



OFFICE OF INSPECTOR GENERAL

*Catalyst for Improving the Environment*

## Evaluation Report

# EPA Needs to Improve Tracking of National Petroleum Refinery Compliance Program Progress and Impacts

Report No. 2004-P-00021

June 22, 2004



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## **Abbreviations**

CO	Carbon Monoxide
EPA	Environmental Protection Agency
FCCU	Fluidized Catalytic Cracking Unit
GAO	General Accounting Office
H <sub>2</sub> S	Hydrogen Sulfide
ICIS	Integrated Compliance Information System
LDAR	Leak Detection and Repair
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
NO <sub>x</sub>	Nitrogen Oxide
OECA	Office of Enforcement and Compliance Assurance
OIG	Office of Inspector General
OMB	Office of Management and Budget
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
PART	Program Assessment Rating Tool
SO <sub>2</sub>	Sulfur Dioxide
VOCs	Volatile Organic Compounds

**Cover photo:** Image of petroleum refinery provided by EPA staff.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

June 22, 2004

**MEMORANDUM**

**SUBJECT:** EPA Needs to Improve Tracking of National Petroleum Refinery  
Compliance Program Progress and Impacts  
Report No. 2004-P-00021

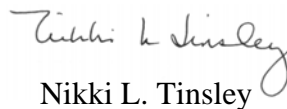
**TO:** Thomas V. Skinner  
Acting Assistant Administrator  
Office of Enforcement and Compliance Assurance

Attached is our final evaluation report regarding the Environmental Protection Agency's (EPA's) national refinery compliance program. This report contains findings that describe problems and lessons learned from the national petroleum refinery compliance program and corrective actions the Office of Inspector General (OIG) recommends. This report represents our opinion, and findings in this report do not necessarily represent the final EPA position. EPA managers will make final determinations on matters in the report in accordance with established procedures.

**Action Required**

As the Action Official, EPA Manual 2750 requires you to provide this Office with a written response within 90 days of the final report date. The response should address all recommendations. For the corrective actions planned but not completed by the response date, please describe ongoing actions and provide a timetable for completion. If you disagree with a recommendation, please provide alternative actions for addressing the findings reported. Our team would like to work with your staff in developing the corrective action plan. Please ask your staff to contact Jeff Hart, Assignment Manager, at (303) 312-6169 for arrangements.

We appreciate the efforts of EPA officials in working with us to develop this report. If you or your staff have any questions regarding this report, please contact me at (202) 566-0847 or Kwai Chan, Assistant Inspector General for Program Evaluation, at (202) 566-0827.

  
Nikki L. Tinsley



# ***Executive Summary***

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The Environmental Protection Agency's (EPA's) Office of Enforcement and Compliance Assurance (OECA) selected the petroleum refinery industry as a national enforcement priority in 1996 because refineries had the highest inspection-to-enforcement ratio of the 29 industry sectors ranked by EPA.

The 145 operating petroleum refineries in the United States span 9 of EPA's 10 regions and 33 States. Petroleum refineries account for significant releases of pollution into the environment. In 2001, refineries released over 35,000 tons of toxic air pollutants, with 75 percent released to the air, 24 percent to the water, and 1 percent to the land. These pollutants seriously impact human health and the environment, and include pollutants known or suspected to cause cancer or other serious human health effects.

## **Results in Brief**

EPA and the U.S. Department of Justice have developed and implemented an integrated refinery compliance strategy that addresses the most important noncompliance problems. EPA's national refinery compliance program began in 1996, and over the last 8 years EPA implemented a succession of tools and strategies as its refinery program evolved and as EPA identified specific compliance problems. EPA's integrated strategy includes compliance assistance, inspections, enforcement, and compliance incentives. As of March 2004, the program resulted in refineries agreeing to invest more than \$1.9 billion in pollution control technologies, pay civil penalties of \$36.8 million, and implement supplemental environmental projects valued at approximately \$25 million. Further, EPA projects the national refinery compliance program will result in annual reductions of approximately 44,000 tons of nitrogen oxide, 95,000 tons of sulfur dioxide, and significant amounts of other pollutants.

However, OECA's performance measurement and reporting approach for the national petroleum refinery program has not provided useful and reliable information necessary to effectively implement, manage, evaluate, and continuously improve program results. OECA has not established and communicated clear goals, systematically monitored refinery program progress, reported actual outcomes, or tracked progress toward achievement of consent decree goals. In addition, during consent decree implementation, EPA delays may have delayed emissions reductions and compromised compliance. OECA must resolve planning issues and delays, and begin to measure outcomes, to ensure timely emissions reductions and to optimally protect human health and the environment, especially for people living in the vicinity of refineries.

EPA learned several important lessons that it should apply throughout its refinery program and consider for other enforcement and compliance assurance programs. EPA effectively demonstrated some of these lessons learned in the refinery program, such as focusing on specific enforcement concerns, becoming knowledgeable about the industry, and encouraging EPA regional and headquarters staff to effectively work together. Other lessons learned that EPA needs to improve upon include the need to clearly communicate roles and responsibilities, meaningfully engage stakeholders throughout the process, and diligently oversee consent decree compliance.

## **Recommendations**

We made various recommendations to OECA related to the development of clear overall refinery program goals. We also made recommendations to OECA to improve refinery consent decree implementation and tracking, and to ensure better measurement and reporting of refinery program outcomes.

## **Agency Comments and OIG Evaluation**

In its April 2, 2004, comments on the draft report, OECA stated that the report will help EPA as it continues to implement the refinery program and other new programs or initiatives. OECA also stated that the report had several significant shortcomings. OECA agreed with 10 recommendations, disagreed with 5, and partially agreed with 3. We made changes to the report as we determined appropriate. We include a summary of EPA's chapter-specific comments and our evaluation of those comments at the end of each chapter. We also provide as Appendix G the Agency's memorandum summarizing its overall comments, including its comments on the recommendations. Appendix H contains our evaluation of those comments. OECA also provided us with detailed comments as an attachment to its summary memorandum. We have posted this attachment and our evaluation of OECA's comments on our web site at <http://www.epa.gov/oig/publications.htm>.

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# Preface

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## Purpose of Evaluation

Enforcement and compliance assistance practices have seen considerable innovation in recent years. The Environmental Protection Agency's (EPA's) Office of Enforcement and Compliance Assurance (OECA) adopted a problem-based approach to addressing environmental problems. This strategic approach includes: (1) giving up-front consideration to which combination of tools to use (e.g., enforcement, compliance assistance) when addressing particular environmental problems; and (2) encouraging up-front development of measures to assess progress and outcomes. According to an internal OECA evaluation, prior to using its problem-based approach, OECA implemented integrated strategies on an ad-hoc basis with limited measurable results.

The Office of Inspector General (OIG) has planned a series of environmental enforcement evaluations with the overall objective of answering the following question: *What impact have the enforcement and compliance assurance actions, activities, and policies of EPA and its partners had on the regulated community's compliance with environmental requirements and on protecting human health and the environment?* At OECA's request, we agreed to first pilot-test our overall evaluation approach on a single priority area. In consultation with OECA, we selected the petroleum refinery priority area for this pilot evaluation and developed objectives that would demonstrate the feasibility of our overall evaluation approach as well as provide meaningful insight on EPA's refinery program. Our specific objectives were to answer the following questions:

1. What is the nature and extent of the regulated petroleum refinery universe?
2. To what extent have EPA (OECA, other program offices, and EPA regions), the U.S. Department of Justice, and EPA's partners (States and Tribes) developed an integrated strategy (that considers compliance assistance, compliance incentives, inspections, and enforcement actions) to address priority noncompliance problems at petroleum refineries?
3. Does the performance measurement and reporting approach for petroleum refineries provide the information necessary to effectively implement, manage, evaluate, and improve OECA's petroleum refinery program?
4. Did EPA effectively implement and manage the petroleum refinery program?
5. What lessons can be learned from OECA's petroleum refinery program?

We address questions 1 and 2 in Chapter 1, questions 3 and 4 in Chapter 2, and question 5 in Chapter 3.

## **Scope and Methodology**

We conducted our evaluation of EPA's refinery program between June 2003 and March 2004. We performed our evaluation in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States.

Our evaluation focused on OECA's enforcement and compliance assurance activities at petroleum refineries from fiscal years 1996 through 2004. To answer our five objectives, we interviewed staff and collected and analyzed data from OECA, EPA's National Enforcement Investigations Center, EPA regions, States, industry, environmental groups, and the U.S. Department of Justice.

See Appendix A for a detailed description of our scope and methodology, including details on prior reviews.

# Chapter 1

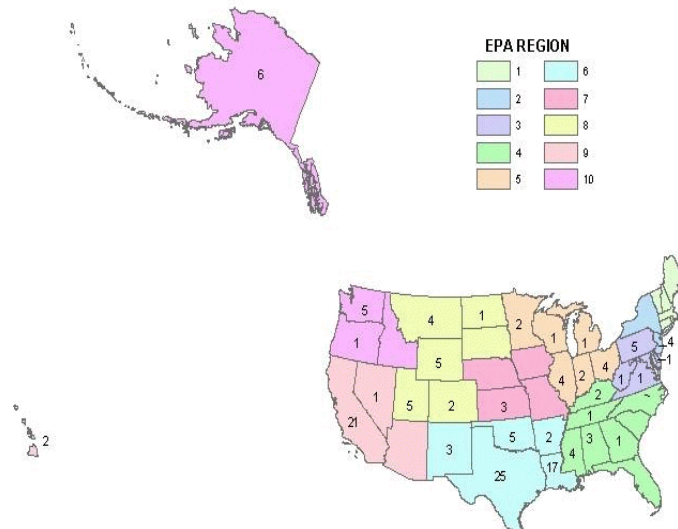
## EPA's National Refinery Compliance Program Evolved to Become Fully Integrated

EPA and the U.S. Department of Justice have developed and implemented an integrated refinery compliance strategy that addresses the most important noncompliance problems. Petroleum refineries account for significant releases of pollution into the environment. EPA's national refinery compliance program began in 1996, and over the last 8 years EPA has implemented a succession of tools and strategies as its refinery program evolved and as EPA identified specific compliance problems. EPA's integrated strategy includes compliance assistance, inspections, enforcement, and compliance incentives. As of March 2004, the program has resulted in refineries agreeing to invest more than \$1.9 billion in pollution control technologies, pay civil penalties of \$36.8 million, and implement supplemental environmental projects valued at approximately \$25 million. Further, EPA projects the national refinery compliance program will result in annual reductions of approximately 44,000 tons of nitrogen oxide (NO<sub>x</sub>), 95,000 tons of sulfur dioxide (SO<sub>2</sub>), and significant amounts of other pollutants.

### Background

Petroleum represents the single largest source of energy for the United States. Petroleum refineries span 9 of EPA's 10 regions and 33 States (there are no refineries on tribal lands). See Figure 1.1.

**Figure 1.1: Location and Number of Refineries by State and EPA Region**



*Map developed by  
EPA Region 8*

Fifty-seven corporations oversaw 145 petroleum refineries operating in those 33 States as of January 1, 2003. These refineries processed a total of 16.5 million barrels of crude oil each calendar day. See Appendix B for a complete listing of U.S. petroleum refinery companies and key information on each.

Petroleum refineries account for significant releases of pollution into the environment. The Clean Air Act, Clean Water Act, and Resource Conservation and Recovery Act regulate the majority of releases at petroleum refineries. In 2001, refineries released over 35,000 tons of toxic air pollutants according to EPA's most current Sector Facility Indexing Project data, with 75 percent released to the air, 24 percent to the water, and 1 percent to the land. In 1999, according to the most current data from EPA's AirData system, refineries released approximately 243,000 tons of NO<sub>x</sub>, 396,000 tons of SO<sub>2</sub>, and 412,000 tons of other common air pollutants (also known as "criteria air pollutants").

Petroleum refining is the physical, thermal, and chemical separation of crude oil into its major components, which are further processed into a variety of finished petroleum products. Appendix C illustrates the complexity of the petroleum refining process, potential releases and release points, and the major applicable environmental regulations. For example, according to one refinery expert, an average petroleum refinery processing 120,000 barrels of crude daily can have 100,000 connection points. Each connection point is a possible leaking emissions source. The fluidized catalytic cracking units (FCCUs) and heaters and boilers represent the largest refinery emitters. FCCUs use heat, pressure, and a catalyst to break larger hydrocarbon molecules into smaller ones. FCCUs can emit several thousand tons of NO<sub>x</sub> and SO<sub>2</sub> per year.

Petroleum refinery emissions seriously impact human health and the environment. In 2000, OECA reported that 45 percent of all refineries at that time were within 3 miles of population centers containing 25,000 or more people, and 26 percent were within 3 miles of population centers containing 50,000 or more people. Appendix D provides a summary of the human health and environmental effects of the following common air pollutants released at refineries: volatile organic compounds (VOCs); SO<sub>2</sub>; NO<sub>x</sub>; particulate matter (PM); carbon monoxide (CO); hydrogen sulfide (H<sub>2</sub>S); and toxic air pollutants. Toxic air pollutants include pollutants known or suspected to cause cancer or other serious human health effects.

## **Refinery Program Uses an Integrated Strategy**

OECA's current refinery program incorporates various tools and strategies as part of an integrated effort to address the most important compliance problems. Using research, investigations, and national EPA experts, EPA identified four priority areas that addressed the most important noncompliance areas in the industry.

EPA also used compliance assistance and incentives to educate the industry and address noncompliance.

### ***Identifying Priority Areas***

During the initial stages of the program, OECA and regional officials used multiple sources of information to identify refinery priority areas. These sources included inspections, formal EPA information requests to refineries, and industry trade journals. OECA and regional officials shared with each other the results of these initial research efforts and began to focus (or target) investigations on the noncompliance areas indicated by their research. EPA's national experts continued gaining experience regarding compliance issues within the refinery industry, and helped select the four Clean Air Act priority areas that became the refinery program's focal point. State, refinery industry, and environmental interest groups generally agreed that these four priority areas represented the most important noncompliance problems at petroleum refineries:

1. New Source Review (NSR) / Prevention of Significant Deterioration (PSD)
2. Flaring / New Source Performance Standards (NSPS)<sup>1</sup>
3. Leak Detection and Repair (LDAR)
4. Benzene Waste National Emissions Standards for Hazardous Air Pollutants (NESHAP)

Figure 1.2 briefly describes the primary problems, related regulations, and solutions EPA and the refineries agreed to implement for each priority area. The agreement between EPA and refiners resulted in consent decrees that primarily focused on these four priority areas.

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<sup>1</sup> The refinery program addressed two different flaring programs: the elimination of acid gas flaring; and the reduction of hydrocarbon flaring. The NSPS priority focused on ensuring that companies complied with NSPS at their recovery plants, flares, and fuel gas combustion devices.

**Figure 1.2: Problems, Related Regulations, and Solutions for Priority Areas**

**Flaring/NSPS**

**Problem:** Refineries used flares for routine purposes instead of only to vent dangerous gases as required by the Clean Air Act. Also, EPA identified problems with NSPS compliance at sulfur recovery plants and fuel gas combustion devices.

**Regulation:** CAA Section 111. 40 CFR Part 60, Subparts A and J.

**Solution:** Consent decrees require facilities to: identify root causes of each flaring incident; implement plans to address root causes such as installing new equipment, revising operating procedures, or providing training; comply at all times for all sulfur recovery units within the plant; install new sulfur recovery units and tail gas controls devices to ensure compliance with emissions standards and good air pollution control practice obligations.



**LDAR**

**Problem:** EPA found that fugitive emissions, or refinery leaks, were two to ten times higher than reported by the facility. If uncorrected, facilities continued to release fugitive emissions of VOCs and other hazardous air pollutants. The cumulative effect of fugitive emissions posed significant health and environmental risks.

**Regulation:** CAA Section 112. 40 CFR Part 61, Subpart J; Part 63, Subparts H and CC; and Part 60 Subparts VV, GGG, and QQQ.

**Solution:** Consent decrees require facilities to identify VOC leaks at an earlier stage than that required by regulations and make repairs before emissions become significant. Other solutions include more frequent monitoring, lower leak rate goals refinery-wide, and use of innovative monitoring technologies for monitoring VOCs. As an "enhanced" program, the LDAR program includes requirements that bring a company beyond compliance with applicable regulations.

**NSR/PSD**

**Problem:** Relatively few refineries obtained pre-construction and operating permits for physical construction that increased their capacity and emissions. Capacity increases and modifications should have triggered NSR permitting and pollution control requirements. Investigations focused on physical modifications to FCCUs.

**Regulation:** Parts C and D of Subchapter I of CAA. 40 CFR Parts 51 and 52.

**Solution:** Consent decrees require petroleum refineries to install continuous emissions monitoring equipment so that facilities, EPA, and States can access real-time emissions data. More importantly, consent decrees also require facilities to install and implement a suite of controls to reduce NO<sub>x</sub>, SO<sub>2</sub>, and PM emissions.



