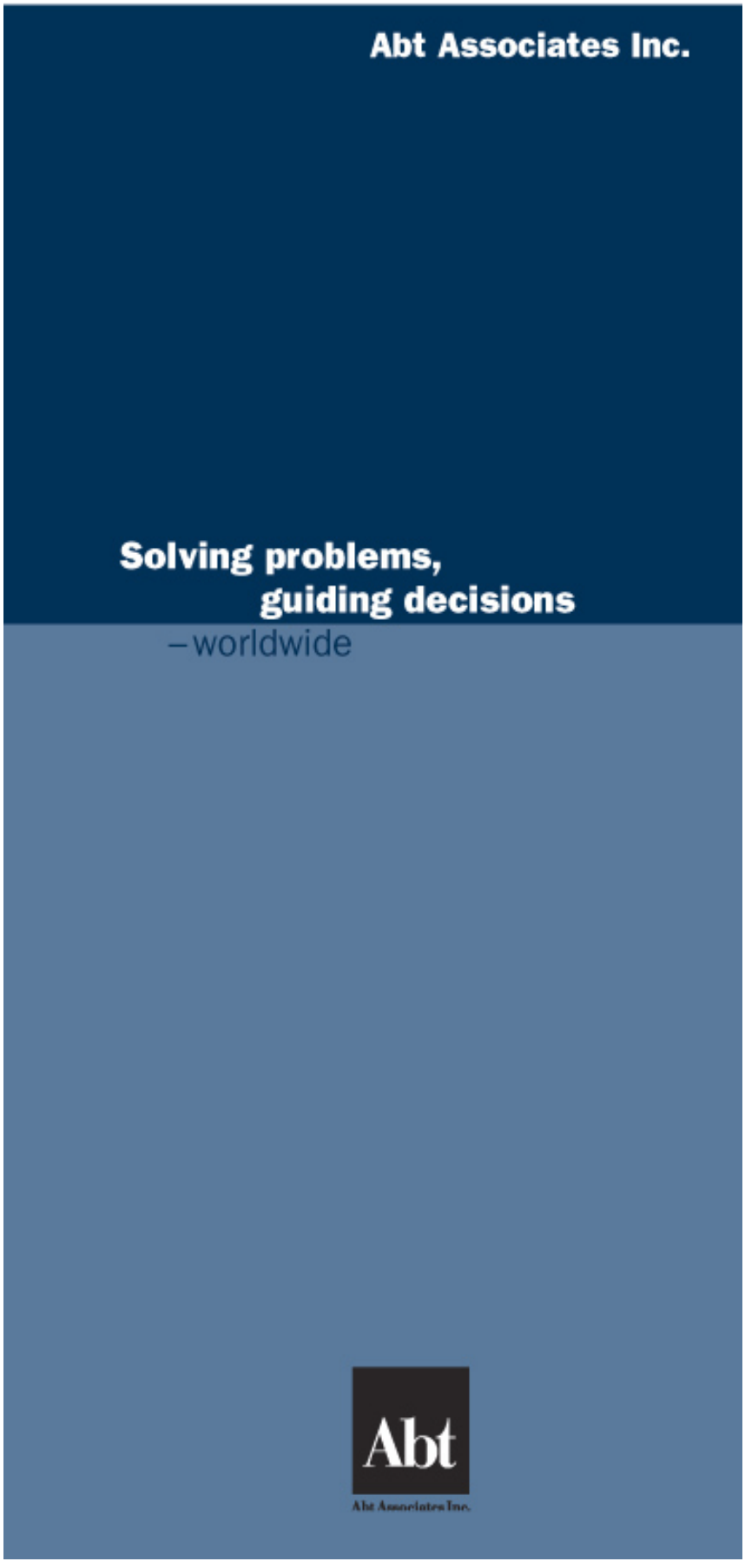


A Framework for Reviewing EPA's State Administrative Cost Estimates: A Case Study

Technical Report Volume 1

Contract EP-W-05-022
Work Assignment: 1 and 26

FINAL REPORT

September 14, 2007

Prepared for
National Center for
Environmental Economics
U.S. Environmental Protection
Agency
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

Prepared by
Abt Associates Inc.
55 Wheeler Street
Cambridge, MA 02138

Acknowledgements

Abt Associates wishes to acknowledge the invaluable assistance that we received from numerous individuals at EPA, the Environmental Council of States, and in particular, the states that participated in this case study. Our ability to complete this draft final report depended on the states providing us with detailed information on four different delegated environmental programs, and taking time out of their busy schedules to further address questions that we had during our analysis of the data. In particular, we would like to recognize:

Case Study States

Ron Hammerschmidt, Kansas Department of Health and Environment

Leo Drozdoff, Nevada Department of Environmental Protection

Marybeth Brenner, New Jersey Department of Environmental Protection

Steve Thompson, Oklahoma Department of Environmental Quality

Robin Stephens, South Carolina Department of Health and Environmental Control

Mike Murphy, Virginia Department of Environmental Quality

In addition to these state personnel, who were the lead coordinators for each state in this effort, numerous individuals in the various state environmental programs contributed substantial time and thoughtful input in providing the state-level cost information that was essential for this effort.

The Environmental Council of the States (ECOS)

R. Steven Brown, Executive Director, Environmental Council of the States

Robert W. King, Jr., ECOS President and Deputy Commissioner, South Carolina Department of Health and Environmental Control

U.S. Environmental Protection Agency

Ronn Dexter, Project Manager, and Brett Snyder, Director, Benefits Assessment and Methods Development Division, National Center for Environmental Economics, U.S. Environmental Protection Agency

Jack Bowles, Andrew Hanson, Michelle Hiller-Purvis, Randy Kelly; Office of Congressional and Intergovernmental Relations, U.S. Environmental Protection Agency

Allen Basala, Phil Lorang, Kimber Scavo, Butch Stackhouse, Jerry Stubberfield; Office of Air Quality Planning and Standards, Office of Air and Radiation, U.S. Environmental Protection Agency

Donald Brady, Joel Corona, Jack Faulk, Thomas Grubbs, John Powers, Stig Regli; Office of Water, U.S. Environmental Protection Agency

George Faison, Michael Galbraith, Peter Grevatt, Scott Palmer, Sonya Sasseville, Sara Strasser; Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency

Contents: Volume 1

Tables: Volume 1

Exhibits: Volume 1

Executive Summary
A Framework for Reviewing EPA's State Administrative Cost Estimates: A Case Study

Study Background and Objectives

In winter 2004, the Environmental Council of the States (ECOS) published a study showing that during the past few years, states have faced at least a $1 billion annual funding shortfall in the amount needed to administer current federal environmental laws.[1] The study states that the gap has been caused by the confluence of the growing fiscal crisis in the states and the need to implement many new federal environmental laws without any increase in federal funding. Given this situation, ECOS recommended in its 2004 study that the federal government provide additional funding or other relief to states to support administration of delegated federal rules.

In 2006, ECOS representatives met with EPA's Administrator, Steve Johnson, to discuss this study and to explore how EPA could work with ECOS to better understand the situation. As a first step in examining this situation, Administrator Johnson agreed to have the Office of Policy, Economics and Innovations, National Center for Environmental Economics (NCEE) conduct a study to assess how EPA can improve its estimates of the administrative costs borne by states in implementing delegated environmental regulations. In response to this commitment, NCEE worked with ECOS to design a project with the following objectives:

- Assess the costs incurred by a subset of state governments to administer four delegated environmental regulations and, if possible, one EPA guidance-related action.
- Identify ways EPA can improve its estimates of the costs states incur in administering federal regulations by comparing the state-reported costs with information on costs to states contained in or derived from information found in the EPA analyses that supported the rulemaking process.
- Propose topics that EPA, ECOS, and the states may want to discuss further to ensure that future regulatory cost analyses reflect all appropriate cost categories and assumptions that have an effect on the costs states incur to administer delegated environmental regulations.

To implement this project, NCEE asked Abt Associates Inc. to provide technical support by developing the overall analytic framework for the study, working with NCEE to identify the four regulations to examine, developing a schema to identify eight candidate states that would serve as the case studies, and performing the case study analyses of EPA and state administrative costs. This report summarizes Abt Associates' study approach and case study findings.

Project Analytic Framework

Working with EPA, and in consultation with ECOS, Abt Associates developed an overall approach to completing the study that compared the costs estimated by EPA during the development of its regulations (the "pre-promulgation" cost estimates) with costs that states

[1] Brown, R. Steven, "The Funding Gap, One Billion Dollars Short," *ECOStates*, Winter 2004.

report that they incur or have incurred in administering federal environmental regulations. To complete the analysis, Abt Associates addressed the following three key analytic issues:

- Identification of data needed to compare EPA and state cost estimates
- Reliance on a case study approach
- Development of a framework for assembling and analyzing administrative costs.

Abt Associates also developed a clear set of study limitations, given the scoping nature of the study.

Identification of Data Needed to Compare EPA and State Cost Estimates

As an initial step in conducting this study, Abt Associates needed to identify the sources of information available to analyze and compare EPA's estimates of state costs for administering EPA regulations and the costs reported by states in order to understand the key differences between them. Abt Associates developed separate approaches for compiling the EPA and state cost estimates, respectively, as discussed below. A number of normalization adjustments were then applied to make the EPA and state cost estimates consistently comparable. These normalizations included adjusting for inflation, the number of regulatory administrative activities performed by individual states, and certain labor cost considerations.

EPA Estimates

During regulation development, EPA typically estimates the nationwide costs that will be incurred both by the regulated community in meeting regulatory requirements, and by federal, state, and local agencies responsible for administering the regulations. EPA prepares these pre-promulgation estimates of the costs to government agencies to support:

- Regulation development in accordance with environmental statutes that require consideration of costs
- Comprehensive cost-benefit analysis of regulations, as may be required under Executive Orders such as E.O. 12866, Regulatory Planning and Review
- Requirements of the Unfunded Mandates Reform Act (UMRA)
- An Information Collection Request (ICR).

These nationwide cost estimates, which are typically published in a Regulatory Impact Analysis (RIA), Economic Analysis, or ICR document, are the source of the EPA estimates used by Abt Associates in this analysis. To facilitate comparison of the pre- and post-promulgation administrative cost estimates at the state level, Abt Associates undertook an approach to disaggregate EPA's nationwide estimates to the individual case study states. This approach relied on EPA's overall administrative cost methodology. The report refers to these estimates as *EPA-based* estimates because they were neither developed by EPA nor published in EPA's own Economic Analyses, but are based on its general administrative cost methodology.

State Estimates

Abt Associates relied on the states to provide the costs they incurred for the rules included in the study. Initial conversations with states confirmed prior expectations that states typically do not track their labor and other costs according to the specific federal regulation that their activities are performed to support. As a result, the states would only be able to provide their *best estimates* of the costs that they incur in administering federal environmental regulations.

In most instances, the cost estimates that Abt Associates received from the states were provided by one or a few individuals who either had been involved in the state's programs to implement the regulation or had participated in implementing regulations similar to the ones selected for this analysis. The accuracy of the estimates, therefore, depends on the ability of these individuals to construct estimates of the activities undertaken for administering a regulation. As part of this process, Abt Associates followed up with state personnel, as appropriate, to clarify any questions or uncertainties that were observed after reviewing their responses. However, lacking detailed activity and cost records for verification of these estimates, Abt Associates is unable to judge the extent and potential direction of error in the estimates provided by the states.

Reliance on a Case Study Approach

Given the scoping focus of this effort, EPA and ECOS agreed at the outset that this effort would rely on a limited set of case studies for comparing EPA and state cost estimates. EPA and ECOS recognized that this approach would fall short of the more systematic and comprehensive review that would be needed to develop statistically valid insights about the accuracy of cost estimates for all states and EPA regulations. However, this approach was viewed as a practical initial step to provide EPA and ECOS with data suitable for analysis, and to highlight some issues that might be appropriate to examine more closely in the future. In addition, lessons learned from the process itself would provide insights into the approach that would be needed to more definitively address these issues. Abt Associates applied the case study concept in two ways:

1. **Abt Associates worked with EPA to select *four regulations* as the basis for identifying and analyzing the differences between EPA's pre-promulgation cost estimates and the costs reported by states**. Although ECOS requested that EPA consider assessing the cost impacts to states for an EPA guidance-related action, EPA was unable to identify an appropriate guidance to include in the study.
2. **Abt Associates worked with *six states* as the basis for estimating the costs incurred by states in administering these regulations**. Consistent with the original intent of this study, Abt Associates used the results of its analysis and input from ECOS to identify eight states as potential study participants. Only six states finally agreed to participate in the study.

Because Abt Associates relied on a case study approach, it became important to select from the existing federal regulations and state environmental programs in ways that would help generate a broad-based understanding of the potential differences between EPA and state estimates of administrative costs. To meet this objective, Abt Associates worked with the EPA Project Manager; other NCEE and EPA program office staff; and the ECOS Executive Director, R. Steven Brown, to outline criteria for selecting the regulations and the case study states.

Regulations Examined

Abt Associates worked with EPA to select four regulations to examine based on the following principles:

- The regulations should be representative of the kinds of regulations that impose material administrative costs on states.
- The regulations should be representative of key federal environmental statutes, such as the Clean Water Act and Clean Air Act.
- The regulations should have been promulgated in the last 3 to 7 years. This period represents sufficient time for states to have worked through the challenges of

administering the regulations and thus be able to understand and estimate the requirements for administering them. But the period is not so long that states would be unable to recall with reasonable accuracy the activities and costs involved in administering these programs.

Abt Associates applied these principles to two sources of information: the ECOS list of recommended regulations and guidance to examine, and EPA's Rule and Policy Information and Development System (RAPIDS), which tracks EPA regulations that are under development or have been promulgated since 1994. Abt Associates recommended four regulations that EPA and ECOS reviewed and approved for inclusion in this study (see Table ES-1).

Table ES-1: Regulations Included in the Study

Regulation	Comments
Stormwater Phase II Final Rule (64 Federal Register 68721, 12/08/1999)	Included on the ECOS list. Viewed by the states as a significant administrative requirement. Depending on the state, this regulation is not consistently implemented by the state department of environmental quality.
Stage 1 Disinfectant/Disinfection Byproducts Rule (63 Federal Register 69390, 12/16/1998)	Related to the Stage 2 Disinfectant/Disinfection Byproducts Rule. Depending on the state, this regulation may be implemented by the public health department rather than the department of environmental quality.
Particulate Matter National Ambient Air Quality Standards (62 Federal Register 38652, 7/18/1997)	Related to a number of NAAQS regulations that ECOS identified.
Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers at Hazardous Waste TSDFs and Hazardous Waste Generators (59 FR 62896,12/06/1994 most recently amended 1/21/99)	Included on the ECOS list.

Selection of Case Study States

Abt Associates developed state selection criteria using indicators of states' ranking relative to:

- Environmental protection and sustainability (source: Resource Renewal Institute's Green Place Capacity Index)
- Effectiveness in public sector management, including environmental programs (source: Pew Government Performance Project)
- Overall level of environmental permitting activity (source: EPA OTIS)

Abt Associates also sought diversity across EPA Regions.

Abt Associates used these indicators to develop eight groupings of potential case study states and met with EPA and ECOS on March 2, 2006, to discuss the states that might be selected from each of the eight groupings. Based on this meeting, Abt Associates identified eight states that were initially contacted as candidates to participate the project. During these calls, the states were informed about the information that would need to be collected, and were asked about their willingness to participate in the study. A few states declined to participate in the study after these initial discussions; others chose not to participate in the study until they had reviewed Abt

Associates' request. In the end, six states were recruited for participation in the study. All six case study states—while facing their own day-to-day responsibilities and challenges—did an exemplary job of trying to provide as much information as possible on the four regulations examined in this effort. Table ES-2 lists the initial and final case study states.

Table ES-2: Case Study States Selected for Analysis

Initial States Contacted	Final Case Study States
Colorado (EPA Region 8)[a]	Kansas (EPA Region 7)
Kansas (EPA Region 7)	Nevada (EPA Region 9)
Michigan (EPA Region 5)[a]	New Jersey (EPA Region 2)
New Jersey (EPA Region 2)	Oklahoma (EPA Region 6)
Oklahoma (EPA Region 6)	South Carolina (EPA Region 4)
Oregon (EPA Region 10)[a]	Virginia (EPA Region 3)
South Carolina (EPA Region 4)	
Virginia (EPA Region 3)	

[a] Declined to participate in study because of limited staff resources.

Development of a Framework for Assembling and Analyzing Administrative Costs

Abt Associates identified three key steps to developing the framework, which are discussed below:

1. Develop a comprehensive administrative activity category framework that would allow Abt Associates to organize and compare, in a meaningful way, the sources of administrative cost.
2. Identify an efficient and effective way of gathering data from the case study states.
3. Organize and analyze the data in a way that would support insights on administrative cost categories that were the most important sources of difference, and identification of opportunities to further research and improve EPA's administrative cost estimates.

The Abt Associates Administrative Activity Category Framework

As a first step in developing a framework for assembling and analyzing costs, Abt Associates needed to capture the general categories of activity that may impose administrative costs – whether estimated by EPA or reported by the states – in a way that would support a consistent comparison of the EPA-based and participating state estimates. From a review of previous regulatory cost studies and cost accounting literature, Abt Associates developed an administrative activity category framework that includes 14 broad categories (13 administrative activity categories and one additional category to capture baseline activities), as shown in Table ES-3.

Within each administrative activity, Abt Associates further defined the framework to account for the factors underlying the EPA and state cost estimates. These factors include:

- The frequency with which a cost-generating activity occurs – is the activity performed only once at the start-up of regulatory administration, or does the activity recur?
- If the activity recurs, what is the average number of occurrences per year?
- For each activity, whether one-time or recurring, what components of cost do states incur: labor, materials, and other expenses (e.g., travel, purchase of services)?

- For labor costs, what categories of labor are required to perform the activity, for what duration for each activity, and at what labor rates?
- For materials and other expenses, what is the cost incurred for each activity?

Table ES-3: Abt Associates Administrative Activity Costing Framework

General Administrative Activity Categories	Examples of Line-Item Cost Components
1. Tracking EPA's rulemaking process	Review Federal Register notice; attend meetings and conferences. Provide comments on the proposed rule.
2. Obtaining additional delegated authority	Perform tasks to obtain delegated authority; amend state laws and regulations to adopt the new federal regulations; litigation costs.
3. Designing implementation plan	Design alternative standards; obtain approval from EPA.
4. General start-up activities	Develop internal guidance and procedures; attend EPA training; conduct internal training.
5. Compliance assistance: start-up activities	Conduct outreach and create awareness; develop training.
6. Permit administration: start-up activities	Determine specific permit requirements; develop infrastructure for permit administration.
7. Monitoring: start-up activities	Establish procedures and infrastructure necessary for monitoring.
8. Enforcement: start-up activities	Establish procedures and infrastructure necessary for enforcement.
9. Compliance assistance: recurring activities	Respond to phone calls, letters, requests for assistance; conduct training.
10. Permit administration: recurring activities	Review submitted documents and supporting materials; verify data sources; consult with facilities; issue notifications; administer public hearings; issue permits.
11. Monitoring: recurring activities	Collect, review, record, and/or report monitoring data.
12. Enforcement: recurring activities	Conduct inspections; review inspections; give warnings; give citations; take legal action to enforce standards; collect fines; keep records; provide notifications; report to EPA.
13. Other: recurring activities	Any other types of recurring activities not categorized above.
14. Baseline activities	Were any of the activities reported above already being performed before the rule? Were there any related regulatory activities taking place before the rule that no longer take place because of the rule? Report these activities and their costs here. Costs associated with baseline activities will be subtracted from post-rule costs to estimate the regulation's incremental costs.

Using this activity category framework, Abt Associates was able to break down and categorize costs in a way that supported a consistent comparison of Abt Associates' EPA-based and state cost estimates, and led to a better understanding of:

- The extent to which EPA's cost estimates encompass the full set of activities that states report they perform in administering regulations
- The key differences between the EPA-based and state estimates at a reasonable level of accounting disaggregation.

Implementing the State Questionnaire Form and Process

Working with EPA and ECOS, Abt Associates developed a process for collecting cost information from case study state respondents that followed five steps:

1. Review, with state agency personnel, Abt Associates' EPA-based estimates of regulatory administration costs as assigned to the individual states, based on the procedures described later in this section.

2. Obtain comments from these personnel on whether the components of the EPA-based estimates are higher or lower than their own experience; obtain alternative estimates where applicable. Specifically, within the framework of the information collection form, state agency personnel were asked to provide information on:
   - Whether they performed the specific activities
   - The number of those activities performed annually
   - The number of hours for performing each activity
   - The hourly cost of labor for performing each activity
   - Any non-labor costs incurred for the activity.
3. Identify activities omitted from EPA's analysis by reviewing a checklist of possible activities related to implementing and administering a regulation.
4. Estimate the time requirements, labor costs, number of activities, and other relevant cost elements for the activities identified as being omitted from EPA's analysis.
5. Identify the cost component, if any, of the activities reported in Steps 2-4 that results from the *part of those activities* that a state undertook independent of the requirements for administering the EPA regulation (the "baseline activity cost").

Abt Associates developed a questionnaire that mirrored these steps. In response to Steps 1 and 2, the questionnaire allowed the states to comment on each component of the EPA-based cost estimates. To assist the states in identifying activities that EPA may have omitted from its analysis (Step 3), Abt Associates incorporated a checklist into the questionnaire with a comprehensive list of activities. The states could use the checklist to identify activities that they perform, but that were not included in EPA's regulatory analysis; they also had the option of adding activities not included on the checklist. To address Step 4, the questionnaire allowed states to provide general or more detailed estimates for any activities that were omitted from EPA's analysis. Finally, to ensure that Abt Associates correctly calculated the incremental costs attributable to the regulation (Step 5), the questionnaire requested that the participating states identify those costs, if any, that they incurred independent of the regulatory requirements.

Initially, Abt Associates requested that the case study states independently generate their own cost estimates without seeing the EPA-based estimates of the costs applicable to their state. But after pre-testing this approach with South Carolina – whose staff took the time to provide very insightful comments on the information-gathering approach – it became clear that this approach would not work. South Carolina staff indicated that it would be too difficult for them to develop estimates without a starting point. The approach then adopted, wherein state staff would review EPA's estimates before developing their own, was better received by the states. This approach also had the advantage of prompting the states to frame their cost estimates in terms of the components needed for analysis in this effort. Abt Associates recognizes that providing the EPA-based estimates as a starting point might introduce some biases that could influence state agency personnel's responses to questions in the questionnaire. On balance, however, Abt Associates viewed the approach as a necessary and reasonable compromise that was practical to implement and could produce credible data for the study.

Organizing and Analyzing the Administrative Cost Data

Exhibit ES-1 shows how Abt Associates developed, organized, and analyzed the EPA-based and state estimates. Based on this organization, Abt Associates first compared the EPA-based cost

estimates with the state estimates in each of the 13 broad cost categories Abt Associates defined for this analysis, assessing the extent to which differences occur in:

- Those activity categories for which EPA estimated costs, and
- Those categories for which EPA did not estimate costs, but for which some states did report costs.

Abt Associates also noted whether any case study states indicated that some activities did not need to be performed. Based on the results of this initial comparison, Abt Associates then assessed the importance of individual activity categories in terms of their contribution to the differences between the EPA-based and the state estimates, as shown in Exhibit ES-1.

Abt Associates identified an activity category as being a "material" source of difference for an individual case study state and regulation when:

- The source of difference between the total state estimate and the total EPA-based estimate exceeded 25 percent, and
- The activity category contributes to more than 20 percent of that difference.

