, if granted, would consist of a further delay, on an individual refinery basis, for up to two years. Following the two years, a small refiner will be allowed to request one or more extensions of the compliance date for the 0.62 vol% annual average benzene standard until the refinery's material situation has changed.

In addition, the general hardship relief provisions discussed in section VI.A.3.b of the preamble are available to any refiner, including the situations that could arise for small refiners. This includes hardship in meeting the 1.3 vol% maximum average standard, as discussed below.

4.9.1.2 ABT Program

What Commenters Said:

The Small Refiners commented that, in addition to additional lead-time, they strongly endorse: a nationwide ABT program which allows small refiners to earn credits and also includes some provisions to encourage more credit trading to small refiners (i.e., the extension of credit life by two years if generated by, or traded to, small refiners); a review of the ABT program and the small refiner flexibility options by 2012, including the submission of pre-compliance reports; and consideration of additional small refiner provisions on a case-by-case basis, depending upon the results of the ABT program review. In addition, the commenters stated that equally as significant are the design and review of the ABT program. The Small Refiners noted that many small refiners estimate their benzene reduction costs to be higher on a per gallon basis than EPA's estimates, thus they believe that, for many, the only feasible approach [to meet the 0.62 vol% benzene standard] will be to purchase credits. The Small Refiners stated that compliance with desulfurization regulations and planned refinery expansions are expected to increase benzene production. Therefore, the commenters stated that they believe it is essential

that the availability and cost of credits be known as soon as possible (well before the small refiner compliance deadline) and that steps must be taken to ensure a functional credit market with reasonable credit costs.

The Small Refiners also commented that they believe that provisions should be included to address enforceability with regard to extended credit life for small refiner standard credits in light of the five-year statute of limitations on EPA enforcement activities. The commenters suggested that enforceability could be addressed in spite of the statute of limitations with a relatively simple approach of suspending the right to participate in the credit program of any small refiner that abuses the system. The commenters also stated that they believe that the proposed requirement for annual compliance reports will provide a relevant data base, and that suspensions could be for a definite period of time for first or second violations, working up to indefinite suspension if transgressions are repeated.

Letters:
Ad Hoc Coalition of Small Business Refiners OAR-2005-0036-0686

Our Response:

We are in fact finalizing an early credit generation provision to allow small refiners the opportunity to generate early credits for reductions of at least ten percent of the refiner's 2004-2005 benzene levels prior to the small refiner compliance deadline on January 1, 2015. We believe that early credit generation opportunities for small refiners will provide more credits for the MSAT2 ABT program. Further, it will help to achieve the air quality goals of the MSAT2 program earlier than otherwise required, as there will be an incentive for these refiners to reduce their benzene levels prior to the small refiner compliance deadlines. The small refiner early credit generation period will be from June 1, 2007 to December 31, 2014, after which standard credits may be generated indefinitely for those that overcomply with the 0.62 vol% annual average standard.

We are also finalizing provisions for extended credit life, to increase the certainty that credits will be available. We believe that this will encourage trading to small refiners. We are finalizing that standard credits traded to, and ultimately used by, small refiners will receive an additional two years of credit life. The extension does not apply to early credits because refiners already have an incentive to trade early credits to small refiners. Based on the nature of the early credit life program (three-year life based on the start of the program in 2011) and small refiners' delayed program start date in 2015, early credits traded to small refiners are already valid for an additional four years. Further, we do not believe that there is a need to extend credit life for credits generated by small refiners, because in this event, the small refiner would already have the utmost certainly that the credits would be available for use. Regarding the commenters' note about the five-year statute of limitations on EPA enforcement activities, this is discussed fully in section 4.7.4.2, above.

4.9.1.3 ABT Program Review

What Commenters Said:

A number of commenters stated that they support the proposed EPA review of the ABT program in 2011. The commenters reiterated that a review of both the credit program and the small refiner flexibility options by 2012 is essential because of the critical importance to small refiners of a viable credit system and the fact that some small refiners believe that it will be economically and/or technically necessary for them to purchase and use credits.

The Small Refiners specifically requested that EPA include small refiners in the development of the final design for the program review and in the review process/credit program evaluation itself. The commenters stated that they believe it will be important that the review include an evaluation of small refiner benzene reduction capital equipment and operating costs compared with the cost of credits. The commenters further suggested that EPA perform annual reviews to assess potential changes in the credit marketplace. The Small Refiners also offered comments on elements that they believe should be included in the review, and actions that might follow the review:
1) Revisiting the small refiner provisions if it is found that the credit trading market does not exist to a sufficient degree to allow small refiners to purchase credits, or that credits are only available at a cost-prohibitive price. Revisions could include additional hardship provisions on a case-by-case basis, such as further delay or relaxation of the standard with the possibility of multiple extensions until the refinery's material situation changes.
2) Options to either help the credit market or help small refiners gain access to credits if it is found that there is not an ample supply of credits or that small refiners are having difficulty obtaining them. One option suggested was the "creation" of credits by EPA to introduce into the credit market, or imposing additional requirements to encourage trading with small refiners (e.g., requiring a percentage of all credits be set aside for small refiners only, requiring that some credits be made available to small refiners before they can be sold to any other refiners).

Letters:
Ad Hoc Coalition of Small Business Refiners OAR-2005-0036-0686
Caribbean Petroleum Corporation OAR-2005-0036-1010
Colonial Oil Industries, Inc. OAR-2005-0036-0990
Gladieux Trading & Marketing Co., L.P. OAR-2005-0036-0972
U.S. Oil & Refining Company OAR-2005-0036-0992

Our Response:

EPA will review the ABT program (and thus, the small refiner flexibility options) in 2012, one year after the general program for the 0.62 vol% annual average benzene standard begins. Coupled with the small refiner four-year additional lead time provision, the ABT program review after the first year of the overall program will provide small

refiners with roughly more three years, after learning the results of the review, to obtain financing and perform engineering and construction with respect to that standard. In part to support the review, we are requiring that refiners submit pre-compliance reports, similar to those required under the highway and nonroad diesel programs. This review will take into account the number of early credits generated industry-wide each year prior to the start of the MSAT2 program, as well as the number of credits generated and transferred during the first year of the overall benzene control program. Section VI.A.2.a.iii of the preamble to the final rule contains detailed information on the requirements for the ABT pre-compliance reports. EPA will publish generalized summaries (to maintain the confidentiality of information from individual refiners submitted in the reports) of the reports annually. We will also take input on how to conduct the review and potential options to consider if a viable credit market does not exist.

If, following the review, EPA finds that the credit market is significantly at odds with the assumptions underlying the final rule provisions for small refiners, we will revisit the provisions to determine whether or not they should be altered or whether EPA can assist the credit market (and small refiners' access to credits). Further, as noted above in section 4.9.1.1, if we find that some small refiners still cannot comply with the 0.62 vol% benzene standard even with a viable credit market and that credit purchase is the refiner's only option for compliance with the standard, we are finalizing an additional hardship provision to potentially assist those small refiners.

4.9.1.4 Concerns with 1.3 Vol% Refinery Maximum Average Standard

What Commenters Said:

Representatives of small refiners were critical of the possibility of adding a 1.3 vol% refinery maximum average to the fuel benzene standards. They expressed their concerns in both written and oral statements to the agency, challenging both the maximum average standard and the procedures by which it was adopted. They maintain that the imposition of a 1.3 vol% refinery maximum average violates the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 because the Small Business Advocacy Review (SBAR) Panel did not have the opportunity to review the impacts of such a standard on small businesses. At a minimum, they believe EPA would need to present the maximum average provision to the Panel for its consideration prior to including it as part of a final rule (citing 5 U.S.C. § 609). They add that the possibility of a maximum average was never raised during the SBAR Panel process which assessed the impact of an MSAT2 rulemaking. They continue that had it been, the small refiner representatives would have opposed the concept as greatly damaging to their segment of the industry. They further contend that such a maximum average significantly changes the economics of small refiner compliance and that it should (and must) be considered by an SBAR Panel before a rule is finalized.

The commenters also stated that there are at least eight small refiners that have benzene levels above 1.3 vol%. The commenters also expressed concerns such as maintaining octane levels, costs for transportation of extracted benzene, and ability to locate other treatment facilities. More generally, they stated that applying the maximum average to small refiners is at odds with the premise of the proposed rule: that unlimited ABT is needed to provide sufficient flexibilities for refiners which otherwise would need to make expensive capital investments. They stated that for many small refineries, the cost of meeting the 1.3% level will require significant capital investment and likely would remove them from the credit buying market not only to meet the 1.3 vol% levels, but also at levels below 1.3%. They continued that the inability of small refiners currently above 1.3% benzene gasoline levels to comply with credits threatens the very existence of those refiners and calls into question EPA's assumptions regarding impact of the rule on fuel supply. They maintain that EPA itself recognized that absent small refiner flexibilities, EPA would likely have to consider setting a less stringent benzene standard or delaying the overall program to diminish burden on small refineries (citing 71 FR 15877). Given these concerns about the inability to use credits to meet levels above 1.3 vol%, thus they suggested that EPA should allow small refiners to use credits for compliance with the 1.3 vol% refinery maximum average, with either a PADD restriction on credit trading or discounting credits used to meet the 1.3 vol% standard.

Letters:
Ad-Hoc Coalition of Small Business Refiners OAR-2005-0036 (late comments)

Our Response:

EPA disagrees that adopting a refinery maximum average in the final rule without specifically presenting the option for consideration by the section 609 SBAR Panel, or without reconvening that panel, violates the requirements of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996. Section 609 imposes various procedural requirements for gathering comments from small entities when EPA promulgates a rule which will have a significant economic impact on a substantial number of small entities (as the MSAT2 fuel provisions do). EPA complied with all of these requirements. EPA conducted outreach to small entities and convened an SBAR Panel to obtain advice and recommendations of representatives of the small refiner industry. Section 609(b) requires that an SBAR Panel be convened before EPA publishes a notice of proposed rulemaking, and this Panel was timely convened. Section 609(b)(4) further requires the panel to "review any material the agency has prepared in connection with this chapter, including any draft proposed rule". This provision does not contemplate that the Panel have before it every detail of a proposed rule, given that the Panel's deliberations occur pre-proposal. EPA provided the SBAR Panel with the material required by section 609(b)(4), and also complied with the requirements of section 603 by preparing and publishing an initial regulatory flexibility analysis with the notice of proposed rulemaking. Furthermore, EPA considered the SBAR Panel recommendations carefully, and proposed many of them as part of the proposed rule (see generally 71 FR 15924-926). Indeed, EPA decided to adopt many of the recommendations as provisions in the final rule, including separate lead time for

compliance with the 0.62 vol% annual average benzene standard, extended opportunities to generate early credits for the ABT program, as well as various hardship provisions to accommodate situations where individual refiners (both small and non-small) incur significant economic hardship after making best efforts to comply.

EPA also complied fully with the requirements of section 604 of SBREFA, preparing a final regulatory flexibility analysis (found in chapter 14 of the RIA) which, among other things, describes small refiner entities to which the rule applies, estimates their compliance burdens, and describes steps EPA has taken to minimize significant impact of the rule on small refiners. These steps, in addition to those described in the previous paragraph, include extended lead time for complying with the 1.3 vol% refinery maximum average, a small refiner-specific hardship provision for small refiners that are only able to comply with the 0.62 vol% annual average benzene requirement through purchase of credits and find themselves unable to do so, and a clarification of the circumstances under which the other hardship provisions in the final rule could apply.

The commenter maintains, in essence, that EPA cannot lawfully make changes to a rule between the convening of an SBAR Panel and publication of the final rule, or at least cannot lawfully do so without reconvening the Panel. The RFA contains no such requirements. The statute, in fact, contemplates that there will be changes between proposed and final rules, and states that EPA's only procedural requirement in such a case is to describe that change in the Final Regulatory Flexibility Analysis. See section 604 (a)(2) (each Final Regulatory Flexibility Analysis "shall contain a summary of the significant issues raised by the public comments in response to the initial regulatory flexibility analysis, a summary of the assessment of the agency of such issues, and a statement of any changes made in the proposed rule as a result of such comments"). EPA has fully complied with this requirement. Moreover, as explained above, there is no requirement that a Panel be presented with every provision an agency proposes, much less every provision ultimately adopted as a final rule. The RFA also contains no requirement that EPA reconvene a Panel between the proposed rulemaking and the final rulemaking.

Nor were the small refiners prejudiced by the procedures EPA used to adopt the maximum average requirement. EPA solicited comment on the option of adopting a 1.3 vol% maximum average (71 FR 15869, 15903) and received comment on the issue (including from small refiners). EPA thus adopted the maximum average requirement in compliance with procedures required by the RFA.

We have carefully evaluated the potential impacts on small refiners of meeting the 1.3 vol% maximum average standard (as well as the 0.62 vol% annual average standard). As explained in detail in chapter 14 of the RIA, we believe that it is both technically and economically feasible for small refiners to meet these standards. Indeed, there are compliance options for small refiners that are less costly than those we used for our cost estimates (see RIA section 9.3). The rule also accommodates circumstances of small refiners by including four extra years of lead time to comply with the maximum average standard (in keeping with our discussion at 71 FR 15877-78 cited by the commenter

explaining why additional lead time is often needed for small refiners to comply with fuel standards). We have also added provisions to the general hardship provision at section 80.1335(c)(2), and clarified in the preamble to the final rule (section VI.A.3.b), that an individual refiner which demonstrates that it would incur significant hardship in complying with the maximum average standard may obtain one or more waivers of the standard's compliance date. We thus do not agree with the comments that the maximum average requirement is infeasible for small refiners and that the inclusion of the provision will undermine conclusion's about the rule's effect on fuel supply, or that the standard should be more lenient or not apply at all to small refiners.

We also disagree with the suggestion that small refiners be permitted to comply with the maximum average standard through use of PADD-specific credits. Geographic restrictions on credit use can prove to be very problematic. PADD restricted trading would necessitate that we set different standards in different PADDs, due to the different level of benzene reductions achievable considering cost and other factors in those PADDs. The annual average standard would, by necessity, have to be less stringent in some PADDs than the 0.62 vol% annual average standard that we are setting. This would also reduce the liquidity of the credit trading market, and thus drive up the costs of the program. We do not see this step as necessary given our analysis showing that the maximum average standard is feasible at reasonable cost for all refiners, including small refiners.

We believe that setting a nationwide standard with nationwide credit trading (to meet the 0.62 vol% annual average benzene standard) will meet the environmental goals of the program as well as the needs of refiners. We believe that even with a maximum average standard, the combination of provisions that we are finalizing will minimize the likelihood of extreme hardship for small refiners. As discussed earlier, we are finalizing several significant relief provisions that apply specifically to small refiners, namely four years of additional lead-time to meet the 1.3 vol% maximum average (until July 1, 2016). Further, the hardship provisions that we are finalizing are available to all refiners, and these provisions could apply to situations that the commenters identified may still occur. Please see section 4.1.1.4 of this Summary and Analysis document for a greater discussion on the 1.3 vol% maximum average.