**Benzene Waste/NESHAP**

**Problem:** Investigations showed that refineries did not account for or control benzene in all waste streams (e.g., groundwater and process sewers). Short-term exposure to benzene can cause temporary nervous system disorders, immune system depression, and anemia, while long-term exposure can cause chromosome aberrations and cancer.

**Regulation:** CAA Section 112 (d). 40 CFR Part 61, Subpart FF.

**Solution:** Consent decrees require increased monitoring, regular laboratory and program audits, quarterly benzene balances, and replacement of carbon emission filters as soon as monitoring detects any benzene emissions above background levels. As an "enhanced" program, the benzene waste/NESHAP priority includes requirements that bring a company beyond compliance with applicable regulations.

## **Compliance Assistance and Incentives Provided in Various Forms**

OECA conducted various compliance assistance and incentive activities including:

- Making presentations at industry conferences describing noncompliance issues.
- Developing and disseminating *Enforcement Alert* newsletters on each of the four refinery priority areas.
- Developing two compliance assistance guidance documents; one to help increase understanding of the Refining Maximum Achievable Control Technology Standard, and another to improve understanding of regulations covering benzene waste and transfer operations.
- Developing the slotted guidepole initiative that provided a compliance incentive for refinery companies to install controls within specific time frames to address emissions from petroleum storage tanks. If companies complied with their schedules for installing acceptable controls, EPA would eliminate penalties.

### **Definition of Compliance Assistance**

Activities, tools, or technical assistance that help the regulated community understand and comply with environmental regulations or help other compliance assistance providers aid the regulated community.

### **Definition of Compliance Incentive**

Policies and programs that eliminate, reduce, or waive penalties under certain conditions.

## **Four Basic Phases Noted in National Refinery Compliance Program**

EPA's national refinery compliance program began in 1996 and evolved as EPA learned more about the noncompliance issues and applied a variety of tools and strategies to address those issues. While OECA did not specifically outline a phased program or develop a comprehensive master plan, in reviewing the strategy, it appeared that four phases emerged. We used these phases to facilitate our description of the refinery program. In many instances, activities overlapped as one phase continued while a new phase began. Appendix E provides a detailed time line of the refinery program's evolution.

### **Phase I: Refineries Become a National Enforcement Priority**

EPA had long conducted inspections and taken enforcement actions in the refinery industry. OECA began to focus significant attention on refinery compliance concerns in 1996 when refineries became an enforcement priority due to the industry's high rate of noncompliance and pollutant releases. OECA reported in 1996 that the refining sector had the highest inspection-to-enforcement ratio of the 29 industry sectors ranked by EPA. In 1996, when compared to 496 other sectors, OECA ranked refineries number one for releases of VOCs, number two for SO<sub>2</sub>, number three for NO<sub>2</sub> (a particular type of NO<sub>x</sub>), number four for PM<sub>10</sub>.

(a particular type of PM), and number five for CO releases. In its 1996/1997 Memorandum of Agreement guidance, OECA ranked petroleum refineries number one for noncompliance and identified petroleum refining as one of three national enforcement priorities. The Memorandum of Agreement guidance generally sets forth the Agency's enforcement and compliance assurance priorities and activities for a 2-year period. Designation as an OECA enforcement priority meant that an industry received special emphasis. OECA maintained refineries as a national priority and began working with regional officials to explore ways to address compliance issues.

### ***Phase II: Program Uses Investigations to Identify Significant Compliance Problems***

Although EPA identified refineries as a national priority, OECA officials said they did not see significant improvement in the regional approach to addressing compliance issues during 1996 and 1997. According to a senior OECA official, after 2 years of typical regional inspections of the refinery industry, the inspections did not identify significant national problems. However, OECA obtained anecdotal information from OECA's National Enforcement Investigations Center and regional investigations regarding problems at refineries. OECA determined that it needed a more comprehensive approach to help assess the extent of compliance problems identified in a few regions. OECA began coordinating with the National Enforcement Investigations Center and regional staff who were developing expertise regarding compliance issues at refineries. The anecdotal information caused OECA to shift its focus from routine Clean Air Act inspections that broadly assessed refinery compliance using checklists, to more targeted, resource-intensive investigations. These investigations focused on assessing emissions released from certain industrial processes as opposed to compliance with specific statutory requirements, and identified problems not found during typical inspections. OECA officials stated that this phase of the refinery program was extremely successful at developing new targeting and investigative tools.

### ***Phase III: Program Shifts to Pursue Global Settlements***

In 2000, OECA shifted the refinery program focus to pursue voluntary global settlements with refinery companies that resulted in consent decrees.<sup>2</sup> OECA and regional officials coordinated with the U.S. Department of Justice who took the lead on all of the global settlement negotiations. OECA referred to these settlements as "global" because they applied to all facilities owned by one company. OECA's approach presented corporate officials with the option of avoiding possible investigation and litigation. OECA's strategy included

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<sup>2</sup> OECA found success with global settlements in other industries. However, OECA officials stated that their prior experience related to a much narrower set of issues and on a much smaller scale than what they achieved under the national refinery compliance program.



coordinating with interested States and local authorities. States that signed consent decrees had their own legal claims against the settling refineries and received a share of the penalties paid by companies. Along with EPA and the U.S. Department of Justice, 18 States or local authorities have signed consent decrees as of May 21, 2004. Beginning in 2002, OECA began to shift its emphasis from pursuing new negotiations to concluding on-going investigations and negotiations, since over 80 percent of the domestic refining capacity universe had entered into global consent decrees, was in negotiations with EPA, and/or was under active investigation. As part of the shift in emphasis, OECA planned for regions and States to assume larger roles with new investigations and negotiations.

#### ***Phase IV: Consent Decree Implementation Initiated***

Implementation of refinery consent decrees began a new and additional phase. The first two consent decrees entered the implementation phase in early 2001. The consent decrees span 8 to 10 years and require coordination and communication among OECA, EPA regions, States, and industry. While the signing of a consent decree ends the settlement process for that company, it begins a new process of oversight and interaction by and between the parties. As of 2004, OECA continues to conduct negotiations, assist regions in assuming a larger role with the refinery program, and work with refiners to implement consent decrees.

### **Settlements Projected to Result in Significant Emissions Reductions**

By March 2004, OECA had entered into 11 global settlements or consent decrees covering 42 of the 145 refineries. As shown in Table 1.1 below, the settlements covered 39 percent of total U.S. petroleum refining capacity.<sup>3</sup>

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<sup>3</sup> Table 1.1 represents the settlements on the date of their entry by the Court. Since that date, companies may have sold some of their refineries and, while those refineries remain subject to the global settlements, they may be owned by separate refining entities. Consequently, this table may not easily reconcile with the information in Appendix B.

**Table 1.1: Refinery Companies in Global Settlements**

Company	Date Company Signed Settlement with OECA	Number of Refineries	Production Capacity (barrels per cal. day)	Total U.S. Production Capacity
Koch Petroleum Group	December 2000	2	524,980	3%
BP Exploration and Oil, Co.	January 2001	8	1,501,500	9%
Motiva Enterprises LLC/ Equilon Enterprises/Deer Park Refining (Shell)	March 2001	9	1,682,150	10%
Marathon Ashland Petroleum LLC	May 2001	7	935,000	6%
Navajo Refining Company and Montana Refining Company	December 2001	2	65,000	0.4%
Conoco, Inc.	December 2001	4	566,000	3.4%
Lion Oil	March 2003	1	63,000	0.3%
Chevron USA Inc.	October 2003	5	909,000	5.5%
CHS Inc. (Cenex)	October 2003	1	55,000	0.4%
Coastal Eagle Point Oil Co.	October 2003	1	142,287	0.9%
Ergon Refining Inc.	October 2003	2	42,400	0.3%
<b>Total Refineries under Decrees (Listed Above)</b>		<b>42</b>	<b>6,486,317</b>	<b>39%</b>
<b>Total Refineries Not under Decrees</b>		<b>103</b>	<b>10,271,053</b>	<b>61%</b>
<b>TOTALS</b>		<b>145</b>	<b>16,757,370</b>	<b>100%</b>

Based on settling companies' estimates, once companies fully implement the consent decrees, they will achieve annual reductions of atmospheric emissions of approximately 44,000 tons of NO<sub>x</sub> and 95,000 tons of SO<sub>2</sub>, as well as reductions in benzene, VOCs, and PM. The settling companies agreed to invest more than \$1.9 billion in pollution control technologies and pay civil penalties of \$36.8 million (OECA based penalties on violations related to the four priority areas). These refineries also agreed to implement supplemental environmental projects valued at approximately \$25 million.

A key aspect of OECA's global settlements with refinery companies included EPA's "release" or "covenant not-to-sue." As part of the consent decrees, EPA provided companies a release from liability for any past regulatory violations (those that pre-dated the consent decree) associated with the four priority areas.<sup>4</sup>

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<sup>4</sup> In legal terms, OECA officials stated that, under the consent decrees, a company typically receives a covenant not-to-sue. The covenant not-to-sue directly related to the scope of injunctive relief. Where a company agreed to implement a comprehensive program of injunctive relief that will bring it beyond compliance with all aspects of the NSPS and benzene leak detection regulations, EPA and the U.S. Department of Justice extended a covenant not-to-sue regarding all aspects of that company's pre-consent decree compliance with those regulations. In contrast, under a consent decree, a company receives a covenant not-to-sue for NSR/PSD and NSPS for *only* those emission units specifically addressed by the consent decree.

The global settlements also relieved OECA from having to conduct resource-intensive investigations at each refinery a company owned. According to OECA, a refinery-by-refinery, issue-by-issue approach, in which EPA conducted an individual inspection or investigation at each and every refinery followed by information requests, notices of violation, negotiations and/or litigation, could take many years and require resources beyond EPA’s means.

The refinery consent decrees require each company to take various actions over the next several years. These actions include implementing air pollution controls as well as developing policies and procedures that go beyond compliance with existing regulations. As shown in Table 1.2, both the LDAR and benzene priority areas require companies to incorporate “enhanced” practices beyond regulatory requirements. In addition, OECA and the companies agreed to test and use innovative technologies.

**Table 1.2: Examples of Consent Decree Requirements**

Priority Area	Requirements in Consent Decrees
NSR/PSD	<ul style="list-style-type: none"> <li>• Install controls and Continuous Emissions Monitoring Systems to reduce and measure SO<sub>2</sub>, NO<sub>x</sub>, PM, and CO from FCCUs, heaters, and boilers.</li> </ul>
Flaring/NSPS	<ul style="list-style-type: none"> <li>• Implement program to investigate the cause of flaring incidents.</li> <li>• Conduct root cause analyses and take corrective actions.</li> <li>• Requires NSPS compliance at refinery’s flares, sulfur recovery plants, and fuel gas combustion devices.</li> <li>• Install new sulfur recovery units and tail gas control devices to ensure compliance with emissions standards and good air pollution control practices.</li> </ul>
LDAR	<ul style="list-style-type: none"> <li>• Implement enhanced monitoring program.</li> <li>• Train all refinery LDAR personnel annually.</li> <li>• Train all other refinery operations and maintenance personnel on aspects of LDAR relevant to the employee’s duties.</li> <li>• Monitor valves more frequently than regulations require.</li> </ul>
Benzene	<ul style="list-style-type: none"> <li>• Train all employees who draw benzene waste samples.</li> <li>• Establish standard operating procedures for all control equipment used to comply with the benzene waste NESHAP.</li> <li>• Train all equipment operators on procedures.</li> <li>• Audit all laboratories that perform analyses of benzene waste NESHAP samples.</li> </ul>

## Conclusion

EPA and its partners developed and implemented an integrated strategy that included compliance assistance, compliance incentives, inspections, and enforcement actions. EPA staff implemented a succession of tools and strategies as the program evolved. OECA’s integrated strategy addresses the most important noncompliance problems at petroleum refineries. A significant phase and turning

point in the refinery program's evolution came with the negotiation of voluntary global settlements. These settlements resulted in consent decrees between OECA and refinery companies owning multiple facilities.

## **Agency Comments and OIG Evaluation**

OECA stated that the background discussion in this chapter was vague and, at times, did not demonstrate an understanding of the refinery program. OECA stated that the background information implied that they directed the refinery program at all pollutants from refineries. In our opinion, the background information in this chapter provides a broad overview of the refinery industry, including some of the major processes, releases, and health and environmental impacts caused by refining. It describes the refinery industry as a whole and puts in perspective why EPA decided to monitor and address noncompliance within this industry. This chapter also describes how the refinery program focuses on four priority areas under the Clean Air Act and how the refinery program could reduce specific pollutants through companies' effectively implementing consent decrees.

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## **Chapter 2**

# **EPA Has Not Yet Demonstrated Environmental and Human Health Impacts of the Refinery Program**

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OECA's performance measurement and reporting approach for the national petroleum refinery program has not provided useful and reliable information necessary to effectively implement, manage, evaluate, and continuously improve program implementation and results. OECA has not established and communicated clear goals, systematically monitored refinery program progress, reported actual outcomes, or tracked progress toward achievement of consent decree goals. In addition, during consent decree implementation, EPA delays may have delayed emissions reductions and compromised compliance. OECA must resolve planning issues and delays, and begin to measure outcomes to ensure timely emissions reductions and to optimally protect human health and the environment, especially for people living in the vicinity of refineries.

### **Program Lacked Clear Goals, Performance Measurement, and Outcome Reporting**

OECA has not established clear program goals, performance measures, or a reporting system to track progress. Clear goals, performance measures, and a reporting system are essential to ensure that program managers have a systematic approach for gathering performance information for effective decision making. OECA has not clearly and precisely defined official program goals, used performance measures to manage the refinery program, or reported actual environmental outcomes.

#### ***Clear Goals, Performance Measures, and Reporting Essential***

Clear program goals, performance measures, and a reporting system to track progress are all essential to effectively implement, manage, evaluate, and improve any program. Government programs need a systematic approach for gathering performance data and reporting progress toward goals to ensure that program managers and Congress have performance information for decision making.

The Office of Management and Budget's (OMB's) fiscal 2004 budget proposal for EPA stated that one of EPA's top two challenges included, "Tracking and demonstrating programs' effectiveness in achieving public health and ecosystem protection goals." To help improve program and funding decisions, OMB evaluated 11 EPA programs, including the civil enforcement program (which includes the refinery program), using OMB's Program Assessment Rating Tool (PART). OMB developed the PART to provide a consistent approach to

evaluating Federal programs during budget formulation. OMB found that the absence of outcome-based performance data and, in some cases, any data, hindered the Agency in evaluating the impacts of its programs on the environment and public health. OMB recommended that EPA establish performance measures focused on outcomes and efficiencies.

EPA agreed on the need to focus on program results and to use such data in decision-making, but EPA appealed OMB's PART evaluation results. The Deputy EPA Administrator said in a November 6, 2002, memo that, "One of my goals as we implement the President's Management Agenda is to ... continuously improve the results orientation of our programs and inform our decision-making with high-quality information on program performance." However, the Deputy Administrator also concluded that the PART instrument and process needed dramatic overhaul to have any real value.<sup>5</sup>

EPA faces a challenge in the next few years to improve the linkage between its program results and budget resources, which includes developing program measures. We found OMB's findings and observations concerning EPA's civil enforcement program generally consistent with what we specifically found concerning the refinery program.

In fiscal 2004, OECA began moving toward a more performance-based approach to program management as described in its December 18, 2002, *Recommendations for Improving OECA Planning, Priority Setting, and Performance Measurement*. The Assistant Administrator for OECA decided that OECA should develop a performance-based approach for national priorities such as the refinery program. OECA's *Recommendations* document stated that strategies "... should always include ... a goal or set of goals and performance measures that allow progress to be assessed..." and "these elements should be in place before the implementation period ... begins."

### ***Program Goals Not Clearly Defined***

OECA has not clearly and precisely defined official program goals, or ensured that everyone working on the refinery program in EPA headquarters and regional offices and State offices have the same understanding of the goals. Different OECA officials referred to different goals and measures for the refinery program at different times. Table 2.1 summarizes various goals we identified for OECA's refinery program.

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<sup>5</sup> We did not assess the PART tool or OMB's application of the tool.