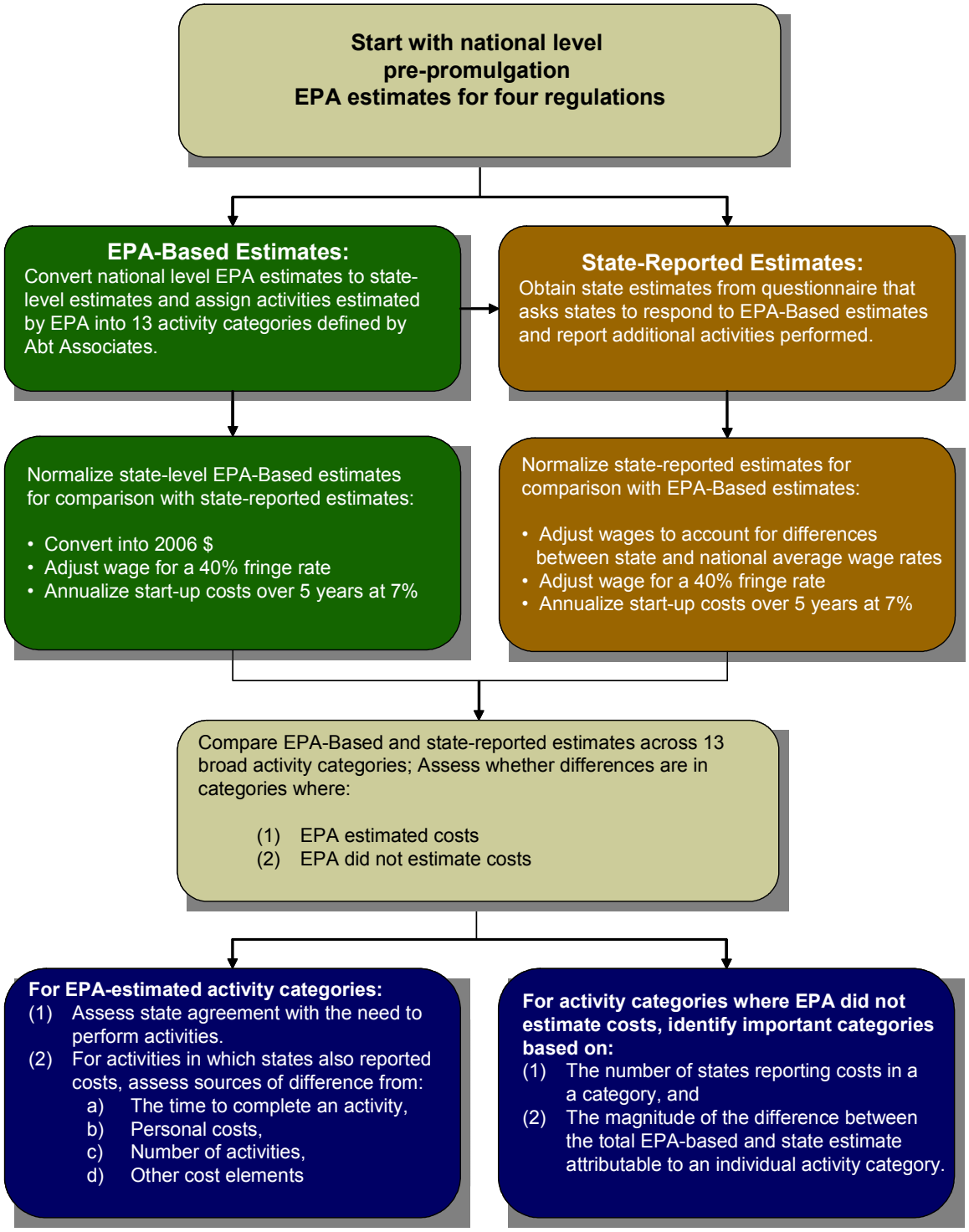
For those activities that both EPA and one or more states agreed needed to be performed, Abt Associates compared the participating states' estimates with the EPA estimates in order to:

- Identify the relative contribution of each component to the total difference between the EPA-based and state estimates for these activities.
- Examine the differences between the EPA-based and state estimates of the amount of time required to perform each activity (reported as labor hours). Abt Associates also looked for the presence of systematic patterns across states and cost categories when differences were observed between the EPA-based and case study states' estimates.

For those activity categories where EPA did not estimate costs, Abt Associates identified the categories that appeared to be important sources of difference between the total estimates based on:

- The number of states reporting costs in a category, and
- The magnitude of the difference between the total EPA-based and total state estimate attributable to an activity category.

Exhibit ES-1: Developing, Organizing, and Analyzing EPA-Based and State Estimates



Study Limitations

Given the scoping nature of this study, there are understandably a number of study limitations that the reader needs to consider when viewing the study findings. The more important limitations are summarized below:

- **The study focused on only four case study environmental regulations and six case study states.** The circumstances of these rules and states, and the resulting findings from the cost comparisons, may be indicative of experiences in some other states and for some other EPA rules. But because of the need to rely on a selective and narrow case study approach for this initial effort, the results contained in the report *are not* based on a statistically valid sample from which broader conclusions can be drawn.
- **For each of the regulations analyzed, Abt Associates attempted to allocate EPA's national administrative cost estimates to the individual case study states to derive the EPA-based estimates.** This allocation process inevitably includes error in understanding how costs would translate to individual states.
- **State estimates of administrative costs were generally not based on detailed records of actual outlays; rather, they typically reflect a recollection or "best estimate" of what is required to perform these activities.** As a result, states' estimates are subject to an unknown degree of error. Abt Associates has no way of precisely identifying the degree to which states' reported costs reflect activities that were already (or would be) ongoing because of state programs implemented independent of the federal environmental regulation's administrative requirements.

  For example, in the case of the Stormwater Phase II Final Rule, it appears that some states reported costs that could be partially attributable to the Coastal Zone Act Reauthorization Amendments (CZARA). In theory, the Stormwater Phase II Final Rule costs should be estimated as the difference between the states' stormwater program costs and the costs these states would incur under the hypothetical scenario of no Stormwater Phase II Final Rule. However, the costs that would be incurred under this hypothetical scenario, where states would have developed only a CZARA permit program, are unknown. As a result, states' reported costs may not all be directly attributable to the requirements of the federal environmental regulations being studied.
- **Abt Associates reported the EPA-based estimates to the case study states as part of the information collection process.** This seeding of the discussion with those estimates may tend to anchor the state-reported values to the EPA-based estimates and produce a narrower range of estimates than would occur if the states had independently generated their cost estimates.
- **Abt Associates' cost normalization procedures are subject to uncertainties that Abt Associates cannot quantify.** These normalization procedures encompassed adjusting regulatory cost estimates to current (2006) dollars, adjusting state and federal wage differences, and annualizing start-up costs.
- **Abt Associates did not consider the impact of state capital budgeting for start-up activities.** This was beyond the scope of Abt Associates' effort, but it could be an important consideration for states that are preparing to administer a new delegated environmental regulation.

Key Findings

Using the data and analytic framework described above, Abt Associates compared the EPA-based and state administrative cost estimates for each of the four regulations and most of the six states. In some instances, a participating state was not able to provide administrative cost data for all four of the regulations. Given the uncertainties associated with the numbers developed for this analysis, as described in the previous section, Abt Associates chose to summarize the findings in a way that would highlight those aggregate cost differences that, consistent with Abt Associates' decision rules, were considered material. These aggregate cost difference findings are summarized in Table ES-4.

Table ES-4: Summary of Total Cost Differences By Regulation and State

	Kansas	New Jersey	Nevada	Oklahoma	South Carolina	Virginia
Stormwater Phase II[1]	−	++	≈	++	++	++
Disinfection Byproducts[2]	−	≈	−	++	−	NR
Particulate Matter (PM) 2.5[3]	≈	NR	NR	++	−	++
RCRA Subpart CC[4]	NR	NR	≈	++	++	−

Key:
≈ : EPA-based and state costs are approximately equal (within ±25%).
− : State costs are more than 25% *less* than EPA-based costs.
+ : State costs are more than 25% *greater* than EPA-based costs.
++: State costs are more than 100% *greater* than EPA-based costs.
NR: The state did not report information for this regulation.

Notes:

[1] The large cost differences noted for New Jersey and South Carolina are attributable to differing views of baseline costs. EPA assumed that certain costs were already underway and attributable to nonpoint control requirements under CZARA; New Jersey and South Carolina did not agree with this determination.

[2] Oklahoma's large cost difference likely results from significantly higher oversight requirements associated with a large number of small surface water systems with water conditions that were difficult to treat.

[3] The large difference noted for Oklahoma results primarily from monitoring costs. EPA provided state grants to pay for PM2.5 monitoring, which were funded by Congress at levels higher than what EPA estimated would be needed as part of its regulatory development process. The observed difference between Oklahoma's reported monitoring costs and the EPA-based estimate may substantially reflect the larger grant amount that the state received from EPA.

[4] Oklahoma's higher cost difference results from unusually high enforcement and litigation costs. This situation would have been very difficult for Abt Associates to anticipate in applying a general framework to assign national costs to individual states. Other cost differences result from differences in the scope of the two estimates – not an oversight in the EPA analysis. An ICR Supporting Statement was the basis for the Resource Conservation and Recovery Act (RCRA) Subpart CC comparison, which does not capture all administrative cost categories. The analysis for the Subpart CC Rule is constrained by the limitations of the ICR and thus provides fewer insights on the correspondence of the state and EPA-based estimates than is the case for the other rules analyzed.

As shown, states reported costs that are higher, lower, and approximately equal to the EPA-based cost estimates. Given the variation in this cost relationship at the aggregate level, Abt Associates then examined more closely the specific administrative cost categories that had a material impact on the observed cost differences; i.e., where the difference between the total state and EPA-based estimates was at least 25 percent *and* the cost category accounted for at least 20 percent of that difference (see Table ES-5 and Table ES-6). While this analysis will obviously not capture all of the potentially important instances of difference, it does highlight some of the more important sources of difference that EPA may wish to research further in reviewing its methodology for estimating state administrative costs.

A number of factors account for the observed cost differences shown in Table ES-4. The following discussion begins with some of the larger, overarching findings and then discusses some of the issues that resulted in material differences for an individual state and regulation:

- **State-specific circumstances explain some of the largest (++) differences summarized in Table ES-4.** In some cases, states disagreed with EPA's baseline determination (i.e., that they were incurring certain costs independent of rule requirements). In other cases, unique situations that would have been difficult for Abt Associates to account for in its cost allocation may account for the large difference. For example:
  - *Stormwater Phase II Final Rule.* New Jersey and South Carolina's large cost differences result in large part from EPA's determination that these states already faced similar requirements under CZARA, and would need to implement nonpoint source requirements independent of the EPA rule. These states disagreed with this baseline determination. For example, South Carolina implemented the Stormwater Phase II Final Rule recognizing that it would also meet the CZARA requirements; accordingly, the state assigned all of the regulatory costs to the stormwater regulation.
  - *Disinfection Byproducts Rule.* In discussions between Abt Associates and the EPA Office of Water, EPA indicated that Oklahoma's large cost difference likely resulted from significantly higher oversight requirements associated with a large number of small surface water systems with challenging water treatment conditions. Other case study states did not face these conditions. This situation could not be anticipated by Abt Associates' framework for assigning national costs to individual states.
  - *PM 2.5 Rule*. Oklahoma's large cost difference for the PM 2.5 Rule results primarily from the state's reporting of higher monitoring costs than the EPA-based estimate. The EPA-based estimate is derived from the RIA estimates, which were prepared before Congress made final appropriations decisions on the value of federal grants that EPA provided states to offset the cost of PM 2.5 monitoring. Although Oklahoma reported PM 2.5 monitoring costs that are higher than the RIA-based estimate, the state also indicated that these monitoring costs were funded by its PM 2.5 monitoring grant. So the observed difference between Oklahoma's reported monitoring costs and the EPA-based estimate may substantially reflect the larger grant amount, which was specified after the time of the RIA estimates. In this analysis, all four of the case study states received a federal grant for PM 2.5 monitoring that was larger than the monitoring cost originally estimated in the RIA, but this difference is greater for Oklahoma than for the other states.
  - *RCRA Subpart CC Rule.* Oklahoma's large cost difference for the Subpart CC Rule results from substantial enforcement and litigation costs, which are less predictable and vary substantially by state. Other states reported lower enforcement costs compared to the EPA-based estimates. Again, this is a situation that would have been very difficult for Abt Associates to anticipate in applying a general framework to assign national costs to individual states.
- **Some cost differences result from differences in coverage of activity categories (i.e., states estimated costs for activities that EPA did not include).** Abt Associates observed that EPA's regulatory analyses generally covered the more important cost categories; however EPA's analyses often did not include one or more activity categories in which some states reported costs.

- This was particularly true for start-up activities (light blue-shaded cells in Table ES-5). Although a substantial number of these instances occur across the case study regulations and states, they did not generally result in material cost differences because the start-up costs constituted a smaller share of the total annualized rule costs compared to the recurring costs of administering a rule. Nevertheless, start-up costs may cause capital budgeting challenges for states in the years that they are incurred.
- Material differences (**dark blue-shaded and white text** cells in Table ES-5) from category coverage occurred for the stormwater regulation and the Subpart CC Rule. The category coverage differences for the Subpart CC Rule largely reflect differences in the scope of the two estimates – not an oversight in the EPA analysis. An ICR Supporting Statement was the basis for the RCRA Subpart CC comparison. Since the scope of an ICR is limited to paperwork-related burdens, and the state-reported estimates were not limited to paperwork-related costs, the scope of costs that states were able to report in this analysis differed materially from the scope of the ICR.

Table ES-5: Summary of Cost Differences Resulting from States Estimating Costs for Activities Not Included by EPA

Activity Category	Stormwater Phase II (6 states)	Disinfection Byproducts (5 states)	PM 2.5 (4 states)	Subpart CC* (4 states)	Total Material Differences, Four Regulations
Start-Up Activities					
1. Tracking EPA's rulemaking process					0
2. Obtaining additional delegated authority					0
3. Designing implementation plan				1	1
4. General start-up activities					0
5. Compliance assistance					0
6. Permit administration					0
7. Monitoring					0
8. Enforcement				1	1
Recurring Activities					
9. Compliance assistance					0
10. Permit administration					0
11. Monitoring					0
12. Enforcement	2				2
13. Other Recurring Activities	1				1

Notes:

*The scope of the EPA analysis for the RCRA Subpart CC Rule was limited to paperwork-related costs. Therefore, EPA's omissions of categories for the Subpart CC Rule reflect the intended limited scope of the EPA analysis.

Tan cells indicate activities for which: (1) EPA did not estimate costs, and (2) fewer than half of the states reported performing activities in a category.

Light blue-shaded cells indicate activities for which: (1) EPA did not estimate costs, (2) at least half of the states reported performing activities in a category, but (3) none of these instances resulted in a "material" cost difference.

Dark blue-shaded and white text cells indicate activity categories for which EPA did not estimate costs and at least one state recorded a material difference in costs in the category. The number indicates the number of states that reported a material difference for the rule and activity category. In all instances, the cost effect is necessarily positive (i.e., the state cost estimate exceeds the "missing" EPA-based estimate).

Blank cells indicate activity categories for which EPA estimated costs for a regulation – not the focus of this discussion.

Cost effects are considered "material" when (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference. These instances are of most interest for understanding the character of differences between the state and EPA-based estimates.

- **Cost differences in categories where EPA estimated costs generally accounted for the more substantial differences (both positive and negative) between the EPA-based estimates and the state estimates. Recurring activity categories were the primary sources of these differences, as illustrated by the dark blue-shaded and white text and light blue-shaded cells in Table ES-6.**
  - Category 11, Monitoring (Recurring), was the activity category that was most often the source of material cost difference between the EPA-based and state estimates. In three instances, states reported costs that are materially above the EPA-based estimates; in three other instances, states reported costs that are materially below the EPA-based estimates.
  - Category 10, Permit Administration; Category 12, Enforcement; and Category 13, Other Recurring Activities, also account for both positive and negative material cost differences in the EPA-estimated categories, although with less frequency than Category 11.

Table ES-6: Summary of Cost Differences in the EPA-Estimated Activity Categories

Activity Category	Stormwater Phase II (6 states)	Disinfection Byproducts (5 states)	PM 2.5 (4 states)	Subpart CC* (4 states)	Total Material Differences, Four Regulations
Start-Up Activities					
1. Tracking EPA's rulemaking process					0
2. Obtaining additional delegated authority					-
3. Designing implementation plan					0
4. General start-up activities					0
5. Compliance assistance					0
6. Permit administration		1			1
7. Monitoring					0
8. Enforcement					0
Recurring Activities					
9. Compliance assistance					0
10. Permit administration	3 / 1				4
11. Monitoring		1 / 2	2 / 1		6
12. Enforcement				1 / 1	2
13. Other Recurring Activities		1			1

Notes:

*The scope of the EPA analysis for the RCRA Subpart CC Rule was limited to paperwork-related costs. Therefore, EPA's omissions of categories for the Subpart CC Rule reflect the intended limited scope of the EPA analysis.

Brown-shaded and white text cells indicate activity categories for which EPA estimated costs and there were no "material" differences in costs for the rule and activity category.

Dark blue-shaded and white text cells indicate activity categories for which EPA estimated costs and at least one state reported costs that exceeded the EPA-based estimate and were "material." The number in the cell identifies the number of states that reported positive "material" differences.

Light blue-shaded cells indicate activity categories for which EPA estimated costs and at least one state reported costs that are less than the EPA-based estimate and were "material." The number in the cell identifies the number of states that reported negative "material" differences.

Cost effects are considered "material" when (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference. These instances are of most interest for understanding the character of differences between the state and EPA-based estimates for this regulation.

- **Within the EPA-estimated categories, different estimates of time requirements for completing certain activities most often accounted for the material differences between the EPA-based and state estimates.** Some states indicated that they needed considerably more – or, in a few instances, less – time to complete specific activities (e.g., permit administration) than estimated by EPA (see Table ES-7). Some of this difference may result from different state implementation approaches, and/or some states developing more efficient models for rule administration.

Table ES-7: Number of Instances of Material Cost Differences from Time Requirement Estimates

State	Stormwater Phase II (6 states)	Disinfection Byproducts (5 states)	PM 2.5 (4 states)	Subpart CC (4 states)	Percent of Regulations Reporting Material Differences in Time Requirements
Kansas				-	0%
Nevada		✓–	-		33%
New Jersey	✓+		-	-	50%
Oklahoma	✓+	✓+		✓+	75%
South Carolina	✓+		✓–		50%
Virginia		-	✓+	✓–	67%

Notes:

(✓+) cells indicate that states estimated materially higher time requirements than the EPA-based estimates.

(✓–) cells indicate that states estimated materially lower time requirements than the EPA-based estimates.

Dashes ("-") indicate that states did not provide an estimate for the regulation.

Blank cells indicate that the difference in time requirements was not material.

The differences in estimates of the time requirement for completing activities are considered "material" when (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference, (3) the contribution from line items estimated by states exceeds 20%, and (4) the Time to Complete Activities factor was found to contribute materially (>20%) to the cost difference.

- **States follow widely different models for tracking and implementing regulations, which can result in significant differences in administrative costs across the states.** Based on discussions with the case study states, Abt Associates found some of the following state-specific trends:
  - Some states spend more resources in the up-front phases of rule development and administrative start-up; others focus more on the implementation phase.
  - Some states devote considerable resources to working closely and supportively with their regulated community during rule implementation, while others appears to incur lower costs by following a more "hands-off" approach.
  - Some states welcome the flexibility that EPA sometimes builds into its regulatory requirements, while others prefer less ambiguity in the requirements in order to reduce their implementation costs. In the case of the Stormwater Phase II Final Rule, for example, New Jersey found that allowing regulated entities the full flexibility allowed under the rule would make it too difficult to implement. As a result, the state developed a more prescriptive version of the rule to satisfy its requirements.

Topics for Further Consideration

Based on Abt Associates' study findings and the strong collaboration and support provided by ECOS, the six case study states, and EPA during this project, Abt Associates suggests some steps that EPA may wish to pursue to strengthen its ability to assess the costs of administering federal environmental regulations. In most instances, these suggestions cut across all of the regulations that Abt Associates examined and could provide useful information (e.g., state best practices) to help improve state and EPA guidance and policies on assessing state costs and ensure more cost-effective administration of state resources supporting these programs.

Some of the proposed steps may potentially be better suited to more immediate consideration, while others would benefit from the lessons learned from these initial actions, as discussed below. Some of the initial steps to consider could include having EPA, ECOS, and states work collaboratively to:

- **Understand why states view certain activities as essential for rule administration that EPA has not consistently included in its cost analysis.** In many instances, EPA and states agree on which state activities are essential to successfully administer new EPA regulations. In other situations, however, some activities that states claim as essential for rule administration, or the level of effort applied to these activities, may be viewed by EPA as more discretionary in character and result from state preferences that go beyond the reasonable needs for rule administration. These different views are manifest for some rules where the differences between the EPA-based and state cost estimates are greatest.
- **Assess the time requirements for performing rule-related activities.** A substantial part of the difference between the state and EPA-based cost estimates results from differences in the estimated time required for performing rule-related activities. For both start-up and recurring activities, some states reported needing to spend more time than EPA estimated. As noted above, some part of the difference may be reasonable, but there could be instances in which the time spent exceeds "reasonable needs."
- **Consider having a subset of states track their administrative costs for a few new regulations.** This would provide the basis for a more rigorous understanding of actual state administrative costs and comparison against the costs that EPA initially predicted. While inevitably somewhat costly to implement, this effort would provide important information on the cost of administering regulations that may result in improvements to EPA's costing methodology, as well as identify opportunities to enhance the efficiency of regulatory program administration.
- **Develop a practical and transparent way to examine and consider baseline costs where there are overlapping federal and state requirements.** For future regulations, EPA and the states may want to discuss reasonable baseline assumptions in greater depth. In other situations where there are overlapping federal and state requirements, EPA and the states could benefit from exploring ways to measure state costs and represent their impacts, including approaches to attribute or assign costs to programs that share similar objectives and resources.
- **Explore opportunities for EPA to provide states with more training and education on the new regulations.** Several of the case study states mentioned that EPA has reduced its level of support in training, education, and compliance assistance for new and revised regulations in response to Agency budget cuts. In some instances, states have incurred

additional costs to fill this gap, which may be a less efficient and cost-effective delivery method than if EPA had provided the support.

Based on the findings of efforts like those described above, as well as others that EPA, ECOS, and the states may jointly pursue, EPA will be in a better position to determine the utility of engaging in additional longer-term efforts, such as:

- **Developing a comprehensive framework for use by EPA's program offices in assessing the costs to states of administering federal regulations.** The framework that was developed for this study received some positive feedback from ECOS, states and EPA reviewers in the course of the study, and it may prove a good overall starting point for conceptualizing this comprehensive set of activities to apply to a wider array of rules. More too can be learned from investigating other successful frameworks and practices in EPA and the states.
- **Updating internal EPA guidance to ensure uniform estimation and reporting of administrative costs.** The guidance should consider identifying best practices for such topics as:
  - Estimating activity costs based on the number of activities to be performed by states in administering a regulation, the time required for performing each unit activity, the unit labor costs for the activity, and any non-labor costs.
  - Normalizing and achieving consistency in the treatment of fringe and overhead costs.
  - Identifying appropriate periods for annualizing start-up costs.
  - Defining the labor categories and the associated base wage rates for performing administrative activities.
- **Presenting administrative costs in ways that would support more focused review and comments from the states.** To facilitate states' review, EPA may want to consider options for disaggregating and reporting administrative cost estimates at the state level. For example, for rules expected to have greater impact on states' costs, EPA may want to explore opportunities to gather input from the states using a Notice of Data Availability during the rulemaking process. It would be useful to gauge the merits of this and other approaches aimed at effectively producing and communicating information on state costs, and engaging states so as to help EPA to prepare reliable state cost estimates.

1 Introduction

1.1 Project Background and Objectives

In winter 2004, the Environmental Council of the States (ECOS) published a study showing that during the past few years, states have faced at least a $1 billion annual funding shortfall in the amount needed to administer current federal environmental laws.[1] The study states that the gap has been caused by the confluence of the growing fiscal crisis in the states and the need to implement many new federal environmental laws without any increase in federal funding. Given this situation, ECOS recommended in their 2004 study that the federal government provide additional funding or other relief to states to support administration of delegated federal rules.

In 2006, ECOS representatives met with EPA's Administrator, Steve Johnson, to discuss this study and to explore how EPA could work with ECOS to better understand the situation. As a first step in examining this situation, Administrator Johnson agreed to have the Office of Policy, Economics and Innovations, National Center for Environmental Economics (NCEE) conduct a study to assess how EPA can improve its estimates of the administrative costs borne by states in implementing delegated environmental regulations. In response to this commitment, NCEE worked with ECOS to design a project with the following objectives:

- Assess the costs incurred by eight state governments to administer four delegated environmental regulations and, if possible, one EPA guidance-related action.
- Identify ways by which EPA can improve its estimates of the costs states incur in administering federal regulations by comparing state-reported costs with information on costs to states contained in or derived from information found in EPA analyses performed as part of the rulemakings for these regulations.
- Use the results from this study to propose topics that EPA, ECOS, and the states may want to discuss further to ensure that future regulatory cost analyses reflect all appropriate cost categories and assumptions that have an effect on the costs states incur to administer delegated environmental regulations.

To implement this project, NCEE asked Abt Associates Inc. to provide technical support by developing the overall analytic framework for the study, working with NCEE to identify the four regulations to examine, developing a schema to identify eight candidate states that would serve as the case studies, and performing the case study analyses of EPA and state administrative costs. This report summarizes our technical approach and case study findings.

1.2 Report Overview

Abt Associates organized this report into the chapters described below. These chapters document our overall technical approach and our findings, focusing on the results for each state that participated in the study, as well as cross-cutting issues of interest to EPA and ECOS. We have also included a list of references and four appendix chapters that describe how we calculated EPA's and the case study states' administrative costs for the four regulations examined.

[1] Brown, R. Steven, "The Funding Gap, One Billion Dollars Short," *ECOStates*, Winter 2004.

1.2.1 Overall Technical Approach

Chapter 2, Overview of Concept and Approach, discusses the overall analytic framework that we used to complete this study.

Chapter 3, Selection of Regulations for Analysis, lists the principles that we developed with NCEE to identify the four regulations included in the study.