4.9.1.5 Small Refiner Criteria

What Commenters Said:

We received comments regarding the criteria to qualify for small refiner status. The commenters stated that they believe that EPA should consider expanding the criteria to allow other refiners that would not otherwise qualify as small refiners to do so.

The commenters stated that many refineries located in PADD 5, including Alaska and Hawaii, are close in size to small refiners located in PADD 4. The commenters stated that they believe refineries in these western PADDs also face geographic

challenges in contracting labor and professional services. The commenters further stated that refiners in these regions possess many of the same limitations and challenges that EPA has identified with small refineries, and they thus believe the rule needs to change to reflect this. The commenters stated that they believe that allowing additional time for non-small refineries to comply with the proposed benzene standard would help to level the competitive playing field.

Other commenters stated that they believe that EPA should abandon the criteria required to small refiner qualification criteria that were proposed (and have been used in prior fuels programs), and instead look to the definitions given in recent Congressional programs. The commenters stated that they believe that EPA's criteria of 1,500 or less employees and crude capacity limit of 155,000 barrels per calendar day (bpcd) are not adequate for determining which companies should receive regulatory flexibility. The Congressional programs that the commenters cited were the American Jobs Creation Act of 2004 (Jobs Act) and the Energy Policy Act of 2005 (Energy Act), both of which contained small refiner or refinery definitions that differ from EPA's criteria. The Jobs Act defines a small refiner as a refiner with a maximum of 1,500 employees in refinery operations only and a crude capacity limit of 205,000 bpcd, while the Energy Act's defines a small *refinery* as a refinery with a crude capacity limit of 75,000 bpcd. The commenters stated that they believe that EPA should use one of these definitions to determine which companies qualify as small.

One commenter specifically noted that it believes that the Small Business Administration's (SBA) definition, which EPA's small refiner criteria are largely based on, is intended to give preferences to small businesses under various government programs and was not written with any specific consideration of the refinery industry. The commenter stated that it believes that using employee count ignores the reality that some refiners are small within the industry but have an employee count swelled by employees in operations unrelated to refining. The commenter further noted that it believes that employee count does not measure of the relative size, financial strength, or the resources available to the company for regulatory compliance. Rather, the commenter stated that it believes that refining capacity is a more accurate and equitable measure of the "smallness" of a refiner—such as the definition provided in the Energy Act. The commenter thus proposed that the rule should define small refiner as: (1) no more than 1,500 employees engaged in refinery operations and no more than 155,000 bpcd crude oil capacity on a company-wide basis; or (2) no more than 155,000 bpcd crude oil capacity on a company-wide basis. The commenter also stated that the rule could, alternatively, extend additional compliance time to each "small refinery", defined as one with a crude oil capacity of no more than 100,000 bpcd.

Another commenter suggested that in the final rulemaking, EPA should use the Energy Act small refinery definition to eliminate "confusion and inequities." The commenter further stated that it believes that the definition should be based on the relative size of the physical plant (i.e., the amount of crude oil the refinery can process). The commenter also stated that EPA could alternatively use the small refiner definition from the Jobs Act.

Letters:
Giant Industries, Inc. OAR-2005-0036-0831
Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation OAR-2005-0036-0989
United Refining Company OAR-2005-0036-0827
United States Senator Michael Enzi, et al. OAR-2005-0036

Our Response:

EPA's small refiner criteria are largely based on the Small Business Administration (SBA) definition of a small refiner. The small business employee criteria were established for SBA's small business definition (per 13 CFR 121.201) to set apart those companies which are most likely to be at an inherent economic disadvantage relative to larger businesses. This definition must also be used during the Small Business Regulatory Enforcement Fairness Act (SBREFA) Panel process to determine which companies are considered small businesses. Under this process, EPA is required to focus consideration on small businesses and evaluate the burdens that a proposed rule would impose, and potential mechanisms to relieve burdens where appropriate. SBREFA and the Regulatory Flexibility Act require agencies to perform this assessment prior to each significant rulemaking that has a significant impact on a substantial number of small businesses. In keeping with the intent of SBREFA, EPA's overall approach in regulations establishing broadly applicable fuel standards has been to limit the small refiner relief provisions to the subset of refiners that are likely to be seriously economically challenged as a result of new regulations due to their size.

The Energy Policy Act of 2005 (EPAct) and the American Jobs Creation Act of 2004 (Jobs Act) both use definitions that are different from the SBA definition, and from the criteria EPA is adopting in this rule. The EPAct focuses on refinery size rather than company size, while the Jobs Act focuses on refinery-only employees rather than employees company-wide. The EPAct's definition is that a small *refinery* is one that produces no more than 75,000 bpcd. The Jobs Act definition states that a small refiner is one that produces no more than 205,000 barrels bpcd and employs no more than 1,500 employees in its refinery operations alone. Under programs subject to the EPAct and Jobs Act definitions, relief would be granted to refineries that are owned by larger companies, or companies that have additional sources of revenue (indicated by more employees and/or refining capacity), and also refineries owned by foreign governments. These definitions do not focus as directly on refiners which, due to their size, could incur serious adverse economic impact from fuel regulations; and EPA consequently is not adopting either of them in this rule.

It is true that the EPAct definition is applicable to the Renewable Fuels Program under section 211(o) of the Clean Air Act, but by its terms it does not apply to the MSAT program (which implements different statutory provisions). Therefore, for the Renewable Fuels Standard proposal (71 FR 55552, September 22, 2006), EPA proposed to apply the 75,000 bpcd small refinery definition. However, even here, because it was

appropriate under the facts, EPA also proposed to apply the small refiner criteria from our previous fuel regulations as part of the RFS program.

We note that the small refiner provisions act to delay obligations to comply with fuel standards and do not act as a complete exemption from such requirements. In addition, the small refiner provisions represent one option in which requirements can be delayed under this program. The general hardship provisions (as discussed further in section VI.A.3.b) are available to all refiners, regardless of whether or not they meet the small refiner criteria. Under these hardship provisions, a refiner that can demonstrate financial and/or technical hardship in complying with the requirements of the regulation may apply under the general hardship provisions. Based on a case-by-case determination, EPA can than grant hardship relief which can act to delay requirements in a manner similar to the small refiner definition.

With regard to the comments on the small refiners' difficulty in meeting the 1.3 vol% refinery maximum average, we do understand the commenters' concerns. However, geographic restrictions on credit use can prove to be very problematic. We believe that, given the national trading of credits to meet the 0.62 vol% annual average benzene standard, neither the goals of refiners nor environmental goals could be met with such a program. We believe that even with a maximum average standard, the combination of provisions that we are finalizing will minimize the likelihood of extreme hardship for small refiners. As discussed earlier, we are finalizing several significant relief provisions that apply specifically to small refiners, namely four years of additional lead-time to meet the 1.3 vol% maximum average (until July 1, 2016). Further, the hardship provisions that we are finalizing are available to all refiners, and these provisions could apply to situations that the commenters identified may still occur.

4.9.1.6 Other

What Commenters Said:

Caribbean Petroleum Corporation and U.S. Oil and Refining Company both commented that they believe that the final rule should allow all refinery restarts the opportunity to participate as small refiners if they meet all requirements other than an ownership or operating status on a given date.

Caribbean and U.S. Oil also both commented that they believe that the rule should encourage refinery capacity increases (and further, any new rulemaking should do that when possible).

Letters:

Caribbean Petroleum Corporation	OAR-2005-0036-1010
U.S. Oil & Refining Company	OAR-2005-0036-0992

Our Response:

Our intent has been, and continues to be, limiting the small refiner relief provisions to the small subset of refiners that are likely to be seriously economically challenged as a result of the new regulations. Similar to earlier fuel rules, we are finalizing a provision that a refiner that restarts a refinery in the future is eligible for small refiner status to account for refineries that may have been temporarily shut down during the baseline year(s) but would otherwise have met the criteria. In such cases, we will judge eligibility under the employment and crude oil capacity criteria based on the most recent 12 consecutive months before the application, unless we conclude from data provided by the refiner that another period of time is more appropriate. However, unlike past fuel rules, this will be limited to a company that owned the refinery at the time that it was shut down. New purchasers will not be eligible for small refiner status. We assume that new owners that purchase a refinery after December 31, 2005 do so with full knowledge of the regulation. Given that they have the resources available to purchase the refinery assets, they are not in an economic hardship situation. Therefore, simply put, they can and should include compliance planning as part of their purchase decision. Companies with refineries built after January 1, 2005 will also not be eligible for the small refiner hardship provisions, again for the reasons given above.

In response to the comments regarding encouraging refinery capacity increases, as in past fuels programs, approved small refiners that grow by normal business practices will not lose their small refiner status for the MSAT2 program. This was discussed during the Small Business Regulatory Enforcement Act (SBREFA) Panel process. We agreed then, as we do now, that small refiner growth by normal business practice should not be discouraged by our regulations.

4.9.2 Other Hardship Provisions

What Commenters Said:

The Municipality of Anchorage, Department of Health and Human Services commented that it fears that credits and accommodation for economic hardship included in the proposed rule may allow benzene concentrations to remain unchanged in Alaska fuel. The commenter stated that it believes that the modest volume of fuel refined in Alaska may lead to claims of economic hardship by local refiners. The commenter noted that, since there is no market for extracted benzene in Alaska, the cost of shipping benzene out of the state may be more costly than potentially expensive refinery modifications. The commenter stated that it would be very disappointing if credits from refineries outside the state were used to support the continuation of current gasoline formulations. The commenter noted that Canadian regulations employ a per-gallon-cap limitation on benzene content with a lower averaging standard; and the commenter recommended that a similar provision be included in the rule to ensure that some reduction in benzene content is accomplished in small markets.

Letters:

Municipality of Anchorage, Department of Health and Human Services OAR-2005-0036-0976

Our Response:

Based on our refinery-by-refinery modeling, we believe that the 0.62 vol% annual average standard will provide a strong incentive for benzene reductions nationwide, including Alaska. In order to provide greater assurance that the modeled reductions occur, we are also finalizing a 1.3 vol% maximum average standard that will preclude refineries from remaining above that level for their actual production. While there are provisions for small refiner relief and hardship relief for any size refiner, these may only serve to delay application of the standard, not waive it indefinitely.

4.10 Western Refiner Issues

What Commenters Said:

We received comments from a group of refiners in the Rocky Mountain and Pacific Northwest regions (Petroleum Districts for Defense (PADDs) 4 and 5, respectively). These refiners commented that they believe that refiners in PADDs 4 and 5 will face compliance challenges with the proposed rule that are considerably more significant than refineries would face elsewhere in the county, as the current gasoline benzene levels for refiners in these areas are well above the national average of 0.97 vol%. The refiners stated that they believe that facilities in their region face the greatest compliance difficulty under the proposed regulation. The commenters further stated they believe that the impact of the regulation is even more challenging for small and independent refiners who have limited averaging options and whose refining operations are concentrated in PADDs 4 and 5.

The commenters stated that they believe other major regulations, along with significant capacity expansions and other major refinery projects, all compete with each other for funding and other resources, and they encourage EPA to sequence the requirements for benzene control relative to these other regulations would be beneficial. They also point to EPA analysis in the proposal showing that refiners in PADDs 4 and 5 will experience the highest compliance costs. The commenters also state that the rule favors large multi-refinery refiners over small and independent refiners because the ABT program's provision for intra-company trading is of more use the more refineries a company own.

In general, the commenters believe that refiners in these areas should receive the same 4-year delay in the benzene requirements as small refiners. The also suggested a specific provisions where refineries in these PADDs be permitted to delay compliance with the 0.62 vol% benzene standard until January 1, 2015 (similar to the small refiner program start date) if they opted to comply with a maximum average benzene standard of 1.3 vol% on a permanent basis. If EPA adopted this approach, the commenters also

suggested that refiners with more than one refinery in either PADD have the flexibility to meet the 1.3 vol% annual average gasoline benzene standard across the PADD if the facilities are located not more than 100 miles apart. The commenters stated that they believe this option would assure that bona fide gasoline benzene reductions will be made in the regions where average levels are the highest.

Letters:
Sinclair Oil Corporation, Flying J. Inc., Suncor Energy (U.S.A.) Inc., and Tesoro Corporation OAR-2005-0036-0989

Our Response:

We have carefully assessed the comments from this group of refiners. Our analysis confirms that refineries in PADDs 4 and 5 tend to have higher benzene levels than refineries in other parts of the country. Our analysis also shows that the costs for compliance will likely be greater for refineries in PADDs 4 and 5 than for other refineries. We recognized this diversity in benzene levels across the country in the design of the program by including a nationwide ABT program with no geographic restrictions. We also considered refineries in all parts of the country in assessing the necessary lead time for compliance.

Overall, we considered characteristics of refineries in the western part of the country, as well as all other refineries, as a part of our analyses supporting the proposed rule, and these characteristics continue to be included in our final rule analyses. We continue to believe that this program very effectively balances the concerns of a wide range of stakeholders in all parts of the country, including this group of refiners. The nationwide ABT program is designed to allow refiners to, in effect, phase in compliance with the 0.62 vol% average standard by generating early credits through partial reductions and then use those credits to postpone full compliance. Refiners can also purchase credits for the same purpose. The additional 18 months that we are providing for compliance with the 1.3 vol% maximum average standard is also intended to allow full use of the credit program through that date. Our analyses indicate that the average standard of 0.62 vol% and the 1.3 vol% maximum average standard, in the context of the nationwide ABT program, will be achievable by all refineries by the respective compliance dates. (See also the discussion of leadtime in section 4.3 above.) In the event that refineries still face extreme hardship situations as defined in the rule, EPA can provide compliance relief on a case-by-case basis.

Regarding the commenters' proposal that refiners in their region be treated as small refiners under this program, we address the issues of expanding the criteria for small refiner status in section 4.9 above.

5. PORTABLE FUEL CONTAINERS

What We Proposed:

The comments in this section correspond to Section VIII of the NPRM, and therefore deal with our proposed regulations for portable fuel containers (PFCs). A summary of the comments received, as well as our response to those comments, are located below. For the full text of comments summarized here, please refer to the public record for this rulemaking.

5.1 Standards

General Support for Standards

What Commenters Said:

We received several comments in strong support of our proposed gas can program.

The Portable Fuel Container Manufacturers Association (PFCMA) commented that several states have adopted California's program. They commented that they "welcome and support a national standard as proposed by the EPA" and look forward to having a national conformity to the standards. DSD International (DSD) also expressed support for the new standards.