**Table 2.1: Various Refinery Program Goals**

Goal	Source
<ul style="list-style-type: none"> <li>Develop innovative approaches to achieve increased compliance within the industry sector priorities</li> </ul>	Fiscal Year 1996/1997 OECA Memorandum of Agreement guidance (National Priority Sector)
<ul style="list-style-type: none"> <li>Reduce emissions from refineries</li> <li>Bring the refineries into long-term compliance (with the issues investigated)</li> <li>Ensure more consistent interpretations and enforcement of regulations</li> </ul>	Fiscal Year 1998 OECA Accomplishments Report (Refinery Strategy)
<ul style="list-style-type: none"> <li>Obtain significantly reduced emissions/ discharges/releases by 20 percent</li> <li>Obtain substantially improved compliance rates by 50 percent</li> </ul>	OECA National Sector Strategies document - not dated (National Sector Strategy)
<ul style="list-style-type: none"> <li>Significantly improve the industry compliance rate and reduce the total emissions that resulted from noncompliance</li> </ul>	Fiscal Year 2001 OECA Accomplishments Report (Refinery Strategy)
<ul style="list-style-type: none"> <li>Address 100 percent of refineries either through consent decrees or other enforcement actions</li> </ul>	2003 and 2004 interviews with senior OECA managers

OECA managers and staff did not agree on program goals. Throughout our evaluation, they cited multiple goals listed in Table 2.1, and did not formally assess their progress toward meeting any of these goals. For example:

- OECA officials said Memorandum of Agreement documentation served as updates to the strategy. However, during our field work, OECA officials said that either the Memorandum of Agreement documents contained inaccurate information or that they were not familiar with that information.
- While some managers stated that the 50-percent and 20-percent goals were the official program goals, other OECA managers disagreed.
- While some managers stated that EPA had met the 50-percent and 20-percent goals, officials could not provide specific data to support their conclusion.

Two OECA senior executives told us that establishing and tracking an overall program goal for the refinery program, or any other program, would require additional resources. Both said that it was more important to use their limited resources to take additional enforcement actions (e.g., seek additional consent decrees) than it was to measure progress toward program goals. We believe that without clear and well-defined program goals, it was difficult for OECA to identify appropriate performance measures and track progress.

### ***Performance Measures Not Used to Manage Program***

Although OECA developed some performance measures, it has not used them to manage the refinery program. For example, while one early OECA strategy document included nine goal areas and more than 50 separate output or activity measures, OECA did not track or communicate progress toward these goals. Performance information should feed back into the management of the refinery program, but OECA could not take advantage of such feedback because OECA lacked a formal system for capturing this information. OECA agreed and intends to use appropriate performance measures and outcomes as part of the fiscal 2005 priority planning process.

In lieu of performance measures to manage the program, OECA officials held national meetings and scheduled monthly conference calls with regional staff to review program progress and discuss regional commitments to support the strategy. In addition, OECA and regional staff formed issue-specific work groups to develop investigative tools, discuss issues, and devise solutions. Senior OECA officials stated that they also tracked program-related activities through regular telephone and electronic mail communications and “status of activities” charts. However, an OECA official acknowledged that OECA had not tracked or disseminated data for most of the activity or output measures OECA established.

### ***Reporting Systems Not Focused on Environmental Outcomes***

Refinery program reporting focused on projected rather than actual environmental outcomes. OECA reported program results in two ways:

- **Press Releases.** OECA used press releases to communicate the signing of consent decrees to the public. Press releases reported the projected emissions reductions at full implementation of consent decrees (consent decrees lasted 8 to 10 years) and the dollars companies agreed to pay in penalties as a result of consent decrees. OECA management did not plan to issue press releases or other reports to the public detailing the actual measured outcomes of consent decree implementation because OECA management did not believe the press would be interested.
- **Reporting to Congress.** EPA used the Integrated Compliance Information System (ICIS) to report EPA enforcement program results to Congress under the Government Performance and Results Act. For refinery consent decrees, OECA input data into ICIS representing (1) the projected annual emissions reductions that would be realized once implementation was complete, (2) the dollar amount of penalties generated, and (3) the dollar value of required supplemental environmental projects. According to OECA, ICIS reporting was not designed to capture, and did not capture, information about environmental outcomes from the consent decrees, such as demonstrated environmental and human health benefits.



EPA used three systems to collect information on consent decree implementation:

- Company data collection through consent decree reports.
- Monthly conference calls between EPA managers and staff working on consent decree implementation (described above).
- Contractor-developed consent decree tracking system (described in detail later in this chapter).

However, EPA did not use these systems to demonstrate progress toward meeting consent decree goals. Consent decrees required companies to provide quarterly reports that included actual emissions data related to NSR and PSD issues – the most significant sources of refinery emissions reductions in consent decrees. OECA used the information to set some emissions limits that consent decrees did not specify. However, OECA did not use this information to monitor, verify, or report progress toward achieving consent decree goals.

## **OECA Has Not Tracked Progress Toward Consent Decree Goals**

OECA should closely and regularly track actual emissions reductions and progress toward consent decree goals for three reasons: (1) refineries have a history of noncompliance (described in Chapter 1); (2) refineries emit toxic chemicals that affect human health and the environment (see Appendix D); and (3) some information used to develop consent decree emissions limits were based on estimates – facility estimates, pollution control equipment estimates, or both.

OECA officials do not plan to regularly verify or monitor actual refinery emissions. A national OECA refinery expert said OECA would use emissions data to assess progress at 4 years into consent decrees and at the conclusion of the decrees. However, two monitoring events over 8 years will not provide OECA with information about company or overall refinery program progress toward predicted emissions reductions, and would limit OECA's ability to modify and improve existing consent decrees or ongoing negotiations.

Through consent decrees, EPA sets compliance schedules and emissions reduction goals for companies. OECA officials said company self-certification processes assured them that companies remained on their compliance schedules. Consent decrees require companies to demonstrate that they reach emissions reductions goals by the fourth year of consent decree implementation. However, during our evaluation, EPA could not demonstrate progress toward meeting emissions reductions goals in any priority area, as shown in Table 2.2, because EPA did not analyze information about company progress toward emissions reductions. Table 2.2 shows compliance status as “on a compliance schedule per consent decree requirements” and emissions status as “currently unknown” because OECA lacked data that demonstrated compliance or emissions status at the time of our evaluation.

**Table 2.2: Current Status of Compliance and Emissions Reductions in the Priority Areas**

Priority Area	Current Compliance Status	Progress Toward Emissions Reductions	Potential Measurement Data/Sources	Issues Associated with Measures
NSR/PSD	On a compliance schedule per consent decree requirements	Currently unknown	Monitoring data reported to OECA on a quarterly basis; 4- and 8-year assessments	OECA is not assessing emissions reductions in this area on an ongoing basis. OECA could use actual monitoring data to establish limits and analyze catalyst tests, but companies need not demonstrate emissions reductions until the fourth year of a consent decree.
Flaring/ NSPS	Reaching compliance	Currently unknown; although National technical lead for flaring documented a decline in flaring events from 1998 through early 2004.	Flaring Root Cause Analyses	Companies do not measure the constituents of flare emissions. Companies provide OECA root cause analysis reports for each flaring incident that OECA can then use to measure the number of flaring incidents. From the reports, OECA can estimate the pollution resulting from the flaring event.
LDAR	On a compliance schedule per consent decree requirements	Currently unknown	State Inspections, company monitoring data, AP-42 <sup>6</sup> and other estimated data	Many States were not advised to track the area and others were not tracking due to implementation delays. OECA must rely on company-developed sampling and monitoring plans, and 4-year company-supplied audits.
Benzene				

OECA indicated that OECA and States share responsibility for ensuring consent decree implementation and verifying refinery emissions. However, an OECA executive acknowledged that headquarters had not provided guidance to States or EPA regions indicating that inspections should take the four priority noncompliance areas into account. EPA and State staff did not generally include the priority noncompliance areas in typical Clean Air Act inspections. These factors left little assurance that EPA or States would verify self-reported company progress under consent decrees.

### **Late and Absent EPA Responses to Consent Decree Documents May Have Delayed Program Outcomes**

Refinery program outcomes will depend on successful consent decree implementation. Late and absent EPA responses to company consent decree documents may have delayed company implementation of projects designed to reduce emissions and compromised compliance. EPA delays developed as soon

<sup>6</sup> AP-42 estimates are emission factors used to estimate emissions from a source when more reliable emissions data are not available. The emission factors used to develop AP-42 estimates are known to have limited accuracy.

as the implementation phase began, and persisted because OECA did not effectively plan how it would manage and monitor consent decree implementation. OECA took steps that reduced but did not eliminate the delays, and did not take steps to address the delays in a timely fashion.

***Program Outcomes Depend on Implementation***

OECA needs to accurately track hundreds of consent decree milestones to ensure that companies comply with consent decree requirements and that expected emissions reductions actually occur. Appendix F provides a detailed flow chart of the consent decree process. As depicted in the flow chart, after a company signs a consent decree and the court enters the decree, the implementation phase of the consent decree begins. After any necessary EPA review and approval, the company is expected to take the required actions that should result in reduced emissions and improved environmental conditions.

OECA's plan for monitoring consent decree implementation called for EPA's written responses to the hundreds of refinery documents and reports required by the consent decrees. Table 2.3 shows the types of company reports required by consent decrees and identifies those reports requiring EPA responses.

**Table 2.3: Examples of Consent Decree-required Company Reports and Required EPA Responses**

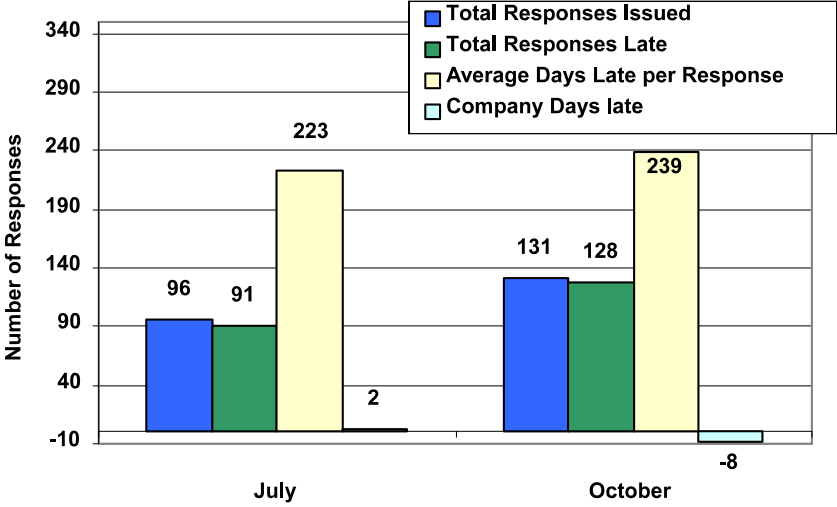
Priority Area(s)	Type of Company Report Required	EPA Response Required?
NSR/PSD	Reports on intended design of major pollution control equipment	Yes
	Reports on testing and optimizing pollution controls	
Flaring/ NSPS	Root cause analysis reports for illegal acid gas flaring incidents	Yes
Flaring/ NSPS and any other violations	Stipulated penalties for consent decree violations (particularly flaring)	Yes
Benzene	Reports on implementing pollution abatement procedures and policies	Yes
	Sampling reports	No
LDAR/ Benzene	Audit reports	No
All	Progress reports and quarterly reports	No

***Late EPA Responses Delayed Implementation Activities and Compromised Compliance***

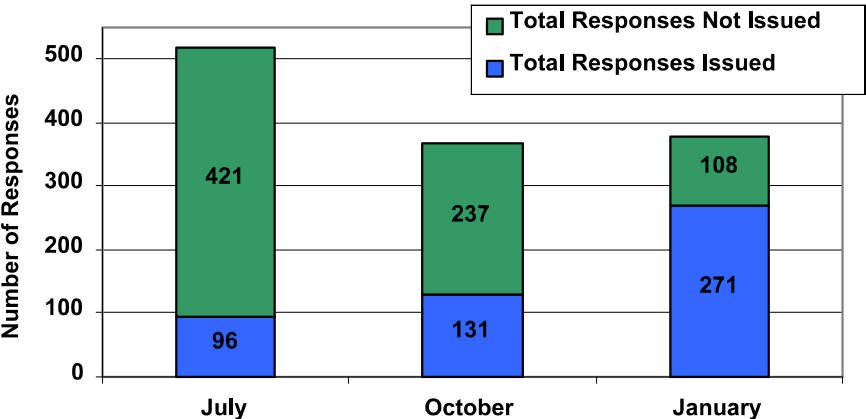
We found that EPA issues the majority of its responses either late or not at all. Late and absent EPA responses delayed company implementation of projects

designed to reduce emissions and compromised company compliance with consent decrees. Figure 2.1 shows the timeliness of responses EPA issued and reports provided by companies (these data were only available for July and October 2003). Figure 2.2 shows the number of required EPA responses and the number of responses EPA issued for July 2003, October 2003, and January 2004.

**Figure 2.1: Timeliness of EPA Responses and Company Reports Mandated by Consent Decrees for July 2003 and October 2003**



**Figure 2.2: Number of EPA Responses Issued Compared with Number of EPA Responses Not Issued per Consent Decree Requirements in July 2003, October 2003, and January 2004**

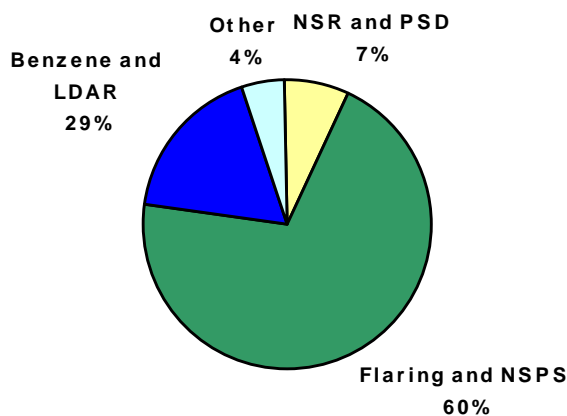


We reviewed information from nine consent decrees well into implementation to determine the extent and potential impacts of EPA response delays. We reviewed information as of July 2003, October 2003, and January 2004. On average, the consent decrees in our analysis required companies to submit a total of 2,191 reports (or 243 reports per company) requiring 421 EPA responses (or approximately 47 responses per company) over the 8-year terms of their consent decrees.

On average, late EPA responses delayed consent decree implementation by nearly 8 months between July 2003 and January 2004. In some cases, companies proceeded with consent decree actions while awaiting EPA approval. In other cases, companies awaited EPA responses before taking actions. OECA management said they kept abreast of implementation activities through regular conference calls with consent decree implementers.

Figure 2.3 demonstrates that most late and absent EPA responses related to flaring/NSPS incidents (60 percent) and benzene handling or LDAR requirements (29 percent).

**Figure 2.3: Required EPA Responses by Priority Area**



To date, consent decree implementation is not complete and we did not discover any instances where response delays affected emissions reductions during the course of our evaluation. However, regional staff, State staff, and refinery company staff told us that EPA response delays might affect some company actions under consent decrees. For example:

- **Acid Gas Flaring:** In one consent decree, as of January 2004, EPA responded to 22 of 23 acid gas flaring reports an average of 273 days (9 months) late. OECA staff acknowledged that problems could arise if EPA did not respond to a company's acid gas flaring root cause analysis report. If a company did not correctly identify a root cause and EPA did

not respond in a timely fashion, companies might take inadequate corrective actions, and unnecessary emissions may have resulted.

- **NO<sub>x</sub> Control:** One EPA consent decree press release stated that the decree would reduce the company's NO<sub>x</sub> and SO<sub>2</sub> emissions by 50,000 tons each year. As of January 2004, EPA issued its response to 5 of 13 NO<sub>x</sub> control plans. For the three responses EPA issued that listed a company report date, EPA waited approximately 174 days (about 6 months) between receiving the company report and issuing a response. As of January 14, 2004 (the date we last received the data), EPA had not approved the company's eight other plans. As a result, EPA had waited at least 478 days (approximately 16 months) between receiving the company reports and responding to them. These delays could have resulted in continued emissions of tons of NO<sub>x</sub> to the surrounding community.

Late and absent EPA responses may have compromised company compliance with consent decrees. EPA company leads said that, in most cases, companies continued along their implementation schedules even if OECA did not issue required responses to reports. In other cases, companies may have awaited EPA responses before taking consent decree actions. Delays in EPA responses caused one company to express concerns about remaining in compliance. The company questioned its compliance status in a July 31, 2003, quarterly report to EPA stating: "It is critical that [the company] receive responses from the EPA . . . to ensure compliance [with] . . . the consent decree . . . [The company] is still awaiting EPA's comments."

### ***Tracking Problems Developed and Persisted***

Delays developed as soon as the implementation phase began and companies began submitting reports to EPA. EPA responded late to refinery documents and reports 95 percent of the time as of July 2003, and 98 percent as of October 2003. Because OECA eliminated tracking for due dates between October 2003 and January 2004, we could not determine timeliness for company reports or EPA responses after October 2003.