Chapter 4, Selection of States for Case Studies, describes the criteria that we developed with NCEE and ECOS to identify a good mix of states for the case studies.

Chapter 5, Analytic Framework, summarizes the steps that we took to implement the analytic framework discussed in Chapter 2, including such activities as normalizing the federal estimates of state administrative costs to the individual state level, developing the information collection form, and working with the case study states to gather the cost information.

1.2.2 Findings

In Chapters 6 through 9, we describe our case study findings for each of the four regulations included in the study:

- Chapter 6, Analyzing Case Study State Costs for Administering the Stormwater Phase II Final Rule
- Chapter 7, Analyzing Case Study State Costs for Administering the Disinfection Byproducts Regulation
- Chapter 8, Analyzing Case Study State Costs for Administering the Particulate Matter 2.5 Regulation
- Chapter 9, Analyzing Case Study State Costs for Administering the RCRA Organic Air Emission Standards (Subpart CC) Regulation

The Executive Summary, which appears at the beginning of this report, provides an overall summary of the key findings that we observed in looking across all of these rules. The Executive Summary also describes our recommendations on research topics that EPA may wish to consider to ensure that future regulatory cost analyses reflect all appropriate cost categories and use appropriate analytic framework and assumptions in estimating the costs within those cost categories.

Numerous instances of *we*, *our*, and *us* appear throughout this report. These references mean Abt Associates and do not include the U.S. Environmental Protection Agency. All analyses, findings, and judgments conveyed in this report are the responsibility of Abt Associates.

2 Overview of Concept and Approach

In this chapter, we provide an overview of the approach taken to meet the project objectives described in the introduction. Key elements of the overall approach include the following:

1. **Identification of Data Needed to Compare EPA and State Cost Estimates.** As an initial step in conducting this study, we identified the information needed to analyze and compare EPA's estimates of state costs for administering EPA regulations with the costs reported by states, and to understand the differences in these costs.
2. **Reliance on a Case Study Approach.** Given the scoping focus of this effort, we decided jointly with EPA and ECOS to use a case study approach for comparing EPA and state cost estimates. We chose to examine four EPA regulations and no more than eight states. This approach would provide EPA and ECOS with a preliminary list of ideas that could be examined more closely in the future.
3. **Development of a Framework for Assembling and Analyzing Administrative Costs.** We developed a framework for collecting, assembling, and analyzing information both from the EPA estimates of state costs and from the cost information to be provided by participating states. This framework is intended to support a consistent comparison of EPA and state estimates, to allow insight into the differences between the EPA and state estimates, and to provide a basis for recommendations for improving future EPA analyses of state administrative costs.

The chapters following this overview – Chapter 3, Selection of Regulations for Analysis; Chapter 4, Selection of States for Case Studies; and Chapter 5, Analytic Framework – provide additional detail on these elements of the overall project approach and their implementation.

2.1 Identification of Data Needed to Compare EPA and State Cost Estimates

Developing ideas for ways that EPA can improve future analyses requires us to compare the costs estimated by EPA during the development of its regulations (the "pre-promulgation" cost estimates) with costs that states report that they incur/have incurred in administering federal environmental regulations.

During regulation development, EPA typically estimates the costs that will be incurred both by the regulated community in meeting regulatory requirements, and by federal, state, and local agencies in administering those regulations. EPA prepares these pre-promulgation estimates of the costs to government agencies to support:

- Regulation development in accordance with environmental statutes that require consideration of costs
- Comprehensive cost-benefit analysis of regulations, as may be required under Executive Orders such as E.O. 12866, Regulatory Planning and Review
- Requirements of the Unfunded Mandates Reform Act (UMRA)
- An Information Collection Request (ICR).

These nationwide cost estimates, which are typically published in a Regulatory Impact Analysis (RIA), Economic Analysis, or ICR document, are the source of the EPA estimates used in this analysis.

For the estimates of the costs incurred by states in administering regulations, we needed to rely on states' estimates of these costs. Our initial conversations with states confirmed our expectation that states typically do not track their labor and other costs according to the specific federal regulation that their activities are performed to support. As a result, the state costs to be compared with the EPA pre-promulgation cost estimates would be states' *best estimates* of the costs that they incur in administering federal environmental regulations. As described in more detail in Chapter 5, Analytic Framework, we encountered a range of specificity and, potentially, reliability and accuracy, with which states were able to provide their estimates of administrative costs.

One state, Oklahoma, did report having a fairly detailed system for tracking employee activities. The state reported that "each program has one or more 'activity codes' assigned to it that tracks the number of hours employees worked in a broad category (e.g. RCRA, solid waste, air quality, water, radiation, etc.). Each of those broad categories can be further broken down into activities such as inspections, enforcement, training, etc." However, in most instances, a state's cost estimates were provided by one or a few individuals who had been involved in the state's programs to implement the regulation, or who had participated in implementing regulations of similar character to the ones selected for this effort. The accuracy of the estimates therefore depends on the ability of these individuals to construct estimates of the activities undertaken for administering a regulation. Where these activities remain ongoing for administering a regulation, these estimates are probably of relatively good quality. For activities that were performed at the start-up of a regulation – and thus may have been performed a number of years ago, perhaps by different persons from those consulted for this study – the estimates are probably subject to greater error. Lacking detailed activity and cost records for verification of these estimates, we are unable to judge the extent and potential direction of error in the estimates provided by the states.

As described in Chapter 5, we performed a number of normalization adjustments to make the EPA and state cost estimates consistently comparable. These normalizations included adjusting for inflation, the number of regulatory administrative activities performed by individual states, and certain labor cost considerations.

2.2 Reliance on a Case Study Approach

Because performing an exhaustive study was not feasible – both in terms of the number of regulations and the number of states for which we could review costs – we used a "case study" approach for the project. We applied the case study concept in two ways:

1. We selected *four regulations* as the basis for identifying and analyzing the differences between EPA's pre-promulgation cost estimates and the costs reported by states.
2. We worked with *six states* as the basis for estimating the costs incurred by states in administering these regulations and in supporting comparison of EPA's pre-promulgation costs with the costs that states estimated they have, in fact, incurred. Consistent with the original intent of this study, we identified eight states to work with, but only six states finally agreed to participate in the study.

Because we relied on a case study approach, it was important to select the regulations and states in ways that would support a broad-based understanding of the potential differences between EPA and state estimates of administrative costs. To meet this objective, we worked with the EPA project manager, other NCEE and program office staff, and the ECOS Executive Director, R. Steven Brown, to outline criteria for selecting the regulations and the case study states.

2.2.1 Selecting Regulations

We agreed that the regulations should be broadly representative of the kinds of regulations that impose material costs on states (i.e., they should be significant regulations and should be based on a range of federal environmental legislative authorities) and should also meet other criteria regarding how recently the regulations were promulgated. On the one hand, the regulations should have been in place long enough that states have encountered the full range of activities and challenges involved in administering the regulations. At the same time, though, the regulations should not have been in place so long that states would not be able to recall with reasonable accuracy the activities and costs involved in administering them. Chapter 3 describes the principles followed in selecting the regulations, and the specific regulations selected for the analysis.

2.2.2 Selecting States

We also agreed that states should be selected to reflect diverse circumstances and challenges in administering federal environmental regulations. To meet this objective, we selected states taking into account the following four factors that could influence the level of costs incurred by states in administering regulations:

1. Degree of environmental management challenge as indicated by the overall level of environmental permitting activity
2. Reported effectiveness in public sector management
3. Level of environmental protection and sustainability
4. Regional diversity.

These criteria form a simple model of the factors that could cause a state's outlays for administering federal environmental regulations to vary both in relation to other states and in relation to the outlays estimated by EPA. All else equal, a *higher* level of environmental protection and sustainable development, *lower* effectiveness in public sector management, and *higher* overall environmental permitting activity may point to *higher* potential costs for administering federal regulations. In contrast, a *lower* level of environmental protection and sustainable development, *higher* effectiveness in public sector management, and *lower* overall environmental permitting activity may point to *lower* administrative costs. Thus, selecting states that are diverse across these criteria should provide a diversity of situations that could lead to higher or lower state administrative costs in comparison to those of other states or EPA. In addition, we considered regional diversity as an overlay criterion in identifying candidate states.

Chapter 4 provides detail on the application of these criteria in identifying the candidate states for the analysis.

2.3 Development of a Framework for Assembling and Analyzing Administrative Costs

The third element of the overall approach involves the framework for assembling and analyzing administrative costs and for understanding how the costs reported by states may differ from those originally estimated by EPA. In laying out a framework for assembling and analyzing costs, we needed to capture the components of administrative costs – whether as estimated by EPA or as reported by states – in a way that would support a consistent comparison of those costs and further to assess the difference between the EPA and participating state estimates. Understanding the differences between the EPA-based estimates and the estimates reported by states enables us to develop ideas for improving future EPA analyses.

The core element of this framework is the identification of general categories of activity that may impose administrative costs. As described in Chapter 5, from a review of previous regulatory cost studies and cost accounting literature, we identified 13 general activity categories in which states might incur costs for administering federal environmental regulations. Using this activity category framework allowed us to break down and categorize costs, as estimated by EPA and by participating states, in a way that would support an understanding of:

1. The extent to which EPA's cost estimates encompass the full set of activities that states report they perform in administering regulations
2. The difference between the EPA and state estimates at a reasonable level of accounting disaggregation.

Within each administrative activity, we further defined the framework to account for the principal factors underlying the EPA and state cost estimates. These factors include:

- The frequency with which a cost-generating activity occurs – is the activity performed only once at the start-up of regulatory administration, or does the activity recur?
- If the activity recurs, what is the average number of occurrences per year?
- For each activity, whether one-time or recurring, what components of cost do states incur: labor, materials, and other expenses (e.g., travel, purchase of services)?
- For labor costs, what categories of labor are required to perform the activity, for what duration for each activity, and at what labor rates?
- For materials and other expenses, what is the cost incurred for each activity?

Consistent with EPA's administrative cost analyses, we also attempted to account for states' own programs that overlapped with the requirements for administering a federal regulation. The states' cost of those "overlapping" activities would properly not be accounted for as resulting from the federal environmental regulation.

Together, these cost elements present a detailed picture of the ways that states incur costs in administering federal environmental regulations and support the decomposition of the aggregate differences between EPA and participating state cost estimates into specific factors. Understanding the costs in this way further supports the development of steps for improving the cost estimates and for better managing the costs incurred by states in administering regulations. Chapter 5 provides detail on the use of this framework for assembling and analyzing the EPA and participating state costs, including a description of the steps we took to normalize the EPA and state estimates so that they could be compared on a consistent basis.

3 Selection of Regulations for Analysis

3.1 Principles Underlying the Selection of Regulations

One of the first tasks we undertook in this project was to develop criteria that we could use to identify the four regulations for examination with the states. To this end, Abt Associates worked closely with NCEE to develop the following key principles:

- The regulations should be representative of the kinds of regulations that impose material administrative costs on states.
- The regulations should be representative of key federal environmental statutes, such as the Clean Water Act and Clean Air Act.
- The regulations should have been promulgated in the last 3 to 7 years. This period represents sufficient time for states to have worked through the challenges of administering the regulations and thus be able to understand and estimate the requirements for administering them. But the period is not too long for states to be able to recall with reasonable accuracy the activities and costs involved in administering these programs.

In addition to considering regulations, ECOS also requested that EPA consider assessing the cost impacts to states for an EPA guidance-related action.

While we used these principles to guide our selection of the four regulations included in this study, as discussed in the next section, we also found it necessary to deviate slightly from these principles to ensure that we had a good mix of regulations. For example, in some cases we needed to focus on regulations that were slightly older than 7 years (but with some more recent modest updates) or were not yet fully implemented because these regulations were representative of key environmental programs that states are implementing and, as a result, needed to be considered in some way in this study.

3.2 Summary of Selected Regulations

We applied the guiding principles to two sources of information on regulations:

1. ECOS' list of recommended regulations and guidance to examine (see Table 3-1)
2. EPA's Regulation Action Database, which tracks EPA regulations that are under development or have been promulgated since 1994.

We first evaluated the ECOS list. ECOS compiled a strong list of high-visibility, high-interest regulations, but many did not qualify for inclusion in this study because they were either promulgated too recently or were still under development. We then analyzed the findings from the EPA database search. In particular, we reviewed the supporting regulatory impact information to assess the potential for significant administrative costs to states. We also assessed which of these regulations either overlapped with or were related to those recommended by ECOS for consideration in this study. Based on this assessment, we identified the four regulations listed in Table 3-2.

Table 3-1: ECOS Recommended Regulations and Guidance for Review	
Regulation	**Comments**
1. Clean Air Fine Particle Implementation (SAN 4752)	Does not meet 3-7 year requirement (under development at time of regulation selection).
2. Implementation Rule for 8-Hour Ozone NAAQS (SAN 4625.1)	Does not meet 3-7 year requirement (promulgated 11/29/05).
3. Clean Air Interstate Rule (SAN 4794)	Does not meet 3-7 year requirement (promulgated 5/12/05).
4. National Primary Drinking Water Regulation: Long-Term 2 Enhanced Surface Water Treatment Rule (SAN 4341)	Does not meet 3-7 year requirement (promulgated 1/05/2006).
5. National Primary Drinking Water Regulation: Stage 2 Disinfectant/Disinfection Byproducts Rule (SAN 4342)	Does not meet 3-7 year requirement (promulgated 1/04/06).
6. National Primary Drinking Water Regulations: Arsenic and Clarifications to Compliance and New Source Contaminant Monitoring (SAN 2807)	Just meets 3-7 year requirement, but the Phase I Disinfectant/Disinfection Byproducts rule viewed as better choice for study (promulgated 2001, effective 2002, compliance by 2006)
7. National Pollution Discharge Elimination System (NPDES) Permit Requirements for Municipal Sanitary and Combined Sewer Collection Systems, Municipal Satellite Collection Systems, Sanitary Sewer Overflows, and Peak Excess Flow Treatment Facilities (SAN3999)	Regulation still under development.
8. Standardized Permit for Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Facilities (SAN 4028)	Does not meet 3-7 year requirement (promulgated 9/8/05).
9. Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers at Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs) and Hazardous Waste Generators (SAN 2240 and 3792 for amendments)	Meets selection criteria (primary rule published in 1994, but a clarification to this rule was published in 1999).
10. National Emissions Standards for Hazardous Air Pollutants (NESHAP): Standards for Hazardous Air Pollutants for Hazardous Waste Combustors (Phase I Final Replacement Standards and Phase II) (SAN 3333, 4418, 4552, and 4566)	Does not meet 3-7 year requirement (most recent rule promulgated 10/05).
11. Stormwater Phase II Final Rule (SAN 3785)	Meets selection criteria (promulgated 12/8/99).
12. EPA Policy Regarding National Pollutant Discharge Elimination System Permit Requirements for Municipal Wastewater Treatment During Wet Weather Conditions (SAN 4690)	Does not meet 3-7 year requirement (under development at time of regulation selection).

As shown in Table 3-2, the regulations that we recommended examining represent key regulatory programs under the Clean Air Act, Clean Water Act, and Safe Drinking Water Act. The four selected regulations also overlap well with the ECOS list. Two of the recommended regulations (Stormwater Phase II Final Rule and the RCRA Organic Air Emission Standards (Subpart CC) Regulation) are on the ECOS list, and the remaining two are closely related to those on the ECOS list (the National Ambient Air Quality Standards (NAAQS) and the Disinfectant/Disinfection Byproducts rule). We did not succeed in identifying an EPA guidance to include in the study.

Table 3-2: Recommended Regulations

Regulation	Comments
Stormwater Phase II Final Rule (64 Federal Register 68721, 12/08/1999)	Included on the ECOS list. Viewed by the states as a significant administrative requirement. Depending on the state, this regulation is not consistently implemented by the state department of environmental quality.
Stage 1 Disinfectant/Disinfection Byproducts Rule (63 Federal Register 69390, 12/16/1998)	Related to the Stage 2 Disinfectant/Disinfection Byproducts Rule. Depending on the state, this regulation may be implemented by the public health department rather than the department of environmental quality.
Particulate Matter National Ambient Air Quality Standards (62 Federal Register 38652, 7/18/1997)	Related to a number of NAAQS regulations that ECOS identified.
Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers at Hazardous Waste TSDFs and Hazardous Waste Generators (59 FR 62896,12/06/1994 with the most recent amendments being 1/21/99)	Included on the ECOS list.

Some of our recommendations did not meet all of the principles that we established for selecting the regulations. In the case of the particulate matter (PM) NAAQS regulation, for example, the full implementation of this program is not anticipated until August 2007. However, we very much wanted to include a NAAQS regulation because of the significance of this program at the state level. This regulation, while slowed in its implementation because of litigation, appeared to be the best option for inclusion in this study. The Organic Emission Standards/TSDFs regulation is another example for which we were unable to meet all of the agreed principles. In this case, we had to look modestly beyond 7 years to find a regulation that would capture some aspect of the RCRA program. Other recommended RCRA regulations were either under development or too recently promulgated to be included in the study.

To ensure that the EPA program offices and ECOS were comfortable with these recommended regulations, NCEE shared the recommended regulations, the selection criteria, and the work plan for the study and requested comment in the following ways:

- Sending an email from Robin Kime to all Assistant Administrators and Associate Administrators on February 21, 2006. Comments were requested, as well as recommendations for EPA-related guidance that could be considered. The program offices were not able to identify any guidance that fit the criteria established for this study.

- Providing regular updates to the EPA Economics Forum and requesting input on the regulations to be considered in the study.
- Emailing R. Steven Brown, Executive Director for ECOS, requesting comments and following up with a meeting on March 2, 2006.

Based on the review and comments received by NCEE, the project continued with a focus on the four recommended regulations.

4 Selection of States for Case Studies

4.1 Selection Methodology

At the direction of NCEE, Abt Associates developed a selection methodology to identify eight states with diverse levels of environmental sustainability, efficiency and effectiveness in their environmental programs, and environmental activity (e.g., permitting, compliance/enforcement inspections) to serve as our case studies. Our goal was to ensure that the case studies' results, while not statistically significant, were generally representative of a range of state characteristics that may affect compliance costs. In addition, we considered regional diversity as an overlay criterion in selecting our eight candidate states.

In choosing our state selection criteria, we looked for measures that would be good indicators of the ranking of states relative to: (1) environmental protection and sustainability; (2) effectiveness in public sector management, including environmental programs; and (3) overall environmental permitting activity. These criteria form a simple model of the factors that could cause a state's outlays for administering federal environmental regulations to vary both in relation to other states or in relation to the outlays estimated by EPA during regulation development. All else equal, a *higher* level of environmental protection and sustainable development, *lower* effectiveness in public sector management, and *higher* overall environmental permitting activity may point to *higher* potential costs for administering federal regulations. In contrast, a *lower* level of environmental protection and sustainable development, *higher* effectiveness in public sector management, and *lower* overall environmental permitting activity may point to *lower* administrative costs. Thus, selecting states that are diverse across these criteria should provide a diversity of situations that could lead to higher or lower state administrative costs in comparison to those of other states or EPA.

In this chapter, we first describe the three indicators that we used for ranking the states. We then describe the method we employed for combining these indicators to develop groupings from which we selected eight case study states that we initially contacted. Next, we discuss how we worked with ECOS and EPA to make substitutions for some of these initial states that were unable to participate in the study because of workload limitations, resulting in a final set of six states that participated in the study. We conclude with a discussion of the limitations involved in selecting our case study states.

4.2 Indicators for Selecting Representative States

4.2.1 Environmental Management and Sustainability

We used the Green Plan Capacity Index of the Resource Renewal Institute (RRI) to rank each state's level of environmental management and sustainability. RRI describes itself as "a nonprofit organization dedicated to solving complex environmental problems by developing, promoting and facilitating innovative strategies for a sustainable future."[2] In its report, *The State of the States: Assessing the Capacity of States to Achieve Sustainable Development Through*

[2] See http://www.rri.org/about/aboutmission.html.

Green Planning, RRI presents the GPC Index, which is based on four attributes that RRI believes are critical for effective environmental management and "successful green planning": (1) strength of the environmental management framework, (2) level of environmental policy innovation, (3) fiscal and program commitment, and (4) quality of governance.[3] These four primary attributes are scored based on the following sub-indicators: [4]

1. **Strength of the Environmental Management Framework**
   a. Existence of a State Sustainability Plan (with Legislative Support)
   b. Existence (and Quality) of State of the Environment Report
   c. Availability of Information to the Public (Web Site Review)
   d. Existence of State Planning Office/Program
   e. State Planning/Development Act, Modernization and Strength of State Role
   f. Proportion of Federally Delegable Programs Delegated to States

2. **Level of Environmental Policy Innovation**
   a. Air Quality Standards (above Clean Air Act requirements)
   b. Pollution Prevention Programs
   c. Energy Policy Supportive of Renewables
   d. Existence of National Environmental Performance Partnership System Program
   e. Existence of Environmental Leadership Program
   f. Existence of State Climate Change Action Plan
   g. State Authored Inventories of Greenhouse Gas Emissions
   h. Existence of State-Level Right-to-Know Act
   i. Existence of Bottle Bill
   j. Existence of Environmental Assessment Requirements
   k. Innovation in Comprehensive Plan Requirements

3. **Fiscal and Program Commitment**
   a. State Budget Environmental Commitment, 1997
   b. Open Space Protection
   c. Expenditure on Public Transport
   d. Recycling Levels, Targets, Commitment

4. **Quality of Governance**
   a. Governance Index, 1999, *Governing* Magazine
   b. Existence of Green Procurement Program
   c. Voter Participation Rate, 1996

For each of these sub-indicators, RRI develops an index from additional sub-factors, which are weighted to provide the overall GPC Index.[5] For our analysis, we used the GPC Index results to group the states into two categories of relative commitment to environmental management and

[3] See http://greenplans.rri.org/pdf/sos.pdf.

[4] See http://www.rri.org/about/aboutmission.html.

[5] We used 65 sub-factors to calculate the 24 sub-indicators presented above. The weightings of the four primary categories are 35 percent, 40 percent, 10 percent, and 15 percent for (1) strength of the environmental management framework, (2) level of environmental policy innovation, (3) fiscal and program commitment, and (4) quality of governance, respectively. See pages 57 through 59 of the RRI report for more details on the factors and the weights (http://greenplans.rri.org/pdf/sos.pdf).

sustainability (higher and lower), with 25 states in each category. Note that while grouping the states into three smaller categories might be desirable (i.e., high, medium, and low), using three groups and three indicators would leave 27 combinations ($27 = 3^3$). Instead, using three criteria with two categories yields eight groups ($8=2^3$), which conveniently matches our target number of states for the analysis. We selected one state from each group to ensure broad representation of relative commitment to environmental management and sustainability.

4.2.2 Government Management Quality

To measure the overall effectiveness of each state's public sector management capabilities, including environmental programs, we used the results of a state grading system that was established by the Government Performance Project (GPP). Established by a grant from the Pew Charitable Trusts, the Maxwell School of Citizenship and Public Affairs at Syracuse University, and *Governing* Magazine, the goal of the GPP is to improve understanding of government management on the city, county, state, and federal levels.[6]

States are graded on a scale from A to D based on four primary criteria: (1) Money, (2) People, (3) Infrastructure, and (4) Information. Each primary criterion is scored based on a set of sub-criteria as summarized below:[7]

1. **Money**
   a. Long-Term Outlook: The state uses a long-term perspective to make budget decisions.
   b. Budget Process: The state's budget process is transparent and easy to follow.
   c. Structural Balance: The state's financial management activities support a structural balance between ongoing revenues and expenditures.
   d. Contracting/Purchasing: The state effectively manages procurement activities.
   e. Financial Controls/Reporting: The state systematically assesses the effectiveness of its financial operations and management practices.

2. **People**
   a. Strategic Workforce Planning: The state regularly conducts and updates a thorough analysis of its human resource needs.
   b. Hiring: The state acquires the employees it needs.
   c. Retaining Employees: The state retains a skilled workforce.
   d. Training and Development: The state develops its workforce.
   e. Managing Employee Performance: The state manages its workforce performance programs effectively.

3. **Infrastructure**
   a. Capital Planning: The state conducts a thorough analysis of its infrastructure needs and has a transparent process for selecting infrastructure projects.
   b. Project Monitoring: The state has an effective process for monitoring infrastructure.
   c. Maintenance: The state maintains its infrastructure according to generally recognized engineering practices.

[6] See http://www.maxwell.syr.edu/gpp/about/index.asp.

[7] See http://governing.com/gpp/2005/how.htm.

d. Internal Coordination: The state comprehensively manages its infrastructure.
e. Intergovernmental Coordination: The state creates effective intergovernmental and interstate infrastructure management networks.

4. Information

a. Strategic Direction: The state actively focuses on the strategic direction of its policy and on collecting information to support that policy direction.
b. Budgeting for Performance: State officials have appropriate data on the relationship between costs and performance, and they use these data when making resource allocation decisions.
c. Managing for Performance: Agency managers have the appropriate information required to make program management decisions.
d. Program Evaluation: The governor and agency managers have appropriate data that enable them to assess the actual performance of policies and programs.
e. Electronic Government: The public has appropriate access to information about the state, as well as the performance of state programs and state services, and is able to provide input to state policymakers.