The Alaska Department of Environmental Conservation (ADEC) commented that it agrees that the gas can provision has potential to improve air quality for those who store gasoline in or near a living space. This situation is prevalent in Alaska; particularly in village homes where residents keep fuel indoors to keep fuel from gelling in the extreme winter cold. Fuel costs in rural Alaska are the highest in the country. Thus, gas can technologies will save money over a 5 year life span by reducing volatilization and loss of product. ADEC further stated that the gas can provisions will assist their efforts to reduce exposures to benzene.

The New York Department of Environmental Conservation (NYDEC) commented that it generally approves of EPA's proposed portable fuel container standards. Volatile Organic Compound (VOC) emissions from this source category continue to be a significant concern to the NYDEC. New York adopted portable fuel container standards effective October 4, 2002 based on the then current California standards. EPA's proposed standards are mostly based on revised California standards and are a welcome improvement over existing standards.

STAPPA and ALAPCO commented that their associations agree with EPA's assessment that emissions from portable gasoline containers contribute significantly to personal exposure to mobile source air toxics and with the agency's proposal to limit gas can hydrocarbon emissions from these containers nationally, consistent with California's revised program. In their hearing testimony, STAPPA and ALAPCO commented that they are pleased that the Agency has acknowledged that emissions from gasoline containers are significant contributors to levels of mobile source air toxics. NESCAUM also expressed support for the new standards.

The Illinois Environmental Protection Agency (IL EPA) commented that it supports the inclusion of portable gasoline containers within the MSAT proposal. IL EPA also stated that it has long considered these containers to be significant sources of emissions, and it believes that a national rule dealing with this consumer product to be the most effective and efficient way to address this source. Wisconsin Department of Natural Resources, Bureau of Air (WDNR) also commented that it is very pleased that federal fuel container standards are being proposed and that EPA has harmonized its proposal with the latest California gas can standards to a great extent.

Letters:
Alaska Department of Environmental Conservation (ADEC) OAR-2005-0036-0975
American Lung Association (ALA) OAR-2005-0036-0365 (Hearing testimony)
DSD International Inc. OAR-2005-0036-0377
Illinois Environmental Protection Agency (IL EPA) OAR-2005-0036-0830
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
New York Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
NESCAUM OAR-2005-0036-0993
State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) OAR-2005-0036-0836
Wisconsin Department of Natural Resources, Bureau of Air (WDNR) OAR-2005-0036-0828
Portable Fuel Container Manufacturers Association (PFCMA) OAR-2005-0036-0365 (hearing testimony)
Portable Fuel Container Manufacturers Association (PFCMA), OAR-2005-0036-0819

Our Response:

We appreciate the comments in support of including PFCs in the program. We continue to believe that PFCs are a significant source of VOC emissions (including air toxics). These emissions also can significantly contribute to elevated indoor exposure. We also concur with comments that reducing emissions from PFCs will result in fuel savings. Finally, as commenters suggested, we have maintained our proposed approach to the standards and other provisions which are similar to those contained in the recently revised California program.

Support for Including Diesel and Kerosene Containers and Utility Jugs

What Commenters Said:

Several commenters supported including diesel and kerosene containers and utility jugs in the program, similar to the recently modified California Air Resources Board (CARB) standard. The NYDEC commented that it is concerned that EPA's current proposal does not reflect the full scope of the modified CARB rules which would regulate kerosene containers and utility jugs in addition to traditional gasoline cans; CARB noted in its adoption of the revised Portable Fuel Container Standards that there is evidence of consumers using these alternative

containers to circumvent the rule, so CARB expanded the scope of its rule. We did not receive any non-supportive comments on including these additional containers in the program.

Letters:
DSD International Inc. OAR-2005-0036-0377
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
New York Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
NESCAUM OAR-2005-0036-0993
STAPPA/ALAPCO OAR-2005-0036-0836

Our Response:

In the final rule, we have decided to apply the new standards to diesel and kerosene containers in addition to gasoline containers. In the proposal, we specifically requested comment on applying the emissions control requirements being proposed for gasoline containers to diesel and kerosene containers. California included diesel and kerosene cans in their regulations largely due to the concern that they would be purchased as substitutes for gasoline containers.

We recognize that using uncontrolled diesel and kerosene containers as a substitute for gasoline containers would result in a forgone emissions reductions. California collected limited survey data which indicated that about 60 percent of kerosene containers were being used for gasoline. In addition, keeping gasoline in containers marked for other fuels could lead to misfueling of equipment and possible safety issues. Finally, as indicated by the comments above, not including these containers would be viewed as a gap in EPA's program, which would likely lead to states adopting or retaining their own emissions control program for PFCs. We believe this would hamper the ability of manufacturers to have a 50-state product line, as they desire. For these reasons, we agree with commenters and have included diesel and kerosene containers in the program.

Commenters also supported including utility jugs in the program. We are clarifying that utility jugs are considered to be gasoline containers under the rule and therefore are subject to the requirements of the program. Utility jugs are designed and marketed for use with gasoline, often to fuel recreational equipment such as all-terrain vehicles and personal watercraft. California, which similarly defines PFCs to include these containers, recently issued a clarification that these containers are covered by their program, after some utility jug manufacturers failed to meet the existing California requirements.

5.2 Timing

What Commenters Said:

We received several comments recommending that the container requirements take effect on January 1, 2008 rather than EPA's proposed date of January 1, 2009. NESCAUM commented that many states have already adopted California's program and that EPA should

require introduction of the PFC standards beginning in 2008, rather than the proposed implementation year of 2009. IL EPA commented that the technology is currently available, so they recommend that the program begin on January 1, 2008 rather than 2009.

Letters:
Illinois Environmental Protection Agency (IL EPA) OAR-2005-0036-0830
NESCAUM OAR-2005-0036-0993
STAPPA/ALAPCO OAR-2005-0036-0836

Our Response:

We must provide lead time to manufacturers to review the final rule, finalize their product designs, and perform the EPA emissions certification process (which is likely to take about 6 months for testing, submittal to EPA, and approval). We also must provide manufacturers with time to ramp up production for a nationwide program. We believe a January 1, 2008 start date recommended by commenters would not provide enough lead time and could result in some products not being available to consumers. Therefore, we are retaining the January 1, 2009 start date as proposed.

5.3 Certification and Test Procedures

Testing With Ethanol-based Fuels

What Commenters Said:

The WDNR commented that the portable fuel containers need to be tested with ethanol-based fuels in order to ensure that the permeation and evaporation rates do not increase with the use of ethanol fuels and that the materials used in these gas cans are not adversely affected.

Letters:
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

We are finalizing, as proposed, requirements to conduct testing using gasoline containing 10 percent ethanol in order to ensure in-use emissions control and materials compatibility with ethanol.

Spout Testing

What Commenters Said:

DSD commented that 400 spout actuation cycles on a product in a short time period does not represent real-world use. Many consumers will have their containers for at least 15 to 25 years. DSD further commented that the only way this would be adequate would be if EPA required manufacturers to inscribe a date on which consumers would have to dispose of their container and there was an obligation for consumers to destroy containers after 5 years. The commenter noted that they personally have had gasoline containers last for more than 30 years. They also commented that they have run their spout through an endurance test of 5,000 complete cycles with gasoline, and that after dismantling the spout, they found no visual changes. Further, they expect their spouts to live for over 250,000 complete cycles. DSD commented that if consumers spend more money for a very good product, it will last 15 to 25 years without leakage or evaporation, and it would be a win-win situation for consumers as well as the environment.

Letters:
DSD International Inc. OAR-2005-0036-0377

Our Response:

In response to DSD comments concerning spout durability testing, we understand that 5 years is an estimate of the typical life and that some containers will be used longer than 5 years, as is indicated by the commenter's experience. However, we continue to believe that the approach we are finalizing is reasonable. This provision is meant to help ensure that spouts are made of quality materials so that the emissions performance will not deteriorate during normal use. The provision also helps to ensure that spouts will not break easily or stick open during normal use, and helps to identify these issues during the certification process prior to sale. We believe the test will further encourage the use of robust designs, consistent with the use of "best available control." In addition, this approach balances the need to ensure quality designs with the manufacturers' need to be able to conduct certification testing in a reasonable amount of time. This type of "accelerated aging" of components is a necessary part of many of EPA's mobile source emissions control programs.

The 5-year time-frame is based on available data which indicates that 5 years is the typical life of containers. We understand that spouts can be designed to function beyond the 5 year time frame. However, DSD indicates that their spouts have been tested to 5,000 actuations and are expected to last 250,000 actuations. If used daily, which would be a high rate of use for most residential applications, 5,000 actuations equates to 13.7 years of use and 250,000 actuations equates to 685 years of use. This is well beyond what we would consider to be normal product usage and life cycles, based on available data. It is not the purpose of our regulations to force manufacturers to design products that last longer than they last today in typical use.

DSD suggests that in order for this testing to be adequate, we would need to require consumers to discard their containers after 5 years. As discussed above, we disagree with the assertion that the testing being required is inadequate. In addition, we do not have the authority to require consumers to turn in products.

Third-party Testing

What Commenters Said:

The PFCMA commented that it recommends that EPA develop these standards in conjunction with an American Society of Testing and Materials (ASTM) standard. The use of an ASTM standard will allow the manufacturers to use third party testing to ensure compliance with the EPA regulations. Third party testing will provide consumers and retailers with an unbiased evaluation of the products and an assurance of compliance with the regulation as well as product safety and performance.

Letters:
Portable Fuel Container Manufacturers Association (PFCMA) OAR-2005-0036-0819

Our Response:

We are willing to work with PFCMA on incorporating the new test procedures into an ASTM standard if it helps with third party testing or product acceptance. In order to be certified, however, the test procedures and program requirements contained in EPA's final rule must be followed regardless of who conducts the testing, and results must demonstrate compliance with the new emissions standard.

5.4 Spout Requirements/Spillage Control

5.4.1 Spout Requirements

What Commenters Said:

DSD commented that it believes that too many errors were made in 1999 by California in establishing requirements for new spouts. DSD noted that if you try the end valve spout models, all of them will splash in many cases. DSD commented that some spout models can be damaged easily, and provided the following example: 0-rings can be damaged during normal usage resulting of leakage and evaporation; this can create child death by inhalation, explosion, fire etc. DSD commented that all states that followed California's legislations did so by necessity, not because the legislation was sound (did so only because they did not have the budget, personnel and capacities to do otherwise).

DSD commented that it is also not convinced that the new California law removing fill height, flow rate, and spill proof spout requirements, and allowing a second opening will result in better spouts. DSD asks "What type of spout will be accepted?" and comments that if fuel flow is too slow, consumers will remove spouts and pour fuel with no spout, or with funnels.

DSD commented that its company has developed a spout they call the angled tip spill proof spout, with the following features:

- Angled tip: the small angled tip guides the flow preventing splash and allows users to see liquid level in the refilling tank preventing over flow (users can easily reduce flow and stop manually).
- Spill proof spout: works well and will stop flowing on over 95% of applications.
- Child resistant features: prevention of accidental spillage, inhalation, explosion and fire (causing death).

DSD noted that it guarantees the angled tip spill-proof spout that it will reduce overfill by more than 95 % and evaporation by close to 100%. The commenter also noted that its spout always functioned well for over 6.5 years in testing and in the field.

DSD also commented that spouts must fit on every application, or the manufacturer must clearly indicate on what applications the spout can be used, and an evaluation must be made by EPA to prevent the possibility of incorrect usage. Spouts designed for CARB's original program did not work on many applications. All containers and spouts must fit on engine motor tanks without using funnels, because funnels can easily create overflows. DSD commented that it has developed the spout after establishing a complete study on fuel tank geometries. The commenter did not rely on the inappropriate CARB test fixtures. DSD noted that the CD contains (which was submitted with their public comments) many pictures and drawings of different gasoline tank necks on many different types of machinery. (*The CD to which the commenter refers, is docket number OAR-2005-0036-0383, and is available at the EPA Docket Center in Washington, DC.*)

Letters:
DSD International Inc, OAR-2005-0036-0377

Our Response:

DSD comments noted several issues with spouts designed to meet the original California program. We understand that several spouts designed to meet these requirements did not work well in-use. Even when used properly, they resulted in increased spillage and consumer complaints. As noted by DSD, some also had problems with o-ring failures and spout breakage. In response to these issues, CARB redesigned their program. The spillage issues were the result of design requirements for spill-proof spouts. Manufacturers were limited in the spout designs, resulting in spout designs that did not work well with many types of equipment. CARB removed these design requirements for spouts. This will allow manufacturers to design spouts that work well in-use. In addition, CARB's original program did not require any certification or durability demonstrations, which led to materials issues and spout breakage. CARB has addressed these issues by requiring certification and durability demonstrations.

We have taken a very similar approach to CARB's new program. We have not included any design-based requirements that would interfere with product designs, so manufacturers will be able to design spouts that work well. We are also requiring up-front certification prior to the sale of products. In addition, we are requiring durability testing to "age" components prior to testing. This includes exposing components to fuel and durability testing for spouts. These durability tests will provide incentive for robust designs in addition to helping to identify design

issues. We have included requirements for a one-year warranty period for consumers so that defective containers can be returned. Finally, we can track warranty claims and in-use performance over the useful life of containers and consider these factors in the future certification of products. This type of program design (i.e., durability demonstration, testing, certification, warranty requirements, and in-use requirements) has been successfully implemented for several mobile source sectors including light-duty vehicles and nonroad equipment. Also, we also believe that the marketplace will provide manufacturers with significant incentive to design products that work well and are durable.

DSD commented that their spout design relies in some cases on providing consumers with a line of sight so they can stop the flow of fuel before overfill occurs. They provided comment that their spout works very well on a variety of equipment types to prevent spillage and that they have not received consumer complaints on their spout design. We concur that line-of-sight is an important feature of spout design which was not available with some of the spouts designed to meet CARB automatic shut-off requirements. Some spouts designed to meet CARB's automatic shut-off requirements prevented a clear view into the fuel tank. This led to spillage in cases where the automatic shut-off failed and consumers could not see into the tank to prevent spills. We are not including any automatic shut-off design requirements, consistent with CARB's new program. Not having automatic shut-off requirements will allow container manufacturers to design spouts with narrower tips, allowing consumers to view the fuel in the receiving tank. We believe this is an important feature that, when combined with an automatically closing spout mechanism, will reduce spillage. Consumers will be able to view the fuel rising in the receiving tank and use the automatic closure to stop the flow of fuel to prevent spillage. We also concur with DSD's comments that the new containers will improve safety by reducing spills and remaining sealed when not in use.

DSD comments that they "are not convinced" that CARB's new program removing fill height, flow rate, and spill-proof spout requirements, and allowing the possibility of adding a second opening, will result in better spouts. They comment that if fuel flow is too slow, consumers will remove spouts and spout fuel without the spouts, or with funnels. For all the reasons noted in the previous paragraphs, we believe that it is appropriate to provide flexibility to manufacturers in designing their spouts and containers so long as emissions standards are met. Manufacturers will need to use automatic closure mechanisms to seal containers in order to meet the new emissions standards. We believe it is appropriate to allow manufacturers flexibility in their spout designs in order for them to optimize the performance and consumer acceptability of their products. Also, this approach allows for novel designs and future improvements which could be prohibited if we were to include design requirements.