OECA quickly found that it did not have the resources to efficiently address all of the company reports arriving at EPA headquarters, particularly since several consent decrees had similar implementation schedules. In the face of the growing document delays, OECA introduced an implementation plan and hired a contractor to help with implementation tracking in January 2002. The implementation plan outlined responsibilities for EPA headquarters, regional staff, national technical leads, company leads, and external contractors, as shown in Table 2.4.

**Table 2.4: Key Roles and Responsibilities for Consent Decree Implementation**

Actor	Role/Responsibilities
EPA Company Lead (1 Lead per consent decree)	Each consent decree has a lead staff member who ensures timely review of deliverables and implementation of all consent decree requirements.
EPA National Expert (4 National Experts)	Each priority area covered by consent decree has a national expert (also known as national technical lead) who ensures national consistency across all refinery consent decrees. EPA national experts also provide support to regional staff on specific priority areas.
EPA Regional Staff (number of staff varies by region)	Regional staff responsible for consent decree implementation review all company submissions directly involving their priority area and/or refinery, recommend any necessary action, and coordinate with affected States as appropriate.
Contractor	Tracking contractor tracks consent decree deliverables and EPA's responses to deliverables. A separate analysis contractor provides support in evaluating control technology performance and setting appropriate emissions limits under NSR/PSD regulations.
OECA	OECA's Air Enforcement Division makes determinations, issues approvals, transmits comments, establishes emissions limits, and assesses stipulated penalties based on consultations with appropriate company leads, national experts, and regional staff.

The contractor developed an archive, a list of required deliverables, and a document tracking system in close coordination with the EPA company leads by late 2002. Meanwhile, the delays had grown as national technical leads attempted to approve each individual EPA response, and OECA reported that its success with obtaining settlements in the refinery sector had created a significant resource drain. Company leads in EPA regions developed and maintained their own, personal tracking systems and did not use the contractor's system to track implementation.

***OECA Took Steps to Address Problems But Did Not Eliminate Them***

During our evaluation, OECA recognized that the document tracking delays caused implementation problems and took steps that reduced but did not eliminate the delays. OECA and regional EPA staff cited the requirement that four national technical leads review each response and the Air Enforcement Division Director's required approval as the reasons for delays.

OECA attempted to address the delays by training implementers, reallocating staff, and making changes to consent decree design and implementation requirements. For example, in a more recent consent decree, EPA required just 5 company reports and no EPA responses, compared with an average of 243 company reports and 47 EPA responses for the 9 consent decrees in our analysis.

OECA managers told us they disagreed with the contractor's interpretation of which items in consent decrees required an EPA response; OECA managers determined that the contractor-developed system included hundreds of items that did not require tracking. Between July and October 2003, OECA eliminated requirements for 149 EPA responses, and eliminated tracking of the timeliness of both company reports and EPA responses from the tracking system. On the January 7, 2004, company lead conference call, OECA management and company leads agreed to use the contractor's system as the principal tool for managing and tracking consent decree implementation. Because OECA eliminated tracking of timeliness, we could not determine the impact the changes had on EPA response time. Also, OECA could not use the tracking system to determine the timeliness of company reports or EPA responses.

OECA did not accurately assess the resources required for consent decree implementation. EPA planning guidance stresses assessing the skills and number of personnel needed to implement programs. More accurate planning that accounted for the specific monitoring and management requirements of each signed consent decree could have enabled OECA to avoid the document tracking delays, delays in EPA responses, and confusion about compliance. OECA management and national technical leads familiar with the four priority areas when they negotiated consent decrees should have more accurately assessed the resources required to monitor and implement the steps outlined in consent decrees. Identifying resource needs during the planning phase would have highlighted resource limitations and EPA could have corrected problems before they caused delays in implementing the program.

## **Conclusion**

OECA did not clearly and precisely define official program goals and measures, or ensure the goals were consistently shared and clearly understood. Because refineries emit toxic chemicals, they should be closely and regularly monitored for compliance. Although OECA officials used informal methods to track program progress, OECA would benefit from using more formal mechanisms to track and measure progress toward consent decree and overall refinery program goals. Implementation problems developed because OECA officials did not establish an accurate, detailed resource plan. Serious delays developed and persisted because OECA did not provide sufficient guidance to the contractor charged with developing the implementation tracking system, and OECA did not reallocate its own resources to provide for implementation tracking. The ultimate success of the refinery program depends on effective management of consent decree implementation.



## Recommendations

To correct issues related to goals, performance measures, and reporting, we recommend that the Acting Assistant Administrator for Enforcement and Compliance Assurance:

- 2-1. Develop clear overall refinery program goals that allow for future assessment or measurement and include timetables for accomplishment.
- 2-2. Instruct OECA refinery program managers to develop clear goals specifically for the refinery program's implementation phase.
- 2-3. Ensure that all goals and performance measures are understood by everyone involved in the national petroleum refinery program, including all EPA and State staff involved in some portion of consent decree implementation, and hold staff accountable for progress in performance agreements.
- 2-4. Instruct OECA refinery program managers to develop reliable performance measures to assess their progress toward meeting national program goals. Specifically, managers should fully implement OECA's performance-based approach to program management as described in its December 18, 2002, *Recommendations for Improving OECA Planning, Priority Setting and Performance Measurement*, which specifies development of plans and reliable performance measures, to the remaining phases of the petroleum refinery program.
- 2-5. Instruct OECA refinery program managers to gather, analyze, and report relevant program data to support overall OECA organizational decision making and daily program decision making.

To ensure the accurate measurement and reporting of refinery program outcomes, we recommend that the Acting Assistant Administrator for Enforcement and Compliance Assurance:

- 2-6. Instruct OECA managers to verify emissions reductions predicted in consent decrees on a quarterly basis. Verification might include establishing a detailed monitoring system, which could contribute to refinery program performance measurement.

To improve refinery consent decree implementation, we recommend that the Acting Assistant Administrator for Enforcement and Compliance Assurance:

- 2-7. Instruct its consent decree tracking contractor to resume tracking both company due dates for reports and EPA response due dates so that OECA and outside parties can easily track company and EPA responsiveness.

- 2-8. Revise and circulate a comprehensive tracking plan and system that outlines specific roles and responsibilities for OECA staff, EPA regions, State and local air pollution control agencies, and companies.
- 2-9. Provide additional training at the regional level, and hold regional experts accountable for reviewing and responding to company reports. Require national technical leads to spot-check responses from regional experts to ensure national consistency.
- 2-10. Develop a formal feedback system to ensure that OECA's workforce and managers have a common understanding of implementation responsibilities, a common perspective on the status of implementation, and the ability to expeditiously address implementation issues.

To avoid similar issues in other enforcement and compliance initiatives, we recommend that the Acting Assistant Administrator for Enforcement and Compliance Assurance:

- 2-11. Ensure frequent and open communication between partners (States, regions) and headquarters about responsibilities for executing portions of strategies to quickly eliminate misconceptions or confusion.
- 2-12. As discussed with OECA managers, include consent decree implementation in OECA priorities and strategic plans, allocating staff and resources to implementation until OECA completely implements all consent decrees.
- 2-13. Develop a plan for allocating negotiation and implementation resources. Use resource planning in new initiatives to determine the predicted workload associated with the initiative; allocate training, education, and development resources; and provide for office-wide reevaluation of the resource plan.

## **Agency Comments and OIG Evaluation**

OECA agreed with 9 of our 13 recommendations above, and disagreed with 4.

OECA disagreed with recommendation 2-6 because OECA officials believed that quarterly monitoring was too frequent and did not take resource limitations into account. OECA stated that these resources are better utilized if devoted to addressing compliance issues in other industry sectors, and that verifying emissions reductions twice over the life of a consent decree (once in the fourth year, and once at the conclusion) would provide EPA with sufficient assurance that consent decrees led to environmental results. Because we do not believe that two monitoring events over the life of a consent decree provide sufficient assurance of results, we continue to recommend that OECA track available data

on its singular outcome measure for the program – change in tons of air emissions – on a quarterly basis.

OECA disagreed with recommendation 2-7 because OECA does not see the necessity of further revising the tracking system at this time. OECA said it has made substantial progress in reducing the delays, indicating that the current approach is having the desired result. We believe that the recommendation to track company report due dates and EPA response due dates in addition to company report receipt dates and EPA response issuance dates is crucial to maintaining accountability for both companies and EPA in consent decree implementation. To avoid similar delays in the future, OECA should track companies' and EPA's timeliness and identify and address problems as they arise.

OECA disagreed with recommendation 2-8 because OECA does not see the necessity of creating a new tracking plan and system when EPA already has a comprehensive consent decree tracking protocol implemented through its contractor. Despite OECA's current tracking plan and system, we found that some EPA and State staff were still unclear about their roles and responsibilities. We recommend that OECA revise as appropriate and circulate its existing tracking plan and system that outline roles and responsibilities to all appropriate stakeholders.

OECA disagreed with recommendation 2-10 because, in light of the small staffing level and their overlapping responsibilities, they did not believe a formal feedback system was necessary. Should the number of staff substantially increase in the future, they said they would consider a feedback system at that time. Despite OECA's monthly conference calls, our evaluation demonstrated management's lack of awareness of some issues we raised in our evaluation. We recommend that OECA develop a formal feedback system so that all staff and managers working on the program can rely on a common system for making suggestions and raising issues separate from their day-to-day interactions.

Our official draft report contained discussion about using a logic model to tie program activities to outcomes, and a recommendation to use the logic model developed in the course of the evaluation for current and future program development. OECA disagreed with the draft report recommendation and specifically stated that several of the short-term, intermediate, and long-term outcome measures in our logic model were not appropriate benchmarks for judging the effectiveness of a compliance and enforcement program. We chose to delete this recommendation because a logic model is only one of several possible means that OECA may employ to achieve the ends we advocate in recommendations 2-1, 2-2 and 2-3 – that is, the agreement on and communication of program goals.



# Chapter 3

## Refinery Program Lessons Learned

EPA's refinery program received mixed reviews from States, industry, and environmental groups, ranging from positive to very negative. For example, two companies with consent decrees viewed their relationship with OECA as more collaborative, but a major industry professional association believed EPA's refinery program severely damaged the Agency's relationship with the industry. Most of the stakeholders are taking a wait-and-see approach, believing the program's success depends on how well EPA maintains a level playing field within industry, and how well companies implement consent decrees. Representatives from environmental groups added that, in addition to effective implementation of consent decrees, they wanted EPA to make program results available to the public, particularly to those communities directly impacted by refineries.

EPA learned several important lessons that it should apply throughout its refinery program as well as consider for other enforcement and compliance assurance programs. Overall, EPA has effectively used some tools for the refinery program, but needs to make improvements in other areas. For example, EPA effectively focused on specific enforcement concerns and became knowledgeable about the industry, but EPA needs to clearly communicate roles and responsibilities. In addition, EPA needs to meaningfully engage stakeholders throughout the process, and diligently oversee consent decree compliance.

### Refinery Program Offered Lessons Learned

OECA, regional, State, and industry officials described lessons they learned from the refinery program that OECA could apply to other industries.

<b>Lesson Learned</b>	<b><i>Become Knowledgeable about the Industry and Its Technical Processes</i></b>
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Each industry has its own characteristics that impact the effectiveness of enforcement and compliance assurance programs. OECA learned an important lesson through obtaining an understanding of petroleum refinery processes. According to one former senior OECA official, the industry did not generally view EPA as credible or very knowledgeable, and believed that EPA staff could be easily misled or overwhelmed by technical details.

A significant tactic of the refinery program involved pulling together EPA staff with knowledge about the refinery industry. These staff attended training on the refinery process, reviewed trade journals, and met with industry officials to learn

about refineries. In addition, OECA identified four national technical leads for the priority areas and ensured national consistency in investigations and negotiations. EPA regional and OECA staff emphasized that technical expertise made them credible to the industry and helped immensely during negotiations. Representatives from companies that signed consent decrees with OECA also said EPA's industry knowledge increased the program's effectiveness. OECA officials stated that the marshaling of in-house, cross-regional expertise to investigate refineries was one of the more remarkable elements of the refinery program.

**Lesson  
Learned**

***Build the Program with Regional and Headquarters Staff Working Together***

The refinery program demonstrated that a single program with experts from headquarters and regional offices working together operated more effectively than having each region and headquarters working alone. EPA regional officials believed the refinery program's strategy to pull together staff with expertise to lead the program regardless of geographic location served as a model for other enforcement programs. One regional EPA official believed the refinery program's approach prevented the 10 regions from conducting their own programs or having OECA dictate the entire program. While OECA coordinated the effort, officials said regional as well as OECA staff drove the program and contributed to its success in identifying and addressing priority areas.

**Lesson  
Learned**

***Designate a Senior EPA Executive to Champion the Program***

Representatives from one company that signed a consent decree stated that EPA obtained success with settlements because the refinery program had a senior EPA executive who championed the program. Industry representatives said that having a senior OECA executive who had specific knowledge about the issues, had decision-making authority, talked with them about the program, and even participated in negotiations, made a positive impact in how they reacted. However, the senior OECA official who had championed the program from its inception left EPA in February 2002. Some industry and EPA staff believed that the departure of this former OECA executive slowed the program's progress in obtaining additional settlements. One OECA official believed the slow progress related more to difficult and contentious negotiations rather than the departure of the prior senior executive. OECA replaced the prior official with another executive, but limited resources and other priorities prevented the new executive from taking a similar role with the refinery program. OECA officials stated that resources often limited the extent to which a senior executive could become actively involved in the day-to-day activities of a single national enforcement program.

**Lesson  
Learned*****Meaningfully Engage Stakeholders Throughout the Process***

As described in Chapters 1 and 2, OECA engaged various stakeholders throughout the program, including the U.S. Department of Justice and the States. Stakeholders' were involved in settlement negotiations and negotiating final consent decrees. However, some State officials said they wanted more participation in the process. For example, officials from one State believed they needed to aggressively try to participate in the negotiations or discussions would take place without them. Officials from another State complained about the lack of adequate time to comment on proposed negotiation decisions. The officials said lack of adequate time gave the appearance that their reviews were irrelevant and would have no impact on the final EPA decision. Other State and local officials commented that OECA did not:

- Keep the State informed on the status of negotiations.
- Keep the State involved during the negotiations or decision making process.
- Adequately describe the benefits of participation to local officials.
- Adequately describe the increased workload necessary to successfully implement and monitor consent decrees.

On the other hand, one OECA official said that many States did not want to participate in the refinery program despite OECA's efforts to include them in negotiations.

One group of stakeholders – the companies that signed consent decrees with OECA – formed a “consenters” group to facilitate a relationship with OECA and minimize the uncertainty around consent decree implementation. The group also formed to facilitate compliance, learn from each other (when appropriate and within anti-trust limitations), and reduce learning curves in implementing consent decree provisions. OECA officials and a representative from a company in the consenters' group said the group provided an effective means to communicate and discuss issues among similarly situated companies.

**Lesson  
Learned*****Clearly Communicate Roles and Responsibilities***

Clear communication is a critical component of any program. OECA's *Framework for a Problem-Based Approach to Integrated Strategies*, dated November 2002, emphasized the importance of communication and clearly defining stakeholders' roles and responsibilities. While OECA effectively communicated its four priority areas to the industry, the public, and other stakeholders through various means (e.g., *Enforcement Alert* newsletters), OECA did not effectively communicate other aspects of its program (particularly environmental outcomes) as discussed in Chapter 2. OECA's *Framework* document encourages the development of a communications plan for internal and

external stakeholders to ensure that OECA keeps stakeholders informed of the program’s progress as well as roles and responsibilities.

**Lesson Learned**

***Focus on the End Result and Establish Incentives for Industry to Participate***

OECA and regional officials believed their focus on emissions reductions rather than individual facility violations led to the refinery program’s success. EPA’s refinery program strategy included identifying and focusing on four priority areas under the Clean Air Act that represented the most significant compliance problems within the industry. OECA directed its pursuit of global settlements at obtaining industry’s agreement on implementing controls and practices that are expected to achieve significant emissions reductions in these four priority areas. As part of its push to achieve significant emissions reductions, EPA encouraged and, in some instances, required refineries to develop and install new emission control technologies. OECA officials stated that the refinery program pushed the use of the most advanced emissions control technologies available.

OECA negotiated with refinery companies and offered an incentive in the form of relief from past liabilities in order to persuade the industry to sign consent decrees. OECA worked with the industry’s desire to obtain a level of certainty regarding regulatory risks with EPA’s desire to significantly reduce emissions. The industry saw many complex regulations on the horizon and viewed participating in consent decrees as “good business” to limit liability and obtain a level of certainty regarding regulatory risks. As a result, EPA obtained consent decrees that included implementing controls expected to reduce emissions as well as requirements to go beyond compliance with regulations.