While the GPP does not directly measure government performance productivity (i.e., value of citizen services provided for each taxpayer dollar spent), it does evaluate criteria that are all measures of the quality of government management, which we would expect to be related to government efficiency. Thus, the GPP index should be a good proxy for government efficiency and effectiveness. All else equal, states with higher government performance productivity may be expected to spend less in administering federal environmental regulations – in relation to other states and perhaps in relation to EPA's estimates of state-level administrative costs – while states with lower government performance productivity may be expected to spend relatively more.

For our analysis, we grouped states into two categories of government management quality (higher and lower). The 20 states that received a grade of "B" or better from the GPP were classified as having "higher" government management quality; the remaining 30 were classified as having "lower" government quality. By selecting states that are diverse in their quality of government, we can ensure that estimated regulatory costs are not overstated because selected states are relatively inefficient at administration, or understated because selected states are especially efficient at program administration.

4.2.3 Environmental Management Challenges

We used the number of regulated major and federally reportable minor facilities, according to EPA's Online Tracking Information System (OTIS) Management Reports tool, to gauge the extent of the environmental management challenges faced by a state. The number of regulated facilities should represent a good proxy for the level of activity required in administering federal regulations. To remove the simple effect of the size of a state's economy in determining the number of regulated facilities, we normalized this measure across states by dividing the number of regulated facilities by Gross State Product (GSP). As a result, our indicator captures the environmental management challenge relative to the aggregate value of economic activity in a state.

As background on EPA's OTIS Management Reports (from EPA's Web site):[8]

> *The OTIS Management Reports tools provide a quick way to view enforcement and compliance monitoring statistics by EPA Region, by State, or by State in each Region, by Fiscal Year, providing either End-of-Year, 3rd Quarter, or Mid-Year counts. The interfaces look at the most recent information in the IDEA system, and provide either a single media or cross media result based upon the selections.*

The facilities included in our indicator are: (1) Clean Air Act (CAA) sources designated as Majors, Synthetic Minors, and NESHAP Minors, (2) Clean Water Act (CWA) facilities designated as Major dischargers in NPDES, and (3) RCRA facilities that are Large Quantity Generators or TSDFs.

This indicator focuses on the major facilities and excludes most minor facilities because of a lack of consistency in the reporting of minor facilities among states (Synthetic Minors and NESHAP Minors are included because they are both federally reportable). Although the focus on major facilities ensures coverage of the most challenging facilities, the requirements for minor facilities may be significant, and the number of these facilities may not be proportional to the number of major facilities across states. Accordingly, the potential requirement of permitting and administration for minor facilities is not accounted for in this indicator. Because of the inconsistent reporting of minor facilities across states, whether and how this exclusion affects the relative rankings of states for this criterion is therefore not known.

For our analysis, we grouped states into two categories of environmental management challenges (higher and lower). These groups are of equal size, with 25 states in each category. By selecting states that are diverse in their environmental management challenges, we can ensure that estimated regulatory costs are not overstated because selected states face relatively high numbers of environmental challenges, or understated because selected states face relatively low numbers of environmental challenges.

4.3 Proposed Method for Selecting States

Using the indicators described above and the results, we classified the states into "higher" and "lower" groupings, which produced eight possible groupings. Thus, if we select one state from each group, the set of states should be fairly representative of all states in terms of (1) relative commitment to environmental management and sustainability, (2) quality of government management, and (3) extent of environmental management challenges. This, in turn, should provide a group of states that are representative of their peers in terms of their capacities to manage the requirements from federal regulations that are delegated to states. These groupings are shown in Exhibit 4-1 and Table 4-1.

[8] See http://www.epa.gov/idea/otis/mgmt_reports.html. (EPA approval is required for access to OTIS. For more information on OTIS, see http://www.epa.gov/compliance/data/systems/multimedia/aboutotis.html.)

Exhibit 4-1: State Selection Groups

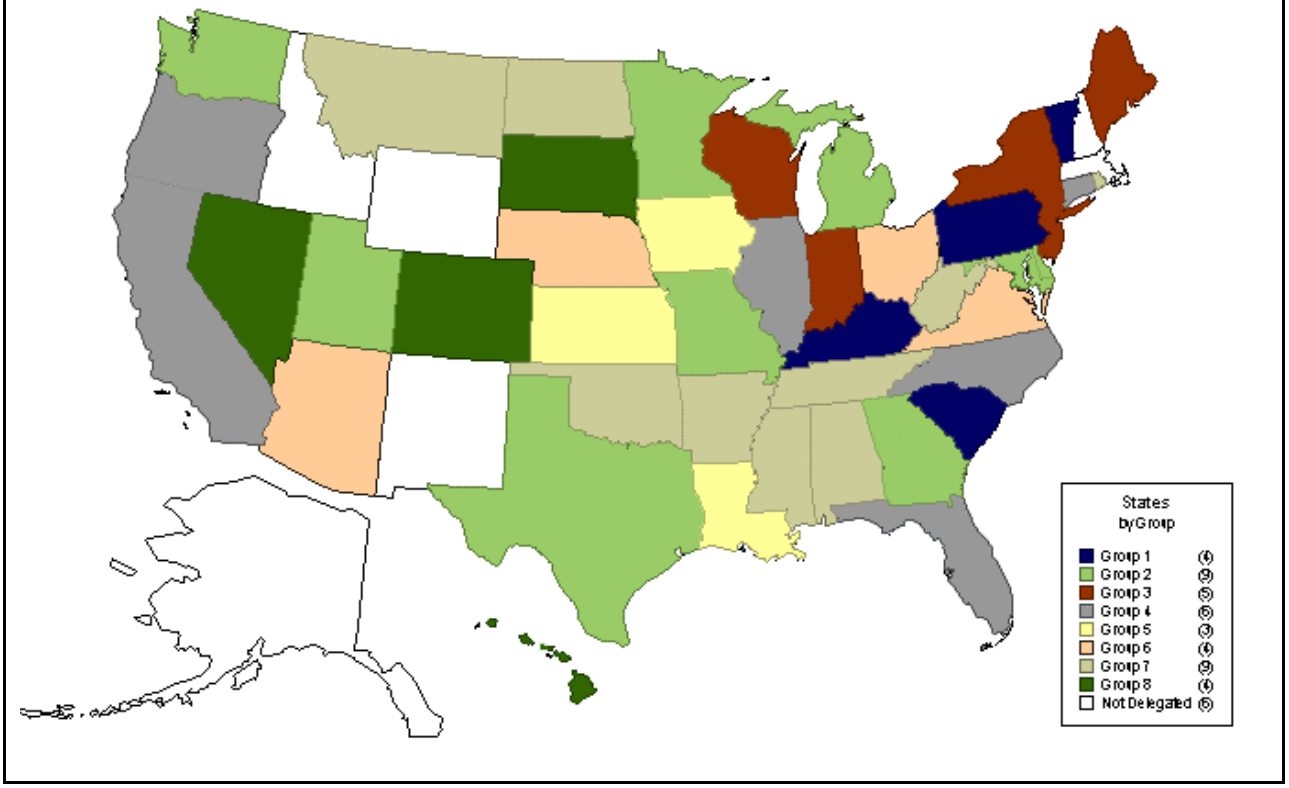


Table 4-1: State Selection Criteria

Group	State	Commitment to Environmental Protection	Government Management Quality	Environmental Challenges
Group 1	South Carolina	Higher	Higher	Higher
	Kentucky	Higher	Higher	Higher
	Vermont	Higher	Higher	Higher
	Pennsylvania	Higher	Higher	Higher
Group 2	Missouri	Higher	Higher	Lower
	Georgia	Higher	Higher	Lower
	Michigan	Higher	Higher	Lower
	Utah	Higher	Higher	Lower
	Maryland	Higher	Higher	Lower
	Delaware	Higher	Higher	Lower
	Minnesota	Higher	Higher	Lower
	Texas	Higher	Higher	Lower
	Washington	Higher	Higher	Lower
Group 3	Wisconsin	Higher	Lower	Higher
	Maine	Higher	Lower	Higher
	Indiana	Higher	Lower	Higher
	New Jersey	Higher	Lower	Higher
	New York	Higher	Lower	Higher
Group 4	Connecticut	Higher	Lower	Lower
	Illinois	Higher	Lower	Lower
	North Carolina	Higher	Lower	Lower
	Oregon	Higher	Lower	Lower
	California	Higher	Lower	Lower
	Florida	Higher	Lower	Lower
Group 5	Iowa	Lower	Higher	Higher
	Kansas	Lower	Higher	Higher
	Louisiana	Lower	Higher	Higher
Group 6	Ohio	Lower	Higher	Lower
	Virginia	Lower	Higher	Lower
	Nebraska	Lower	Higher	Lower
	Arizona	Lower	Higher	Lower
Group 7	Montana	Lower	Lower	Higher
	Oklahoma	Lower	Lower	Higher
	Mississippi	Lower	Lower	Higher
	Arkansas	Lower	Lower	Higher
	North Dakota	Lower	Lower	Higher
	Rhode Island	Lower	Lower	Higher
	Alabama	Lower	Lower	Higher
	Tennessee	Lower	Lower	Higher
	West Virginia	Lower	Lower	Higher
Group 8	Colorado	Lower	Lower	Lower
	South Dakota	Lower	Lower	Lower
	Hawaii	Lower	Lower	Lower
	Nevada	Lower	Lower	Lower
	Massachusetts	Higher	Lower	Lower
Not Delegated [a]	Wyoming	Lower	Lower	Higher
	Alaska	Lower	Lower	Higher
	Idaho	Lower	Lower	Higher
	New Mexico	Lower	Lower	Higher
	New Hampshire	Lower	Lower	Lower

Source: Abt Associates Inc.

[a] Not Delegated = states that do not have delegated authority to administer one or more of the four rules examined in this study.

4.4 Summary of Selected States

After developing the eight groupings to select our case study states, Abt Associates and NCEE met with ECOS on March 2, 2006, to discuss our approach and our views on the states that we could select from each of the eight groupings shown in Table 4-1. ECOS provided additional comments regarding which states they felt might not be able to participate fully in the project (e.g., Louisiana and Texas, given their focus on post-Katrina recovery). Based on this input, we identified eight states that we initially asked to be involved in the study. We contacted these states to discuss the project and the information that we would need to collect from them. A few states declined to participate in the study after these initial discussions; others chose not to participate in the study until they had reviewed our information collection request. In the end, six states agreed to participate in the study. Table 4-2 lists the initial and final case study states, along with their grouping characteristics.

Table 4-2: Summary of States Selected for Analysis

State - EPA Region	Environmental Management and Sustainability	Government Management Quality	Environmental Management Challenges
Initial States Contacted			
Colorado - 8 [a]	Lower	Lower	Lower
Kansas - 7	Lower	Higher	Higher
Michigan - 5[a]	Higher	Higher	Lower
New Jersey - 2	Higher	Lower	Higher
Oklahoma - 6	Lower	Lower	Higher
Oregon - 10 [a]	Higher	Lower	Lower
South Carolina - 4	Higher	Higher	Higher
Virginia - 3	Lower	Higher	Lower
Final Case Study States			
Kansas - 7	Lower	Higher	Higher
Nevada - 9	Lower	Lower	Lower
New Jersey - 2	Higher	Lower	Higher
Oklahoma - 6	Lower	Lower	Higher
South Carolina - 4	Higher	Higher	Higher
Virginia - 3	Lower	Higher	Lower

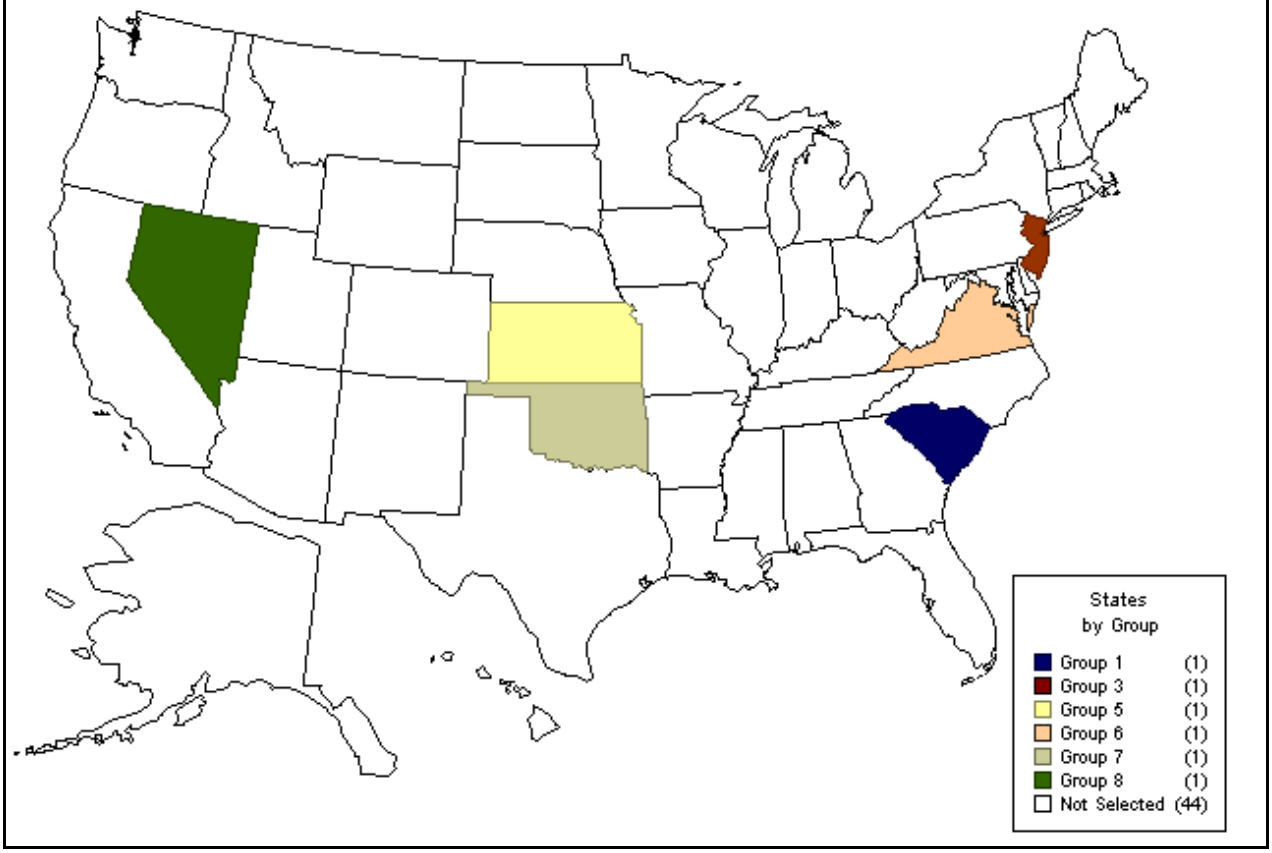
Source: Abt Associates Inc.
[a] Declined to participate in study because of limited staff resources.

We also ensured that these recommended states included regional diversity, being located in six of the ten EPA regions. The four EPA regions not represented were Region 1 (Maine, Vermont, New Hampshire, Massachusetts, and Connecticut); Region 5 (Illinois, Indiana, Minnesota, Wisconsin, Michigan, and Ohio); Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming); and Region 10 (Alaska, Idaho, Oregon, and Washington). Exhibit 4-2 shows the states that agreed to participate in this study.

Each of the six case study states – while facing their own day-to-day responsibilities and challenges – did an exemplary job of trying to provide us with as much information as possible on the four regulations we examined in this project. They responded to our information

collection request (described in greater detail in Chapter 5 and the appendixes), as well as a number of follow-up questions. South Carolina further served as a beta tester for the first information collection request form that we developed. Based on South Carolina's comments, we were able to develop a form that would be easier for the other case study states to complete. In a few instances, the case study states were unable to provide information on all four regulations. For example, in Virginia, all of the individuals responsible for implementing the Stage 1 Disinfectants and Disinfection Byproducts Rule had retired, and so there was no one left at the Department of Public Health who could provide information on the start-up and recurring costs associated with administering this rule.

Exhibit 4-2: Geographic Distribution of Case Study States



4.5 Limitations

As with any methodology, there are limitations to the approach used to select the eight states for this study. First, as discussed earlier in this chapter, we used readily available information on the three diversity factors to sort the states into eight groupings. We were not able to profile each state exhaustively and consider all factors that may influence administrative costs. For example, depending on the state-specific legislative authority, either a state may be able to incorporate a new EPA regulation by reference, or it may need to amend its current law to implement the new requirements, which requires a greater level of effort and resources.

Second, the results for the eight case study states cannot be viewed as exhaustive and representative of all states nationwide. However, we believe that the findings from this project can provide EPA and ECOS with important information and insights on additional research

topics for better understanding and managing the administrative challenges borne by states in implementing delegated environmental programs.

Finally, we selected the eight states for inclusion in this study based on our methodology and input from ECOS regarding which states were likely to be able to participate in this study. However, as we learned later in the conduct of this project, some of the eight states were ultimately unable to participate in the study because they were unable to commit resources for completing the regulation-specific questionnaires that we developed.

5 Analytic Framework

In this chapter, we describe the analytic framework used to assemble and compare EPA's Regulatory Impact Analysis (RIA)/Economic Analysis (EA) and Information Collection Request (ICR) estimates of administrative costs with states' estimates of those costs. This framework includes the following five elements:

- Section 5.1 describes the broad activity categories that states might reasonably undertake in administering delegated regulations.
- Section 5.2 describes the method used to normalize the estimates in EPA analyses to make them comparable with the estimates reported by our case study states.
- Section 5.3 describes the process and reasoning behind the development of our cost information collection forms.
- Section 5.4 describes the process for collecting cost estimates from the participating states.
- Finally, Section 5.5 describes our general approach for organizing and analyzing the cost data.

5.1 General Activity Categories

Table 5-1 presents 14 broad activity categories (13 administrative activity categories and one additional category to capture baseline activities) as well as examples of specific cost components that fall into each category. These broad categories of costs were developed from review of guidance documents, as well as several RIAs and ICR supporting statements.[9] From our review of these documents, we believe these categories capture all of the activities that states might reasonably perform in administering a delegated regulation; at the same time, not all categories are relevant for all regulations. Within each activity category, there are many specific cost elements that states might incur while administering a delegated regulation, and examples of these more specific cost components are presented in the second column of Table 5-1. In general, administrative costs are classified as either one-time (start-up) or recurring costs. One-time administrative costs are associated with the preparations for implementing a new or revised regulation. Recurring costs involve ongoing activities, such as compliance assistance, permit administration, monitoring, and enforcement.

We asked state respondents about each of the broad cost categories and presented them with a list of examples to help them think about costs that they incurred. We presented the information to respondents in this manner to provide state respondents with a comprehensive list of likely cost elements and encourage them to report any additional cost elements that EPA might not have included in its regulatory analysis. In designing and implementing this analytic framework, we encountered two important conceptual issues that can confound the comparison of states'

[9] These sources include Aquaculture Network Information Center (2005), DOI (1998), ECOS (1999), Harrington, Winston, and Morgenstern (2004), Mussatti (2002), Mussatti and Powell (2000), NASBO (2000), OMB (2003 and 1995), U.S. EPA (2003, 2000a, 2000b, 1999a, 1999b, 1999c, 1999d, 1999e, 1998a, 1998b, 1998c, 1998d, 1998e, 1997, 1983, and SF-83 Supporting Statements), and SBA (1996).

reported costs for administering environment regulations with EPA's estimates of the costs for a particular federal environmental regulation.

Table 5-1: General Activity Categories Performed in State Administration of Federal Regulations and Examples of Corresponding Line-Item Cost Components

General Administrative Activity Categories	Examples of Line-Item Cost Components
1. Tracking EPA's rulemaking process	Review Federal Register notice; attend meetings and conferences. Provide comments on the proposed rule.
2. Obtaining additional delegated authority	Perform tasks to obtain delegated authority; amend state laws and regulations to adopt the new federal regulations; litigation costs.
3. Designing implementation plan	Design alternative standards; obtain approval from EPA.
4. General start-up activities	Develop internal guidance and procedures; attend EPA training; conduct internal training.
5. Compliance assistance: start-up activities	Conduct outreach and create awareness; develop training.
6. Permit administration: start-up activities	Determine specific permit requirements; develop infrastructure for permit administration.
7. Monitoring: start-up activities	Establish procedures and infrastructure necessary for monitoring.
8. Enforcement: start-up activities	Establish procedures and infrastructure necessary for enforcement.
9. Compliance assistance: recurring activities	Respond to phone calls, letters, requests for assistance; conduct training.
10. Permit administration: recurring activities	Review submitted documents and supporting materials; verify data sources; consult with facilities; issue notifications; administer public hearings; issue permits.
11. Monitoring: recurring activities	Collect, review, record, and/or report monitoring data.
12. Enforcement: recurring activities	Conduct inspections; review inspections; give warnings; give citations; take legal action to enforce standards; collect fines; keep records; provide notifications; report to EPA.
13. Other: recurring activities	Any other types of recurring activities not categorized above.
14. Baseline activities	Were any of the activities reported above already being performed before the rule? Were there any related regulatory activities taking place before the rule that no longer take place because of the rule? Report these activities and their costs here. Costs associated with baseline activities will be subtracted from post-rule costs in order to estimate the regulation's incremental costs.

The first issue is that some states may have previously implemented, independent of the EPA regulatory action then other development, programs that include some or all parts of the actions required for that regulation. These previous actions could have been undertaken at the state's own initiative or in response to another federal regulation (issued by EPA or by another environmental-related agency – e.g., NOAA). Because states' activities and costs for these *other* programs were undertaken not in response to the requirements of the environmental regulation then being developed by EPA, it would be inappropriate to include the cost of these activities in the cost estimate for meeting the requirements of the new regulation. EPA appropriately attempts to identify the instances in which state programs, already in place, incorporate aspects of the EPA regulation and to set the estimated costs for these activities aside in estimating the incremental costs to be incurred by states in administering the environmental regulation then being developed.

Our cost framework attempts to address this issue by asking, in Category 14, for states to report those activities, and their cost, that a state performed independent of the federal regulation and/or other programs that a state supported in addition to administration of the federal regulation.[10] These *baseline activity* costs are subtracted from the reported *total activity* costs to calculate the incremental cost resulting specifically from adoption of the federal regulation. For example, some states already required stormwater-management permits at some construction sites before EPA issued the Stormwater Phase II Final Rule. Under Category 10, Recurring Permit Administration, these states would report the total cost associated with processing stormwater-management permits for construction sites. Under Category 14, Baseline Activities, states would report the cost associated with the permits they were already processing prior to, and therefore independent of, the Phase II rule. The difference between these two costs represents the incremental cost of the Phase II regulations to the state for the Recurring Permit Administration category.

In practice, we found this concept less than straightforward to implement. In the case of the Stormwater Phase II Final Rule, EPA asserted in its analysis that costs related to construction start permits should be attributable to the Coastal Zone Act Reauthorization Amendments (CZARA), which has similar requirements to the Stormwater Phase II Final Rule. The states, however, disagreed with this assertion. In their view, the Stormwater Phase II Final Rule requirements were more difficult to satisfy, so they developed their programs specifically to meet the Stormwater Phase II Final Rule requirements. They reported that through meeting the Stormwater Phase II Final Rule requirements they satisfied the CZARA requirements.

In theory, the Stormwater Phase II Final Rule costs should be compared to the costs that would be incurred under the hypothetical scenario where there is no Stormwater Phase II Final Rule. However, the costs that would be incurred under this hypothetical scenario, where the states would have developed only a CZARA permit program, are unknown. In our analysis, we include the full costs reported by the states even though some of the costs reported by the CZARA-affected states (New Jersey and South Carolina) may have been otherwise incurred in the absence of the Stormwater Phase II Final Rule.[11] These costs are tracked separately so they can be identified as costs that are not fully attributable to the Stormwater Phase II Final Rule.

The second issue concerns the extent to which states may choose to go beyond basic requirements in implementing a federal environmental regulation. This "going beyond" could occur for a range of reasons, including enactment of special requirements or programs that build upon (but are not required by) the federal regulation, or undertaking activities for the federal regulation in a way that exceeds the reasonable baseline for implementation (e.g., engaging in a high level of outreach and training to the regulated community). It is certainly within states' discretion to undertake these "going beyond" activities; however, it is also reasonable not to recognize the cost of "going beyond" as a cost attributable to the federal environmental regulation.

Like the preceding issue, this matter is highly subjective and contentious: What EPA deems as the activities or costs that are sufficient for administering a regulation may not include all of the activities or costs that a state views as essential for its administration. During the information collection process, we explored this issue quite carefully in the instances both where states

[10] Any such "other program benefit" costs should also be set aside as not being directly attributable to the federal environmental regulation.