5.4.2 Spillage Control

What Commenters Said:

NESCAUM asked that EPA evaluate regulations for controlling spillage from portable containers. Anchorage commented that the use of gasoline containers for fueling equipment, and householder reports of spillage during this fueling, were factors associated with higher in-home

benzene levels in studies performed in Anchorage. They also commented that they support research to develop design standards for cans which minimize spillage.

Letters:
NESCAUM OAR-2005-0036-0993
Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

Our Response:

We believe that the new automatically closing spouts will help reduce spillage because they provide consumers with more control when using the containers to refuel equipment. By not placing design requirements on manufacturers, manufacturers will have flexibility to design products with good line-of-sight, so consumers can see the fuel in the tank and can stop the flow of fuel using the automatic closure before overflow occurs. Also, with no design requirements, manufacturers will be able to design spouts that work on a wide array of equipment and vehicles. This is consistent with CARB's findings and approach. We currently do not know of a feasible way to require automatic shut-off that would work well on all types of equipment, due to the large variation in equipment fuel tank geometries. We believe that it is not appropriate to require automatic shut-off as part of certification when we know there will be some cases in the field where it will not work. We believe this would lead to confusion and consumer dissatisfaction, as it did in California. If new technology is developed making automatic shut-off feasible, and spillage remains a concern even with the new automatically closing containers, we could consider revising the requirements for PFCs.

5.4.3 Other

What Commenters Said:

DSD commented they believe that if good instructions are not provided for users, it will complicate usage of the product. DSD commented that procedures must be established and EPA must evaluate instructions in a way to protect the consumers. Evaluations must be made by educated personnel as per manufacturer instructions to prevent wrong interpretations.

Letters:
DSD International Inc. OAR-2005-0036-0377

Our Response:

We are requiring manufacturers to provide instructions to consumers with the new PFCs. Manufacturers must provide these instructions to EPA for review as part of the certification process, which must be completed prior to introduction into commerce. It is also in the best interest of the manufacturers to provide clear instructions in order to help maintain consumer satisfaction and minimize product returns.

5.5 Emission Reduction Estimates

What Commenters Said:

The WDNR questioned how ethanol-based fuels would affect estimates of emission reductions (e.g., ethanol-based fuels may have higher Reid vapor pressures).

The New Jersey Department of Environmental Protection (NJ DEP) noted that CARB's research and calculations show that the emission reductions are greater than the 61 percent estimated for the proposed rule.

Letters:

New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829

Wisconsin Department of Natural Resources, Bureau of Air (WDNR) OAR-2005-0036-0828

Our Response:

We have adjusted our emissions inventory estimates for PFCs to account for ethanol in the fuel (see section 2.1 of the RIA). These adjustments are based on our estimate of how much E10 (90% gasoline, 10% ethanol mixture) will be used across the country in the future in response to EPA's new Renewable Fuels Standards. As proposed, we are also requiring containers to be tested with E10 fuel in order to ensure that container materials are compatible with E10 and emissions performance is maintained.

In response to NJ DEP's comment about our estimated 61% overall HC reduction, our nationwide emissions reduction estimates include several states that already have adopted emissions controls for PFCs. This results in national percentage reduction estimates that are lower than for states with no existing program. We estimate the overall HC reduction in states that do not have emissions control programs is about 73 percent. In addition, our inventories include factors that are not affected by the new controls, such as vapor displacement and spillage when the container is refilled at the pump. For factors that are reduced by the new standards, including evaporation, permeation and spillage, we estimate the HC reductions to be about 85 percent in states with no program.

5.6 Other

What Commenters Said:

DSD recommended educating the public on suggested motor manufacturer gas tank filling levels to prevent fuel evaporation.

DSD also commented that the new containers could be used to protect the environment

from many other liquids such as insecticides, chemicals, chlorine, etc.

Letters:
DSD International Inc. OAR-2005-0036-0377

Our Response:

DSD is concerned about evaporation from equipment fuel tanks in cases where the tank is overfilled (but not to the point of overflowing and spilling). It is our understanding that engine/equipment manufacturers currently provide consumers with refueling instructions including recommended maximum fill level in the owner's manual.

We understand and appreciate that the container technology could be used for other liquids to reduce unintended releases. This rule is focused on reducing VOCs and we included PFCs due to their close relationship to mobile sources and their significant contribution to VOCs and VOC-based toxics emissions. We did not analyze or otherwise consider any other uses for the container technology (nor is it clear that section 183 authority would reach some of these applications, since section 183 directs VOC control as a means of reducing emissions of ozone precursors). Therefore, any other uses of the technology would need to be considered as part of a future rulemaking focused on the particular pollutant of concern.

6. COST-BENEFIT ANALYSIS

What We Proposed:

The comments in this chapter correspond to Section IX of the NPRM, and therefore are targeted at the cost-benefit analysis. A summary of the comments received, as well as our response to those comments, are located below. For the full text of comments summarized here, please refer to the public record for this rulemaking.

6.1 Predicted Health Benefits of the Rule

What Commenters Said:

The commenters stated that they believe that EPA does not justify the benefit of each programs contained in MSAT2 separately; instead, they claimed the three programs are combined to assess costs and benefits. The commenters stated that this approach makes it difficult to assess the individual contribution of each program under the MSAT2 proposal. If evaluated independently, the commenters stated, the fuels program is likely to provide the lowest potential incremental benefit, yet most costly element of the proposed rule.

The commenters also noted that the quantified economic benefits used by EPA to justify the MSAT2 Proposal are based entirely on reduction of tailpipe emissions of particulate matter. They stated that they believe it is not appropriate to use benefits from one part of one regulatory initiative, namely, the Cold Temperature Vehicle Standard, to justify what essentially constitutes two other separate regulatory initiatives, new limits on benzene content in gasoline and a hydrocarbon emission standard for gas cans.

The commenters stated that they believe EPA's cost/benefit analysis completely fails to monetize the benefits of its gasoline benzene reduction proposal, focusing instead on the particulate matter (PM) related benefits associated with its proposed cold temperature vehicle standards. Hence, the commenters believe that EPA has not justified the need for its proposed reduction in benzene content of gasoline to 0.62 vol% on a cost/benefit basis.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013
Marathon Petroleum Company OAR-2005-0036-0946, -1008

Our Response:

We found, and continue to find, that each of the three major aspects of the rule are separately justifiable under either Clean Air Act section 202(l) or (for portable fuel containers) section 183(e). Furthermore, standards under sections 202(l) and 183(e) are

not established or justified on a cost-benefit basis, and we did not justify any of the rule's programs on that basis.

The statement that the programs are combined to assess costs and benefits is incorrect. We present the emission reductions associated with each of the three programs in this rule. Likewise, we have separately characterized the costs of each program. EPA does not combine the benefits of each of the rule provisions. Chapter 12 of the Regulatory Impact Analysis (RIA) presents only the PM-related benefits associated with emission reductions attributed to the cold temperature vehicle standards. Benefits for all other rule provisions are described qualitatively due to analytical constraints and limitations discussed in the RIA. We do, however, present a comparison between the benefits of the cold temperature vehicle standards versus the costs of that program, as well as a comparison of the benefits of the cold temperature standards versus costs across all programs.

What Commenters Said:

Both API and ExxonMobil commented that they believe the quantified benefits of reducing particulate matter are based on a series of highly uncertain and questionable scientific assumptions and represent extreme overestimates. These include use of overly conservative and inaccurate concentration response functions (CRFs) for mortality and morbidity health endpoints, and monetizing health endpoints for which a causal relationship has not been established. Specifically, the commenters believe: 1) a lower CRF should be used to assess the critical endpoint of chronic mortality; 2) infant mortality should be removed from the cost-benefit analysis (CBA) since causality has not been established; and 3) the morbidity endpoints of bronchitis and restricted activity days cannot be clearly linked to exposure to fine PM nor quantified with any degree of accuracy and should also be removed from the CBA. Our scientific concerns with the EPA benefits assessment regarding particulate matter are further detailed below.

Letters:
American Petroleum Institute OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013

Our Response:

We rely on the published scientific literature to ascertain the relationship between PM and adverse human health effects. We evaluate the epidemiological studies using a well-established set of selection criteria. These criteria include consideration of whether the study was peer-reviewed, the match between the pollutant studies and the pollutant of interest, the study design and location, and characteristics of the study population, among other considerations. The selection of concentration-response functions for all of EPA's benefits analyses is guided by the goal of achieving comprehensiveness and scientific defensibility.

In addition to the above selection criteria, EPA relies on the guidance provided by internal and external review panels, comprised of distinguished scientists, engineers, and economists who are recognized, non-governmental experts in their respective fields. EPA consults with the Science Advisory Board's Health Effects Subcommittee (SAB-HES) and Clean Air Science Advisory Committee (CASAC) in the development and improvement of methods we use to estimate and value the potential reductions in health effects associated with air quality improvements. All of EPA's regulatory analyses also are reviewed extensively by the Office of Management and Budget (OMB). EPA also looks to recommendations provided by panels such as those convened by the National Academy of Sciences (NAS) to specifically address facets of our cost and benefits analyses.

In regard to PM-related adult mortality, the SAB-HES panel recommended using long-term prospective cohort studies in estimating mortality risk reduction.[38] This recommendation has been confirmed by a recent report from the National Research Council (NRC), which stated that "it is essential to use the cohort studies in benefits analysis to capture all important effects from air pollution exposure" (NRC, 2002, p. 108).[39] More specifically, the SAB recommended emphasis on the American Cancer Society (ACS) study because it includes a much larger sample size and longer exposure interval and covers more locations (e.g., 50 cities compared to the Six-Cities Study) than other studies of its kind. Because of the refinements in the extended follow-up analysis, the SAB-HES recommends using the Pope et al. (2002) study[40] as the basis for the primary mortality estimate for adults and suggests that alternate estimates of mortality generated using other cohort and time-series studies could be included as part of the sensitivity analysis (U.S. EPA-SAB, 2004b).[41]

The SAB-HES also recommended using the specific estimated relative risks from the Pope et al. (2002) study based on the average exposure to $PM_{2.5}$, measured by the average of two $PM_{2.5}$ measurements, over the periods 1979–1983 and 1999–2000. In addition to relative risks for all-cause mortality, the Pope et al. (2002) study provides relative risks for cardiopulmonary, lung cancer, and all-other cause mortality. Because of concerns regarding the statistical reliability of the all-other cause mortality relative risk estimates, we calculated mortality impacts for the primary analysis based on the all-cause relative risk. Based on our most recently available SAB guidance, we provide mortality impacts based on the ACS study as the best estimate for comparing across the current and previous RIAs.

The NRC (2002) also recommended that EPA use formally elicited expert judgments as a means of characterizing uncertainty in the concentration-response relationship between $PM_{2.5}$ exposures and mortality. EPA therefore convened a panel of experts to elicit probabilistic distributions describing uncertainty in estimates of the reduction in mortality among the adult U.S. population resulting from reduction in ambient annual average $PM_{2.5}$ levels. The results of this study, completed in 2006 (Industrial Economics, 2006),[42] found that the majority of expert opinion (11 out of 12 experts) believed that the PM2.5-mortality effect was stronger than a comparable result derived from the Pope et al. (2002) ACS study. This leads the Agency to expect that our

estimates of mortality derived from the ACS study understate the benefits associated with the final cold temperature vehicle standard.

Regarding infant mortality, recently published studies have strengthened the case for an association between PM exposure and respiratory inflammation and infection leading to premature mortality in children under 5 years of age. Specifically, the SAB-HES noted the release of the WHO Global Burden of Disease Study focusing on ambient air, which cites several recently published time-series studies relating daily PM exposure to mortality in children. [43] The SAB-HES also cites the study by Belanger et al. (2003)[44] as corroborating findings linking PM exposure to increased respiratory inflammation and infections in children. Recently, a study by Chay and Greenstone (2003)[45] found that reductions in TSP caused by the recession of 1981–1982 were related to reductions in infant mortality at the county level. With regard to the cohort study conducted by Woodruff et al. (1997),[46] the SAB-HES notes several strengths of the study, including the use of a larger cohort drawn from a large number of metropolitan areas and efforts to control for a variety of individual risk factors in infants (e.g., maternal educational level, maternal ethnicity, parental marital status, and maternal smoking status). Based on these findings, the SAB-HES recommends that EPA incorporate infant mortality into the primary benefits estimate and that infant mortality be evaluated using an impact function developed from the Woodruff et al. (1997) study. [47] A more recent study by Woodruff et al. (2006)[48] continues to find associations between $PM_{2.5}$ and infant mortality. The study also found the most significant relationships with respiratory-related causes of death. We have not yet sought comment from the SAB on this more recent study and as such continue to rely on the earlier 1997 analysis.

EPA disagrees with the statement that "the morbidity endpoints of bronchitis and restricted activity days cannot be clearly linked to exposure to fine PM nor quantified with any degree of accuracy and should also be removed from the CBA." Regarding chronic bronchitis, Abbey et al. (1995)[49] examined the relationship between estimated $PM_{2.5}$ (annual mean from 1966 to 1977), PM_{10} (annual mean from 1973 to 1977) and TSP (annual mean from 1973 to 1977) and the same chronic respiratory symptoms in a sample population of 1,868 Californian Seventh Day Adventists. The initial survey was conducted in 1977 and the final survey in 1987. To ensure a better estimate of exposure, the study participants had to have been living in the same area for an extended period of time. In single-pollutant models, there was a statistically significant $PM_{2.5}$ relationship with development of chronic bronchitis, but not for airway obstructive disease (AOD) or asthma; PM_{10} was significantly associated with chronic bronchitis and AOD; and total suspended particulates (TSP) was significantly associated with all cases of all three chronic symptoms. Other pollutants were not examined. Because the cold temperature vehicle standards control direct $PM_{2.5}$, this analysis uses only the Abbey et al. (1995) C-R function based on the results of the $PM_{2.5}$ single pollutant model.