**Lesson Learned**

***Diligently Oversee Compliance with Negotiated Settlements and Consent Decrees and Take Action When Provisions Are Not Met***

As discussed in Chapters 1 and 2, the implementation of refinery consent decrees represents one of the essential pieces of the refinery program. Without effective implementation, the refinery program may not result in anticipated emissions reductions and increased industry compliance. OECA officials expressed concern over the significant amount of resources required by headquarters, regional, and State offices to implement consent decrees while at the same time continuing other enforcement-related activities in other industries. While it will require careful priority-setting and resource allocation, OECA, regions, and States should ensure implementation of consent decree provisions and take appropriate enforcement action when necessary.

## **Conclusions**

OECA’s refinery program resulted in several important lessons learned. OECA and regional officials spent considerable time at the start of the program learning



about the industry and developing expertise in the four areas on which the strategy focused. Officials continued to gain industry knowledge throughout the refinery program. As an on-going program, however, the refinery program could continue to benefit from evaluating where it might apply some of the lessons learned. For example, OECA should improve communication with stakeholders, particularly given the feedback States and regional staff provided on the refinery program. In addition, OECA should designate a senior EPA executive to champion the consent decree implementation phase.

## Recommendations

We recommend that the Acting Assistant Administrator for Enforcement and Compliance Assurance:

- 3-1. Disseminate the lessons learned from the refinery program to EPA staff to benefit other compliance efforts, obtain additional feedback from stakeholders – including States, industry, and environmental groups – on other lessons learned, and update relevant OECA guidance documents such as OECA’s *Framework for a Problem-Based Approach to Integrated Strategies* or other appropriate documents for on-going and future industry-specific enforcement programs.
- 3-2. Designate a senior OECA executive to assume the role of champion for the refinery program to ensure (a) that refiners enter into consent decrees or face appropriate alternative enforcement actions, and (b) that consent decrees are effectively implemented.
- 3-3. Consider, on a case-by-case basis, designating a senior OECA executive to assume the role of champion for each of the other enforcement priority areas. EPA and industry officials should recognize the champion as knowledgeable and as having the authority to make decisions related to the priority area.
- 3-4. Develop a communications plan for refinery consent decree implementation. The plan should clearly describe the roles and responsibilities of all stakeholders, including refinery priority area experts and regional and State officials.

## Agency Comments and OIG Evaluation

OECA agreed in part with the first three recommendations in this chapter and fully agreed with the last recommendation.

OECA concurred in part with recommendation 3-1. OECA disagreed that it needed to revise the *Framework for a Problem-Based Approach to Integrated Strategies* to reflect lessons learned from the refinery program. We view the

lessons learned from the refinery program as significant and believe OECA should reflect them in a written document (either combined with lessons learned from other initiatives or by itself) and distributed to stakeholders. We revised the recommendation so that OECA can determine the appropriate document – either the *Framework* document or another guidance document – to capture the lessons learned and communicate them to stakeholders.

OECA also concurred in part with recommendation 3-2. OECA agreed that a senior enforcement official needed to manage national enforcement priorities and OECA designated a senior official responsible for managing the refinery program. OECA disagreed, however, that a senior OECA official needed to ensure that EPA settle or litigate against all refiners in the industry. OECA officials stated that after the refinery program reaches its goal of 50 percent increased compliance and 20 percent decreased emissions, the program would return to the “core” enforcement program, with primary enforcement and compliance assurance program responsibility devolving to States and EPA regional offices. We continue to recommend that while the refinery program remains as a national priority, a senior OECA official maintain responsibility and accountability for the program.

For recommendation 3-3, OECA stated that it would make the determination of whether any particular priority area requires an OECA-designated “champion” on a case-by-case basis as appropriate in light of all relevant facts and circumstances. We agree, and revised this recommendation accordingly.

## ***Details on Scope and Methodology***

We conducted our evaluation of EPA's national petroleum refinery program between June 2003 and March 2004. We performed our evaluation in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States.

We began our evaluation of the petroleum refinery program at the request of OECA senior managers and after we conducted extensive preliminary research on EPA's enforcement and compliance assurance program. We began our general preliminary research on EPA's enforcement and compliance assurance program in February 2002 to obtain information on EPA's traditional and alternative approaches to enforcement and compliance assistance. Our preliminary research included interviewing officials in EPA's OECA, Office of Research and Development, Office of Environmental Information, and Office of the Chief Financial Officer. We interviewed these officials to obtain information on EPA activities related to enforcement and compliance assistance strategies. We reviewed a variety of documentation describing integrated strategies, compliance assistance grants, Memorandum of Agreement priorities, Government Performance and Results Act reporting, and enforcement and compliance assistance databases (Enforcement and Compliance History Online, Sector Facility Indexing Project, and Integrated Data for Enforcement Analysis System).

We also interviewed officials at non-EPA organizations. We met with officials at the General Accounting Office (GAO), the National Academy of Public Administration, and the Environmental Council of the States to obtain information on prior reviews they performed on enforcement and compliance assistance programs, and to obtain their perspectives on significant concerns and issues related to enforcement and compliance assistance. In addition, we reviewed reports they issued on enforcement and compliance assistance issues.

We used the results of our initial preliminary research to develop objectives for four separate evaluations of the enforcement and compliance assurance program. These four evaluations became part of OIG's March 2003 *Multi-Year Plan Fiscal 2003 - 2005*.

In December 2002, we had held an entrance conference with OECA to begin one of the four evaluations in the *Multi-Year Plan*. We designed the first evaluation to describe the regulated universe, the compliance status of OECA's priorities, and the enforcement and compliance assurance strategies EPA and its partners applied to each of the priorities. However, OECA senior managers said they found the scope of the evaluation too broad and thought it would not provide meaningful results. After discussions with OECA senior management, we agreed to first conduct a pilot evaluation of one of the priorities. The pilot evaluation would review the strategies and measures for one priority area and test our approach to answering the objectives in all four evaluations.

From February through May 2003, we performed additional research on OECA's priorities to determine which priority to include in the pilot evaluation and to develop the specific evaluation objectives. We met with OECA staff to determine the status of each priority and to obtain a brief

background on the issues prompting OECA to identify them as priorities. As a result of additional research and analysis, we selected the petroleum refinery program as our pilot issue. In addition to its status as an OECA national enforcement priority, OECA also had listed the petroleum refinery as a separate priority industry sector for several years.

### ***Nature and Extent of Petroleum Refinery Industry and Strategies Used***

To understand the nature and extent of the petroleum refinery universe and what strategies EPA and its partners developed to address compliance at refineries, we interviewed and collected documents from OECA staff, EPA's National Enforcement Investigations Center, regions, States, industry, environmental groups, and the U.S. Department of Justice.

We interviewed OECA, National Enforcement Investigations Center, and regional staff to determine the compliance problems in the industry, the specific strategies and approaches used to address the problems, and the industry's current compliance status. We interviewed officials in EPA regions 5, 6, 8, and 9 and State officials in Louisiana, Oklahoma, New Mexico, Minnesota, Delaware, Texas, Arkansas, and Colorado. We also interviewed officials in the Northwest Air Pollution Authority. We asked the regions, States, and local air authority to provide their perspectives on the effectiveness of EPA's strategy to address refinery compliance problems, their level of participation in the strategy, and suggestions for improving the refinery strategy and other enforcement and compliance strategies. We based our selection of regions on whether they had a significant number of refineries within their region. We based our selection of States on whether the State participated in a consent decree as part of EPA's strategy, the number of refineries in the State, and recommendations from EPA officials and outside organizations.

We met with two petroleum refinery industry groups – the American Petroleum Institute and the National Petrochemical and Refiners Association – and asked for their perspectives on the effectiveness of EPA's refinery strategy and their members' view of the strategy. In addition, we spoke with representatives from two companies and a representative from the consenters group<sup>7</sup> to obtain reasons why refineries did or did not enter into settlement agreements with EPA. We chose not to interview officials of refineries that had not entered into agreements with EPA because we did not want to interfere with their ongoing negotiations with OECA.

We reviewed documentation on the petroleum refinery industry to better understand the industry, its compliance issues, and impact on the environment. These documents included the following:

- EPA Office of Compliance Sector Notebook Project - Profile of the Petroleum Refining Industry, September 1995
- Sector Facility Indexing Project
- Scientific literature on the petroleum refining industry

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<sup>7</sup> The consenters group consists of representatives from petroleum refinery companies that already signed consent decrees with EPA.

We also reviewed and analyzed documentation on EPA's refinery strategy, justification for its approach and priority, and compliance assistance efforts. These documents included:

- Memorandum of Agreement Guidance for fiscals 1996 through 2004
- *Enforcement Alert* Newsletters
- Internal documents describing the refinery strategy, goals, and performance measures

We attended the Refining Process Services Inc.'s *Basics of Petroleum Refining for Non-Technical Personnel* training to help us better understand the petroleum refining process. We also toured three refineries – in Denver, Colorado; Whiting, Indiana; and Texas City, Texas – to observe refineries with various capacities and emissions issues. We also met with officials at each of these refineries to obtain feedback on how they viewed EPA's refinery strategy and the consent decree process.

### ***Goals, Performance Measures, and Reporting Approach for Petroleum Refineries***

To evaluate the performance measurement and reporting approach for petroleum refineries and whether the approach allowed EPA to effectively implement, manage, and improve its strategies for refineries, we interviewed a variety of individuals and analyzed supporting documentation. These individuals helped plan, implement, track, and/or manage EPA's strategies for the petroleum refinery industry. These individuals included staff in OECA's Office of Regulatory Enforcement, Office of Compliance, and OECA refinery issue experts in Headquarters, Region 5, and the National Enforcement Investigations Center. We interviewed these individuals to obtain information on OECA's process to identify priorities, establish goals and performance measures, and report accomplishments. We also interviewed them to determine whether they tracked their progress in achieving the refinery goals and how they determined baselines for pollutant emissions and reductions. In addition, we interviewed the prior Director of the Office of Regulatory Enforcement to determine the refinery program's initial goals and objectives. We also interviewed outside EPA experts to discuss environmental performance measurement.

We reviewed documentation on the refinery strategy goals, performance measures, and accomplishment reports. We evaluated how EPA established baselines for its measures and how it measured emissions reductions. Our documentation review included the following:

- Case Conclusion Data Sheet - Training Booklet, November 2000
- OECA's *Framework for a Problem-Based Approach to Integrated Strategies*
- 11 Global Consent Decrees
- Headquarters and Region 6 Consent Decree Implementation Tracking Databases
- OECA's Accomplishment Reports for fiscals 1996 - 2002

In our interviews with OECA and regional officials, we obtained information on whether they agreed on the refinery strategy goals and objectives and whether OECA met those goals. In addition, we obtained information from States and local authority officials on other measures that OECA could or should use to determine compliance and achievement of refinery strategy goals.

To determine how well OECA managed its consent decree implementation, we analyzed OECA's consent decree tracking information. We retrieved nine company spreadsheets from EPA's contractor on July 31, 2003, October 16, 2003, and January 14, 2004. The company spreadsheets depicted the due dates and deliverables outlined in the consent decrees. From the spreadsheets, we calculated the number of responses EPA had not issued and the timeliness of both company reports and EPA responses. By comparing data from July, October, and January, we determined that company spreadsheet contents changed between the reporting dates; therefore, we assessed the nature of changes that occurred, including comparing the number of company reports and EPA responses required, the types of reports and EPA responses required, and the fields tracked by the spreadsheets (for example, EPA eliminated using tables that tracked the timeliness of company reports and EPA responses between October 2003 and January 2004).

To obtain and document lessons learned that EPA could apply in other industries or that OECA could make to improve the petroleum refining program, we interviewed staff at OECA, EPA's National Enforcement Investigations Center, regions, States, industry, environmental groups, and the U.S. Department of Justice.

### ***Prior Audit and Evaluation Work***

In our research, we found no previous audit or evaluation reports evaluating EPA's petroleum refinery compliance program. However, we identified EPA OIG and GAO reports listed below with findings on performance measurement, monitoring, and tracking:

***EPA OIG: Compliance with Enforcement Instruments, Audit Report No. 2001-P-00006, March 29, 2001.***

We found that OECA's performance measures were not sufficient to determine the program's actual accomplishments. Consequently, we determined Congress had less useful performance data upon which to base its decision making. We also found that EPA regions did not always adequately monitor compliance with enforcement instruments (e.g., consent decrees) nor did they always consider further enforcement actions. We attributed ineffective monitoring primarily to the lack of: (1) guidance detailing how or when to monitor enforcement instruments, and (2) emphasis OECA placed on monitoring. Consequently, OECA risked continued violations that would contribute to human and environmental health impacts, thus decreasing EPA's deterrence effect. In response, OECA concurred that it and the regions can and should improve tracking and enforcing compliance with requirements in enforcement instruments. At that time, we concluded that OECA had begun to take the steps necessary for OIG to close out the report.

***GAO: Environmental Protection: Wider Use of Advanced Technologies Can Improve Emissions Monitoring, Report No. GAO-01-313, June 22, 2001.***

GAO found considerable variation in the compliance monitoring performed by stationary air pollution sources. As a result, regulators and regulated entities lacked certainty about whether air pollution sources maintained continuous compliance with the Clean Air Act.

GAO recommended that EPA encourage wider use of advanced air monitoring technologies. GAO also cited equipment manufacturers and regulators as stating that, without regulatory requirements, manufacturers had little incentive to bring new monitoring technologies to market. OECA responded that it had coordinated efforts to explore ways to increase the application of advanced monitoring technologies with EPA's Office of Air and Radiation and industry while minimizing the perception that cooperation with OECA would lead to greater enforcement actions. OECA guaranteed that they would not punish the industry for their willingness to advance the science of monitoring except in the most egregious cases.

**GAO: Air Pollution: *EPA Should Improve Oversight of Emissions Reporting by Large Facilities*, Report No. GAO-01-46, April 6, 2001.**

GAO reported that EPA performed limited oversight of States' efforts to verify large facilities' emissions reports. GAO recommended that EPA improve its oversight of States' review of emissions reports by evaluating the adequacy of these reviews and, if necessary, strengthening them. In response, EPA stated that it offered tools and encouragement for States to improve facility emissions estimates, but EPA had no basis to impose a requirement on State or local permitting authorities to quality assure annual emissions data.





## Key Information on U.S. Petroleum Refineries

The refinery corporations are listed in order of refining capacity as of January 1, 2003. The corporations highlighted have signed consent decrees as of March 2004 that apply to at least some of their refineries. The consent decrees covered each refinery the company owned and operated on the date of consent decree entry by the court. Since that date, companies may have sold, bought, or closed one or more refineries, however, the consent decree follows a refinery regardless of these actions. As a result, the “number of refineries under consent decrees” may not align with January 1, 2003 data for “number of refineries” owned by a company as depicted in the table.

Corporation	No. of Refineries	No. of Refineries under Consent Decrees	Capacity (barrels per calendar day)	Percent of Total Capacity
Conoco Phillips Co. (known as Conoco, Inc. when consent decree signed)	16 <sup>1</sup>	4	2,276,900	13.59
Exxon Mobil Corp	6		1,808,000	10.79
British Petroleum PLC (known as BP Exploration and Oil, Co. when consent decree signed)	6	8	1,501,500	8.96
Valero Energy Corp	12		1,247,362	7.44
Chevron Texaco (known as Chevron U.S.A. Inc. when consent decree signed)	7 <sup>2</sup>	5	1,079,000	6.44
Marathon Oil Corp (known as Marathon Ashland Petroleum LLC when consent decree signed)	7	7	935,000	5.58
Motiva Enterprises LLC	4	4	879,700	5.25
Sunoco Inc.	4		730,000	4.36
PDV America Inc. (includes Citgo Refining)	5		698,300	4.17
Royal Dutch Shell GP (includes four refineries known as Equilon Enterprises LLC when consent decree signed)	6 <sup>3</sup>	4	603,750	3.60
Tesoro Petro Corp <sup>4</sup>	6		562,500	3.36
Koch Industries Inc. (known as Koch Petroleum Group when consent decree signed)	2	2	524,980	3.13

<sup>1</sup> Conoco purchased 12 of its 16 refineries after it entered into a consent decree with EPA.

<sup>2</sup> Two Chevron Texaco refineries not covered by the consent decree are asphalt refineries rather than petroleum refineries.

<sup>3</sup> Two Royal Dutch Shell GP refineries not covered by the consent decree are operated by Shell Chemical, a separate business unit from its fuels refineries.

<sup>4</sup> Tesoro purchased two refineries from BP, both of which are covered by BP’s consent decree.