[11] Note that Virginia is also subject to CZARA requirements; however, EPA's analysis did not account for this.

claimed that EPA had not included all of the activities that needed to be performed for a regulation, and where a state's estimates of the cost for performing an agreed activity substantially exceeded the EPA estimate. In general, we found that states were adamant in their view that claimed activities not covered by EPA, as well as the additional costs for performing activities included by EPA in its analysis, were essential to responsible implementation of the federal environmental regulation's requirements. Given the subjectivity of this issue, it is beyond the scope of this project to reach any findings on whether state-claimed activities and costs exceed, in some way, the level that is sufficient for administering a regulation. Accordingly, we report those activities and costs as provided by the participating states and identify the extent and character of differences between those costs and the EPA costs, but we reach no findings on whether those differences result from "going beyond" the basic requirements for administering the EPA regulation. This is clearly a topic that EPA, ECOS, and the states could further discuss to ensure that these costs are appropriately addressed in future administrative cost analyses.

5.2 Normalizing the EPA Cost Estimates to the State Level

The central concepts of this study are to (1) examine EPA's estimates of the costs that states incur arising from the administrative requirements in the federal environmental regulations that states are charged with administering, and (2) compare these EPA cost estimates with the states' own information or estimates the costs they incur to meet the administrative requirements. This task is complicated by the fact that the EPA analyses (for example, in an RIA) generally present estimates at the national level. To allow a consistent and meaningful comparison of the EPA and state cost estimates, we therefore needed to apportion EPA's national-level estimates to the individual states. In effect, we allocated the national-level estimates to the participating states, based on the estimated level of activity in those states for administering the specific regulations covered in this analysis. In addition to this "regulatory activity" normalization, we made additional adjustments to the EPA estimates:

- Inflating all cost estimates to 2006 dollars
- Adjusting labor cost estimates to include a fringe rate of 40 percent
- Adjusting individual states' wages for the difference between state wages and the average national wage
- Annualizing start-up costs over 5 years at a discount rate of 7 percent.

We discuss each of these five adjustment categories in detail below.

5.2.1 Normalizing Based on the Number of Regulatory Activities Undertaken by Participating States

The relevant cost components in the RIAs were generally reported as (1) per-state costs, or (2) per-activity costs. In general, administrative costs that do not vary with the amount of regulatory activity are estimated as per-state costs. For example, we would expect the costs associated with tracking EPA's rulemaking process not to vary substantially based on the expected level of regulatory activity performed by a state (assuming that the state will be required to administer the regulation to facilities within the state). However, the cost for other types of activity would depend on the number of regulation-related activities that would occur in the individual state. For example, we would expect the total cost of processing permits to vary *more or less directly* with the number of facilities for which the state would need to administer

permits. Thus, these types of costs are generally estimated as being proportional to the number of permits that must be processed.

Since the per-state costs are the same for each state, adjusting these cost components to the state level was straightforward. However, normalizing values that were estimated as a function of the number of regulatory activities was more difficult. It is important to normalize these national estimates accurately; otherwise, differences between the EPA and state estimates might reflect errors in our normalization methodology rather than true differences between the two estimates. In most cases we were able to gauge the accuracy of our normalization factors by comparing the sum of the state-level estimates to the national estimates presented in the RIA. The normalization factors are discussed in more detail in the appendixes, where we document our calculations in greater detail.

5.2.2 Inflating EPA Estimates to 2006 Dollars

To compare the EPA estimates with the estimates reported by the states, it was necessary to ensure that both estimates were in the same dollar terms. We adjusted the EPA estimates to 2006 dollars (2006$) and asked participating states to report their costs in 2006$ because we believed that this would be the easiest way for states to report this information. In our preliminary discussions with participating states, we learned that states would be best able to estimate labor costs based on the current wage of the staff required to perform various tasks. Thus, we believed that reporting current salaries would be easier than recalling the salary levels from earlier years. We adjusted the EPA estimates to 2006$ using the Consumer Price Index for all Urban Consumers (CPI-U) from the Bureau of Labor Statistics.

5.2.3 Adjusting Labor Cost Estimates to Incorporate a Fringe Rate of 40 Percent

The EPA estimates of administrative costs employed a wide range of assumptions in adding an allowance for fringe and overhead to base wage rates. The composite fringe and overhead markups vary substantially both in description and in resulting numerical value. Over the four regulations, the markups were 40 percent, 50 percent, 110 percent, and 123 percent.[12] All were described as including a "fringe" component and some kind of "overhead" and/or "general and administrative" cost component. The items included in the overhead and/or general and administrative costs appear to vary widely over the four regulatory analyses. Because of the wide range of, and potentially inconsistent, treatments of fringe and overhead in the underlying analyses, we preferred to adopt a consistent and simpler concept of a labor cost "markup" for use in our analyses and in obtaining information from the states.

From our review of this issue and conversations with states early in the framework development and information gathering process, we concluded that states would be readily able to report a fringe rate for labor. However, we also concluded that the overhead concept could be difficult to define and obtain costs for in a consistent way. Overhead, itself, is not a precisely defined or consistently applied accounting concept, and the overhead "markup" depends on the costs that an organization chooses to account for as overhead instead of recording as the direct costs associated with a given activity. For example, "overhead" may include an allowance for upper-level management time, or alternatively, that time and its cost may be included in the directly charged average wage reported for an activity. Indeed, as described above, the EPA analyses themselves reported a wide range in the combination fringe and overhead rates that were used in

[12] These values would apply as "multiplier markups" of 140 percent, 150 percent, 210 percent, and 223 percent in calculating a "loaded" wage rate.

the regulatory analyses, which underscores the challenge of achieving consistency in the treatment of overhead costs. As a result, we chose to adjust the EPA-estimated labor rates to reflect only a "standard" *fringe* rate of 40 percent, which is based on guidance on fringe allowance from the Office of Management and Budget in Circular A-76. The OMB guidance states a rate of 36.5 percent, which is slightly less than the lowest of the composite rates reported in the EPA regulatory analyses. For our analysis, we used a rounded "standard" fringe rate of 40 percent. These adjustments resulted in lower labor costs for all the rules except for the Disinfection Byproducts Rule. We did not include an *overhead* allowance in the analysis because of the issues in achieving consistency in the overhead concept.

5.2.4 Adjusting Individual States' Wage Rates for the Difference Between State and National Average Wage Rates

The EPA cost analyses use national average wage rates to calculate the labor cost of administrative activities. Because the wage rates of individual states vary, often substantially, from the national average, little insight is gained by simply observing that the wage reported by an individual state in performing an administrative activity differs from the EPA wage – if a substantial part of that observed difference results from the difference between state and national average wage values. To provide a more meaningful comparison of the wage value used in the EPA analysis and the value reported by a state for the staff who perform a particular activity, we adjusted the reported state value for the difference between the state average and national average wage values and then compared the adjusted state value with the EPA-reported value, with both values in 2006 dollars. For states with average wages that are higher than the national average, the adjustment reduces the state-reported wage for that percentage difference; for states with average wages that are lower than the national average, the adjustment increases the state-reported wage for that percentage difference. The resulting comparison then provides insight into the residual "real" difference between EPA and state wage values based, for example, on a state's use of a different level of labor to perform regulatory activities than the labor level projected by EPA.

We performed this adjustment using national and state average wage values as reported in the National Occupational Employment and Wage Estimates series by the Bureau of Labor Statistics (BLS). Specifically, we multiplied the state-reported value by the ratio of the national average wage to the state average wage as follows:

$$REGW_{adj,\,s} = REGW_{unadj,\,s} \times \frac{AVGW_n}{AVGW_s} \qquad (1)$$

where:

$REGW_{adj,s}$	=	Adjusted reported wage for state *s* for administering an environmental regulation
$REGW_{unadj,s}$	=	Unadjusted reported wage for state *s* for administering an environmental regulation
$AVGW_n$	=	Average wage, national, all occupations, from BLS Occupational Employment and Wage Estimates, May 2005
$AVGW_s$	=	Average wage, for state *s*, all occupations, from BLS Occupational Employment and Wage Estimates, May 2005

5.2.5 Annualizing Start-Up Costs

When states take responsibility for administering a new regulation, they generally incur start-up costs. These one-time costs typically result from preparations for implementing a new or revised regulation. In addition, states incur recurring costs that are associated with compliance

assistance, permit administration, monitoring, and enforcement. One-time costs can be annualized in order to make them comparable with recurring costs. We annualized these costs over a 5-year period and assumed a discount rate of 7 percent. The 7 percent discount rate is the rate recommended by OMB for annualizing one-time costs in the performance of cost-benefit analyses of regulations. Conceptually, the 5-year annualized cost is the constant value accrued annually over the 5-year period that is equal in present value, at the 7 percent discount rate, to the one-time cost. For this calculation, we assumed that each annual value would be accrued at the beginning of each year.

The use of annualized values for including start-up costs in the total cost calculation has the effect of "smoothing" these costs in a way that may mask short-term difficulties in state budgeting for substantial, one-time outlays. To partially offset this limitation, we conservatively selected a 5-year annualization period (the shortest period found in our review of regulatory analyses, and a value probably shorter than the period over which a state would benefit from its start-up activities). Use of a "shorter" annualization period increases the weight of start-up activities relative to recurring activities. In general, however, our analysis showed that even with this increase, recurring activities substantially dominate start-up costs in the estimated costs for administering regulations, and in the differences observed between state and EPA estimates.

We used the following formula to calculate the 5-year annualized cost:

$$AC = PV \times \frac{r \times (1+r)^5}{(1+r)^5} \qquad (2)$$

where:

AC	=	Annualized cost over 5 years
PV	=	Present value of the one-time cost
r	=	Discount rate (7 percent)

5.3 Implementing the Information Collection Form and Process

Working with EPA and ECOS, we developed a process for collecting cost information from case study state respondents that followed five steps:

1. Review with state agency personnel EPA's estimates of regulatory administration costs as assigned to the individual states, based on the procedures described later in this section
2. Obtain from these personnel comments on whether the components of the EPA estimates are higher or lower than their own experience; obtain alternative estimates where applicable. Specifically, within the framework of the information collection form, we asked state agency personnel to provide information on:
   - Whether they performed the specific activities
   - The number of those activities performed annually
   - The number of hours for performing each activity
   - The hourly cost of labor for performing each activity
   - Any non-labor costs incurred for the activity.
3. Identify activities omitted from EPA's analysis by reviewing a checklist of possible activities related to implementing and administering a regulation
4. Estimate the time requirements, labor costs, number of activities, and other relevant cost elements for the activities identified as being omitted from EPA's analysis

5. Identify the cost component, if any, of the activities reported in Steps 2-4 that results from the *part of those activities* that a state undertook independent of the requirements for administering the EPA regulation (the "baseline activity cost").

We developed an information collection questionnaire that mirrored these steps. In response to Steps 1 and 2, the questionnaire allowed the states to comment on each of the components of EPA's cost estimates for the each of the four rules. To facilitate the case study states' identification of activities that EPA may have omitted from its analysis (Step 3), we incorporated a checklist into the questionnaire with a comprehensive list of activities, allowing states to identify activities that they perform and that were not included in EPA's regulatory analysis. States also had the option of adding activities that they perform but that are not present in the checklist. To address Step 4, the questionnaire allowed states to provide general or more detailed estimates for any activities that were omitted from EPA's analysis. Finally, to ensure that we correctly calculated the incremental costs attributable to the regulation (Step 5), the questionnaire requested that the participating states identify those costs, if any, that they undertook independent of the regulatory requirements.

Initially, we requested that the case study states generate their own cost estimates independently from the EPA-based estimates of their costs (i.e., skipping Steps 1 and 2). We believed that looking over the EPA-based estimates beforehand might bias the states' responses. However, when we pre-tested our approach with South Carolina, whose staff took the time to provide us with very insightful comments, it became clear that this approach would not work. South Carolina staff indicated that it would be too difficult for them to develop estimates without a starting point. The final approach, where state staff would review EPA's estimates before developing their own, was much better received. This concept also had the advantage of prompting the participating states to frame their cost estimates in terms of the components we wanted to analyze: (1) the per-activity time requirement, (2) labor cost, (3) non-labor cost, and (4) number of activities.

We recognize that our approach of providing the EPA-based estimates seeded the state agency personnel with values that they might then lock into as a starting point for their own values. At the minimum, this approach had the potential for anchoring the state results about the EPA estimates. It was also possible that the EPA values could become a floor for states in developing their own estimates. As discussed in the later chapters that present the findings for each regulation, we did find that states more often reported values for the length of time to perform activities and for the hourly cost that were equal to or exceeded the EPA estimated values. However, in several instances, states reported values (e.g., time to perform activities) that were less than the EPA estimates, or reported that EPA had included activities in its analysis that the state did not need to perform in administering the regulation. The occurrence of these "EPA-higher-than-state" findings indicates that states did not systematically treat the EPA estimates as floor values in providing their own cost estimates. On balance, we view the approach that we followed as a necessary and reasonable compromise between preferred process and practicality.

Once we developed the final information collection questionnaire, we worked with ECOS to identify a point of contact in the environmental agencies of each of the participating states. Subsequently, we forwarded the cost collection materials to the state agencies, and followed up with discussions to answer questions and provide guidance as needed for responding to the information request. To gain as much insight as possible on the effectiveness of, and potential issues in, the data collection process, we obtained much of the information from South Carolina in onsite interviews. We obtained information from the other participating states through a

combination of completed forms and follow-up telephone call discussions and email to clarify any uncertainties in their responses. As the last step in this process, we provided the completed questionnaires to the states for their final review and confirmation that we had properly interpreted their responses for use in this analysis.

5.4 Organizing and Analyzing the Cost Information

Our goal was to design an analytic framework that would allow us to develop ideas for improving EPA estimates of costs incurred by states through an understanding of the differences between EPA and case study state estimates of regulatory administrative costs, and the sources of those differences. The analytic framework follows the concept of our questionnaire (described in Section 5.3). Exhibit 5-1 shows how the estimates for our costs comparison were compiled and analyzed.

Based on this organization, we first compared the EPA-based cost estimates with the state estimates in each of the 13 broad cost categories, assessing the extent to which differences occur in:

1. Those activity categories for which EPA estimated costs, and
2. Those categories for which EPA did not estimate costs but for which some states did report costs.

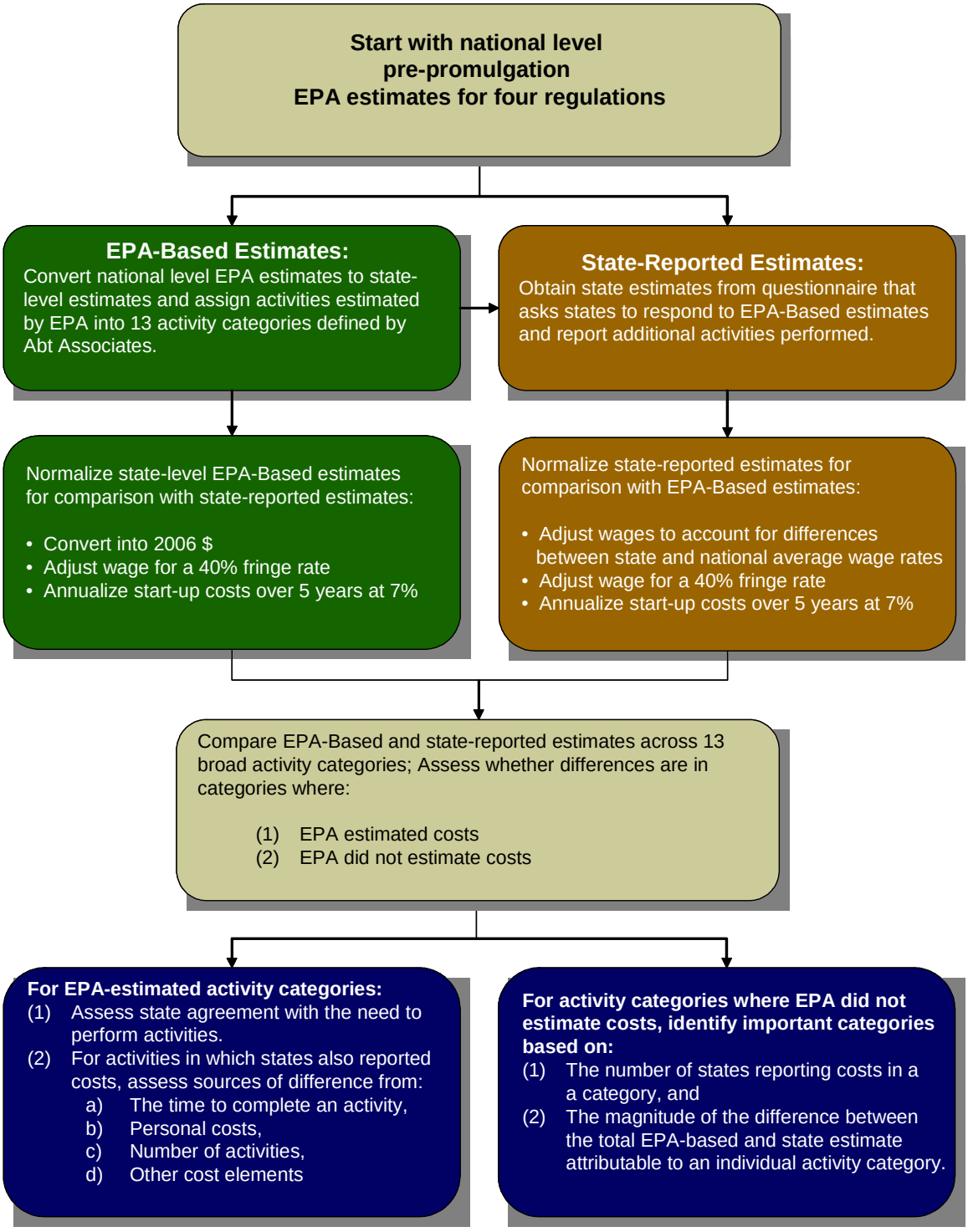
We also noted whether the case study states indicated that some activities did not need to be performed. Based on this initial comparison, we assessed the importance of individual activity categories in terms of their contribution to the differences between the EPA-based and the state estimates. We identified an activity category as being a substantial source of difference within a case study state's estimate for an individual regulation when:

1. The source of difference between the *total* state estimate and the *total* EPA-based estimate exceeded 25 percent, and
2. The activity category contributes to more than 20 percent of that difference.

For those activities that both EPA and one or more states agreed needed to be performed, we compared the participating states' estimates with the EPA estimates for each of the four cost components: per-activity time requirement, labor cost, non-labor cost, and number of activities. This comparison was structured to identify the contribution of each component to the total difference between the EPA and state estimates for these activities. This effort involved a "one-at-a-time" replacement of the EPA estimated component values with the state-reported values to understand the change resulting from each component (e.g., replacing the EPA-estimated "per-activity time requirement" with the participating state's estimate while holding all other EPA-estimated component values unchanged). In addition, for each of these activities, we looked closely at the differences between the EPA and state estimates of the time required to perform each activity. We also looked for the presence of systematic patterns across states and cost categories in the differences between EPA and case study states' estimates.

Examining the differences between the EPA-based and case study state estimates for the four cost components gave us a more comprehensive view of the ways that state estimates can differ from the EPA-based numbers. This information is also useful in identifying areas where further discussion between EPA and the states may improve administrative cost estimates and the overall efficiency of administering delegated programs.

Exhibit 5-1: Developing, Organizing, and Analyzing EPA-Based and State Estimates



For those activity categories where EPA did not estimate costs but for which some states reported costs, we identified the categories that are important sources of difference between the total estimates based on:

1. The number of states reporting costs in a category, and
2. The magnitude of the difference between the total EPA-based and total state estimate attributable to an activity category.

5.5 Limitations

Throughout this chapter, we have alluded to a number of limitations to our analysis. We summarize the more important of these limitations below:

- **The study focused only on four environmental regulations and six case study states**. As such, the results **do not** constitute a statistically valid sample from which broader conclusions can be drawn.
- **For each of the regulations analyzed, Abt Associates attempted to allocate EPA's national administrative cost estimates to the individual case study states (the EPA-based estimates)**. This allocation process inevitably includes error in understanding how costs would translate to individual states. In particular, our estimates of the numbers of regulation-related activities that would be performed by the individual states are probably subject to considerable uncertainty. To a degree, we are able to bypass this problem by focusing on other individual cost components (i.e., length of time to complete activities and the unit labor costs for performing those activities) as independent sources of difference between the EPA and participating states' cost estimates.
- **Participating states' estimates of the costs to perform administrative activities for federal environmental regulations were generally not based on detailed records of actual outlays, but instead reflect more typically a recollection or "best estimate" of what is required to perform these activities.** As a result, states' estimates are subject to an unknown degree of error. In instances where these activities remain ongoing, these estimates are probably less subject to error than for activities that were completed several years ago and that may have been relatively unique in their performance. In some cases, case study states reported that the personnel who were responsible for specific activities are no longer employed by the state agency; these states acknowledged the uncertainty in their estimates because of the loss of this "institutional knowledge." We have no way of validating states' estimates or of knowing the extent and direction of any estimation error.
- **As described at the beginning of this chapter, we have no way of precisely identifying the degree to which states' reported costs reflect activities that were already (or would be) ongoing because of state or other federal programs implemented independent of the federal environmental regulation's administrative requirements.** In the case of the Stormwater Phase II Final Rule, it appears that some states reported costs that could be partially attributable to the Coastal Zone Act Reauthorization Amendments (CZARA). Since we cannot estimate the extent to which costs are attributable to CZARA or the Stormwater Phase II Final Rule, we can only identify the instances where this may be occurring. We also have no way of identifying the extent to which states' reported costs reflect activities that exceed a reasonable baseline of the requirements for implementing a regulation. As a result, states' reported

costs may not all be directly attributable to the requirements of the federal environmental regulations being studied.

- **As described in Section 5.3, we reported the EPA estimates to the case study states as part of our information collection process.** This seeding of the discussion with those estimates may tend to anchor the state-reported values to the EPA estimates and produce a narrower range of estimates than would occur if the estimates were not seeded in this way. The EPA estimates could also serve as a floor for the state-reported values and thus impart an upward bias to the state cost estimates in relation to the EPA-based estimates. As discussed in later chapters presenting the findings for each regulation, we did find that states more often reported values that were equal to or exceeded the EPA-based estimated values. However, in several instances, states reported values (e.g., time to perform activities) that were less than the EPA-based estimates, or reported that EPA had included activities in its analysis that the state did not need to perform in administering the regulation. The occurrence of these findings indicates that states did not systematically treat the EPA estimates as floor values in providing their own cost estimates.
- **The EPA cost estimates for the various regulations were all prepared several years ago, and the costs in those estimates reflect labor costs and other prices prevailing at that time.** For this effort, we inflated the EPA estimates to current (2006) dollars based on an accepted price-adjustment index. Nevertheless, this adjustment for change in prices over time introduces uncertainty in comparing the updated EPA estimates with the current state estimates.
- **Other elements of the cost normalization process (e.g., adjusting for the difference between state and national average wages, annualizing start-up costs over a specific number of years and discount rate) are also subject to uncertainty and error.** It is not possible to know the degree of error introduced by these adjustments or the extent to which these adjustments introduce bias in the resulting values and comparisons.
- **We did not explicitly consider the impact of state capital budgeting for start-up activities.** This was beyond the scope of our effort, but could be an important consideration for states that are preparing to administer a new delegated environmental regulation.

6 Analyzing Case Study State Costs for Administering the Stormwater Phase II Final Rule

6.1 Analytic Overview and Key Findings

6.1.1 Analytic Overview

In this chapter, we compare the costs of administering the Stormwater Phase II Final Rule provided by our case study states with costs estimated by Abt Associates for the regulation using EPA's methodology. Key steps in this comparison, also illustrated in Exhibit 6-1, include:

- Assigning EPA's nationwide cost estimates into the Abt Associates analytic framework and apportioning them to the individual case study states (to derive the EPA-based cost estimates). The Abt Associates analytic framework and our apportionment procedures are described in Chapter 5 and the appendixes.
- Comparing the total EPA-based cost estimates with the costs reported by case study states for administering the Stormwater Phase II Final Rule. In particular, we assessed the extent to which differences occur in:
  - Those activity categories for which EPA estimated costs and
  - Those categories for which EPA did not estimate costs but for which some states reported costs.

  Given the uncertainties associated with our cost estimates and those provided by the states, we determined with EPA that we would focus primarily on those total differences that are substantial – that is, exceeding ± 25 percent.
- Assessing the contribution of the individual activity categories to the total difference. Where it was apparent that there were substantial differences in the cost estimates, we adopted an approach to focus the analysis on the activity categories that had the greatest influence on the estimated differences. Recognizing the limitations of the data, we focused our analysis on those activity categories that accounted for at least 20 percent of the total cost difference. This rule helps identify the activity categories that are worthy of closer review, with the goal of providing insight into how EPA might improve its estimation of the costs to states for administering environmental regulations.
- Within those activity categories for which EPA estimated costs, assessing the extent to which states agreed that they incurred costs for these activities. We then analyzed the factors that would contribute to the cost differences, including the time to complete an activity, personnel costs, and the number of activities (e.g., number of permitting events).
- For those activity categories for which EPA did *not* estimate costs, but for which some states reported costs, identifying which of these categories are most important. We made this determination based on the frequency with which states reported costs and the contribution of these categories to the total difference between the EPA-based and state estimates.