Ostro and Rothschild (1989)[50] estimated the impact of $PM_{2.5}$ and ozone on the incidence of minor restricted activity days (MRADs) and respiratory-related restricted activity days (RRADs) in a national sample of the adult working population, ages 18 to 65, living in metropolitan areas. The annual national survey results used in this analysis

were conducted in 1976-1981. Controlling for ozone, two-week average $PM_{2.5}$ was significantly linked to both health endpoints in most years. The C-R function for PM is based on this co-pollutant model. The study is based on a "convenience" sample of non-elderly individuals. Applying the C-R function to this age group is likely a slight underestimate, as it seems likely that elderly are at least as susceptible to PM as individuals under 65. The elderly appear more likely to die due to PM exposure than other age groups (e.g., Schwartz, 1994, p. 30)[51] and a number of studies have found that hospital admissions for the elderly are related to PM exposures (e.g., Schwartz, 1994; Schwartz, 1994).[52,53]

The Agency would also like to point out that MRADs and other morbidity endpoints have been a standard part of recent, peer-reviewed benefits assessments. These include Ostro et al. (2006),[54] Levy et al. (2003),[55] Cifuentes et al. (2001),[56] Levy et al., (2001)[57] and Hubbell et al., (2005).[58]

What Commenters Said:

Both API and ExxonMobil noted that, for the fuels program separately, EPA states it cannot quantify benefits since the NATA assessments do not take full account of the exposure ranges of the population. The commenters stated that EPA instead listed "unquantified" and nonmonetized effects. The commenters noted that these effects are categorized as "ozone health", "ozone welfare", "PM health", "PM welfare", "MSAT Health", and "MSAT welfare" (Table IX.E1, page 15908). The commenters believe that the only benefits from this list that are applicable to the fuels program are "MSAT Health". The commenters also noted that under "MSAT Health", EPA listed the following as applicable to benzene: cancer, anemia, disruption of production of blood components, reduction in the number of blood platelets, excessive bone marrow formation, and depression of lymphocyte counts. The commenters stated that it appears that EPA simply listed all outcomes that have ever been associated with benzene, regardless of whether they could possibly occur at ambient levels. Lastly, the commenters stated that EPA's own reference concentration (RfC) of 30 µg/m3 is in fact regarded as the safe level to protect against all noncancer health effects. The commenters believe that since this level is above present day ambient concentrations, noncancer effect should be referenced in this table.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013

Our Response:

As discussed in Chapter 3 of the RIA, there are numerous observations of personal exposure and indoor air concentrations of benzene in excess of the RfC. Also, as discussed in the RIA for the proposal, estimated average population cancer risks from inhalation exposure to benzene are likely to be substantial underestimates. In addition to

the potential for the current unit risk range to be a substantial underestimate, inventories used in risk modeling for the proposal did not include elevated cold start emissions for gasoline vehicles or portable fuel container emissions. Moreover, the exposure modeling did not adequately capture near road impacts on risk, or impacts of emissions in attached garages to exposure and risk. Modeling done for the final rule did account for the additional sources of exposure described above.

What Commenters Said:

The commenters stated that ambient levels of sulfur dioxide in the U.S. are much lower today than those present when the ACS study was conducted. The commenters further stated that clinical and toxicology studies clearly demonstrate that sulfur dioxide (SO_2) enhances the toxicity of PM, particulate matter (Costa, 2001). The commenters believe this supports the concept that CRFs reported by Pope et al. and used by EPA in the benefits analysis for particulate matter should be adjusted downward to account for the reduced impact of SO_2 between past and current conditions.

The commenters believe that whether ambient exposure to SO_2 produces an independent risk for mortality, as suggested by Krewski et al., acts as a surrogate for other pollutants in the air pollution mix (as suggested by some authors) or actually increases the risk of PM (as suggested by clinical and toxicology studies) is arguable. The commenters state that since SO_2 increases the toxicity of particulate matter, use of the 6% value – without adjustment – does not provide an accurate estimate of PM risk.

For the critical health effect of chronic PM mortality, the commenters stated tht they believe the authors of the CBA used an overly conservative, scientifically invalid and inflated value of 6% change in mortality per 10 µg/m3 of PM2.5, as derived from the ACS Study as reported by Pope et al. (2002). The commenters stated that they believe the results of the thorough reanalysis of this study by Krewski et al. (2000, 2003) clearly demonstrate effect modification by education and other factors such as temperature variation and population change, attenuation of particle effect when spatial correlation was considered, and most importantly, strong attenuation of the particle effect when sulfur dioxide was simultaneously considered in the model. The commenters therefore suggested using a coefficient of 1% rather than 6%, based on data by Krewski et al. which they believe provides a more complete adjustment for the effects of SO_2.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013
Alliance of Automobile Manufacturers OAR-2005-0036-0881

Our Response:

We agree with the need to address co-pollutants when employing epidemiologic models. The Health Effects Institute (HEI) reanalyses generally confirmed the original

investigators' findings of associations between mortality and long-term exposure to PM, while recognizing that increased mortality may be attributable to more than one ambient air pollution component. Regarding the validity of the published ACS Studies, the HEI Reanalysis Report concluded that overall, the reanalyses assured the quality of the original data, replicated the original results, and tested those results against alternative risk models and analytic approaches without substantively altering the original findings of an association between indicators of particulate matter air pollution and mortality.

The most recent external review draft of the PM criteria document reaches similar conclusions.

While the Agency recognizes the ongoing need to research the issue of copollutants, including SO_2, and their role in quantifying the relationship between long-term exposure to PM2.5 and mortality, we disagree with the commenter's interpretation of the HEI reanalysis and their assertion that we are using an overly conservative, scientifically invalid and inflated coefficient. Although the HEI reanalysis did find a robust association between mortality and SO_2, such an association was also reported for fine particles and sulfate. In addition, the study points out that efforts to address spatial autocorrelation for ecologic-scale variables such as fine particles and sulfate may have over-adjusted estimated effects for these regional pollutants compared with effect estimates generated for local copollutants including SO_2. This could partially account for the higher effect estimate generated for SO_2 relative to fine particles and for sulfate. In addition, SO_2 is associated with sulfate formation and consequently, SO_2 concentrations are likely surrogates for sulfate concentrations, which could explain their statistical association with PM2.5-related mortality.

In considering this issue of SO_2 as a copollutant and its impact on the association between mortality and long-term exposure to PM2.5, it is also important to consider the wider literature. Two recent studies examining the relationship between gaseous copollutants (including SO_2) and PM-related health effects including mortality (Samet et al., 2000),[59] conclude that SO_2 is likely to represent a surrogate for ambient PM2.5 concentrations and may in certain circumstances represent a surrogate for personal exposure to PM2.5. Furthermore, both studies conclude that SO_2 is unlikely to be a confounder for PM2.5-related health effects (i.e., it is unlikely to be associated directly with these health effects while being correlated with PM2.5 exposure). Further evidence against SO_2 as a confounder specifically for mortality effects involves biological plausibility. While SO_2 is recognized as effecting airways causing difficulty in breathing, especially for asthmatics, there is little evidence of a causal link between SO_2 exposure and cardiovascular- or lung cancer-related mortality. This argues against SO_2 as a confounder for PM2.5-related mortality effects.

Following recommendations from the National Academy of Sciences and SAB-HES, we have continued to update our methods for benefits estimation to reflect the latest research and are now using the Pope et al, (2002) reanalysis of the ACS study data. This latest reanalysis has a number of advantages over prior studies in evaluating the role of SO_2 in the relationship between PM2.5 exposure and mortality. The ACS reanalysis

includes 8 additional years of follow up data, including data on fine particulates and gaseous copollutant exposure. The ACS reanalysis also considers a variety of additional covariates believed to be associated with mortality and uses the latest statistical methods (e.g., non-parametric spatial smoothing) for addressing key issues such as spatial autocorrelation. While the ACS reanalysis continues to show a strong correlation between SO_2 and all cause and cardio-vascular mortality, suggesting that it is likely a surrogate for particulate fine and more likely sulfate exposure, the study also provides the strongest evidence yet for an association between long-term exposure to PM2.5 and mortality.

The NRC (2002) also recommended that EPA use formally elicited expert judgments as a means of characterizing uncertainty in the concentration-response relationship between $PM_{2.5}$ exposures and mortality. EPA therefore convened a panel of experts to elicit probabilistic distributions describing uncertainty in estimates of the reduction in mortality among the adult U.S. population resulting from reduction in ambient annual average $PM_{2.5}$ levels. The results of this study, completed in 2006 (Industrial Economics, 2006),[60] found that the majority of expert opinion (11 out of 12 experts) believed that the PM2.5-mortality effect was stronger than a comparable result derived from the Pope et al. (2002) ACS study. This leads the Agency to expect that our estimates of mortality derived from the ACS study understate the benefits associated with the final cold temperature vehicle standard.

What Commenters Said:

Commenters stated that they believe that EPA's continued use of the Value of a Statistical Life (VSL) approach, with a cost of $6 million per hypothesized mortality event, markedly inflates the benefits in this proposal. They suggested that EPA consider the more scientifically valid approach based on life years lost.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013

Our Response:

EPA agrees that there is a large amount of uncertainty in the VSL for application to environmental policy analysis. However, as noted in the RIA, the SAB Environmental Economics Advisory Committee has advised that the EPA "continue to use a wage-risk-based VSL as its primary estimate, including appropriate sensitivity analyses to reflect the uncertainty of these estimates," and that "the only risk characteristic for which adjustments to the VSL can be made is the timing of the risk"(EPA-SAB-EEAC-00-013).[61] In response to concerns about the range of estimates included in the VSL distribution, we have modified the value of life distribution. The mean value of avoiding one statistical death is now assumed to be $5.5 million in 1999 dollars. This represents a central value consistent with the range of values suggested by recent meta-analyses of the

wage-risk VSL literature. The distribution of VSL is characterized by a confidence interval from $1 to $10 million, based on two meta-analyses of the wage-risk VSL literature. The $1 million lower confidence limit represents the lower end of the interquartile range from the Mrozek and Taylor (2000) meta-analysis.[62] The $10 million upper confidence limit represents the upper end of the interquartile range from the Viscusi and Aldy (2003) meta-analysis.[63] The mean estimate of $5.5 million is consistent with the mean VSL of $5.4 million estimated in the Kochi et al. (2006) meta-analysis.[64]

In developing our estimate of the benefits of premature mortality reductions, we have discounted over the lag period between exposure and premature mortality. However, in accordance with the SAB advice, we use the VSL in our primary estimate. Consistent with the SAB advice and in accordance with the provisions contained in the FY04 Appropriations bill, we do not adjust the VSL to reflect any differences across age groups.

What Commenters Said:

API and ExxonMobil commented that they have concerns regarding EPA's evaluation of bronchitis as a health endpoint. First, contribution of particulate matter to the incidence of bronchitis is entirely attributed to fine particle exposure, which is scientifically incorrect. They commented that this invalid attribution contrasts with the etiology of bronchitis, and highlights the need for clinical input to the EPA CBA. The commenters noted that bronchitis is primarily a disease of the upper respiratory tract; and coarse particles, which deposit in the upper respiratory tract, are much more likely to contribute to the etiology of this disease. The commenters stated that fine particles deposit primarily in the lower respiratory tract, and are not expected to significantly contribute to the incidence of bronchitis. The commenters stated that they believe it is biologically inappropriate to convert the morbidity function from a study using coarse PM10 to fine PM2.5; rather, for bronchitis, a separate benefits analysis for PM10 or other coarse-particle metric – such as total PM2.5, 10 or TSP – should be provided. The commenters noted that in the study by Abbey et al. (1995a,b), a stronger relationship was observed for TSP – the actual metric of particle exposure used – than for either PM10 or PM2.5.

The commenters also commented that they are concerned that concentration response functions used were incorrectly applied to the air pollutant under consideration. Since monitoring both PM10 and PM2.5 was very limited in California before 1986, Abbey et al. (1995a,b) used data for TSP to estimate PM10, and airport visibility records to derive an estimate for PM2.5. The commenters stated that they believe this approach is awkward for estimating exposures, and seriously jeopardized the findings from this study.

The commenters further commented that they are concerned that the assessment of bronchitis is based on a single study (Abbey et al., 1995a,b), for which the result was

not statistically significant – even at the 5% level. They do not believe that causality can be established based on the results of a single ecological epidemiology study. Further, they questioned the accuracy of a concentration response function based on a single study result. In particular, they stated that they are concerned with the accuracy of the adjustment for smoking in this study, which they believe is a major contributor to the incidence of bronchitis. The commenters stated that they believe the magnitude of calculated risk due to PM air pollution, which is essentially the same as the background rate attributed to all other factors, raises more suspicion and illustrates the need for reality checks. Finally, the commenters stated that EPA's development of a concentration response function based on findings from a single study (here, results that were not statistically significant at the 5% level) begs the question as to whether are sufficiently robust data set to conclude in a CBA.

The commenter also questioned the adjustment of a concentration-response function for PM10 to one based on PM2.5 based on the simple mean ratio of these particles in urban air. The commenter stated that the authors offer no biological explanation as to why such as an adjustment is appropriate, or why fine PM would be expected to exhibit the same potency as coarse particles. The commenter noted that fine and coarse particles distribute differentially in the respiratory tract and produce a different and separate spectrum of health effects; and certain respiratory symptoms would be expected to be exacerbated more by exposure to coarse rather than fine PM, a finding consistent with the actual study, where stronger associations were observed for TSP than for PM10 or PM2.5 surrogates. The commenters stated that it is unclear why the authors of the CBA choose to attribute all RAD related effects to fine PM.

The commenters stated that they are concerned with the use of data from California during the period of 1966-1988 when air pollution was high, likely resulting in an inflated CRF. The commenters stated that the air pollution data that are the basis of the study used for the CBA are from 1966-1987—close to 30 years old. The commenters questioned if concentration response functions based on results using this air pollution data are robust enough to use in a CBA designed to project results nearly 20 years into the future. The commenters further stated that California data are dominated by photochemical smog, but this concentration response function overestimates effects of low levels of PM alone. The commenters also stated that whether or not a threshold exists for this endpoint, and whether or not the concentration response function is specific to particulate matter, photochemical pollution, other gases present in ambient air, or a combination of these, has not been evaluated.

The commenters stated that they are likewise concerned that assessment of Restricted Activity Days (RADs) and Minor Restricted Activity Days (MRADs) endpoints are solely based on the results of the Health Interview Study, as reported by Ostro (1987) and Ostro & Rothchild (1989). They noted that the concentration-response functions derived from this study are based on air pollution data from 1976-1981, when air pollution levels were significantly greater. The commenters also questioned the exposure metrics used in this study, as PM10 and PM2.5 levels were not measured (PM2.5 levels were estimated from visibility data from airports). The commenters

further stated that there has been no assessment of whether RADs or MRADs would even be triggered by lower air pollution levels—thus they believe that the issue of threshold has not been explored at all for these morbidity endpoints.