Corporation	No. of Refineries	No. of Refineries under Consent Decrees	Capacity (barrels per calendar day)	Percent of Total Capacity
Blackstone Group LP	2		416,500	2.49
The Williams Co. (Premcor) <sup>5</sup>	2		377,928	2.26
Deer Park Refining Limited Partnership (known as Deer Park Refining Limited Partnership (Shell) when consent decree signed)	1	1	333,700	1.99
Lyondell Petrochemical Co.	1		270,200	1.61
Chalmette Refining LLC	1		182,500	1.09
TotalFinaElf SA	1		175,068	1.04
El Paso Corp (includes Coastal Eagle Point Oil Co. that signed consent decree)	2	1	158,787	0.95
Crown Central Petro Corp	2		155,000	0.92
Orion Refining Corp <sup>6</sup>	1		155,000	0.92
Sinclair Oil Corp	3		152,195	0.91
Frontier Oil Corp	2		149,000	0.89
Cenex Harvest States COOP (includes Cenex, also known as CHS Inc., when consent decree signed)	2	1	136,200	0.81
Murphy Oil Corp <sup>7</sup>	2		128,000	0.76
Farmland Industries Inc. <sup>8</sup>	1		112,000	0.67
Ergon Inc. (includes Lion Oil Company, Ergon West Virginia Inc., and Ergon Refining Inc. that all signed consent decrees)	3	3	105,400	0.63
Giant Industries Inc.	3		96,200	0.57
Calumet Lubricants Co. LP	3		67,520	0.40
Holly Corp (includes Navajo Refining Company and Montana Refinery Company that signed consent decrees)	2	2	65,000	0.39
United Refining	1		65,000	0.39
Petro Star Inc.	2		62,550	0.37
Alon USA Energy Inc	1		58,500	0.35
Gary Williams Co.	1		52,500	0.31
Paramount Acquisition Corp	1		50,000	0.30
Placid Refining Co.	1		48,500	0.29
Time Oil Co.	1		44,350	0.26
Hunt Consolidated Inc.	1		33,500	0.20
Transworld Oil USA Inc.	1		29,400	0.18

<sup>5</sup> EPA took enforcement action against Premcor under the refinery program and entered into a limited, non-global settlement. EPA reached similar limited, non-global settlements with Murphy, Farmland, Frontier, Pennzoil, Crown, and NCRA (owned by Cenex Harvest States COOP).

<sup>6</sup> A consent decree with the State of Louisiana (patterned after EPA's settlements) covers Orion's refinery.

<sup>7</sup> EPA took an enforcement action against Murphy Oil for operations at one of its refineries that included elements similar to the global refinery consent decrees.

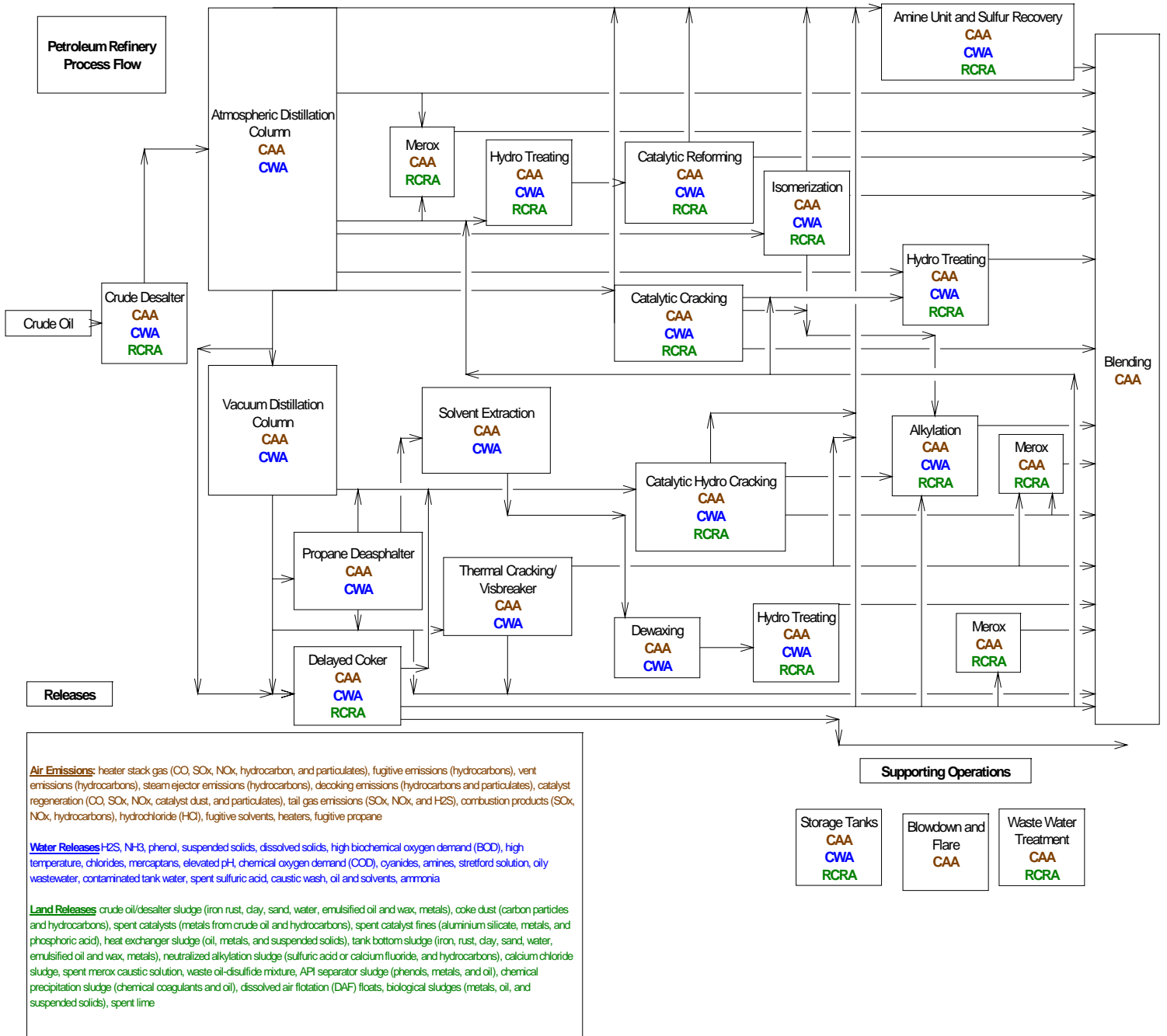
<sup>8</sup> Farmland recently resolved its liability with EPA through a consent decree patterned after the global refinery consent decrees.

<b>Corporation</b>	<b>No. of Refineries</b>	<b>No. of Refineries under Consent Decrees</b>	<b>Capacity (barrels per calendar day)</b>	<b>Percent of Total Capacity</b>
Apex Oil Co. Inc.	1		26,000	0.16
Kern Oil & Refining Co.	1		24,700	0.15
San Joaquin Refining Co. Inc.	1		24,300	0.15
Flying J Inc.	1		24,000	0.14
Countrymark COOP Inc.	1		23,000	0.14
Southland Oil Corp	2		16,800	0.10
Silver Eagle Refining	2		14,000	0.08
Wyoming Refining Co.	1		12,500	0.07
Age Refining & Marketing	1		10,200	0.06
American Refining Group Inc.	1		10,000	0.06
Greka Energy	1		9,500	0.06
World Oil Co.	1		8,500	0.05
Cross Oil & Refining Co. Inc.	1		6,800	0.04
Somerset Refinery Inc.	1		5,500	0.03
Young Refining Corp	1		5,400	0.03
Foreland Refining Corp	1		5,000	0.03
Oil Holding Inc.	1		2,800	0.02
Dow Chemical USA	1		880	0.01
<b>TOTALS</b>	<b>145</b>	<b>42</b>	<b>16,757,370</b>	<b>100</b>



# Petroleum Refining Process Flow Chart

This flow chart illustrates the petroleum refinery process, potential releases, potential release points, and the major applicable environmental regulations.





## ***Refinery Releases and Effects***

This table provides a summary of the human health and environmental effects of the following common air pollutants released at refineries: volatile organic compounds (VOCs); sulfur dioxide (SO<sub>2</sub>); nitrogen oxide (NO<sub>x</sub>); particulate matter (PM); carbon monoxide (CO); hydrogen sulfide (H<sub>2</sub>S); and toxic air pollutants. Toxic air pollutants include pollutants known or suspected to cause cancer or other serious human health effects and include refinery releases such as benzene and toluene. EPA does not consider SO<sub>2</sub>, NO<sub>x</sub>, PM, CO, and H<sub>2</sub>S toxic air pollutants, but EPA lists pollutants such as benzene as both VOCs and toxic air pollutants.

Releases		VOCs	SO <sub>2</sub>	NO <sub>x</sub>	PM	CO	H <sub>2</sub> S	Toxic Air Pollutants
<b>Human Health Effects</b>	Reacts with other chemicals to create PM that can cause respiratory illness, aggravation of heart conditions and asthma, permanent lung damage, and premature death.		<b>T</b>	<b>T</b>	<b>T</b>			
	Aggravates respiratory conditions.						<b>T</b>	
	Reacts with other chemicals leading to ground-level ozone and smog, which can trigger respiratory problems.	<b>T</b>		<b>T</b>				
	Can cause health problems such as cancer.	<b>T</b>						<b>T</b>
	Can cause reproductive, neurological, developmental, respiratory, immune system, and other health problems.							<b>T</b>
	Reacts with common organic chemicals forming toxins that may cause bio-mutations.			<b>T</b>				
	Affects cardiovascular system and can cause problems within the central nervous system.				<b>T</b>		<b>T</b>	
<b>Environmental Effects</b>	Causes visible impairments that may migrate to sensitive areas such as National Parks.	<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>	<b>T</b>		
	Contributes to formation of acid rain, which damages crops, trees, and buildings; and increases acidity in soils, lakes, and streams.		<b>T</b>	<b>T</b>			<b>T</b>	
	Contributes to the formation of ground-level ozone, which harms vegetation.	<b>T</b>				<b>T</b>		
	Contributes to global warming, which leads to rising sea levels and other adverse changes to plant and animal habitat.			<b>T</b>				
	Causes environmental hazards, including concentration of toxic chemicals (e.g., mercury) up the food chain.							<b>T</b>
	Settles on ground and water, acidifying streams and lakes, damaging forests and farm crops, and depleting soil nutrients.		<b>T</b>		<b>T</b>			





## ***National Refinery Program Time Line***

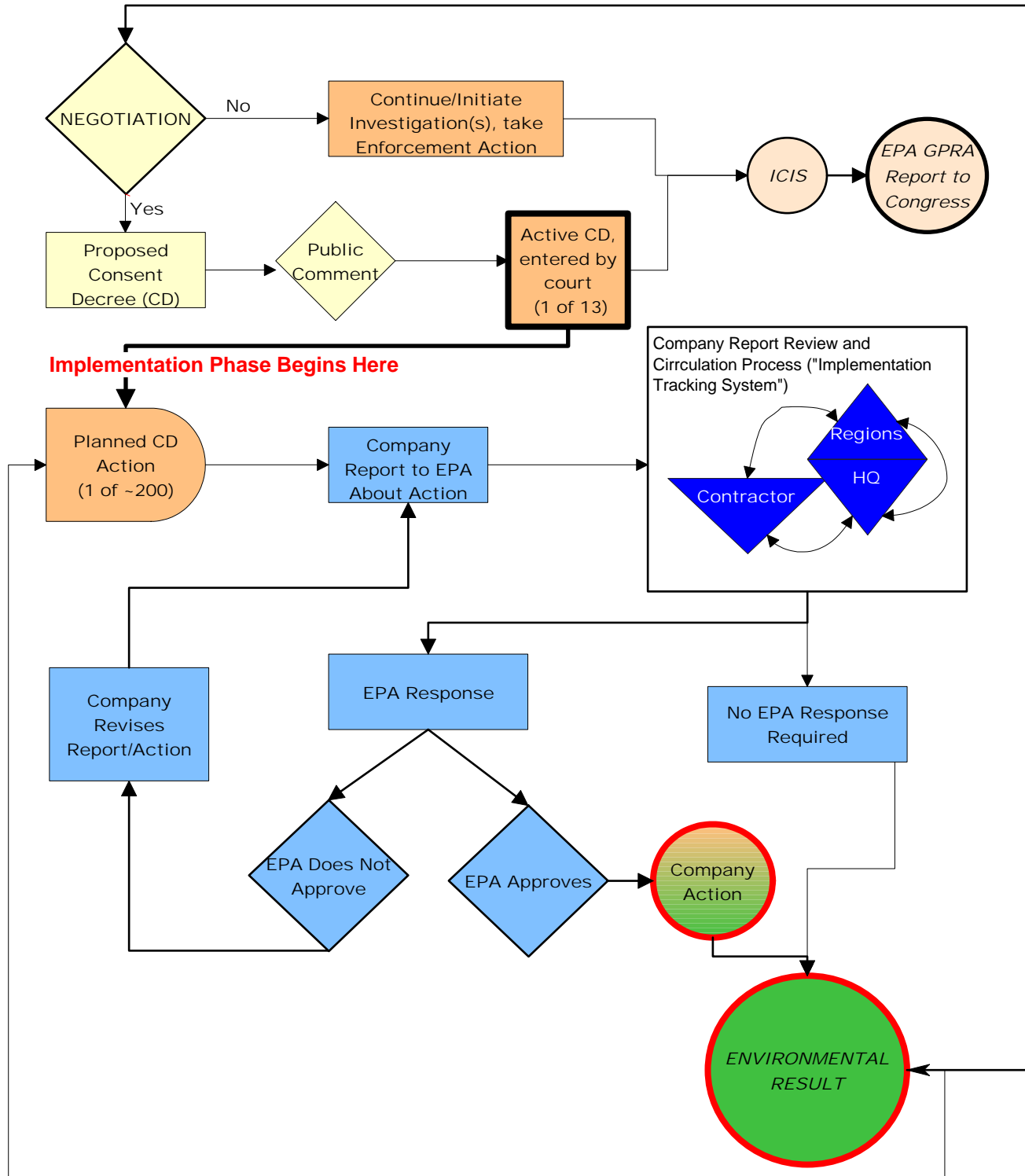
Date		Event
<b>1995</b>	June	Petroleum refining identified as national enforcement priority in OECA's fiscal 1996/1997 Memorandum of Agreement Guidance. OECA required each Region to develop compliance/enforcement strategies for the refinery enforcement priority.
	September	OECA issued the <i>Profile of the Petroleum Refining Industry</i> sector notebook.
<b>1996</b>	1996	OECA officials made presentations at the National Petrochemical and Refiners Association conference on the results of LDAR and benzene inspections.
<b>1997</b>	Late 1997	OECA forms the national refinery workgroup with an initial conference structured to discuss refinery issues and regional initiation of their own enforcement actions. The workgroup, comprised of OECA and regional staff, focused on investigations/enforcement at petroleum refineries.
	Late 1997	OECA officials share environmental and enforcement concerns with the refinery industry, State/local officials, community groups, and environmental advocates. Based on publicly available information, OECA became aware that refinery capacity had increased substantially but relatively few refineries had applied for NSR permits.
<b>1998</b>	Early 1998	<p>First annual meeting of the Refinery Compliance and Enforcement Workgroup. The workgroup sets up three sub-workgroups to focus on four priority issues:</p> <ul style="list-style-type: none"> <li><b>T</b> NSR/PSD</li> <li><b>T</b> Flaring</li> <li><b>T</b> LDAR</li> <li><b>T</b> Benzene Waste</li> </ul> <p>The workgroup held monthly conference calls and annual meetings from 1998 through 2000 that emphasized: (1) sharing expertise among the regions, (2) training, (3) developing policy, and (4) encouraging and coordinating focused investigation and enforcement efforts on the priority areas.</p>
	April	Began full-scale implementation of the national strategy, including investigations.
	November	EPA officials made presentations at the National Petrochemical and Refiners Association annual meeting to present enforcement priority areas to refinery industry.
<b>1999</b>	January	OECA issued an <i>Enforcement Alert</i> on complying with NSR and PSD.
	February	National meetings of EPA workgroup and senior enforcement managers to review investigation progress.
	October	OECA issued an <i>Enforcement Alert</i> on LDAR (fugitive emissions).
	November	EPA officials presented preliminary investigation results to the National Petrochemical and Refiners Association's annual environmental meeting.