Table 6-1 summarizes the total EPA-based and state costs estimate for the stormwater regulation. Our key findings from this analysis are summarized below.

Exhibit 6-1: Developing, Organizing, and Analyzing EPA-Based and State Estimates

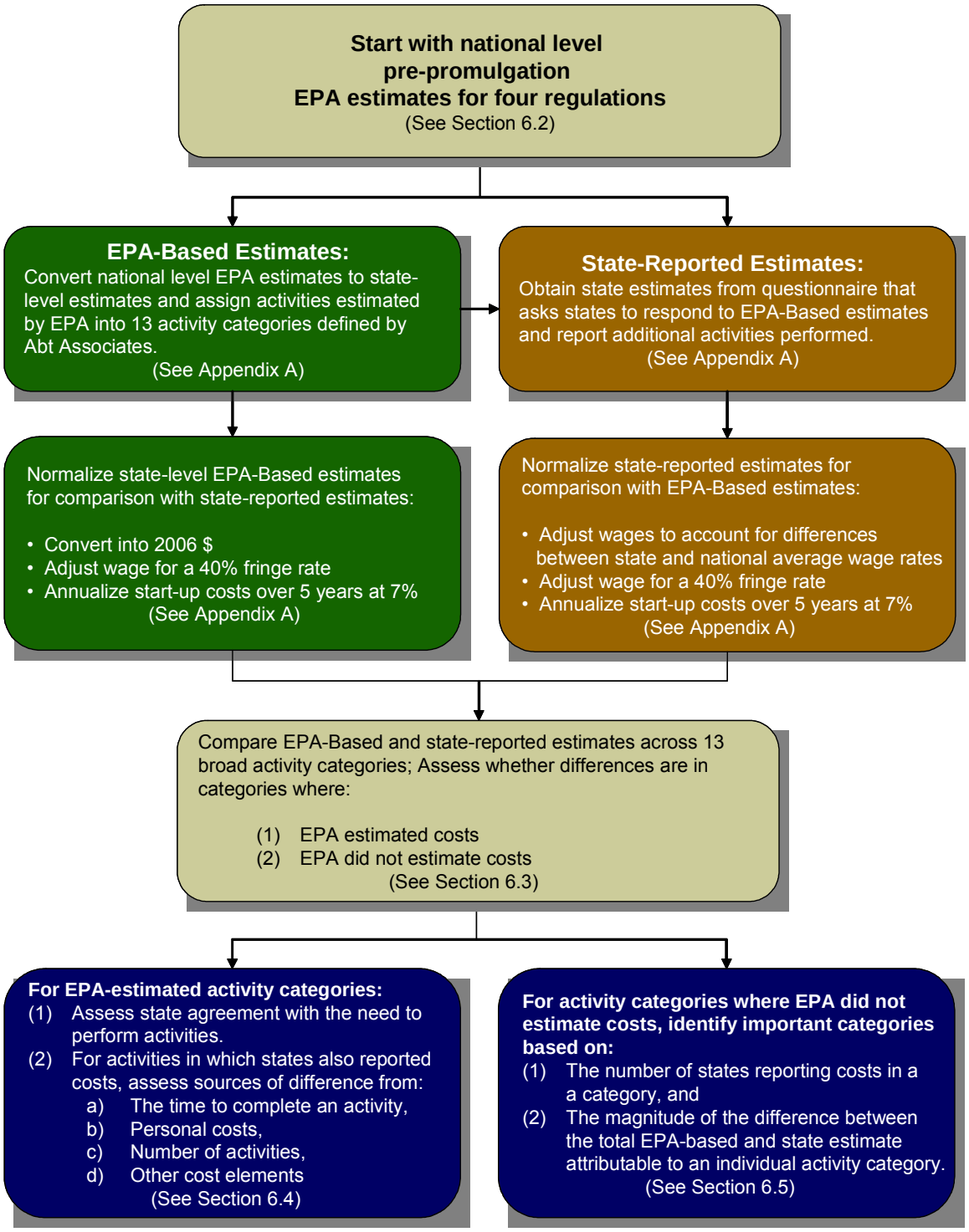


Table 6-1: Total EPA-Based and Case Study State Cost Estimates, Stormwater Phase II Final Rule

($000, 2006)	Kansas	Nevada	New Jersey	Oklahoma	South Carolina	Virginia
EPA-Based Estimate	$115	$125	$67	$89	$19	$164
State Estimate	$57	$150	$2,090	$418	$1,104	$1,194
Difference (State Estimate - EPA-Based Estimate)	($58)	$25	$2,024	$328	$1,085	$1,031
Percent Difference	-51%	20%	3,021%	367%	5,838%	629%

Notes:

- The very large percentage differences reported for New Jersey and South Carolina result to a large degree from EPA's assessment that the state was already performing certain activities resulting from implementing CZARA nonpoint source pollution control measures, which were promulgated prior to the Stormwater Phase II Final Rule.
- States with shaded values are those in which the contribution to total cost difference from the EPA-Estimated activity categories is "material" as described in Section 6.1: that is, (1) the EPA/state total cost difference is substantial – i.e., greater than ±25% .

6.1.2 Key Findings

Overall Cost Relationships

- All six case study states provided cost information for the Stormwater Phase II Final Rule.
- Four case study states reported costs for the regulation that substantially exceed (by more than 25 percent) the EPA-based estimates.
  - For two of these states (New Jersey and South Carolina) the cost comparison is substantially affected by EPA's assessment that the state was already performing certain activities independent of the EPA regulation.
    - EPA excluded from its assessment state expenditures to meet the Coastal Nonpoint Source Pollution Control Measures developed under Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA).
    - New Jersey included all costs associated with the implementation of their Stormwater program, which satisfies the requirements of CZARA and the Stormwater rule; it was not able to assign costs to each rule separately.
    - South Carolina developed its stormwater program to respond to EPA's requirements, which would address any CZARA requirements. Accordingly, South Carolina assigned these costs to the Stormwater II Final Rule.
    - EPA and the states may wish to examine further how to assign baseline costs when overlapping regulatory requirements occur.
  - For Oklahoma and Virginia, the main sources of cost difference relate primarily to higher costs associated with specific activity categories, as described in the next section.
- One state, Kansas, reported costs that are substantially less than (by more than 25 percent) the EPA-based estimate.
- One state, Nevada, reported costs that are approximately equal to the EPA-based estimate (within ±25 percent).

Cost Relationships by Activity Category

- In estimating the costs of the rule to states, EPA anticipated that costs would arise in 3 of the 13 activity categories (two start-up activity categories and one recurring activity

category). The case study states generally agreed that they need to perform these three broad activities.

- In addition, one or more of the states responded that they incurred costs in the remaining 10 activity categories; however, states showed little consistency in indicating that they needed to perform all of these activities. For most of these "missed" activities, no more than three states reported needing to perform the activity.
- By individual state and activity category, the material differences (i.e., where: (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference.) occur in the following recurring activities (see Table 6-4):
  - *Permit Administration*. While EPA estimated costs for this category, four of the six states (New Jersey, Oklahoma, South Carolina, and Virginia) identified the need for a greater amount of time to complete recurring permit administration activities (see Table 6-6).
  - *Enforcement and Other Recurring Activities*. EPA did not include costs for these activity categories, but several states included costs for these activities, especially enforcement (Table 6-7).
- From this analysis, it would be useful for the EPA to better understand the requisite efforts by states to administer permits for new or modified regulations. It would also be useful to address the basis for states choosing to perform other activities, such as compliance assistance and enforcement, and how these might have implications for EPA efforts to measure the economic impact of new rules affecting states.

In the following sections, we present our analysis and provide a more detailed discussion of the results underlying these key findings. Our discussion is organized as follows:

- Section 6.2, Overview of the Stormwater Phase II Final Rule and EPA's Cost Estimates, provides an overview of the stormwater regulation and reviews EPA's estimates of costs to state governments for administering the regulation.
- Section 6.3, Comparison of EPA-Based and State Estimates – Total Costs and Costs by Broad Category, compares the EPA-based and state estimates in terms of total difference and by the 13 activity categories, as outlined in Chapter 5.
- Section 6.4, Analysis of EPA-Estimated Activity Categories, examines more closely those activity categories for which EPA estimated costs.
- Section 6.5, Analysis of Activity Categories for Which Only States Estimated Costs, examines those activity categories for which EPA did not estimate costs, but in which one or more states reported incurring costs.
- Section 6.6, Issues Related to EPA's Baseline Cost Assumptions, reviews briefly the issues arising from states' claims of incurring costs for activities that EPA assessed as being performed by the state independent of the EPA regulation, but that the state indicated were undertaken because of the regulation.

Appendix A provides more detailed information on each participating state's cost estimates and comparison of those estimates, on an item-by-item basis, with the EPA-based estimates.

6.2 Overview of the Stormwater Phase II Final Rule and EPA's Cost Estimates

In its regulatory analysis of state costs for the Stormwater Phase II Final Rule, EPA estimated that states would incur costs for administering the regulation as follows (U.S. EPA 1999e, p. B-55):

> *States and Territories that are authorized to operate the NPDES program will experience both start-up costs and annual costs.*[1] *The start-up costs include the costs associated with revising each NPDES authorized State's procedures, as described by 40 CFR 123.62(b), the incorporation of Clean Water Act 401 certification language into the general permit, and designation of additional MS4s [Municipal Separate Storm Sewer Systems].*
>
> *The annual cost includes the State's responsibility as the permitting authority. For the Phase II municipal program, States will be required to annually process the applications, review plans, issue NPDES storm water permits to the municipal applicants, and review and file any reports. For construction sites disturbing between one and five acres of land, the States will be required to process the notices of intent (NOIs), notices of termination (NOTs), and waiver certification form. For small MS4s, States will be required to process and review the NOI and report.*

In addition, the Stormwater Phase II Final Rule added a "no-exposure" exclusion for Phase I regulated industrial facilities to reduce compliance costs. "No exposure" means all industrial materials or activities are protected by a storm-resistant shelter so that the materials are not exposed to rain, snow, snowmelt, or runoff. EPA estimated that authorized states would receive about 151,000 applications for no-exposure certification, and that it would require about 1 hour to process each application.

Activities related to administering the stormwater regulation fall into 3 of the 13 activity categories outlined in Chapter 5. EPA further estimated that states would incur costs for nine specific "line item" activities within these three categories, as follows:

- **Activity Category 3: Designing Implementation Plan**
  - Time required to identify and designate additional Municipal Separate Storm Sewer Systems (MS4s) as within the scope of the regulation.
  - Time required to revise state procedures for implementing the new regulation.
- **Activity Category 4: General Start-Up Activities**
  - Time required to add 401 language to the general permit.
- **Activity Category 10: Permit Administration (Recurring)**
  - Processing and Review of applications for Construction Start Waiver Certification
  - Processing and Review of Construction Start Notices of Intent (NOIs)
  - Processing and Review of Construction Start Notices of Termination (NOTs)
  - Processing and Review of MS4 NOIs
  - Processing and Review of MS4 Reports
  - Process no-exposure certification forms submitted by Phase I facilities

Based on the estimates presented in EPA's Regulatory Impact Analysis (RIA), the total state costs were projected to be about $10.4 million (2006$), when one-time costs are annualized over

[1] Forty-four states and territories are authorized to operate the NPDES program. No Native American tribes currently have NPDES authorization.

a 5-year period assuming a 7 percent discount rate. Table 6-2 summarizes the national-level cost estimates for the Stormwater Phase II Final Rule RIA within the cost activity framework, with all dollar values stated in 2006$. We applied the adjustments outlined in Chapter 5 to convert them to state-level values for the specific states in this analysis. Appendix A provides these "converted" values[2] for each of the subject states.

Table 6-2: EPA Estimate of State Administrative Costs for the Stormwater Phase II Final Rule: All States with Permitting Authority

Description	Time Burden (hours)	Labor Costs (hourly wage plus fringe, 2006$)	Non-Labor Costs	Number of Activities	Total Hour Burden	Total Costs ($000, 2006$)
Start-Up Activities						
1. Tracking EPA's Rulemaking Progress	No costs estimated in this category.					
2. Obtaining Additional Delegated Authority	No costs estimated in this category.					
3. Designing Implementation Plan						
Time required to identify and designate additional MS4s	66.6	$31	$0	44	2,948	$91
Time required to revise state procedures for implementing the new rule	100	$31	$0	44	4,400	$136
4. General Start-Up Activities						
Time required to add 401 language to the general permit	12	$31	$0	44	528	$16
5. Compliance Assistance	No costs estimated in this category.					
6. Permit Administration	No costs estimated in this category.					
7. Monitoring	No costs estimated in this category.					
8. Enforcement	No costs estimated in this category.					
Total Start-Up Costs					*7,876*	*$244*
Total Annualized Start-Up Costs[a]						*$60*
Recurring Activities						
9. Compliance Assistance	No costs estimated in this category.					
10. Permit Administration						
Processing and Review of applications for Construction Start Waiver Certification	1	$31	$0	17,845	17,845	$553
Processing and Review of Construction Start NOIs	1	$31	$0	101,119	101,119	$3,135
Processing and Review of Construction Start NOT	0.5	$31	$0	101,119	101,119	$3,135
Processing and Review of MS4 NOIs	0.8	$31	$0	4,749	50,560	$1,567
Processing and Review of MS4 Reports	1.6	$31	$0	4,749	3,799	$118
Process no-exposure certification forms submitted by Phase I facilities	1	$31	$0	150,999	150,999	$4,681
11. Monitoring	No costs estimated in this category.					
12. Enforcement	No costs estimated in this category.					
13. Other	No costs estimated in this category.					
Total Recurring Costs					*414,330*	*$13,189*
Total Annualized Costs[a]						***$13,249***

Source: U.S. EPA 1999e and Abt Associates calculations.

[a] *One-time costs are annualized over a 5-year period assuming a 7 percent discount rate.*

Note: Acronyms used in this table are defined as follows: Municipal Separate Storm Sewer System (MS4), Notice of Intent (NOI), Notice of Termination (NOT).

6.3 Comparison of EPA-Based and State Estimates – Total Costs and Costs by Broad Category

We received cost estimates for administering the stormwater regulation from all six of the case study states. Table 6-3, following page, summarizes overall cost information for the Stormwater Phase II Final Rule, including the total dollar values of costs for each of the six states and our

[2] In this and the following chapters, we refer to these "converted EPA values" as the "EPA-based" estimates or values.

EPA-based estimates, and the breakout of these costs by the individual activity categories. Table 6-4 reports the percentage share contribution by activity category to the total cost difference.

Table 6-3: Summary of EPA-Based and State Estimated Costs, Stormwater Phase II Final Rule

Activity Category		Kansas	Nevada	New Jersey[1]	Oklahoma	South Carolina[1]	Virginia
All Activities ($000, 2006)							
Total Costs	*EPA-Based Estimate*	*$115*	*$125*	*$67*	*$89*	*$19*	*$164*
	State Estimate	*$57*	*$150*	*$2,090*	*$418*	*$1,104*	*$1,194*
	Difference (State - EPA)	*($58)*	*$25*	*$2,024*	*$328*	*$1,085*	*$1,031*
	Percentage Difference	*(50%)*	*20%*	*3,033%*	*367%*	*5,838%*	*629%*
Start-Up Activities ($000, 2006)							
1. Tracking EPA's Rulemaking Process	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	$0	-	$7	-	-	-
	Difference (State - EPA)	$0	-	$7	-	-	-
2. Obtaining Additional Delegated Authority	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	-	-	$0	$66	-
	Difference (State - EPA)	-	-	-	$0	$66	-
3. Designing Implementation Plan	EPA-Based Estimate	$1	$1	$1	$1	$1	$1
	State Estimate	$1	$2	$110	$4	$51	$6
	Difference (State - EPA)	($1)	$1	$109	$3	$49	$5
4. General Start-Up Activities	EPA-Based Estimate	$0	$0	$0	$0	$0	$0
	State Estimate	-	$0	$15	$2	$1	-
	Difference (State - EPA)	($0)	$0	$15	$2	$0	($0)
5. Compliance assistance	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	$8	$0	$59	$3	$4	-
	Difference (State - EPA)	$8	$0	$59	$3	$4	-
6. Permit administration	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	$1	$29	$3	$0	-
	Difference (State - EPA)	-	$1	$29	$3	$0	-
7. Monitoring	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	$7	-	-	$7	-	-
	Difference (State - EPA)	$7	-	-	$7	-	-
8. Enforcement	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	-	$15	$5	-	-
	Difference (State - EPA)	-	-	$15	$5	-	-
All Start-Up Activities	*EPA-Based Estimate*	*$1*	*$1*	*$1*	*$1*	*$1*	*$1*
	State Estimate	*$17*	*$4*	*$235*	*$24*	*$122*	*$6*
	Difference (State - EPA)	*$15*	*$3*	*$234*	*$23*	*$121*	*$5*
Recurring Activities ($000, 2006)							
9. Compliance Assistance	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	$1	$193	-	-	-
	Difference (State - EPA)	-	$1	$193	-	-	-
10. Permit Administration	EPA-Based Estimate	$114	$124	$65	$88	$17	$162
	State Estimate	$40	$142	$839	$294	$982	$171
	Difference (State - EPA)	($73)	$18	$774	$206	$965	$8
11. Monitoring	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	-	-	$14	-	-
	Difference (State - EPA)	-	-	-	$14	-	-
12. Enforcement	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	$2	$258	$80	-	$907
	Difference (State - EPA)	-	$2	$258	$80	-	$907
13. Other Recurring Activities	EPA-Based Estimate	-	-	-	-	-	-
	State Estimate	-	-	$564	$6	-	$110
	Difference (State - EPA)	-	-	$564	$6	-	$110
All Recurring Activities	*EPA-Based Estimate*	*$114*	*$124*	*$65*	*$88*	*$17*	*$162*
	State Estimate	*$40*	*$146*	*$1,855*	*$394*	*$982*	*$1,188*
	Difference (State - EPA)	*($73)*	*$22*	*$1,790*	*$306*	*$965*	*$1,026*

Notes:

- "-" indicates no cost was estimated; $0s indicate values with magnitudes smaller than $500.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.

[1]Cost comparisons for New Jersey and South Carolina (green shaded) are substantially affected by EPA's determination that these states had programs underway independent of the Stormwater Phase II Final Rule's requirements, and that these programs overlapped with the administrative needs for this regulation. Thus, a significant part of costs otherwise assignable to these states was set aside in EPA's analysis. The states disagreed with this assessment and/or were unable to separate stormwater costs from other related program costs, and thus reported full program costs. This treatment of costs for these states leads to comparing the total reported costs from the states (in the numerator) with a "reduced" value from EPA (in the denominator) and thus leads to a very large calculated percentage difference between the state and the EPA-based estimates.

Table 6-4: Percentage Contribution to Cost Differences by Activity Category

Activity Category	Kansas	Nevada	New Jersey	Oklahoma	South Carolina	Virginia
State Estimate Minus EPA Estimate ($000, 2006)						
All Activities	($58)	$25	$2,024	$328	$1,085	$1,031
Percentage Difference, Total (State vs. EPA)	-50%	20%	3,021%	369%	5,711%	629%
Start-Up Activities (Percentage Contribution to Difference)						
1. Tracking EPA's Rulemaking Process	1%		0%			
2. Obtaining Additional Delegated Authority				0%	6%	
3. Designing Implementation Plan	-1%	4%	5%	1%	5%	0%
4. General Start-Up Activities	0%	0%	1%	1%	0%	0%
5. Compliance Assistance	14%	2%	3%	1%	0%	
6. Permit Administration		6%	1%	1%	0%	
7. Monitoring	13%			2%		
8. Enforcement			1%	2%		
All Start-Up Activities	*26%*	*11%*	*12%*	*7%*	*11%*	*0%*
Recurring Activities (Percentage Contribution to Difference)						
9. Compliance Assistance		5%	10%			
10. Permit Administration	-126%	75%	38%	63%	89%	1%
11. Monitoring				4%		
12. Enforcement		9%	13%	24%		88%
13. Other Recurring Activities			28%	2%		11%
All Recurring Activities	*-126%*	*89%*	*88%*	*93%*	*89%*	*100%*
All Activities	**-100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

- Percentages are calculated as the share of the total difference between the EPA and state estimates occurring in the indicated activity category. Shares by activity category sum to either +100% or –100%. Shares sum to +100% for states in which the state-reported costs exceeds the EPA-based estimate. Shares sum to –100% for states in which the EPA-based estimate exceeds the state-reported costs.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.
- **Dark grey and white text** items are those for which the cost effect is material because (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference. These items are of most interest for understanding the character of differences between the state and EPA-based estimates for this regulation.

Review of these tables provides several observations about the case study state and EPA-based estimates of the costs for administering the Stormwater Phase II Final Rule. We summarize these as follows:

6.3.1 Total Cost Difference

As shown in Table 6-3 and Table 6-4, the relationship between the state and EPA-based cost estimates varies substantially:

- Two states, New Jersey and South Carolina, reported costs that are substantial multiples of the EPA-based estimates. However, these very large percentage differences result, to a large degree, from EPA's treatment of costs for these states in its regulatory analysis and the difference of judgment or analytic treatment by the states in their cost estimates.
  - In the Stormwater Phase II Final Rule analysis, EPA determined that these states had programs underway to respond to the Coastal Nonpoint Source Pollution Control Measures developed under CZARA Section 6217. These requirements were promulgated prior to the Stormwater Phase II Final Rule. Thus, a significant part of the costs otherwise assignable to these states was set aside in EPA's analysis.
  - The states disagreed with this assessment and/or were unable to separate their stormwater costs from other related program costs, and thus reported full program costs. This treatment of costs for these states leads to comparing the total reported costs from the states (in the numerator) with a "reduced" value from EPA (in the

denominator) and thus leads to a very large calculated percentage difference between the state and EPA-based estimates.
  - Other factors (e.g., states' reporting of costs for activities that EPA did not account for in its analysis) also account for the cost differences for these states.
- Two other states, Oklahoma and Virginia, also reported costs that are substantially larger (369 percent and 629 percent, respectively) than the EPA-based estimates. In these cases, the large cost differences (to be examined later) result from different estimates of the cost of performing those activities that EPA accounted for in its analysis (in particular, for Oklahoma) or from the states reporting costs for activities, especially recurring enforcement activities, that EPA did not account for in its analysis (Oklahoma and Virginia).
- One state, Nevada, reported costs that are 20 percent higher than the EPA-based estimate. In this case, given the uncertainties both in the assignment of EPA's national costs to the case study states and in states' reporting of costs for rule administration, we view the state and EPA-based estimates as not being materially different.
- One state, Kansas, reported costs that are 50 percent less than the EPA-based estimate. This cost difference largely results from Kansas estimating lower time requirements and costs for performing those activities that EPA accounted for in its analysis.

6.3.2 Costs by Activity Category

EPA estimated costs in three administrative activity categories for the Stormwater Phase II Final Rule:

- Two start-up categories: Category 3, Designing Implementation Plan, and Category 4, General Start-Up Activities
- One recurring category: Category 10, Permit Administration.

States generally agreed that they need to perform these activity categories. In only two instances—Kansas and Virginia for Category 4, General Start-Up Activities—did states report not performing the activity.

In each of the remaining 10 activity categories, for which EPA did not estimate costs, at least one state indicated that it incurred costs. However, for none of these remaining categories did all states indicate that they would need to perform the activity and incur costs.

As shown in Table 6-4, the cost differences at the level of the state and individual activity category are material in only a few instances based on (1) the total cost difference for the state being substantial (i.e., greater than ±25 percent) and (2) the activity category contributing at least a 20 percent share of this total difference for the state:

- In **Category 10, Permit Administration,** an activity category for which EPA estimated state administrative costs, the contribution to total cost difference is material for four states. However, the direction of this contribution is not consistent, with the contribution leading to the state's costs exceeding the EPA-based estimated costs for three states (New Jersey, Oklahoma, and South Carolina) and with the contribution leading to the state's costs being less than the EPA-based estimated costs for one state (Kansas).
- For **Category 12, Enforcement,** an activity category for which EPA did not estimate state administrative costs, the contribution to total cost difference is material for two states, Oklahoma and Virginia. Because EPA did not estimate costs in this activity

category, this activity category necessarily leads to the states' costs exceeding the EPA-based estimated costs.

- For **Category 13, Other Recurring Activities,** also an activity category for which EPA did not estimate state administrative costs, the contribution is material for New Jersey. Again, the effect of cost estimates in this category necessarily leads to the state's costs exceeding the EPA-based estimated costs.

As shown, differences in recurring activities are substantially more important overall than differences in start-up activities, but there is no clear pattern showing that these material cost differences occur primarily in the activity categories for which EPA estimated costs or in those in which it did not estimate costs. The next two sections analyze in greater depth the activity categories for which EPA and the states estimated costs.