The commenters stated that it believes that the health endpoints of RAD and MRAD are highly subject to socioeconomic confounding. The commenters noted that the in study used to derive the concentration response functions, significant city-to-city differences in RAD rates were observed. The commenters believe that this was likely due to socioeconomic factors and other factors that were not adequately controlled in the selected study. The commenters also stated that they believe that many of the socioeconomic factors that need to be controlled to identify the potential effect of air pollution are likely much more important than air pollution itself in the production of RADs and MRADS.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884
ExxonMobil Refining & Supply Company OAR-2005-0036-0772, -1013

Our Response:

EPA relies on the guidance provided by internal and external review panels comprised of distinguished scientists, engineers, and economists who are recognized, non-governmental experts in their respective fields. EPA consults with the Science Advisory Board's Health Effects Subcommittee and Clean Air Science Advisory Committee in the development and improvement of methods we use to estimate and value the potential reductions in health effects associated with air quality improvements. All of EPA's regulatory analyses also are reviewed extensively by the Office of Management and Budget. EPA also looks to recommendations provided by panels such as those convened by the National Academy of Sciences to specifically address facets of our cost and benefits analyses. We point this out because chronic bronchitis and MRADs have been included in every major air quality-related RIA for the last 10 years.

During that time, the Agency has received much internal and external review on these, and other, morbidity endpoints. The Agency's desire to characterize a comprehensive suite of health effects associated with its rules has been noted by both the National Academy of Sciences (NRC, 2002)[65] and the SAB-HES (EPA, 2004),[66] despite our reliance on an aging literature. Though weaknesses and uncertainties in the epidemiological literature are acknowledged and described qualitatively in the RIA (see Chapter 12), our decision to include these endpoints in our cost-benefit analyses continue to be supported by Agency internal and external review.

Furthermore, the Agency's Staff Paper on the Particulate Matter Air Quality Criteria Document characterized the chronic bronchitis literature as follows,

> For respiratory effects, notable new evidence from epidemiological studies substantiates positive associations between ambient PM concentrations and not

> only respiratory mortality…Of much interest are emerging new findings indicative of likely increased occurrence of chronic bronchitis in association with (especially chronic) PM exposure. The biological pathways underlying such effects can include inflammatory responses, increased airway responsiveness or altered responses to infectious agents. Toxicological studies have provided evidence that supports plausible biological pathways for respiratory effects of fine particles.
>
> Considered together, the CD finds that the long-term exposure studies on respiratory morbidity reported positive and statistically associations between fine particles or fine particle components and lung function decrements or chronic respiratory diseases, such as chronic bronchitis (CD pp. 8-313, 8-314).[67]

The Agency would also like to point out that MRADs and other morbidity endpoints have been a standard part of recent, peer-reviewed benefits assessments. These include Ostro et al. (2006),[68] Levy et al. (2003),[69] Cifuentes et al. (2001),[70] Levy et al., (2001)[71] and Hubbell et al., (2005).[72]

What Commenters Said:

API commented that the choice of using the benefit endpoints of 2020 and 2030 and the focus on PM are clear indicators that EPA largely used the air modeling work and benefit analysis associated with the Nonroad Diesel Rule for the benefit analysis for the MSAT 2 proposal. API noted that it also commented on the Nonroad Diesel Rule proposal (68 FR 28328, May 23, 2003) that it believed that EPA's PM benefit estimates associated with the Nonroad Diesel Rule were flawed. The commenter believes that since EPA relied on that analysis to estimate PM related benefits associated with the MSAT2 proposal, the estimated PM benefits associated with the MSAT2 proposal are also flawed. API listed the following issues of concern related to the estimated PM benefits: 1) the treatment of uncertainty in cost-benefit analysis; and 2) estimates of value of statistical life.

Regarding the treatment of uncertainty in cost-benefit analysis, the commenter stated that it believes that it was incomplete, flawed and highly misleading. The commenter stated that EPA did not assume a threshold in the CR function for PM mortality, but rather reflected a background threshold assumption of 3 micrograms per cubic meter (DRIA, Ch.12, p. 1230). This, the commenter noted, despite EPA's most recent PM2.5 Criteria Document that concludes that "the available evidence does not either support or refute the existence of thresholds for the effects of PM on mortality across the range of concentrations in the studies" (DRIA, Ch.12, p. 1229). The commenter stated that not including the uncertainties surrounding the issue of threshold values of the CR (PM mortality) function renders EPA's analysis of uncertainty to be of little or no value.

The commenter stated that it believes that another source of uncertainty is that surrounding the EPA estimates of VSL. The commenter noted that EPA used a central estimate of VSL of $6.6 million (2020 income level expressed in $2000) and $6.8 million (2030 income level expressed in $2000); however, the commenter stated that these estimates are based upon a range of values from various meta-analyses and may reflect risk preferences significantly different from the target population.

The commenter stated that it endorses the use of the best available science throughout the policy making process, and it believes that more research is needed in the derivation of defensible base estimates for the value of a statistical life. The commenter stated that estimates of VSL need to accurately reflect the risk preferences of the target population; however, it does not believe that this was the case with the use of the estimates used by EPA. The commenter noted concerns with the fact that the studies from which the estimates are derived targeted the middle-aged working population and not the most vulnerable population segments to air pollution—the elderly (in fragile health) and the very young. The commenter also stated that the type of risk being valued, typically job related risk, is very different from the risk associated with increased air pollution. The commenter further stated that it believes that little, if any, confidence can be placed in the appropriateness of the VSL estimates used by EPA in valuations of reduced mortality due to decreases in PM concentrations. The commenter stated that this is critical since VSL, along with the EPA estimate of the number of reduced mortalities due to PM reduction (also highly flawed as explained above) are overwhelmingly the predominant factors driving the benefit estimation in this RIA.

The commenter recommended that the EPA move to a comprehensive assessment of uncertainty in its benefit-cost analyses so as to reflect the true uncertainty associated with its net benefit estimates (the commenter suggested that EPA could use a Monte Carlo analysis that captured the true extent of uncertainty associated with the health impacts of PM2.5 concentrations in addition to the other major sources of uncertainty). The commenter believes that the assessment of uncertainty in the proposal is disjointed and conveys a misleading sense of certainty to its net benefit estimates, and only provides limited value to policy deliberations. The commenter also stated that it believes that EPA's unequivocal assertion that societal benefits vastly exceed societal costs in the rule is not supportable given the problems and omissions associated with its benefit estimates and uncertainty analysis.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884

Our Response:

We refer the reader to the Nonroad Diesel Rule response-to-comments document for detail regarding the commenter's assertion that the Nonroad Diesel Rule's benefits were flawed (http://epa.gov/nonroad-diesel/2004fr.htm#summary).

Due to the analytical constraints associated with the benefits scaling approach, which are explained in the RIA, we are unable to conduct an analysis of the impact of alternative thresholds. We do, however, qualitatively indicate the uncertainty associated with various $PM_{2.5}$ cutpoints used in the calculation of PM-related mortality. We refer the reader to Chapter 12 of the RIA for this discussion. We also provide a scaled estimate of the Monte Carlo-based confidence interval associated with the benefits for each endpoint and for the total benefits associated with the cold temperature vehicle standards. As one can see, the statistical uncertainty associated with these estimates do not "show a distribution of benefits so disperse as to make any definitive conclusions regarding benefits and costs impossible." We acknowledge, however, that this range does not capture all sources of uncertainty, such as the impact of different thresholds. Per the recommendations of the National Research Council (2002), the Agency is moving towards a comprehensive assessment of uncertainty in its benefit-cost analyses when possible.

EPA agrees that there is a large amount of uncertainty in the VSL for application to environmental policy analysis. However, the SAB Environmental Economics Advisory Committee has advised that the EPA "continue to use a wage-risk-based VSL as its primary estimate, including appropriate sensitivity analyses to reflect the uncertainty of these estimates," and that "the only risk characteristic for which adjustments to the VSL can be made is the timing of the risk"(EPA-SAB-EEAC-00-013). In response to concerns about the range of estimates included in the VSL distribution, we have modified the value of life distribution. The mean value of avoiding one statistical death is now assumed to be $5.5 million in 1999 dollars. This represents a central value consistent with the range of values suggested by recent meta-analyses of the wage-risk VSL literature. The distribution of VSL is characterized by a confidence interval from $1 to $10 million, based on two meta-analyses of the wage-risk VSL literature. The $1 million lower confidence limit represents the lower end of the interquartile range from the Mrozek and Taylor (2000) meta-analysis. The $10 million upper confidence limit represents the upper end of the interquartile range from the Viscusi and Aldy (2003) meta-analysis. The mean estimate of $5.5 million is consistent with the mean VSL of $5.4 million estimated in the Kochi et al. (2006) meta-analysis. The modified VSL distribution is reflected in the scaled benefits estimated for this analysis.

In developing our estimate of the benefits of premature mortality reductions, we have discounted over the lag period between exposure and premature mortality. However, in accordance with the SAB advice, we use the VSL in our primary estimate. Consistent with the SAB advice and in accordance with the provisions contained in the FY04 Appropriations bill, we do not adjust the VSL to reflect any differences across age groups. The modified lag distribution is reflected in the scaled benefits estimated for this analysis.

6.2 Predicted Social Costs of the Rule

What Commenters Said:

API noted that EPA estimates costs of the fuels program to be $250 million annually in total social welfare costs in 2030 (in 2003 $) (Table IX.E4, page 15912). API believes this $250M social cost estimate is very likely to underestimate true social costs, since EPA considered only the fuels program impact on residential users in their calculations. The commenter goes on to state that the Agency focused only on impacts related to personal transportation or residential lawn/garden care and recreational use. Additional costs associated with complying with the proposed programs related to production of goods and services that use gasoline fuel as production input were not considered. EPA justifies their focus on only residential cost impacts based on 1) a Department of Energy (DOE) and California Air Resources Board (CARB) study suggesting that the commercial share of the end user market for gasoline is relatively small and 2) EPA's assumption that the share of gasoline-related costs to total production costs is small (page 15913 of proposed rule). However, the commenter believes the true costs would undoubtedly be much larger if these were taken into account. As such, a key question not answered by EPA is whether the benefits of the fuel program alone exceed the estimated $250M annual social cost of the fuels program.

Letters:
American Petroleum Institute (API) OAR-2005-0036-0884 (p.19)

Our Response:

Our method for estimating the social costs of the program uses a partial equilibrium model that examines the impacts on directly affected stakeholders (fuel providers and users). We did not examine the impacts on application markets (goods and services produced using gasoline fuel). This is because a price change of the magnitude associated with the fuel requirements is very small and well within the normal gasoline price fluctuations experienced by such commercial entities. In addition, gasoline fuel is likely to be only a small part of the total production inputs used to produce those goods and services. For example, the gasoline used in a delivery van is likely to be small part of the operating costs of a delivery service company, with labor and other inputs constituting the main production costs. Finally, the vast majority of consumers of gasoline fuel are individual noncommercial users. This is supported by the information cited in the question as well as DOE data that indicates that only about 6 percent of gasoline fuel sold in the United States is used for commercial or industrial transportation.

For these reasons we believe that the impacts on the broader economy would be relatively small and perhaps not large enough to disturb the results had a general equilibrium model of the economy been designed and utilized in this analysis. Consequently, while there are other non-quantified social costs in addition to the social costs estimated in the EIA, these are not likely to be large.

7. ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS

What We Proposed:

The comments in this chapter deal with the administrative and procedural requirements related to the proposed rule. A summary of the comments received, as well as our response to those comments, are located below. For the full text of comments summarized here, please refer to the public record for this rulemaking.

7.1 SBREFA Process/Regulatory Flexibility Act

What Commenters Said:

The Ad-Hoc Coalition of Small Business Refiners commented that it greatly appreciated the opportunity to be involved during the Small Business Regulatory Enforcement Fairness Act (SBREFA) Panel process as well as the efforts made by the members of the Federal Panel and EPA staff to understand their special circumstances.

During the development of the final rule, representatives of the small refiners commented that they believed that the imposing a 1.3 vol% refinery maximum average is a violation of the Regulatory Flexibility Act (RFA), because the Panel did not have the opportunity to review the impacts of such a cap on small businesses. The commenters (citing 5 U.S.C. § 609) stated that they believe EPA would, at a minimum, need to present the maximum average provision to the Panel for its consideration prior to including it as part of a final rule.

Letters:
Ad Hoc Coalition of Small Business Refiners OAR-2005-0036-0686

Our Response:

We appreciate the comments regarding the SBREFA process and agree that the Panel process was quite effective and beneficial to all of the small entities that participated in the SBREFA process. We have also provided small refiners continued opportunities to comment throughout the rulemaking (i.e., following the end of the Panel process), both through the public comment process and through direct meetings with agency personnel to discuss emerging issues of concern. (Memoranda of these meetings are included as part of the administrative record for this rule.)

Please see section 4.9.1.4 of this Summary and Analysis document for a greater discussion of the comments, and our response, regarding the assertion that the 1.3 vol% refinery maximum average was adopted without complying with the procedural requirements of the RFA.

7.2 Clean Air Act Requirements

7.2.1 Section 202(l)- Requirements for Mobile Source-Related Air Toxics

7.2.1.1 General

What Commenters Said:

The New York State Department of Environmental Conservation, LRAPA, OR DEQ, NJ DEP, Environmental Defense, Natural Resources Defense Council, U.S. PIRG, American Lung Association, STAPPA and ALAPCO, IL EPA, and FL DEP all noted in their comments that section 202(l) of the Clean Air Act (CAA) requires EPA to regulate hazardous air pollutants from motor vehicle fuels to the "greatest degree of emissions reduction achievable." The commenters all stated that they believe that the proposed annual average benzene standard of 0.62 vol% (along with an ABT program) does not go far enough in reducing fuel benzene levels to meet the CAA mandate. The commenters stated that proven technology is commercially available to reduce benzene content substantially lower than what was proposed.

The Puget Sound Clean Air Agency, Environmental Defense, NRDC, U.S. PIRG, and ALA stated that they understand that section 202(1)(2) requires EPA to look at the costs of the technology. However, the commenters stated that they believe that the capital costs of the MSAT2 program are economically reasonable in contrast to refiners' annual profits (about which the commenters stated "…exuberant profits are consistent among most of the nation's refiners"). The Puget Sound Clean Air Agency further commented that it believes that benefits to human health far outweigh the costs of less than a few cents per gallon.

Environmental Defense, NRDC, U.S. PIRG, ALA, STAPPA/ALAPCO, Illinois EPA, and the Florida Department of Environmental Protection also offered specific comments regarding lower benzene standards (including a per-gallon benzene cap) that EPA should finalize in order to meet the mandates of CAA section 202(l). Environmental Defense, NRDC, U.S. PIRG, and ALA also commented that they do not agree with EPA's statements that a per-gallon benzene cap would not represent the greatest achievable degree of reduction because it would have to be sufficiently high to accommodate all refiners (70 FR 15865). The commenters noted that the operative legal language in section 202(l) is not whether stronger standards would be "challenging," but whether they would be "achievable."

The Independent Fuel Terminal Operators Association (IFTOA) commented that it believes that the proposal is a reasonable and appropriate means to achieve the statutory objectives of the Clean Air Act and the Energy Policy Act.