	Date	Event
2000	February	National meeting of senior enforcement managers to review progress and discuss targeting major companies for national investigations on priority areas.
	Early 2000	BP and Koch Industries separately approach OECA to explore the possibility of voluntary settlements of violations of the Clean Air Act.  OECA decided to pursue global settlements with refineries by approaching corporate officials and presenting them with the option to resolve all issues of widespread compliance/enforcement concern to EPA.
	March	OECA held meetings with BP and Koch to kick-off global settlement negotiations.
	May	OECA issued an <i>Enforcement Alert</i> that announced EPA's compliance assistance program developed with American Petroleum Institute on slotted guidepoles.
	June	Kick-off meeting held with Motiva, Equilon, and Shell Deer Park.
	July 25	OECA announces "Agreements in Principle" for BP and Koch settlements.
	August	Kick-off meeting held with Marathon Ashland Petroleum.
	October	OECA issued an <i>Enforcement Alert</i> on flaring.
	December 22	Koch settlement filed with the court. <sup>1</sup>
2001	January 18	BP settlement filed with the court.
	March 21	Motiva, Equilon, and Shell Deer Park settlements filed with the court (25 percent of industry now under consent decrees; additional 25 percent in similar global settlement negotiations).
	May 11	Marathon Ashland Petroleum settlement filed with the court.
	Mid-2001	Consenters Committee formed by refinery companies that had entered into global consent decrees with EPA.
	December 20	Conoco, Navajo Refining, and Montana Refining settlements each filed with the court (30 percent of industry now under consent decrees; additional 30 percent in similar global settlement negotiations).
2002	January 24	Murphy Oil Settlement filed with the court for one of its refineries. Settlement included elements patterned after the global settlements.
2003	March 11	Lion Oil settlement filed with the court.
	October 1	Coastal Eagle Point Oil Company (CEPOC), CHS Inc. (Cenex), and Ergon Refining settlements filed with the court.
	October 16	Chevron settlement filed with the court (40 percent of industry now under consent decrees; additional 40 percent in similar global settlement negotiations).

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<sup>1</sup> A consent decree is filed with the court and then is subject to a 30-day public comment period. After the comments are addressed, the consent decree is entered by the court and becomes effective. The time line includes the date that the consent decrees were filed with the court and open to public comment. It does not include the date the consent decrees were entered into court.

## Consent Decree Process Flow Chart



developed by EPA OIG 02/2004



## ***EPA Comments on the Official Draft Report***

Apr. 2, 2004

### MEMORANDUM

**SUBJECT:** The Office of Enforcement and Compliance Assurance's Agency Response to the Draft "Evaluation Report: Opportunities Exist to Improve and Replicate EPA's National Petroleum Refinery Compliance Program," dated March 5, 2004

**FROM:** Phyllis Harris /s/  
Acting Assistant Administrator  
Office of Enforcement and Compliance Assurance

**TO:** Jeffrey K. Harris  
Director  
Program Evaluation, Cross-Media Issues  
Office of Inspector General

### **Introduction**

Today, on behalf of the Office of Enforcement and Compliance Assurance's (OECA), and as the designated "Action Official," I am forwarding to you our consolidated "Agency Response" (Response) regarding the Office of Inspector General's (OIG) draft "Evaluation Report: Opportunities Exist to Improve and Replicate EPA's National Petroleum Refinery Compliance Program," dated March 5, 2004 (Evaluation Report). OECA has actively solicited comments from Regions 5, 6, 8, and 9. Accordingly, the attached Response represents the consolidated comments of OECA and those Regions that have provided comments.

In accordance with the instructions provided in your March 5, 2004 memorandum, the Response addresses the factual accuracy of the draft Evaluation Report. Consistent with those instructions, the Response also specifically indicates whether OECA concurs with each of the recommendations proposed by the OIG. Further, to the extent that action has already been initiated or planned to address issues identified in the draft Evaluation Report, the Response specifically identifies those actions that have been initiated or planned. Finally, your March 5, 2004 memorandum expressly states that the "final report will include an assessment of [the] comments" made in the Response. Consequently, I am specifically requesting that this memorandum and the attached Response be attached to, and be made a part of, the final version of the draft Evaluation Report.

It is OECA's view that the final report should remain confidential in its entirety. The draft Evaluation Report and Response are a road map of OECA's internal deliberations regarding how, when, and under what circumstances it will deploy its array of enforcement tools to secure compliance. Because targeting, settlement, and litigation under the Refinery Petroleum Initiative (Initiative) remains extremely active and planning is currently underway for further implementation during the fiscal year 2005 through 2007 time frame, it is our view that disclosure of such deliberative product is not appropriate at this time. Moreover, from a practical perspective, the publication of this report will make it far more difficult for EPA to reach agreement with other refiners. At a minimum, the publication of this draft Evaluation Report will offer potential settlers and their counsel arguments that they can advance in negotiations and, more significantly, litigation that the conduct of the Initiative is inconsistent with the comments made in the draft Evaluation Report and therefore unfair.

The Evaluation Report expresses the views of the OIG only. As summarized in this memorandum and noted in greater detail in the attached Agency response, OIG's Report does not represent the views of OECA regarding the Initiative.

### **General Comments**

It is apparent from the face of the draft Evaluation Report that it is the product of a considerable amount of work and effort. Moreover, as indicated in the attached Response, there are observations, recommendations and lessons learned made in the draft Evaluation Report that will be helpful to EPA as it moves forward in the Initiative and as it develops and implements new initiatives.

However, as outlined below in this memorandum, and with more specificity in the attached Response, it is OECA's view that the draft Evaluation Report has several significant shortcomings. We highlight those shortcomings below:

**The draft Evaluation Report contains errors, omissions and misstatements.** To assist you in the preparation of the final report we have highlighted those errors, omissions and misstatements in the attached Response by reference to the page, chapter and sentence in which they appear. In addition, we have provided you with the specific comments that explain the bases for our view that the identified sections of the draft Evaluation Report should be corrected.

**The draft Evaluation Report does not place the petroleum refining priority in its proper historical context.** The draft Evaluation Report does not reflect an understanding of the many challenges that OECA identified and overcame as it established and sustained priority attention on this industrial sector and its multi-media problems. Rather, the draft Evaluation Report gives the impression that sector-based and multi-media analysis and targeting, environmental baseline and results measurement, and national planning and accountability processes were fully mature in the mid-1990's when the first work on the Initiative commenced. To the contrary, many of these features were in their early or conceptual stages of development when the petroleum refining sector first appeared on OECA's radar screen. The OECA reorganization in 1994 marked a nearly complete overhaul of EPA's compliance and enforcement business model, and to not put this report in that context is a big shortcoming.

**The draft Evaluation Report is unbalanced and does little to highlight the Initiative’s successes.** The Petroleum Refinery Initiative is one of the most successful enforcement initiatives ever undertaken by EPA. Since approximately January 2000, the date that EPA began to formally engage petroleum refining companies in global settlement discussions regarding their Clean Air Act noncompliance, EPA has obtained settlements with 11 petroleum refiners representing almost 40% of the nation’s domestic refining capacity and covering 42 separate refineries for each of the major four substantive areas related to Clean Air Act compliance. The settlements contain substantial “beyond compliance” requirements, and taken together, represent a breadth and depth of coverage not previously realized in the enforcement program.

**The draft Evaluation Report does not demonstrate an appreciation for the complexity of the issues EPA has successfully addressed under the Initiative and its unprecedented scope.** Prior to development of the Initiative, EPA had largely approached enforcement on a facility-by-facility, issue-by-issue basis. The Initiative represents a radical departure from this practice. There are few industries as complex as the petroleum refining industry and there are few regulatory programs as complex as the Clean Air Act. Notwithstanding this complexity, under the Initiative, EPA successfully embraced the global consent decree as a mechanism to secure permanent, consistent compliance with the Clean Air Act on a company-wide basis. Yet, the draft Evaluation Report only mentions this in passing. Moreover, the substantive discussion does not appear to recognize or fully appreciate this complexity as a factor in the development of OECA’s consent decree implementation strategy.

**The draft Evaluation Report fails to account for the evolution of the Initiative.** For example, the OIG in the draft Evaluation Report appears to fault OECA for having an “absence of strategic direction” for the petroleum refining priority. The OIG asserts that this is so because some strategy documents do not have dates or a signature. We do not agree that from these facts the OIG can conclude that OECA management did not have an idea of what it wanted to accomplish strategically in this sector. As identified with further specificity in our comments, the Initiative strategy did evolve over time as EPA learned more about the sector based on its experience in the field. EPA learned, for example, that noncompliance in this sector was much more significant and widespread than our original analysis suggested. The documents that OIG should look to determine whether OECA had a strategic direction for this priority include not only the petroleum refining sector strategy, but also the MOA guidance documents, the individual regional MOAs which were agreed upon at the highest management levels in OECA and the regions, and the MOA updates. Similarly, EPA learned, and continues to learn, from its experience as the consent decree implementation phase of the Initiative continues to evolve. Many of those lessons learned have already been incorporated into the consent decree implementation process and have resulted in a significant improvement in responding to consent decree deliverables.

**The OIG fails to recognize the severe resource constraints under which the Initiative operates, and the innovative approach EPA employed to overcome these resource constraints.** First, the OIG in the draft Evaluation Report criticizes the level of resources committed to the Initiative. However, the OIG fails to consider the total level of resources available to OECA’s air enforcement program overall (covering the Refinery Initiative as well as

all other air enforcement activities). Because this is nowhere taken into account, the critique of the resource levels supporting the Initiative is wholly without context. Had the OIG included this in the assessment, the leveraging benefits of the “global consent decree” approach would have become apparent.

Second, as a corollary proposition, and perhaps more importantly, the draft Evaluation Report nowhere acknowledges or considers the level of resources that would have been required to secure company-wide compliance and “beyond compliance” commitments had the innovative “global” settlement approach not been used. A refinery-by-refinery, issue-by-issue approach in which an individual inspection(s) or investigation(s) is conducted at each and every refinery followed by information request(s), notice(s) of violation, negotiations and/or litigation would take many years from the inception of the investigation to a final resolution. The resources that the Agency would have needed to expend under those circumstances to obtain company-wide compliance under the New Source Review, new source performance standards, benzene waste, and leak detection and repair programs would have been beyond our means. By way of illustration, during the fiscal year 2001 and 2002 timeframe, EPA conducted inspections or investigations at 7 facilities for compliance with new source performance standards and leak detection and repair program requirements. On just these two areas, EPA inspectors spent, on average, approximately 366 hours (with a high of 702) at each facility. Had EPA addressed the refinery non-compliance issues in such a piecemeal fashion, using the high end of this range (which is conservative since those investigations covered a narrower set of compliance issues), we estimate that EPA would have expended nearly 15 full-time equivalents or 29,400 hours to inspect each of the 42 refineries now covered by global consent decrees. This level of resources is unavailable to OECA to devote solely to compliance in a single industry, without compromising efforts elsewhere.

Additionally, under the refinery-by-refinery, issue-by-issue approach, the scope of injunctive relief at each separate facility would typically be limited to correcting those violations identified during the inspection or investigation. By leveraging activities at fewer facilities to support a company-wide settlement on a broad range of emissions issues using the global approach, EPA extended its reach and effectiveness far more efficiently than it otherwise would have. Rather than recognize OECA’s approach in the Initiative as a creative solution in the face of limited resources that was developed and spearheaded by those charged with accomplishing results, the draft Evaluation Report overlooks this almost completely.

## **Conclusion**

In an era of shrinking resources, it is OECA’s view that the OIG unfairly criticizes a creative and innovative approach to extending the reach of OECA’s air enforcement program’s efforts to address the difficult compliance challenges presented by the petroleum refining industry. The draft Evaluation Report lacks balance, overemphasizing shortcomings and failing to provide a robust discussion of accomplishments. Moreover, the OIG vastly underestimates the complexity of refinery operations and of the controls necessary to reduce emissions, as well as of the resource implications of the evaluation’s various recommendations. It also consistently understates (or simply fails to give credit for) the “beyond compliance” aspects of the consent



decrees and of the benefits of a “global” approach to settlement. Finally, the draft Evaluation Report does not display a real understanding of the enforcement program as a whole, nor of how the Initiative fits within that larger context. As a result, and without any basis for comparison, the draft Evaluation Report draws unsupported and unsupportable conclusions regarding the Initiative, the accomplishments achieved to date under the Initiative, and how those accomplishments compare to other enforcement efforts.

Attachments

## Responses to Proposed Recommendations

### Chapter 3

*Recommendations 3-1, “Develop clear overall refinery program goals that allow for future assessment or measurement and include timetables for accomplishment”; 3-2, “Instruct OECA refinery program managers to develop clear goals specifically for the refinery program's implementation phase”; and 3-3, “Ensure that all goals and performance measures are understood and shared by everyone involved in the national petroleum refinery program, including all EPA and State staff involved in some portion of consent decree implementation.”*

[This comment now refers to Recommendations 2-1, 2-2, and 2-3.]

Concur. As discussed in detail in the preceding comments, OECA believes that the refinery program's goals have been clearly articulated since the national strategy was initiated in 1998, and that as the program evolved they were further reflected in MOAs, etc. in the following years. As a general matter, OECA agrees with these recommendations and will continue to develop and articulate appropriate goals and performance measures.

Following the identification of refineries as an enforcement priority for FY96/97, OECA soon recognized the need for a comprehensive national strategy. It then developed a flexible, integrated strategy (including sub-strategies) to address issues of widespread compliance and enforcement concern at petroleum refineries. The resulting 1998 strategy was developed in close consultation and coordination with the Regions, the Office of Compliance and the Office of Regulatory Enforcement's media-specific enforcement divisions. It has remained largely unchanged since then, with a focus on targeted investigations of “marquee” issues at petroleum refineries and the goal of 50% improved compliance and 20% reduced emissions. The national petroleum strategy and its implementation were regularly discussed at the staff level and periodically reviewed by senior management in meetings, during conference calls and through the MOA process. Periodic progress updates have also been and will continue to be circulated to OECA management and the regions, but the extent to which specific individuals clearly understand the national strategy, including its sub-strategies, goals and objectives, may depend on the level of their direct involvement in these processes and communications.

*Recommendation 3-4, “Instruct OECA refinery program managers to use existing EPA, OECA, and outside guidance to develop reliable performance measures to assess their progress toward meeting national program goals. Specifically, managers should fully implement OECA's performance-based approach to program management as described in its December 18, 2002, Recommendations for Improving OECA Planning, Priority Setting and Performance Measurement, which specifies development of plans and reliable performance measures, to the remaining phases of the petroleum refinery program.”*

[This comment now refers to Recommendation 2-4.]

Concur. OECA has already begun to implement this recommendation (planned for prior to the Evaluation), as priority planning process consistent with existing OECA guidance for FY 2005 has already been initiated.

*Recommendation 3-5, “Validate and build upon the refinery program logic model we developed during the evaluation, and consider developing similar program logic models for other OECA programs to develop a clear consensus on program goals and how a program is intended to work.”*

[This recommendation was eliminated from the final draft.]

Non-concur. OECA does not agree that several of the short-term, intermediate and long-term outcome measures in this logic model are appropriate benchmarks for judging the effectiveness of a compliance and enforcement program. These goals – such as “increased flexibility for refineries to expand or upgrade operations” – are not realistic or likely to be obtained in an adversarial enforcement context. The absence of recommendations for how OECA would benchmark the “before” conditions and measure changes over time for these ultimate outcomes means that there is no basis for OECA to determine whether these measures are feasible. However, OECA does agree that it should use appropriate performance measures and outcomes to measure performance under the Initiative, and intends to do so as part of the FY 2005 priority planning process.

*Recommendation 3-6, “Instruct OECA managers to verify emissions reductions predicted in consent decrees on a quarterly basis. Verification might include establishing a detailed monitoring system, which could contribute to refinery program performance measurement.”*

[This comment now refers to Recommendation 2-6.]

Non-concur. As noted in the detailed comments on this issue, OECA does not believe that this is an appropriate or effective use of resources. Furthermore, the recommendation fundamentally misconceives the timing of reductions under the decrees, which does not happen immediately upon lodging or entry of the decree (as is apparently assumed), with regular reductions on a steady quarterly basis. In part because these facilities are operating under court order, and are required to submit reports and certify regarding their compliance with consent decree requirements (punishable by contempt and/or criminal sanction), there are sufficient indicia of reliability such that quarterly oversight of emissions reductions is not necessary. Significantly, the recommendation does not take into account the resource implications of this level of monitoring – both with respect to those available for the Initiative (failing to recognize that this work would need to be performed and/or reviewed by the same group of national experts responsible for all other aspects of the Initiative), as well as those available to the air enforcement program and OECA as a whole. Even if OECA agreed that this level of monitoring is appropriate, it is not clear how this would be accomplished within the current resource levels and in light of other priority activities. On balance, these resources are better utilized if devoted to addressing compliance issues in other industry sectors. Notwithstanding the foregoing, OECA agrees that it is important to track emissions reductions under the consent decrees, as appropriate given the consent decree milestone dates.

*Recommendation 3-7, “Instruct OECA refinery program managers to gather, analyze, and report relevant program data to support overall OECA organizational decision making, and daily program decision making.”*

[This comment now refers to Recommendation 2-5.]