6.4 Analysis of EPA-Estimated Activity Categories

As described above, EPA estimated costs for the Stormwater Phase II Final Rule for three activity categories: Category 3, Designing Implementation Plan; Category 4, General Start-Up Activities; and Category 10, Permit Administration. There is general agreement across the six case study states that the EPA-estimated activities are needed for administering the Stormwater Phase II Final Rule.

Only in two instances – Kansas and Virginia for Category 4, General Start-Up Activities – did states report not performing activities in an EPA-estimated activity category. Because this particular activity category is general in nature, it is reasonable that some states may have not reported costs for the category, perhaps placing any relevant costs in another start-up category. Regardless, the cost effect of these few exceptions is trivial, accounting for less than 1 percent of the total cost difference in these two states.

As discussed in the preceding section, some of the cost differences in the categories in which EPA estimated costs are substantial and contribute to a material difference in total cost between the state and EPA-based estimates. Given the overall importance of the differences in the EPA-estimated categories, we performed a more detailed analysis to identify the factors that account for most of the cost differences. First, we looked within the EPA-Estimated Activity categories and divided the specific activity line-items into three groups:

- **Line-Item Activities Estimated Only by States.**
- **Line-Item Activities Estimated Only by EPA,**
- **Line-Item Activities Assumed Baseline by EPA, and**
- **Line-Item Activities Estimated by States and EPA.** Within these activities we assessed the extent to which cost differences in these categories result from the individual components underlying the EPA-based and state cost estimates:
  - The length of time to complete each activity.
  - The unit cost of labor (hourly wage plus fringe allowance) for performing the activity.
  - The number of activities – either for start-up activities or the estimated number of activities performed annually for recurring activities.

- The non-labor costs reported for the activity.

To assess the separate contributions from these underlying cost components, we recalculated the EPA-based cost values in each category by replacing, one at a time, the EPA-based values with the state-provided values for the underlying cost components. For states that estimated higher costs than the EPA-based estimates, we calculated a positive share contribution from each of the one-at-a-time changes that contributed toward that positive effect. For states that estimated lower costs than the EPA-based estimates, we calculated a negative share contribution from each of the one-at-a-time changes that contributed toward that negative effect.

Table 6-5 summarizes the contribution of each component to the difference between state and EPA-based estimates in the EPA-estimated categories for each state.

Table 6-5: Sources of Cost Difference in EPA-Estimated Categories

	Kansas	Nevada	New Jersey	Oklahoma	South Carolina	Virginia
Sources of Difference for Activities in EPA-Estimated Categories[1]						
Line-Items Estimated by States and EPA	*-99%*	*100%*	*34%*	*103%*	*16%*	*375%*
Line-items Estimated by States Only	0%	0%	46%	1%	0%	0%
Line-items Estimated by EPA Only	-1%	0%	0%	-4%	0%	-275%
Line-items Assumed Baseline by EPA	0%	0%	20%	0%	84%	0%
Total Change	**-100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Contribution of Components to Differences in Activities Estimated by States and EPA[2]						
Time to Complete Activities	-10%	0%	**100%**	**95%**	88%	51%
Unit Labor Costs	—	5%	0%	5%	12%	10%
Number of Activities	-90%	95%	—	—	—	39%
Non-Labor Costs	0%	0%	0%	0%	0%	0%
Total Change	**-100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

[1] Percentages indicate the share of total cost difference in the EPA-estimated activity categories contributed by each of the four underlying calculation factors. Shares sum to either +100 percent or -100 percent. Shares sum to +100 percent for states in which the state-reported costs in the EPA-estimated categories exceeds the EPA-based estimate. Shares sum to -100 percent for states in which the EPA-based estimate exceeds the state-reported costs in the EPA-estimated categories.

[2] For those specific activities estimated by both EPA and the states, the sources of difference can be examined more closely. Here we evaluate the sources of these differences attributable to the estimates components: (1) length of time to complete each activity, (2) unit cost of labor, (3) number of activities, or (4) non-labor costs. Where states reported higher costs for these activities, the share contributions of each component of the costs that contributed toward this positive effect are shown as positive numbers. Where states reported lower costs for these activities, the share contributions of each component of the costs that contributed toward this negative effect are shown as negative numbers.

- A "—" indicates that a cost component contributed toward the opposite direction of the aggregate effect.
- States with light blue shading are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 6.1.1: that is, (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference.
- The **dark green-shaded and white Text** values are those in states with light blue shading where: (1) the contribution from Line-Items Estimated by States exceeds 20%, and (2) the Time to Complete Activities factor was found to contribute materially (>20%) to the cost difference.

Several observations may be drawn from Table 6-5:

- For four states (Kansas, Nevada, Virginia, and Oklahoma), the Line-Items Estimated by States and EPA were the most important source of difference within the EPA-Estimated Categories.
- For two of these states (New Jersey and South Carolina), the cost comparison is substantially affected by EPA's assessment that the state was already performing certain activities independent of the EPA regulation. In the case of South Carolina, this is the most important source of difference within the EPA-Estimated Categories.

- Additional line-item activities reported by New Jersey (i.e., line items not included by EPA in its analysis for an EPA-estimated activity category) were the most important source of difference within the EPA-estimated categories. The additional line-items they listed included:
  - Category 3, Designing Implementation Plan
    - Designed alternative standards to those in the federal regulation,
    - Performed activities related to obtaining EPA approval for the state implementation plan, and
    - Met with stakeholders and/or responded to stakeholder concerns regarding this rule.
    - Category 4, General Start-Up Activities
      - Developed internal guidance and procedures for implementing the new regulation,
      - Attended EPA training or other non-EPA sponsored training for implementing the new regulations, and
      - Conducted internal training.
    - Category 10, Permit Administration.
      - Conduct regular reviews of submitted documents and supporting materials,
      - Verify data sources on a regular basis,
      - Consult regularly with facilities about the permitting process,
      - Issue notifications to affected entities regarding permits,
      - Provide opportunities for the public and/or stakeholders to comment on ongoing permitting processes, and
      - Issue and/or review permits to affected entities.
- Line-Items estimated by EPA and the States were also an important source of difference within the EPA-Estimated categories for New Jersey.
- For all states except Kansas, the state-reported cost values exceed the EPA-based estimates in the EPA-estimated activity categories.
  - The cost difference, however, is material for only four states, indicated by the light blue shading in the table: Kansas, New Jersey, Oklahoma, and South Carolina.
  - For Nevada and Virginia, the contribution to total cost difference from differences in the EPA-estimated activity categories is not material.
- For the two case study states with material cost effects *exceeding* the EPA-based estimates (New Jersey, Oklahoma, and South Carolina), the Time to Complete Activities category accounts for almost all of the estimated cost differences. However, for South Carolina, the Time to Complete Activities is not considered a material source of difference because the Line-Items Estimated by States and EPA only account for 16 percent (i.e., <20%) of the difference within the EPA-Estimated Activity Categories.
- For Kansas, the one case study state with material cost effects *less* than the EPA-based estimates, the Number of Activities category accounts for the largest share of the negative

cost difference. Although this cost factor appears substantial for this state, we assign less significance to this finding because of the method that we used to allocate the total EPA activity counts to each of the case study states. As such, the state-level activity values are subject to a higher degree of error. The Unit Labor Costs factor accounts for a moderate *positive* difference for this state.

- Overall, the contributions from the Unit Labor Costs and Non-Labor Costs factors are much smaller than the contributions from the Time to Complete Activities factor.

Given the importance of Time to Complete Activities as the principal source of difference in the EPA-estimated categories, we looked more closely at states' reported time requirements in comparison to the EPA estimates. Table 6-6 summarizes reported time requirements in the EPA-estimated categories by the specific activities in each category. In this table, the **dark green-shaded and white text** values are those for which the contribution to total cost difference from the EPA-estimated activity categories is material.

Table 6-6: EPA and State Estimates of Time Required to Complete Activities in the EPA-Estimated Activity Categories

(Hours per Activity)	EPA	Kansas	Nevada	New Jersey	Oklahoma	South Carolina	Virginia
Activity Category 3: Designing Implementation Plan (Start-Up)							
Identify and designate additional MS4s	66.6	66.6	66.6	1,040.0	240.0	170.0	4.0
Revise state procedures	100.0	-	100.0	4,160.0	200.0	5,103.3	300.0
Activity Category 4: General Start-Up Activities (Start-Up)							
Revise general permit	12.0	-	12.0	-	40.0	12.0	-
Activity Category 10: Permit Administration (Recurring)							
Review Construction Start Waiver	1.0	1.0	1.0	-	-	-	-
Review Construction Start NOIs	1.0	1.0	1.0	**5.0**	**2.5**	8.5	1.0
Review Construction Start NOTs	0.5	0.5	0.5	**0.8**	**4.0**	-	0.5
Review MS4 NOI	0.8	0.8	1.0	**6.1**	**30.0**	19.9	40.0
Review MS4 reports	1.6	0.5	1.6	**9.2**	**8.0**	12.0	8.0
Process no-exposure certifications	1.0	0.5	1.0	**5.2**	**4.5**	1.5	-

Notes:
- "-" in a cell indicates that the state did not report a cost for this activity.
- Abbreviations used in this table are defined as follows: Municipal Separate Storm Sewer System (MS4), Notice of Intent (NOI), Notice of Termination (NOT).
- The **dark green-shaded and white text** values indicate where the Time to Complete Activities factor was found to contribute materially; that is, where (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference, (3) the contribution from Line-Items Estimated by States exceeds 20%, and (4) the Time to Complete Activities factor was found to contribute materially (>20%) to the cost difference.

Several observations may be drawn from Table 6-6:

- In general, estimated time differences for activities in Category 10, Permit Administration (Recurring), are substantial.
  - The two states with material cost effects (New Jersey and Oklahoma) report generally higher time requirements than estimated by EPA (0.5 to 1.6 hours per activity) for the following five activities:
    - Review Construction Start NOIs
    - Review Construction Start NOTs
    - Review MS4 NOI
    - Review MS4 Reports
    - Process No-Exposure Certifications.

  - In our conversations with states during the information gathering phase, some states indicated that providing guidance to the regulated community was the most time-consuming aspect of reviewing the MS4 NOIs and reports because the Stormwater Phase II Final Rule offers considerable flexibility instead of prescribing specific practices.
  - While the differences between the EPA and state estimates of time requirements vary considerably by state and activity, the relative consistency of the higher estimates suggests that EPA may want to further review the time needs associated with permit administration.
- Although some estimates of time difference in the start-up categories are large numerically, they are of low importance in the total cost estimates.
  - First, these activities occur only once (i.e., at start-up) instead of being performed repeatedly during the recurring activities phase of rule administration.
  - Second, the large differences in a few instances (e.g., New Jersey and South Carolina) appear to reflect differences of regulatory implementation approach followed by these states. From conversations with state agency personnel, we understand that:
    - Some states spend relatively greater resources preparing the regulated community for the new regulatory requirements, including conducting guidance and training sessions at locations throughout the state.
    - Some states also essentially *rewrite* the EPA regulation into the state's own regulations, with a substantial commitment of legal and other personnel resources to ensure proper integration of the EPA regulation with the existing state code.
    - Other states simply *adopt* the EPA regulation directly into the existing state code with no significant effort for the integration effort.

6.5 Analysis of Activity Categories for Which Only States Estimated Costs

In Table 6-7, we show the activity categories for which only states estimated costs. We have also highlighted those activities for which the cost effect is material.

Table 6-7: Activity Categories for Which Only States Estimated Costs

Activity Category	Kansas	Nevada	New Jersey	Oklahoma	South Carolina	Virginia
Start-Up Activities						
1. Tracking EPA's Rulemaking Process	✓		✓			
2. Obtaining Additional Delegated Authority		✓	✓	✓	✓	
5. Compliance Assistance	✓	✓	✓	✓	✓	
6. Permit Administration		✓	✓	✓	✓	
7. Monitoring	✓			✓		
8. Enforcement			✓	✓		
Recurring Activities						
9. Compliance Assistance		✓	✓			
11. Monitoring				✓		
12. Enforcement		✓	✓	✓		✓
13. Other Recurring Activities			✓	✓		✓

Notes:
- "✓" indicates that the state reported costs in this activity category.
- "✓" indicates those instances in which the cost effect is material, which means that (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), and (2) the activity category contributes at least a 20 percent share of this total difference.

As shown in Table 6-7,

- At least one state reported costs in all of these ten "missed" categories, but there is not a consistent trend across the six case study states. Indeed, for all but one of these

categories, the number of case study states needing to perform the activity does not exceed four.

- Although the number of instances in which states reported costs is greater for start-up activities than for recurring activities, none of the start-up activities have a material cost impact.
- In only three instances—all in the recurring activity categories—are the state-reported costs material (see Table 6-4):
  - Category 12, Enforcement, for Oklahoma
  - Category 12, Enforcement, for Virginia
  - Category 13, Other Recurring Activities, for New Jersey.
- While the findings from this analysis do not contradict EPA's decision not to account for these activity categories in its cost assessment, they do suggest that EPA may wish to examine more closely certain activities, especially recurring enforcement, as part of future regulatory analyses. This closer look would attempt to determine:
  - The specific activities undertaken by the states in these omitted activity categories
  - The reasons why states view these activities as essential elements in administering the stormwater regulation and why they are relatively costly compared to other activity categories
  - Why the EPA analysis for the Stormwater Phase II Final Rule did not account for these activities.

  Our analysis to date has not been able to delve to this level of follow-up investigation, but we do have information from the states (included in their questionnaire responses and summarized in Table 6-8) that provides a first step in better understanding the specific activities undertaken by states, regardless of whether the cost effect is material, related to Categories 12 (Enforcement) and 13 (Other Recurring Activities).

6.6 Issues Related to EPA's Baseline Cost Assumptions

As described in Section 6.3, Comparison of EPA-Based and State Estimates – Total Costs and Costs by Broad Category, EPA assessed in its analysis that costs related to construction start permits for New Jersey and South Carolina should be attributable to CZARA, which has similar requirements to the Stormwater Phase II Final Rule. The states, however, disagreed with this assessment. In their view, the Stormwater Phase II Final Rule requirements were more difficult to satisfy, so they developed their programs specifically to meet the Stormwater Phase II Final Rule requirements. They reported that through meeting the Stormwater Phase II Final Rule requirements, they satisfied the CZARA requirements.

In theory, the Stormwater Phase II Final Rule costs should be estimated as the difference between the states' stormwater program costs and the costs they would incur under the hypothetical scenario where there was no Stormwater Phase II Final Rule. However, the costs that would be incurred under this hypothetical scenario, where the states would have developed only a CZARA permit program, are unknown. Therefore, it is not feasible to make the ideal theoretical comparison in this case.

This "special issue" accounts for a large part of the difference between the state and EPA-based estimates for the Stormwater Phase II Final Rule. In addition, it sets up an anomalous mathematical comparison of the state and EPA-based costs because the EPA-based estimates for

these states set aside substantial costs that would have otherwise been in the denominator of the percentage difference calculation.

Table 6-8: Activities Cited by Case Study States Related to Enforcement and Other Recurring Activities

Category	State	Cited Activities
12. Enforcement		
	Nevada	▪ Conduct and review regular inspections for regulatory enforcement purposes. ▪ Issue warnings and/or citations for violations. ▪ Take legal actions to enforce the regulation. ▪ Collect fines for violations. ▪ Keep records of enforcement actions. ▪ Provide notifications of enforcement actions. ▪ Report enforcement activities to EPA.
	New Jersey	▪ Conduct and review regular inspections for regulatory enforcement purposes. ▪ Issue warnings and/or citations for violations. ▪ Take legal actions to enforce the regulation. ▪ Collect fines for violations. ▪ Keep records of enforcement actions. ▪ Provide notifications of enforcement actions. ▪ Report enforcement activities to EPA. ▪ Incur additional recurring costs associated with enforcement activities.
	Oklahoma	▪ Conduct and review regular inspections for regulatory enforcement purposes. ▪ Take legal actions to enforce the regulation. ▪ Collect fines for violations. ▪ Keep records of enforcement actions. ▪ Report enforcement activities to EPA. ▪ Issue warnings and/or citations for violations.
	Virginia	▪ Enforcement, recurring activities: Inspections for land disturbing activities covered or not covered by the General Permit for construction activities. ▪ Enforcement, recurring activities: Follow-up inspections per findings of initial inspections. ▪ Enforcement, recurring activities: Enforcement actions on land disturbing projects not in compliance with the General Permit
13. Other Recurring Activities		
	New Jersey	▪ Statewide Stormwater Education Program.
	Virginia	▪ Citizen complaints about land disturbing activities covered or not covered by the General Permit for construction activities. ▪ Citizen complaints regarding the MS4 operation, maintenance, and water quality.
	Oklahoma	▪ Fee Invoicing and Collection.

Apart from the analysis and appropriate interpretation of the findings, the exclusion of costs from EPA's calculation highlights several substantive issues concerning how best to account for:

- Overlapping activities that a state may have undertaken to meet other federal regulatory requirements.
- Overlapping activities that a state may have undertaken on its own, independent of the EPA regulation.
- Rule-related activities that may go beyond the reasonable minimum for rule administration.

Within the federal-state governmental framework, states may reasonably decide to follow different approaches in rule implementation with resulting different levels of costs. However, whether and when the state's decisions and resulting costs go beyond the *reasonable minimum* is, of course, a matter of policy judgment that cannot be addressed in this analysis. Some part of the cost differences observed in this analysis, both across states and between the state and EPA-based estimates, may result from this factor.

It does appear reasonable that a new regulatory requirement may overlap with other federal programs, previously undertaken or underway, and that it is appropriate to account for, or at least acknowledge, that these overlapping efforts may "share costs." At the same time, it may be difficult to sort out costs in a precise way over these overlapping efforts, and states and EPA may disagree whether and how costs should be assigned. Given this observation and the finding that this factor substantially affected the analysis for the stormwater regulation, it appears important to clearly define the way in which administration requirements may overlap and perhaps to review with states any cost adjustments made on this basis before building these effects into the cost analysis for the new regulation.

7 Analyzing State Costs for Administering the Disinfection Byproducts Regulation

7.1 Analytic Overview and Key Findings

7.1.1 Analytic Overview

In this chapter, we compare the costs of administering the 1998 Disinfection Byproducts Rule provided by our case study states with costs estimated by Abt Associates for the regulation using EPA's administrative cost estimation methodology. Key steps in this comparison, also illustrated in Exhibit 7-1, include:

- Assigning EPA's nationwide cost estimates into the Abt Associates analytic framework and apportioning them to the individual case study states to derive the EPA-based cost estimates. The Abt Associates analytic framework and our apportionment procedures are described in Chapter 5 and the appendixes.
- Comparing the total EPA-based cost estimates with the costs reported by case study states for administering the Disinfection Byproducts Rule. In particular, we assessed the extent to which differences occur in:
  - Those activity categories for which EPA estimated costs and
  - Those categories for which EPA did not estimate costs but for which some states reported costs.

  Given the uncertainties associated with our cost estimates and those provided by the states, we determined with EPA that we would focus primarily on those total differences that are substantial – that is, exceeding ±25 percent.
- Assessing the contribution of the individual activity categories to the total difference. Where it was apparent that there were substantial differences in the cost estimates, we adopted an approach to focus the analysis on the activity categories that had the greatest influence on the estimated differences. Recognizing the limitations of the data, we focused our analysis on those activity categories that accounted for at least 20 percent of the total cost difference. This rule helps identify the activity categories that are worthy of closer review, with the goal of providing insight into how EPA might improve its estimation of the costs to states for administering environmental regulations.
- Within those activity categories for which EPA estimated costs, assessing the extent to which states agreed that they incurred costs for these activities. We then analyzed the factors that would contribute to the cost differences, including the time to complete an activity, personnel costs, and the number of activities (e.g., number of permitting events).
- For those activity categories for which EPA did *not* estimate costs, but for which some states reported costs, identifying which of these categories are most important. We made this determination based on the frequency with which states reported costs and the contribution of these categories to the total difference between the EPA-based and state estimates.

Table 7-1 summarizes the total EPA-based and state costs estimate for the Disinfection Byproducts Rule. Our key findings from this analysis are summarized below.

Exhibit 7-1: Developing, Organizing, and Analyzing EPA-Based and State Estimates

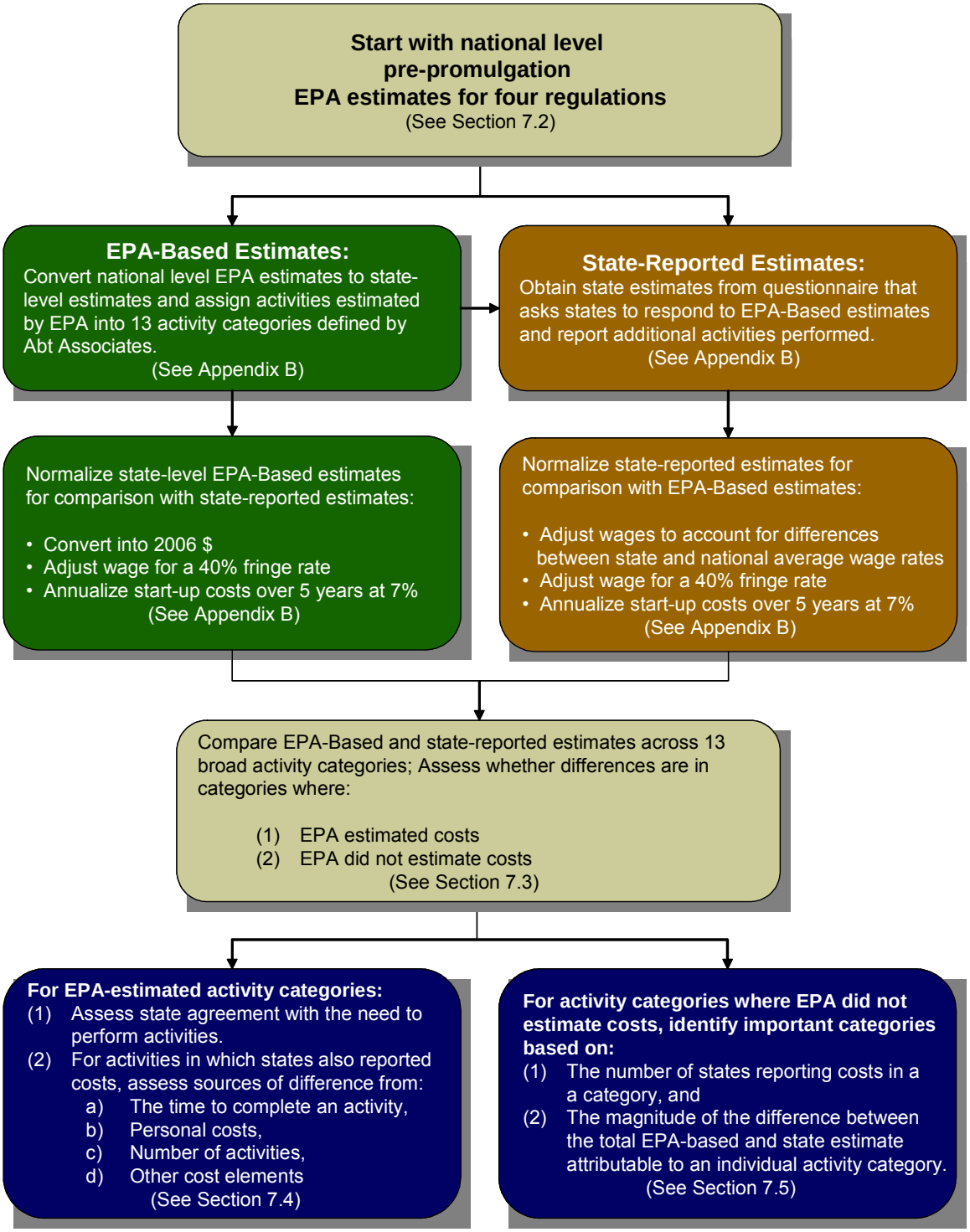


Table 7-1: Summary of EPA-Based and State Cost Estimates for Disinfection Byproducts Regulation

($000, 2006$)	Kansas	Nevada	New Jersey	Oklahoma	South Carolina
Total EPA-Based Estimate	$499	$374	$736	$659	$497
Total State Estimate	$337	$142	$748	$1,780	$571
Total Difference (State Estimate – EPA-Based Estimate)	($162)	($232)	$12	$1,122	$75
Total Percent Difference	(32%)	(62%)	2%	170%	15%

Notes:

- States with shaded values are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 7.1.1; that is, the EPA/state total cost difference is substantial (i.e., greater than ±25%).

7.1.2 Key Findings

Overall Cost Relationships

- Five case study states, Kansas, Nevada, New Jersey, Oklahoma, and South Carolina, provided cost information for the PM 2.5 Rule. Virginia could not provide estimates for this rule because key staff members have recently retired.
- One case study state, Oklahoma, reported costs for administering the Disinfection Byproducts regulation that exceeded the EPA-based estimates (by more than 25 percent), while two states, Kansas and Nevada, reported costs that are lower (by more than 25 percent) than the EPA-based estimates (see Table 7-1). Two states, New Jersey and South Carolina, reported total costs approximately equal to the EPA-based estimate (within ±25 percent).
- Of the five states, the reported cost difference for Oklahoma is considerably larger (at $1.1 million) than the difference, positive or negative, for the other states. Oklahoma's higher costs may largely result from special water issues in that state. Specifically, some of Oklahoma's drinking water supplies are especially challenging to treat, and therefore it is reasonable to expect that the state would have higher than average costs. The framework we developed to assign national estimates to states is not rich enough to take special state circumstances of this sort into account.