Letters:
ALA OAR-2005-0036-0365 (hearing comments)
Environmental Defense, Natural Resources Defense Council (NRDC), U.S. PIRG, American Lung Association (ALA) OAR-2005-0036-0868
Engine Manufacturers Association (EMA) OAR-2005-0036-0810
Florida Department of Environmental Protection (FL DEP) OAR-2005-0036-
Illinois Environmental Protection Agency (IL EPA) OAR-2005-0036-0830
Independent Fuel Terminal Operators Association (IFTOA) OAR-2005-0036-1007
Lane Regional Air Protection Agency (LRAPA) OAR-2005-0036-0848

New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829
New York State Department of Environmental Conservation OAR-2005-0036-0722
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993
Oregon Department of Environmental Quality (OR DEQ) OAR-2005-0036-0987
Puget Sound Clean Air Agency OAR-2005-0036-0780
STAPPA/ALAPCO OAR-2005-0036-0836

Our Response:

We considered a range of average benzene standards, taking into account technological feasibility as well as cost and the other enumerated statutory factors. The commenters supporting a more stringent average benzene standard did not provide data or analysis to address the potential negative effects of different standards that we presented in the proposal, especially in the context of the proposed ABT program. Some of the commenters essentially stated that because lower annual average levels of benzene are attainable, greater emission reductions are achievable, and hence the proposal would not comply with section 202(l)(2) if adopted. The commenters, however, apparently fail to note that "achievable" in section 202(l)(2) is defined not only in terms of technical capability, but also in reference to cost, energy, safety, and lead time (see Sierra Club v. EPA, 325 F. 3d at 379). As discussed at length in the preamble and RIA to both the proposed and final rules, we do not consider a standard with a more stringent annual average benzene standard to be achievable considering costs, especially when costs to individual refineries are taken into consideration.

Some commenters that supported a more stringent annual average standard considered the role of costs and argued that the program does not impose significant costs on refiners in the aggregate, but did not address the wide range of compliance costs for individual refineries that we discuss in the proposal. It is critical to recognize that as more stringent annual average standards are considered, the costs for individual technologically-challenged refineries tend to become more extreme. (Please see section VI of the preamble to the final rule, chapter 9 of the RIA, and section 4.4 of this comment response document for a more detailed discussion of the costs of this program and how EPA considered these costs in determining which standards were achievable.)

We reassessed the level of the standard in light of the key factors we are required to consider, and concluded that 0.62 vol% is the appropriate level for the average standard, because it achieves the greatest achievable emission reductions through the application of technology that will be available, considering cost, energy, safety, and lead time. We have also chosen to finalize a maximum average standard. We believe that a maximum average standard at a level of 1.3 vol% accomplishes the reasonable goal of reasonably assuring lower gasoline benzene levels both nationally and regionally (see section 202(l)(2), authorizing EPA to establish "reasonable requirements"), while balancing the negative aspects of more- and less-stringent benzene standards, and avoids the serious drawbacks of a per-gallon cap. As further discussed in section VI of the preamble to the final rule, chapter 9 of the RIA and responses in chapter 4 of this comment response document, we do not believe that a per-gallon cap would be achievable within the meaning of section 202(l)(2).

7.2.1.2 On-Board Diagnostics

What Commenters Said:

Regarding the mandates of CAA section 202(l), MECA, NESCAUM, and the New Jersey Department of Environmental Protection (NJ DEP) commented that they believe that EPA should support inspection and maintenance (I/M) programs and introduce on-board diagnostics (OBD) for all heavy-duty vehicles (especially those over 14,000 pounds). NESCAUM further commented that it believes that the final MSAT rule should contain a commitment to heavy-duty OBD, as it would allow for optimization of combustion in gasoline engines and reduce excess hydrocarbon emissions. NJ DEP further commented that it believes that EPA's support for I/M programs, through continually updated and comprehensive technical guidance, will help ensure the air toxic reductions projected from national exhaust and evaporative emission standards programs provide the expected benefits.

MECA commented that it believes that the MSAT2 proposal should have also considered a light-duty gasoline aftermarket converter policy that sets higher performance and durability standards (similar to California Air Resources Board's (ARB) interim policy requirements for aftermarket converters used on OBD-equipped vehicles). The commenter noted that, based on surveys that it performed with aftermarket converter manufacturers, significant additional reductions of hydrocarbon emissions, including toxic hydrocarbon emissions, and NOx emissions could be achieved with a national aftermarket converter policy that made use of the same higher performance OBD-compliant aftermarket converters available in California.

Letters:
Manufacturers of Emission Controls Association (MECA) OAR-2005-0036-0808
New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993

Our Response:

With regard to the comments on including heavy-duty OBD standards as part of this rule, EPA explained at proposal that such standards are being pursued in a separate proceeding (71 FR 15844). EPA in fact proposed OBD requirements for heavy-duty vehicles over 14,000 pounds (72 FR 3200, January 24, 2007). Given the nature of the heavy-duty trucking industry, 50-state harmonization of emissions requirements for these vehicles is an important consideration. To work towards this goal, the Agency signed a Memorandum of Agreement in 2004 with the California Air Resources Board which expresses both agencies' interest in working towards a single, nationwide program for heavy-duty OBD. Since that time, California has established their heavy-duty OBD program, which will begin implementation in 2010. EPA also proposed a 2010 implementation date for its program. We believe that it is far more sensible to continue to coordinate these requirements by means of an independent rulemaking proceeding, than to disrupt the process by trying to 'shoehorn' heavy-duty OBD requirements into this rulemaking.

Regarding California high-performance OBD-compliant aftermarket converters, we note that vehicles already have an 8 year, 80,000 mile emission warranty with a 100,000 to 150,000 full useful life (FUL) for emissions. Therefore, original equipment manufacturer (OEM) catalysts are already required to be durable and effective for FUL. EPA does not have the authority to require catalyst changes on properly functioning catalysts even after FUL. However, for the small amount of catalyst failures that may occur after 80,000 miles, there is an EPA replacement policy in place that should restore the vehicle to an acceptable emission level.

Finally, with respect to the suggestion to support I/M programs as an aspect of vehicular toxics control, EPA can and does support such programs. However, I/M programs apply principally to existing vehicles, and to the extent that they do, cannot be required under the section 202(l)(2) authority which applies exclusively to new vehicles (Sierra Club v. EPA, 325 F. 3d at 380-82).

7.2.1.3 Heavy-Duty Diesel and Small Spark-Ignited Engines

What Commenters Said:

Environmental Defense, NRDC, U.S. PIRG, ALA, NESCAUM, and NJ DEP commented that they believe that the MSAT2 program does not fulfill the requirements of section 202(l) because EPA should have also promulgated standards for heavy-duty diesels such as in-use highway and nonroad diesel engines and locomotive and marine diesel engines, none of which were regulated by recent diesel standards. The commenters also noted that the full pollution reduction and public health benefits of the highway and nonroad diesel rules will not be realized for twenty years due to the lag in time before the emission standards come into effect and because of the long life spans of these diesel engines. The commenters stated that they believe that retrofitting these highly durable vehicles is important to achieving toxic emission reductions in the near-term. One commenter noted the Urban Bus Retrofit Program, and stated that it believes that expanding this program would greatly reduce toxic emissions from heavy-duty trucks and buses. Environmental Defense, NRDC, U.S. PIRG, ALA further commented that they believe that locomotive and marine engines are two of the most significant sources of the nation's diesel air pollution. The commenters cited many reports and public comments on EPA's Advanced Notice of Proposed Rulemaking for locomotive and marine diesels (August 30, 2004).

However, the Engine Manufacturer's Association (EMA) noted that the highway and nonroad diesel programs will reduce emissions of both NOx and PM by more than 90 percent. The commenter further stated that it agrees with EPA's assessment that cleaner-burning diesel fuel, engine improvements, and the addition of diesel particulate filters and other aftertreatment devices will significantly reduce MSAT emissions from new diesel engines. The commenter also cited studies which show that emissions of MSATs from today's advanced diesel engines are significantly lower than those observed in prior studies. The commenter stated that it believes that these studies demonstrate that EPA's aggressive rulemaking efforts for PM and other emissions are already reducing MSAT emissions to the greatest extent feasible. The

commenter thus stated that it believes that the implementation of these stringent (and technology-forcing) standards for diesel engines, including the upcoming locomotive and marine rule, there clearly is not a need for additional engine, vehicle, or fuel controls to reduce MSAT emissions from diesel engines.

Additionally, EMA commented that it believes that EPA's upcoming proposed regulations small spark-ignited engines will result in significant emissions reductions for all pollutants, including MSAT emissions. The commenter stated that, because the emission reduction technologies that will be employed to reduce criteria pollutant emissions from these other mobile source sectors are also the best available technology to reduce MSAT emissions, the commenter believes that no additional controls are needed, or indeed are available, to control MSAT emissions from those sources. The commenter stated that it believes that EPA correctly avoids duplicate or redundant regulation of small spark-ignited engines by relying on upcoming small engine regulation to reduce MSATs; and thus EPA is justified in not proposing specific controls on small engines in the MSAT proposal.

Letters:
Environmental Defense, Natural Resources Defense Council (NRDC), U.S. PIRG, American Lung Association (ALA) OAR-2005-0036-0868
Engine Manufacturers Association (EMA) OAR-2005-0036-0810
New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829
Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993

Our Response:

With regard to comments that EPA did not fulfill the CAA requirements because of the omission of in-use highway and nonroad diesel engines, locomotive and marine engines, and small SI engines, we note first that CAA section 202(l) applies to "motor vehicles and motor vehicle fuels." Nonroad diesel engines, locomotive and marine engines, and equipment using small SI engines are not "motor vehicles" (see CAA section 216(2), definition of "motor vehicle"). Second, the commenter may well be correct that retrofits of existing diesel engines could achieve significant emission reductions. However, again, section 202(l)(2) provides no authority to compel those retrofits since it does not apply to in-use engines (Sierra Club v. EPA, 325 F. 3d at 381-82). Finally, for those diesel engines which are included within the scope of section 202(l), we adhere to our findings that existing vehicle-based controls represent the greatest emission reductions achievable. We further agree with the EMA comment making essentially this point. With respect to diesel fuel, we also adhere to our findings at proposal that the existing controls on sulfur levels represent the greatest achievable reductions.

7.2.1.4 Technology Forcing Standards

What Commenters Said:

The Energy Future Coalition (EFC) commented that it believes that EPA failed in its statutory duty to set standards that control hazardous air pollutants from motor vehicles to the maximum extent that is reasonably achievable. The commenter believes that EPA ignored an available option that is cost-effective and in use today – the replacement of aromatic compounds in gasoline with liquid biofuels. The commenter stated that it believes that EPA's approach of only reducing benzene emissions from gasoline is a limited measure that does not satisfy the requirements of the Clean Air Act, which it stated requires ("at a minimum") reductions in emissions of benzene and formaldehyde plus additional reductions in other air toxics that reflect the "greatest degree of emissions reductions achievable through the application of technology which will be available," taking cost, noise, energy, safety, and lead times into account. The commenter stated that the CAA requirements do not mandate the least costly degree of emission reduction; rather, it mandates the greatest degree of reduction possible, taking costs and other factors into account. The commenter also noted that the CAA provision is "technology-forcing" because it requires, not just the best current technology can do today, but the best that it can do in the future.

The American Petroleum Institute (API) and the National Petrochemical and Refiners Association (NPRA) commented that they believe that the EFC's comments primarily rest upon the premise that the operative portion of the Clean Air Act section 202(l) is that the standard should achieve "the greatest degree of emissions reduction achievable through the application of technology which will be available" and that the section is a "technology-forcing" provision. The commenters noted that in section 202 Congress required regulations to contain "reasonable requirements to control hazardous air pollutants from motor vehicle fuels" through "standards for such fuels or vehicles or both, which…reflect the greatest degree of emissions reduction achievable through the application of technology which will be available, taking into consideration…the availability and costs of the technology, and noise, energy, safety factors, and lead time." The commenters stated that they believe that the EFC has taken a selective reading of the legislation and fails to recognize the fact that EPA is to take all of these items into consideration. The commenters also noted that this same argument was raised in a legal challenge to the MSAT1 rule, and that in response to this argument, the court stated: "...petitioners point out that section 202(l) is 'technology-forcing,' so that the agency must consider future advances in pollution control capability…The statute also intends the agency to consider many factors other than pure technological capability, such as costs, lead time, safety, noise and energy." Thus, the commenters noted that, contrary to the EFC's assertion regarding the mandates of section 202(l), the Court of Appeals for the DC Circuit has ruled that this is but one of several factors that the Agency must consider when promulgating standards under section 202(l).

Letters:
API & NPRA OAR-2005-0036-1015
Energy Future Coalition OAR-2005-0036-0840

Our Response:

As explained in detail in section VI of the preamble, chapter 9 of the RIA, and other comment responses in chapter 4 of this document, there are strong reasons not to adopt controls

on aromatics as part of this rulemaking. In this regard, we find persuasive points raised by the petroleum industry in its reply comments on this issue.

7.2.2 Section 211(c)(4)- State Pre-emption in Fuels Regulations

What Commenters Said:

The New York State Department of Environmental Conservation noted that Clean Air Act Section 211(c) only allows states some flexibility in regulating fuels, and that it does not believe that it should be preempted from the regulation of gasoline benzene content. The New Jersey Department of Environmental Protection further noted that states are preempted by section 211(c)(4) from taking additional action in regulating gasoline benzene, and it urged EPA to maximize the opportunity to glean the greatest benzene reductions possible.

In contrast, Marathon Petroleum Company (MPC) and the National Petrochemical and Refiners Association (NPRA) commented that they believe that the Clean Air Act federal preemption provisions help preserve the national motor fuel supply because states are precluded from adoption of unique specifications unless EPA grants a waiver.

Letters:
Marathon Petroleum Company LLC (MPC) OAR-2005-0036-1008
National Petrochemical & Refiners Association (NPRA) OAR-2005-0036-0809
New Jersey Department of Environmental Protection, Division of Air Quality (NJ DEP) OAR-2005-0036-0829
New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722

Our Response:

Since the implementation of the RFG program, several states and localities have made their own unique fuel property requirements in an effort to further improve air quality. As a result, by summer 2004 the gasoline distribution and marketing system in the U.S. had to differentiate between more than 12 different fuel specifications when storing and shipping fuels between refineries, pipelines, terminals, and retail locations. These unique fuels decrease nationwide fungibility of gasoline, which can lead to local supply problems and amplify price fluctuations. We believe that a nationwide benzene standard can help to alleviate the problems that tend to occur with proliferation of "boutique fuel" programs.