Concur. As with Recommendations 3-1 through 3-4, OECA agrees with the principle embodied in this recommendation, and will take steps to implement appropriate data gathering and analysis to support program decisionmaking. However, in light of activities identified in response to Recommendations 3-1 through 3-4, this recommendation appears redundant and unnecessary.

*Recommendation 4-1, “Instruct its consent decree tracking contractor to resume tracking both company due dates for reports and EPA response due dates so that OECA and outside parties can easily track company and EPA responsiveness.”*

[This comment now refers to Recommendation 2-7.]

Non-concur. As discussed in the detailed comments above, OECA does not agree that it is necessary to further revise the tracking system at this time; this recommendation has been overtaken by events. During the time that OIG was conducting its investigation, OECA itself identified some deficiencies with its tracking system, and appropriate revisions were made (note that due dates for reports and EPA responses continue to be tracked under each consent decree’s Master Inventory). The critical issue is not simply tracking, but responding to those reports requiring an EPA response. Changes have already been made to address this. For example, in January 2004, Matrix and Region 6 tracking systems were compared and verified for accuracy and usefulness, and a single system was selected for implementation nationally, and access provided to all parties responsible for consent decree implementation – including companies. In addition, changes to requirements for company submittals have been made to subsequent consent decrees to better manage the process. Furthermore, substantial progress has been made to reduce the backlog, indicating that the current approach is having the desired result.

## **Chapter 4**

*Recommendation 4-2, “Create a comprehensive tracking plan and system that outlines specific responsibilities for OECA staff, EPA Regions, State and local air pollution control agencies, and companies.”*

[This comment now refers to Recommendation 2-8.]

Non-concur. OECA does not agree that this recommendation is necessary. Sixteen states are parties to global refinery consent decrees and currently receive copies of all consent decree submissions that relate to each refinery within their states. OECA staff, EPA Regions and state/local authorities who are parties to the consent decrees are and continue to be reflected in the consent decree implementation plan. Specific tracking tools (*e.g.*, Master Inventories and Activity Lists) are circulated on a monthly basis to all necessary participants. As discussed

above, EPA has a comprehensive consent decree tracking protocol that is being implemented through our contractor. Subject to claims of privilege and confidentiality, OECA does not object to any interested non-party, including other states and local authorities, requesting tracking information from Matrix at its own expense.

*Recommendation 4-3, "Provide additional training at the regional level, and empower regional experts to review and respond to company reports. Allow national technical leads to spot-check responses from regional experts to ensure national consistency."*

[This comment now refers to Recommendation 2-9.]

Concur. OECA agrees with this recommendation, and has provided (and will continue to provide) appropriate training as needed.

*Recommendation 4-4, "Develop a formal feedback system to ensure that OECA's workforce and managers have a common understanding of implementation responsibilities, a common perspective on the status of implementation, and the ability to expeditiously address implementation issues."*

[This comment now refers to Recommendation 2-10.]

Non-concur. As explained in the detailed comments, in light of the small staffing level and their overlapping responsibilities, a formal feedback system is not necessary. Should the number of staff substantially increase in the future, a feedback system may be appropriate at that time.

*Recommendation 4-5, "Ensure frequent and open communication between partners (States, regions) and headquarters about responsibilities for executing portions of strategies so that misconceptions or confusion can quickly be eliminated."*

[This comment now refers to Recommendation 2-11.]

Concur. OECA will continue to communicate with Initiative partners.

*Recommendation 4-6, "As discussed with OECA managers, include consent decree implementation in OECA priorities and strategic plans, allocating staff and resources to implementation until OECA completely implements all consent decrees."*

[This comment now refers to Recommendation 2-12.]

Concur. OECA agrees with the principles underlying these recommendations, and efforts have already begun for FY05 implementation on these matters. OECA will continue to allocate adequate resources to the Initiative whether it is identified as a national priority or part of the core program.

*Recommendation 4-7, “Develop a plan for allocating negotiation and implementation resources. Use resource planning in new initiatives to determine the predicted workload associated with the initiative; allocate training, education, and development resources; and provide for office-wide reevaluation of the resource plan.”*

[This comment now refers to Recommendation 2-13.]

Concur. This recommendation has been overtaken by events (priority planning for FY05), and implementation and other resources will be allocated in concert with other OECA priorities and core programs requirements. Office-wide (and Region-wide) reevaluations are considered as part of regular planning processes.

## **Chapter 5**

*Recommendation 5-1, “Disseminate the lessons learned from the refinery program to OECA staff to benefit other compliance efforts, obtain additional feedback from stakeholders – including States, industry, and environmental groups – on other lessons learned, and update OECA’s “Framework for a Problem-Based Approach to Integrated Strategies” for on-going and future industry-specific enforcement programs.”*

Concur in part, non-concur in part. OECA does not agree that revisions to the recently-issued *Framework for Problem-Based Approach to Integrated Strategies* (November 2002) (“*Framework*”) are needed to reflect lessons learned from the Initiative. Rather, the lessons learned from EPA’s Refinery Initiative have informed and continue to inform the Agency’s evolving problem-based approach to solving environmental compliance problems. For example, OECA is currently engaged with the Regions in developing performance-based strategies for each of the national priorities selected for FY05-07. As part of that effort, EPA is reviewing and refining, where appropriate, the goals and the strategies for the refinery initiative. In developing these performance-based strategies, OECA and the Regions will be guided by the recently-issued guidance, *Template for Developing a Performance-Based Strategy for National Compliance and Enforcement Priorities* (Final Draft February 18, 2004) as well as the *Framework*. As EPA gains more experience in the development and implementation of such strategies, we will refine guidance on the use of such strategies where needed.

*Recommendation 5-2, “Designate a senior OECA executive to assume the role of champion for the refinery program to ensure (a) that all refiners enter into consent decrees or face appropriate alternative enforcement actions, and (b) consent decrees are effectively implemented.”*

Concur in part, non-concur in part. As noted above in the comments on the “Conclusion” section, OECA does not agree that there is no “champion” for the Initiative. However, OECA agrees with the need for national enforcement priorities to be managed by a senior enforcement official (e.g., Division Directors or their Associates), working on a team with other senior managers from EPA headquarters, regions and DOJ. Since 2002, the senior enforcement official responsible for managing the refinery initiative has and continues to be the Associate Director of ORE’s Air Enforcement Division, who is now serving as the Acting Director of the Air Enforcement Division. OECA agrees that the Air Enforcement Division Director is responsible

for ensuring that (a) refineries enter into consent decrees or face appropriate enforcement action, and (b) consent decrees are effectively implemented. OECA does not agree that it is necessary for EPA to settle with or litigate against **all** refiners in the industry under the Initiative. The goal of the Initiative is and has been to increase compliance by 50% and decrease emissions from refineries by 20%. The “100%” goal suggested by OIG miscomprehends the purpose of a “priority.” Even after this is no longer a priority, further work in this area would be undertaken through the “core” program guidance, including the potential for multi-regional priorities, as well as the potential for State efforts. OECA’s work in an area is not just be driven by a coverage number, but by whether there continues to be an appropriate federal role. OECA designates a set of national priority criteria (*i.e.*, significant environmental benefit, pattern of noncompliance, appropriate federal role), and following the return of refineries to the “core” program certain refineries may be better handled by States or as part of a multi-regional priority. OIG’s suggestion of “all” refineries lacks the context of taking into account all of our regulatory partners, and that certain types of facilities are best addressed at different levels.

*Recommendation 5-3, “Consider designating a senior OECA executive to assume the role of champion for each of the other enforcement priority areas. EPA and industry officials should recognize the champion as knowledgeable and as having the authority to make decisions related to the priority area.”*

Concur in part, non-concur in part. The determination of whether any particular initiative or priority area requires an OECA-designated “champion,” and at what level, will be made on a case-by-case basis as is appropriate in light of all relevant facts and circumstances. For those areas that have been selected as national enforcement priorities for FY 2005, senior OECA and regional management have been named as “champions” for the purpose of developing performance-based strategies for each priority area. In addition, the OECA Planning Council, which meets monthly, will regularly assess progress implementing, and results achieved through the priority performance-based strategies. In order to ensure that adequate progress is being made towards achieving priority goals the Planning Council will modify performance-based strategies as needed, and make recommendations to the OECA Assistant Administrator for flexibly deploying resources to address workforce gaps.

*Recommendation 5-4, “Develop a communications plan for refinery consent decree implementation. The plan should clearly describe the roles and responsibilities of all stakeholders, including refinery priority area experts and regional and State officials.”*

Concur. OECA is already in the process of priority planning for FY 2005 (begun prior to the Evaluation), which will result in a revised performance-based strategy for the refinery sector. The performance-based strategy for FY 2005 will outline the path forward in (a) completing the refinery sector as a national priority and (b) ensuring that refineries governed by federal consent decrees comply with the terms and conditions of their consent decrees.





## ***OIG Evaluation of EPA Comments***

On April 2, 2004, OECA provided us with a memorandum summarizing its overall comments, including its comments on the recommendations. We included the full text of OECA's summary memorandum as Appendix G. In this Appendix, we highlight and evaluate specific comments from OECA's summary memorandum. We organized this Appendix along the same lines OECA used in its summary memorandum. OECA also provided us with detailed comments as an attachment to its memorandum. We have posted this attachment and our evaluation of OECA's comments on our web site at <http://www.epa.gov/oig/publications.htm>. We modified the text as we determined appropriate based on OECA's detailed comments.

OECA stated that the report will help to EPA as it continues to implement the refinery program and other initiatives. OECA also stated that the report had several significant shortcomings. OECA stated that the report unfairly criticized a creative and innovative approach to address the difficult compliance challenges presented by the petroleum refining industry.

OECA agreed with 10 of the 18 recommendations in our official draft report, partially agreed with 3, and disagreed with 5. We included a summary of OECA's chapter-specific comments and our evaluation of those comments at the end of each chapter.

We made various changes to the report as we determined appropriate based on OECA's comments. We also eliminated some unnecessary detail, and combined the information previously in draft report Chapters 1 and 2 into a single chapter (now Chapter 1), and Chapters 3 and 4 into a single chapter (now Chapter 2) to clarify our message. We renamed draft report Chapter 5 as Chapter 3. In addition, we eliminated a recommendation concerning the use of a logic model because the logic model is only one of several possible means that OECA may employ to achieve the ends we advocate.

### **Report Confidentiality**

OECA requested that the final report remain confidential in its entirety because the report findings may adversely impact current and future negotiations with the refinery industry. We asked OECA to identify specific enforcement sensitive portions of the report, or portions where the release would damage negotiations; OECA did not do so. We believe the report provides an accurate evaluation of the refinery program at a point in time and makes recommendations that can improve program implementation and results.

### **Errors, Omissions, and Misstatements**

OECA stated that the draft report contained errors, omissions, and misstatements. Where the Agency clearly identified specific errors, omissions, or misstatements, and where we either already had specific evidence supporting the Agency's suggested changes or where the Agency

provided specific evidence supporting different facts as part of its written comments, we made appropriate changes to the report.

## **Historical Context**

OECA stated that the draft report did not place the petroleum refining priority in its proper historical context, did not reflect an understanding of the many challenges that OECA overcame, and gave the impression that all necessary management systems had fully matured when the program began. OECA also stated that we should mention the 1994 OECA reorganization, which marked a nearly complete overhaul of EPA's compliance and enforcement business model.

We believe the report places the petroleum refining priority in its proper historical context given our evaluation scope and objectives. We understand the challenges that OECA overcame and believe the report reflects that fact. For example, in Chapter 1 of the report, we describe how EPA shifted from routine Clean Air Act inspections to more targeted, resource-intensive investigations that focused on carefully assessing emissions released as a result of refinery processes. We also believe that OECA could have done a better job planning and implementing the program whether or not its various management processes had fully matured in 1996 when the refinery program began. Further, we did not state in the report that any of these processes had fully matured, although we believe they should have matured sooner than they did.

## **Balance**

OECA stated the draft report was unbalanced and did little to highlight the program's successes. OECA stated that the settlements with refiners contain substantial "beyond compliance" requirements and, taken together, represent a breadth and depth of coverage not previously realized in the enforcement program.

We believe the report is well balanced and adequately highlights the program's success. For example, we recognize in Chapter 1 that EPA obtained settlements with 11 petroleum refiners representing 39 percent of the nation's domestic refining capacity and covering 42 separate refineries and the settlements address each of the four priority areas under the refinery program. Chapter 1 also recognizes that the settlements contain "beyond compliance" requirements and describes OECA's compliance assistance and incentives developed as part of the refinery program. In Chapter 3, we describe the lessons learned from the refinery program, such as focusing on specific enforcement concerns, pulling together EPA staff with knowledge about the industry, using in-house experts, focusing on the end result, and encouraging and requiring the development of new emissions control technologies.

## **Complexity of the Issues**

OECA stated that the draft report did not demonstrate an appreciation for the complexity of the issues EPA successfully addressed and the refinery program's unprecedented scope.

We believe the report demonstrates a keen appreciation for the complexity of the issues EPA addressed. Without becoming too technical, the report provides sufficient and succinct background on the complexity of the industry and the compliance issues addressed under the refinery program and in the global consent decrees. For example, Chapter 1 references Appendix C that illustrates the complexity of the petroleum refining process, explains why OECA used EPA national experts in investigating compliance, and summarizes the four priority areas addressed under the refinery program and the consent decree requirements for each priority area. Readers should not interpret our succinct descriptions of the four priority areas to mean that we did not appreciate or understand their complexities. In addition, in Chapter 3, we describe how refinery program staff applied technical expertise to gain knowledge of the industry and compliance issues, and to obtain credibility with the industry on its technical aspects. We cannot comment on the “unprecedented” scope of the refinery program because we did not compare it to all other enforcement programs conducted by EPA.

## **Program Evolution**

OECA stated that the draft report did not account for the program’s evolution. Our official draft report referred to an “absence of strategic direction” for the refinery program and OECA stated that, “We do not agree that from these facts that OIG can conclude that OECA management did not have an idea of what it wanted to accomplish strategically in this sector.” OECA stated that the strategy evolved over time as EPA learned more about the sector based on its experience in the field. As evidence of its strategic direction, OECA suggested that we look at Memorandum of Agreement guidance documents, the individual regional Memorandum of Agreements agreed upon at the highest management levels in OECA and the regions, and Memorandum of Agreement updates. Similarly, OECA stated that EPA learned, and continues to learn, from its experience as the consent decree implementation phase continues to evolve. OECA stated that it has already incorporated many lessons learned into the consent decree implementation process, resulting in significant improvement in responding to consent decree deliverables.

We believe the report appropriately communicates that the strategy evolved over time as EPA learned more about the refinery sector. The report recognizes that OECA learned from implementation experiences and took steps to address its challenges. Chapter 1 clearly describes the evolution of the refinery program from inspections to investigations, through global settlements and consent decree implementation.

Although we do not believe the report conveyed that OECA “did not have an idea of what it wanted to accomplish strategically in this sector,” we believe EPA could have done a better job of communicating and documenting its goals and strategy. We discuss these issues in greater detail in Chapter 2.

To determine whether OECA had a strategic direction for this priority, we looked at not only the petroleum refining sector strategy documents, but also the Memorandum of Agreement guidance documents and updates OECA referred to in its comments. As we describe in Chapter 2, some OECA officials told us the information in the Memorandum of Agreement documents was not entirely accurate or they were not familiar with the information. Based upon meetings with

senior OECA officials, we concluded that not all managers and staff used or even considered the Memorandum of Agreement documents for planning and managing the refinery program.

## **Resource Constraints**

OECA stated that we did not recognize the severe resource constraints under which the refinery program operates and the innovative approach EPA employed to overcome these constraints. OECA stated that we did not consider the total level of resources available to OECA's air enforcement program and, had we done so, we would have realized that OECA leveraged benefits through its "global consent decree" approach. OECA stated that by leveraging activities at fewer facilities to support company-wide settlements on a broad range of emission issues, EPA extended its reach and effectiveness far more efficiently than it otherwise would have. OECA stated it applied a creative solution in the face of limited resources.

We fully recognize the resource constraints under which this and all EPA programs operate, and we believe the report accurately describes the approach EPA employed to overcome resource constraints. We did not evaluate the amount of resources EPA chose to devote to the refinery program compared to the total amount of resources OECA made available to its overall air enforcement program or to other OECA programs. While we originally planned to conduct evaluations of OECA's entire suite of enforcement priorities, OECA persuaded us to first pilot our approach in a single priority area. In consultation with OECA, we chose the refinery sector for our pilot. We also consulted numerous times with senior OECA officials over several months at the beginning of this evaluation in determining the evaluation's scope and objectives. Throughout our extensive consultations, OECA staff never suggested that we include among our objectives a comparison of resources devoted to various other enforcement programs such as OECA suggested in its comments.

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