7.2.3 Other Clean Air Act Sections

7.2.3.1 Sections 202(a)(4) and 206(a)(3)

What Commenters Said:

The New York State Department of Environmental Conservation commented that it believes that EPA did not utilize information that is, or should be, available to the Agency through reporting under CAA sections 202(a)(4) and 206(a)(3).

Letters:
New York State Department of Environmental Conservation OAR-2005-0036-0722

Our Response:

EPA believes that it has comprehensively examined and analyzed existing data relevant to all of the standards adopted in the rule, as well as to other potential standards.

7.2.3.2 Section 211(k)(8)

What Commenters Said:

The New York State Department of Environmental Conservation commented that they do not believe that EPA can eliminate the conventional gasoline (CG) anti-dumping provisions as proposed because Clean Air Act section 211(k)(8) prohibits EPA from eliminating these provisions. The commenter noted that in the preamble (71 FR 15871) it was stated that the proposed rule would preempt state regulation of gasoline benzene content; the commenter stated, however, that it does not believe that EPA can use preamble language to preempt state authority to regulate.

Letters:
New York State Department of Environmental Conservation OAR-2005-0036-0722

Our Response:

We note that EPA is not eliminating these requirements—the statutory anti-dumping requirements remain. EPA continues to find, however, that the anti-dumping requirement is met by satisfying the final MSAT2 rule (along with satisfying gasoline sulfur requirements from the Tier 2 Gasoline Sulfur rule). Thus, the anti-dumping requirements will be met by these rules (and EPA therefore will continue meeting the mandates of section 211(k)(8) in issuing regulations that implement statutory anti-dumping requirements). In this sense, the final MSAT 2 rule implements not only section 202(l)(2), but section 211(k)(8) as well.

7.2.3.3 Section 211(l)

What Commenters Said:

The Alliance of Automobile Manufacturers (the Alliance) commented that it believes that EPA should update the fuel additive regulations under section 211(l) of the Clean Air Act, to achieve the additional MSAT reductions sought in this proposed rule, to further control deposits

in the port fuel injector area, intake valve area and combustion chamber. The commenter noted that section 211(l) requires EPA to establish specifications for additives that will provide sufficient detergency in gasoline "to prevent the accumulation of deposits in engines or fuel supply systems," which can have a pronounced impact on emissions at 20°F (and other temperatures) and vehicle performance. The commenter noted that EPA adopted requirements in 1995 to help control deposits on port fuel injectors (PFID) and intake valves (IVD); the commenter believes that the requirements need to be updated because they are based on 1986 vehicle technology, and are inconsistent with more stringent emissions standards adopted since 1986. The commenter also cited Coordinating Research Council (CRC) studies of commercial gasoline in Florida, which have shown substandard levels of detergency based on poor PFID additive performance and that the additive levels required by EPA's regulations are inadequate to provide optimum emission performance.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

The commenter did not maintain that additive controls would result in any further emission reductions than would be achieved under the vehicle-based cold temperature NMHC standard we are adopting in this rule. The comment is more directed at shifting the burden by which that standard would be satisfied. The potential need for EPA's gasoline deposit requirements to be amended is beyond the scope of this rulemaking; however, to the extent that such an amendment may be needed, it will be considered in another rulemaking.

8. OTHER/MISCELLANEOUS COMMENTS

What We Proposed:

The items raised in the following comments were not all specifically proposed in the NPRM, and therefore do not necessarily have a corresponding NPRM section. However, for comments concerning other upcoming EPA regulatory programs, please see sections V.D and V.G of the preamble to the proposed rule for more information.

8.1 Public Comment Period

What Commenters Said:

We received comments regarding the length of the public comment period for the MSAT2 rule. Commenters generally stated that they believed that a 60-day comment period was insufficient for a rule of this size with such a highly complex and technical nature. The commenters stated that they would find it difficult to fully review and provide written comments in the timeframe that was provided. Thus, these commenters stated that the comment period should have been extended to 90 days.

The New York State Department of Environmental Conservation (NYDEC) also commented on specific factors that it believes led to need for more time: there was no Advanced Notice of Proposed Rulemaking to allow a prior view of the EPA's intentions, many of the technical documents cited in the DRIA had never been released to the public prior to the March 29, 2006 Federal Register notice (i.e., there was no previous opportunity to study and analyze the reports), and the public docket contained 610 documents as of March 30, 2006.

Letters:

New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0362, 0722
Vermont Air Pollution Control Division OAR-2005-0036-0444
American Petroleum Institute (API) OAR-2005-0036-0366, 0367

Our Response:

We appreciate that commenters wanted as much time as possible to adequately review the proposal and be able to provide comments. However, due to the fact that the rulemaking schedule is on a court-ordered timeline, we were only able to provide 60 days for public comments in order for us to then assess those comments and complete the final rule on time. All of these commenters, and many others, provided robust, detailed, pointed, and helpful comments on the proposed rule. EPA does not believe any commenter was prejudiced by the 60-day period for submitting public comment. We also note that pre-publication versions of the proposed rule and preamble were posted on EPA's website on February 28 (the day of the proposed rule's signing), so that commenters had more than 60 days to prepare comments on critical aspects of the proposed rule.

8.2 Comments Outside the Scope of the Proposal

8.2.1 Mileage Standards and Flex-Fuel Vehicles

What Commenters Said:

The Regional Air Pollution Control Agency (RAPCA) commented that it urges EPA to consider raising the mileage standards for automobile fleets, as it believes this would have a positive impact on concentrations of MSATs, energy security, and greenhouse gas emissions. The commenter also urged EPA to consider mandating increased availability of the Flex-Fuel vehicle (FFV) fleet and adequate numbers of bio-fuel pumps at gasoline service stations, as it believes that the increased usage of oxygenates reduce MSATs in exhaust and the oxygenates will help reduce ozone.

Letters:
Regional Air Pollution Control Agency (RAPCA) OAR-2005-0036-0771

Our Response:

These comments are outside the scope of the MSAT2 program. We appreciate the commenter's concern. However, EPA does not have the authority to require such actions. Only Congress has the authority to change mileage standards (Corporate Average Fuel Economy, or CAFE) and mandating increases in FFVs and bio-fuels. Regarding the comments on spark-ignited engines, we note that equipment using such engines are not "motor vehicles" and therefore are not subject to section 202(l)(2). In any case, EPA intends to propose regulations for these types of engines by mid-2007.

8.2.2 Spark-Ignited Engines

What Commenters Said:

STAPPA/ALAPCO commented that they urge EPA to capitalize on opportunities to reduce MSATs from nonroad spark-ignited engines in addition to gasoline.

MECA noted that EPA is currently developing the next set of exhaust and evaporative emission standards for spark-ignited engines used in non-handheld equipment. The commenter urged EPA to complete this rulemaking process as soon as possible, and harmonize emission standards for this class of engines with those standards already in place in California for Class I and Class II nonroad engines and California's 2008 exhaust emission standards for sterndrive and in-board marine engines. The commenter stated that it believes that further lowering of hydrocarbon exhaust emission standards for all of these engines can provide additional significant reductions to toxic hydrocarbon emissions across the U.S.

Letters:

Manufacturers of Emission Controls Association (MECA) OAR-2005-0036-0808
STAPPA/ALAPCO OAR-2005-0036-0836, -0378

Our Response:

Nonroad engines are not "motor vehicles" as defined in section 216(2) of the CAA, and so are not within the scope of section 202(l)(2). (See also section 216(10) defining nonroad engines as "an internal combustion engine … that is not used in a motor vehicle".) This comment is consequently beyond the scope of this proceeding.

8.2.3 Stage I Controls

What Commenters Said:

STAPPA/ALAPCO, the Florida Department of Environmental Protection, and the Illinois EPA commented that they are very concerned with regulation of mobile source air toxics emissions and encouraged EPA to consider additional measures for controlling fugitive emissions in the gasoline distribution system. The commenters urged EPA to consider making Stage I controls mandatory at gasoline stations to reduce emissions from the refueling of underground storage tanks.

Letters:
Florida Department of Environmental Protection, Bureau of Air Monitoring and Mobile Sources OAR-2005-0036-0770
Illinois Environmental Protection Agency (IL EPA) OAR-2005-0036-0830
STAPPA/ALAPCO OAR-2005-0036-0836, -0378

Our Response:

Stage I controls are pipes and hoses installed to collect and transfer vapors (which are generated during the loading of gasoline into an underground tank, or exist in the tank and are displaced out a vent to the air) back into the tank truck tank. Then, the vapors travel back to where the truck is loaded and the vapors are recovered or destroyed. Stage I vapor balance systems are used in ozone non-attainment areas to reduce volatile organic compound emissions. EPA has evaluated the use and need for Stage I vapor balance system for air toxics, including the recovered product value. EPA proposed standards (71 FR 66064, November 9, 2006) that would require that service stations in urban areas to use submerged fill pipes to reduce the amount of gasoline vapor generated during the loading of the storage tank. In the proposal, EPA specifically requested public comment on the need to require vapor balancing. Additionally, emission controls are being proposed for the other facilities that transfer and store gasoline between the refinery and end user. These controls were proposed under the authority of Clean Air Act sections 112(c)(3) and (k)(3)(B).

8.2.4 Fuel Quality

What Commenters Said:

The Alliance of Automobile Manufacturers (Alliance) commented that EPA has not addressed the role that fuel quality plays in NMHC emissions and vehicle performance. The commenter stated that due to vehicle hardware considerations coupled with the high variability in fuel quality, compliance with the proposed 20° F NMHC standard will be a greater challenge than the low temperature CO standards. The commenter stated that the high variability in winter and shoulder season gasoline volatility, and variability in gasoline parameters (e.g., RVP, T10, and T50) could drive significant hardware changes in some engine families; further; manufacturers may also find it difficult to calibrate vehicles to strict cold temperature emissions standards as a result. The commenter noted that the auto industry commented on how poor volatility increases NMHC emissions in its 1999 petition to EPA, which urged the Agency to cap the Distillation Index (DI) at 1200 and enforce a minimum T50 limit of 170°F.

The commenter stated that it believes EPA should consider regulatory action to control the variability of gasoline during the winter months and shoulder seasons impacted by the MSAT2 rulemaking. The commenter further stated that a 1200 DI cap is needed to ensure that vehicles and fuels work more effectively as a system, and also that some type of volatility control would be needed for this proposed standard. The commenter stated that it believes that increased control of cold-start toxic emissions will be difficult for some packages absent stricter gasoline volatility standards. The commenter lastly stated that additional research is needed on the proper winter fuel volatility before the proposed NMHC standard can be adopted, and there is a chance that emissions could increase rather than decrease if this is not done.

The Alliance also commented that EPA should update the fuel additive regulations under CAA section 211(l), and that controlling distillation, sulfur, and detergency should be accomplished at the federal level.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

We did not propose any changes to gasoline fuel quality other than benzene content. Although we discussed the potential for sulfur and/or RVP changes to generate reductions in MSAT emissions, we did not discuss potential changes in other fuel properties such as volatility. The commenter did not provide any information indicating that compliance with the 20° F NMHC standard cannot be attained without greater controls on gasoline volatility, nor did it provide any indication that new controls on volatility or DI would generate cost-effective reductions in MSATs. Any impacts of new controls on volatility, DI, or detergents on emissions of other pollutants or on fuel-vehicle system efficiency is outside the scope of this rulemaking.

We believe that manufacturers can design their vehicles to accommodate the variation in fuel quality for in-use fuels while still meeting the cold temperature NMHC standard in this final

rule. The commenter provided no conclusive data to the contrary. For a further discussion on this comment, see section 4.7 of this Summary and Analysis document.

8.2.5 Remote Sensing Program for "Super-emitters"

What Commenters Said:

RAPCA commented that it believes that new vehicle standards have little effect on "super-emitters" (mobile sources that are old or ill-maintained, or both) which have a disproportionate impact on the MSAT problem. The commenter stated that one of the difficulties of inspection and maintenance (I/M) programs is their patchwork application and perceived inequities. The commenter thus urged EPA to promulgate a national remote sensing program to identify and mitigate the impact of these "super-emitters."

Letters:
Regional Air Pollution Control Agency (RAPCA) OAR-2005-0036-0771

Our Response:

Although this is an interesting comment, it is essentially beyond the scope of this rulemaking. Section 202 (l) provides no authority over vehicles already on road (Sierra Club v. EPA, 325 F. 3d at 380-82), and so cannot prescribe controls over the "super-emitters" of concern to the commenter.

8.3 Other Comments

What Commenters Said:

NESCAUM commented that it does not believe that EPA has completed the analysis which was outlined in the 2001 MSAT rule (MSAT1). For improved understanding of effectiveness and costs of control strategies, the commenter believes EPA needs to consider fully all cost-effective control measures for the final rule.

Anchorage commented that though it promotes block heater use through federally-funded advertising and block heater installation, Anchorage air is significantly impacted by cold-start vehicle emissions. The commenter noted that the 2000 carbon monoxide (CO) inventory attributes as much as 43% of CO in some Anchorage neighborhoods to cold start emissions during the morning period. The commenter also noted that sampling at State and Local Air Monitoring Stations (SLAMS) in past winters shows a close correlation between benzene and CO concentrations, and that CO is a useful indicator of other products of incomplete combustion including such pollutants as 1,3-butadiene, acrolein, and polycyclic aromatic matter. Lastly, the commenter stated that occasional winter periods of poor atmospheric mixing can hinder dispersion of these emissions.

Letters:

Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

National Petrochemical Refiners Association (NPRA) OAR-2005-0036-0809

New York State Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722

NESCAUM (Northeast States for Coordinated Air Use Management) OAR-2005-0036-0993

Our Response:

With regard to comments regarding data gaps noted by EPA in the MSAT1 rulemaking, EPA has conducted extensive analyses of toxic emissions from nonroad compression and spark ignition engines to meet commitments as part of the technical analysis plan (albeit these engines would not be covered by any section 202(l) since they are not associated with "motor vehicles", as noted above). Section 2.3 of the RIA discusses recent nonroad emission test programs and plans to integrate data from these programs into the NMIM model. In addition, EPA has made substantial progress in better characterizing air toxics exposure in microenvironments, as well as the total range of exposures, and the Agency's progress in this area is discussed in Chapter 3 of the RIA. The national scale analyses conducted for the final rule use the new HAPEM6 model, which models better accounts for elevated near road exposures. In addition, EPA has comprehensively evaluated potential vehicle and fuel controls under its section 202(l)(2) authority, and the result of these analyses have been the fuel benzene and cold temperature hydrocarbon emission standards adopted in this rule. As previously noted, EPA is addressing toxic emissions from small spark ignition engines, and locomotive and marine engines under separate statutory authorities, and in the future will continue to work on finding additional strategies to further reduce mobile source air toxics.

With regard to the comment on cold start emissions in Anchorage, we note that the emission control approaches that will be used in vehicles to meet the finalized MSAT2 NMHC standards are expected to also result in reductions in CO and other products of incomplete combustion.

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