Cost Relationships by Activity Category

- EPA estimated costs in 9 of the 13 activity categories (six start-up activity categories and three recurring activity categories). All five states agreed that they needed to perform activities in these categories.
- In the remaining four activity categories, no more than half of the states reported activities under a given category. In the categories reported only by states, no states reported activities that were a *material* source of total cost difference – that is, none of these state-only reporting instances accounted for at least 20 percent of the total difference, and where the total state/EPA difference was also at least ±25 percent for the state.
- Six of the seven instances identified as material differences between the EPA-based estimates and the state estimates were in recurring activity categories. By individual state

and activity category, the material differences occur in the following activities (see Table 7-4):

- *Category 9, Compliance Assistance,* was a source of material cost difference in two states.
  - Oklahoma reported materially higher costs in this category.
  - Nevada reported materially lower costs in this category.
- *Category 11, Monitoring.* Three states reported material differences between the EPA-based estimates and the state estimates in this activity category.
  - Two states, Kansas and Nevada, reported materially lower costs in this category.
  - One state, Oklahoma, reported materially higher costs in this category.
- *Category 13, Other.* Nevada reported costs that were materially lower than the EPA-based estimates for other recurring activities.

- Only one instance of a material difference between the EPA-based estimates and the state estimates occurred in the start-up activity categories. Kansas reported start-up costs in *Category 6, Permit Administration,* that were materially lower than the EPA-based cost estimates (see Table 7-4).

In the following sections, we present our analysis and provide a more detailed discussion of the results underlying these key findings. Our discussion is organized as follows:

- Section 7.2, Overview of the Disinfection Byproducts Rule and EPA's Cost Estimates, provides an overview of the Disinfection Byproducts regulation and reviews EPA's estimates of costs to state governments for administering the regulation.
- Section 7.3, Comparison of EPA-Based and State Estimates – Total Costs and Costs by Broad Category, compares the EPA-based and state estimates in terms of total difference and by the 13 activity categories, as outlined in Chapter 5.
- Section 7.4, Analysis of EPA-Estimated Activity Categories, examines more closely those activity categories for which EPA estimated costs.
- Section 7.5, Analysis of Activity Categories for Which Only States Estimated Costs, examines those activity categories for which EPA did not estimate costs, but in which one or more states reported incurring costs.

Appendix B provides more detailed information on each participating state's cost estimates and comparison of those estimates, on an item-by-item basis, with the EPA-based estimates.

7.2 Overview of the Disinfection Byproducts Rule and EPA's Cost Estimates

The Stage 1 Disinfection Byproducts Rule RIA (U.S. EPA 1998e) estimated the total state costs associated with the rule to be about $64 million (2006$) for the first year of the rule's implementation. The RIA categorizes state costs as annually recurring or one-time. One-time tasks include program development and staff training, public outreach and assistance, technical system upgrading and compliance support, and various administrative tasks. Annually recurring activities include meeting reporting requirements, enforcement support, coordination with EPA, ongoing staff training, and data entry. We estimated annualized costs to be $27 million (2006$), when one-time costs are annualized over a 5-year period assuming a 7 percent discount rate.

These activities fall into 9 of the 13 activity categories outlined in Chapter 5. EPA further estimated that states would incur costs for 26 specific "line item" activities across these 9 categories, as follows:

- **Activity Category 1: Tracking EPA's Rulemaking Progress**
  - Regulation Adoption and Program Development
- **Activity Category 4: General Start-Up Activities**
  - Staff Training (Rule Specific)
- **Activity Category 5: Compliance Assistance**
  - Public Notification
  - Initial Laboratory Certification and Training; Site Visit and Follow-Up
  - System Training and Technical Assistance
- **Activity Category 6: Permit Administration**
  - Review Plans and Specifications (Large Ground Water Systems)
  - Review Plans and Specifications (Large Surface Water Systems)
  - Review Plans and Specifications (Small Ground Water Systems)
  - Review Plans and Specifications (Small Surface Water Systems)
  - Enhanced Coagulation Determination
  - Issue Notice of Intent
- **Activity Category 7: Monitoring**
  - Maintain Data Management System
  - Upgrade Primacy Laboratory for Haloacetic Acids (HAA5s), Chlorite, and Bromide
  - Notification of Required Monitoring
  - Issue/Monitor Compliance Schedule
- **Activity Category 8: Enforcement**
  - Violation Letters
- **Activity Category 9: Compliance Assistance**
  - Enforcement Support: Ongoing Technical Assistance
  - Staff Training (Ongoing)
  - Enforcement Support: Laboratory Certification
  - Enforcement Support: Compliance Follow-Up
- **Activity Category 11: Monitoring**
  - Safe Drinking Water Information System (SDWIS) Reporting
  - Data Entry (ground)
  - Data Entry (surface)
- **Activity Category 13: Other**
  - Coordination With EPA
  - Clerical
  - Supervision

Table 7-2 summarizes the national-level cost estimates for the Disinfection Byproducts Rule within the cost activity framework. We applied the adjustments outlined in Chapter 5 to convert these national values to state-level values for the specific states in this analysis. Appendix B provides these "converted" values for each of the case study states.

Table 7-2: EPA Estimate of State Administrative Costs for the Disinfection Byproducts Rule: All States with Permitting Authority

Description	Time Burden (hours)	Labor Costs (hourly wage plus fringe, 2006$)	Non-Labor Costs	Number of Activities	Total Hour Burden	Total Costs (thousands, 2006$)
Start-Up Activities						
1. Tracking EPA's Rulemaking Progress						
Regulation Adoption & Program Development	840	$41	$0	56	47,040	$1,929
2. Obtaining Additional Delegated Authority	No costs estimated in this category.					
3. Designing Implementation Plan	No costs estimated in this category.					
4. General Start-Up Activities						
Staff Training (Rule Specific)	80	$41	$0	662	52,960	$2,171
5. Compliance Assistance						
Public Notification	168	$41	$0	56	9,408	$386
Initial Lab Certification and Training and Site Visit and Follow Up	24	$41	$0	1,800	43,200	$1,771
System Training and Technical Assistance	1,680	$41	$0	56	94,080	$3,857
6. Permit Administration						
Review Plans and Specifications (LGW)	40	$41	$0	197	7,880	$323
Review Plans and Specifications (LSW)	80	$41	$0	1,009	80,720	$3,310
Review Plans and Specifications (SGW)	24	$41	$0	8,324	199,776	$8,191
Review Plans and Specifications (SSW)	32	$41	$0	3,611	115,552	$4,738
Enhanced Coagulation Determination	23	$41	$0	4,620	106,260	$4,357
Issue Notice of Intent	24	$41	$0	1,231	29,544	$1,211
7. Monitoring						
Maintain Data Management System	2,184	$41	$0	56	122,304	$5,014
Upgrade Primacy Lab for HAA5s, Chlorite, and Bromide	2,291	$41	$25,000	56	128,296	$5,285
Notification of Required Monitoring	2	$41	$0	61,563	123,126	$5,048
Issue/Monitor Compliance Schedule	80	$41	$0	26	2,080	$85
8. Enforcement						
Violation Letters	2	$41	$0	12,312	24,624	$1,010
Total Start-Up Costs					*1,186,850*	*$48,686*
Total Annualized Start-Up Costs						***$11,097***
Recurring Activities						
9. Compliance Assistance						
Enforcement Support: Ongoing Technical Assistance	840	$41	$0	56	47,040	$1,929
Staff Training (Ongoing)	40	$41	$0	214	8,560	$351
Enforcement Support: Lab Certification	840	$41	$0	56	47,040	$1,929
Enforcement Support: Compliance Follow-Up	840	$41	$0	56	47,040	$1,929
10. Permit Administration	No costs estimated in this category.					
11. Monitoring						
SDWIS Reporting	840	$41	$0	56	47,040	$1,929
Data Entry (ground)	1	$41	$0	55,003	55,003	$2,255
Data Entry (surface)	9	$41	$0	2,560	23,040	$945
12. Enforcement	No costs estimated in this category.					
13. Other						
Coordination With EPA	840	$41	$0	56	47,040	$1,929
Clerical	1,680	$41	$0	18	30,240	$1,240
Supervision	1,680	$41	$0	19	31,920	$1,309
Total Recurring Costs					*383,963*	*$15,742*
Total Annualized Costs[a]						***$26,840***

Source: U.S. EPA 1998e and Abt Associates calculations.

[a] One-time costs are annualized over a 5-year period assuming a 7 percent discount rate.

7.3 Comparison of EPA-Based and State Estimates – Total Costs and Costs by Broad Category

We received cost estimates for administering the Disinfection Byproducts Rule from five of the six participating states. Table 7-3 summarizes overall cost information for the Disinfection

Byproducts Rule, including the total dollar values of costs for each state and the EPA-based estimates, and the breakout of these costs by the individual activity categories.

Table 7-3: Summary of EPA-Based and State Estimated Costs for the Disinfection Byproducts Rule

Activity Category		Kansas	Nevada	New Jersey	Oklahoma	South Carolina
All Activities ($000, 2006)						
Total Costs	*EPA-Based Estimate*	*$499*	*$374*	*$736*	*$659*	*$497*
	State Estimate	*$337*	*$142*	*$748*	*$1,780*	*$571*
	Difference (State - EPA)	*($162)*	*($232)*	*$12*	*$1,122*	*$75*
	Percentage Difference	*(32%)*	*(62%)*	*2%*	*170%*	*15%*
Start-Up Activities ($000, 2006)						
1. Tracking EPA's rulemaking process	EPA-Based Estimate	$8	$8	$8	$8	$8
	State Estimate	$9	$9	$19	$96	$9
	Difference (State - EPA)	$1	$1	$11	$88	$1
2. Obtaining additional delegated authority	EPA-Based Estimate	-	-	-	-	-
	State Estimate	-	-	-	-	-
	Difference (State - EPA)	-	-	-	-	-
3. Designing implementation plan	EPA-Based Estimate	-	-	-	-	-
	State Estimate	-	-	$2	$0	-
	Difference (State - EPA)	-	-	$2	$0	-
4. General start-up activities	EPA-Based Estimate	$10	$5	$13	$15	$9
	State Estimate	$8	$1	$13	$20	$8
	Difference (State - EPA)	($2)	($5)	$0	$5	($1)
5. Compliance assistance	EPA-Based Estimate	$24	$24	$24	$24	$24
	State Estimate	$15	$7	$40	$51	$95
	Difference (State - EPA)	($9)	($18)	$16	$27	$71
6. Permit administration	EPA-Based Estimate	$109	$35	$164	$212	$97
	State Estimate	$16	$11	$47	$263	$54
	Difference (State - EPA)	($93)	($24)	($117)	$51	($43)
7. Monitoring	EPA-Based Estimate	$63	$55	$73	$68	$63
	State Estimate	$35	$37	$84	$89	$56
	Difference (State - EPA)	($28)	($18)	$11	$21	($7)
8. Enforcement	EPA-Based Estimate	$3	$1	$5	$4	$3
	State Estimate	$1	$1	$12	$18	$2
	Difference (State - EPA)	($2)	$0	$7	$14	($1)
All Start-Up Activities	*EPA-Based Estimate*	*$217*	*$129*	*$287*	*$331*	*$204*
	State Estimate	*$84*	*$65*	*$217*	*$537*	*$224*
	Difference (State - EPA)	*($133)*	*($64)*	*($70)*	*$206*	*$20*
Recurring Activities ($000, 2006)						
9. Compliance assistance	EPA-Based Estimate	$110	$108	$112	$110	$110
	State Estimate	$178	$55	$137	$427	$147
	Difference (State - EPA)	$68	($54)	$26	$317	$37
10. Permit administration	EPA-Based Estimate	-	-	-	-	-
	State Estimate	-	-	-	$15	-
	Difference (State - EPA)	-	-	-	$15	-
11. Monitoring	EPA-Based Estimate	$90	$62	$199	$128	$100
	State Estimate	$6	$10	$230	$548	$112
	Difference (State - EPA)	($84)	($52)	$31	$420	$12
12. Enforcement	EPA-Based Estimate	-	-	-	-	-
	State Estimate	-	-	-	$79	$1
	Difference (State - EPA)	-	-	-	$79	$1
13. Other Recurring Activities	EPA-Based Estimate	$83	$76	$138	$90	$83
	State Estimate	$69	$13	$164	$174	$86
	Difference (State - EPA)	($14)	($63)	$26	$85	$4
All Recurring Activities	*EPA-Based Estimate*	*$282*	*$246*	*$448*	*$327*	*$292*
	State Estimate	*$253*	*$77*	*$531*	*$1,243*	*$347*
	Difference (State - EPA)	*($29)*	*($168)*	*$83*	*$916*	*$55*

Notes:

- "-" indicates no cost was estimated. $0s indicate values with magnitudes smaller than $500.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.

Table 7-4 reports the percentage share contribution by each activity category to the total cost difference.

Table 7-4: Percent Contribution to Cost Differences by Activity Category

Activity Category	Kansas	Nevada	New Jersey	Oklahoma	South Carolina
State Estimate Minus EPA Estimate ($000, 2006)					
All Activities	*($162)*	*($232)*	*$12*	*$1,122*	*$75*
Percentage Difference, Total (State vs. EPA)	*(32%)*	*(62%)*	*2%*	*170%*	*15%*
Start-Up Activities (Percentage Contribution to Difference)					
1. Tracking EPA's rulemaking process	1%	0%	87%	8%	2%
2. Obtaining additional delegated authority	-	-	-	-	-
3. Designing implementation plan	-	-	12%	0%	-
4. General start-up activities	-1%	-2%	4%	0%	-1%
5. Compliance assistance	-6%	-8%	129%	2%	95%
6. Permit administration	**-57%**	-10%	-954%	5%	-58%
7. Monitoring	-17%	-8%	90%	2%	-10%
8. Enforcement	-2%	0%	58%	1%	-1%
All Start-Up Activities	*-82%*	*-28%*	*-573%*	*18%*	*27%*
Recurring Activities (Percentage Contribution to Difference)					
9. Compliance assistance	42%	**-23%**	210%	**28%**	50%
10. Permit administration	-	-	-	1%	-
11. Monitoring	**-52%**	**-22%**	250%	**37%**	17%
12. Enforcement	-	-	-	7%	2%
13. Other Recurring Activities	-8%	**-27%**	213%	8%	5%
All Recurring Activities	*-18%*	*-72%*	*673%*	*82%*	73%
All Activities	**-100%**	**-100%**	**100%**	**100%**	**100%**

Notes:

- Percentages are calculated as the share of the total difference between the EPA and state estimates occurring in the indicated activity category. Shares by activity category sum to either +100 percent or –100 percent. Shares sum to +100 percent for states in which the state-reported costs exceeds the EPA-based estimate. Shares sum to –100 percent for states in which the EPA-based estimate exceeds the state-reported costs.
- **Boxed/grey shaded** activity categories are those for which EPA estimated costs for this regulation.
- **Dark grey and white text** items are those for which the cost effect is material; that is, (1) the EPA/state total cost difference is substantial (greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference. These items are of most interest for understanding the character of differences between the state and EPA-based estimates for this regulation.

Review of these tables provides several observations about the case study state and EPA-based estimates of the costs for administering the Disinfection Byproducts regulation.

7.3.1 Total Cost Difference

As shown in Table 7-3 and Table 7-4, the relationship between the state and EPA-based cost estimates varies across the states:

- One of the states participating in this study reported total costs that exceeded the EPA-based estimate (by more than 25 percent).
- Two states reported total costs that are lower (by more than 25 percent) than the EPA-based estimates.
- Two states reported total costs approximately equal to the EPA-based estimate (within ±25 percent).
- Of the five states, the cost difference for Oklahoma is considerably larger at $1.1 million than the difference, positive or negative, for the other states. Oklahoma's higher costs may be largely attributable to special water issues in that state. Specifically, some of Oklahoma's drinking water supplies are especially challenging to treat, and therefore it is reasonable to expect that the state would have higher than average costs. The framework

we developed to assign national estimates to states is not rich enough to take special state circumstances of this sort into account.

7.3.2 Costs by Activity Category

EPA estimated costs in nine administrative activity categories for the Disinfection Byproducts Rule:

- Six start-up categories: Category 1, Tracking EPA's Rulemaking Progress; Category 4, General Start-Up Activities; Category 5, Compliance Assistance; Category 6, Permit Administration; Category 7, Monitoring; and Category 8, Enforcement.
- Three recurring categories: Category 9, Compliance Assistance; Category 11, Monitoring; and Category 13, Other.

All five states agreed that they needed to perform activities in these categories. In the remaining four activity categories, no more than half of the states reported activities under a given category.

In the categories reported only by states, no states reported activities that were a material source of difference – that is, none of these state-only reporting instances accounted for at least 20 percent of the total difference, and where the total state/EPA difference was also at least ±25 percent for the state.

As shown in Table 7-4, recurring activities were more important than start-up activities as a source of material cost differences:

- Six of the seven instances identified as material differences between the EPA-based estimates and the state estimates were in recurring activity categories.
  - *Category 9, Compliance Assistance,* was a source of material cost difference in two states. Oklahoma reported materially higher costs in this category. Nevada reported materially lower costs in this category.
  - *Category 11, Monitoring.* Three states reported material differences between the EPA-based estimates and the state estimates in this activity category. Two states, Kansas and Nevada, reported materially lower costs in this category. One state, Oklahoma, reported materially higher costs in this category.
  - *Category 13, Other.* Nevada reported costs that were materially lower than the EPA-based estimates for other recurring activities.
- Only one instance of a material difference between the EPA-based estimates and the state estimates occurred in the start-up activity categories. Kansas reported start-up costs in *Category 6, Permit Administration,* that were materially lower than the EPA-based cost estimates.

7.4 Analysis of EPA-Estimated Activity Categories

As described above, EPA estimated costs for the Disinfection Byproducts Rule for nine activity categories: Category 1, Tracking EPA's Rulemaking Progress; Category 4, General Start-Up Activities; Category 5, Compliance Assistance (Start-Up); Category 6, Permit Administration (Start-Up); Category 7, Monitoring (Start-Up); Category 8, Enforcement (Start-Up); Category 9, Compliance Assistance (Recurring); Category 11, Monitoring (Recurring); and Category 13, Other (Recurring). All five states agreed that performing activities in these categories was

necessary for administering this rule. It should be noted, however, that not all states reported performing all of the specific activities for which EPA estimated costs within each activity category. Nevertheless, there is general agreement across the five states that the EPA-estimated activities are needed for administering the Disinfection Byproducts Rule.

As discussed in the preceding section, some of the cost differences in the categories in which EPA estimated costs are substantial and contribute to a material difference in total cost between the state and EPA-based estimates. Given the overall importance of the differences in the EPA-estimated categories, we performed a more detailed analysis to identify the factors that account for most of the cost differences. First, we looked within the EPA-estimated activity categories and divided the specific activity line items into three groups:

- **Line-Item Activities Estimated Only by States**
- **Line-Item Activities Estimated Only by EPA, and**
- **Line-Item Activities Estimated by States and EPA.** Within these activities we assessed the extent to which cost differences in these categories result from the individual components underlying the EPA-based and state cost estimates:
  - The length of time to complete each activity.
  - The unit cost of labor (hourly wage plus fringe allowance) for performing the activity.
  - The number of activities—either for start-up activities or the estimated number of activities performed annually for recurring activities.
  - The non-labor costs reported for the activity.

To assess the separate contributions from these underlying cost components, we recalculated the EPA-based cost values in each category by replacing, one at a time, the EPA-based values with the state-provided values for the underlying cost components. For states that estimated higher costs than the EPA-based estimates, we calculated a positive share contribution from each of the one-at-a-time changes that contributed toward that positive effect. For states that estimated lower costs than the EPA-based estimates, we calculated a negative share contribution from each of the one-at-a-time changes that contributed toward that negative effect.

Table 7-5 summarizes the contributions of each factor to the difference between state and EPA-based estimates in the EPA-estimated categories for each state.

Table 7-5: Sources of Cost Difference in EPA-Estimated Categories

	Kansas	Nevada	New Jersey	Oklahoma	South Carolina
Sources of Difference for Activities in EPA-Estimated Categories[1]					
Line-Items Estimated by States and EPA	*7%*	*-99%*	*227%*	*58%*	*8%*
Line-items Estimated by States Only	0%	0%	255%	42%	97%
Line-items Estimated by EPA Only	-107%	-1%	-383%	0%	-5%
Total Change	**-100%**	**-100%**	**100%**	**100%**	**100%**
Contribution of Components to Differences in Activities Estimated by States and EPA[2]					
Time to Complete Activities	—	**-100%**	23%	**45%**	38%
Unit Labor Costs	72%	—	—	29%	—
Number of Activities	12%	—	—	6%	62%
Non-Labor Costs	16%	—	77%	21%	0%
Total Change	**100%**	**-100%**	**100%**	**100%**	**100%**

Notes:

[1] Percentages indicate the share of total cost difference in the EPA-estimated activity categories contributed by each of the four underlying calculation factors. Shares sum to either +100 percent or -100 percent. Shares sum to +100 percent for states in which the state-reported costs in the EPA-estimated categories exceeds the EPA-based estimate. Shares sum to -100 percent for states in which the EPA-based estimate exceeds the state-reported costs in the EPA-estimated categories.

[2] For those specific activities estimated by both EPA and the states, the sources of difference can be examined more closely. Here we evaluate the sources of these differences attributable to the estimates components: (1) length of time to complete each activity, (2) unit cost of labor, (3) number of activities, or (4) non-labor costs. Where states reported higher costs for these activities, the share contributions of each component of the costs that contributed toward this positive effect are shown as positive numbers. Where states reported lower costs for these activities, the share contributions of each component of the costs that contributed toward this negative effect are shown as negative numbers.

- A "—" indicates that a cost component contributed toward the opposite direction of the aggregate effect.
- States with light blue shading are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 7.1.1; that is, (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference.
- The **dark green-shaded and white text** values are those in states with light blue shading where: (1) the contribution from line items estimated by states and EPA exceeds 20%, and (2) the Time to Complete Activities factor was found to contribute materially (more than 20%) to the cost difference.

Several observations may be drawn from Table 7-5:

- For those states with the material differences in EPA-estimated categories (light blue shading), differences in estimates for Line-Items Estimated by States and EPA is the primary source of difference for Nevada and Oklahoma. For Kansas, the primary sources of difference within the EPA-Estimated Categories were line-items that EPA estimated but Kansas did not report performing.
- In Nevada, the only source that contributed to Nevada's lower estimate of costs for the Line Items Estimated by States and EPA was the Time to Complete Activities.
- In Oklahoma, the Time to Complete Activities was the primary cost component that contributed to the difference in the Line Items Estimated by States and EPA. However, Oklahoma also reported higher values for Unit Labor Costs, Number of Activities, and Non-Labor Costs.

We looked more closely at states' reported time requirements in comparison to the EPA estimates by the specific activities in each category (see Table 7-6). In this table, the **dark green-shaded and white text** values are those for which the contribution to total cost difference from the EPA-estimated activity categories is material, and the Time to Complete Activities factor was found to contribute materially to the cost.

Table 7-6: EPA and State Estimates of Time Required to Complete Activities in the EPA-Estimated Activity Categories

(Hours per activity)	EPA	Kansas	Nevada	New Jersey	Oklahoma	South Carolina
Activity Category 1: Tracking EPA's Rulemaking Progress						
Regulation Adoption & Program Development	840.0	840.0	840.0	200.0	8,400.0	840.0
Activity Category 4: General Start-up Activities						
Staff Training (Rule Specific)	80.0	40.0	48.0	40.0	80.0	50.0
Activity Category 5: Compliance Assistance (Start-Up)						
Public Notification	168.0	80.0	216.0	168.0	168.0	168.0
Initial Lab Certification, Training, Site Visit, Follow-Up	24.0	-	32.0	24.0	24.0	24.0
System Training and Technical Assistance	1,680.0	1,378.0	204.0	2,000.0	3,360.0	1,680.0
Activity Category 6: Permit Administration (Start-Up)						
Review Plans and Specifications (LGW)	40.0	8.0	12.0	40.0	40.0	5.0
Review Plans and Specifications (LSW)	80.0	-	20.0	120.0	80.0	27.4
Review Plans and Specifications (SGW)	24.0	-	4.0	40.0	24.0	3.7
Review Plans and Specifications (SSW)	32.0	24.0	6.0	60.0	32.0	28.2
Enhanced Coagulation Determination	23.0	-	0.5	-	23.0	23.0
Issue Notice of Intent	24.0	-	-	-	24.0	-
Activity Category 7: Monitoring (Start-Up)						
Maintain Data Management System	2,184.0	504.0	200.0	4,000.0	-	2,184.0
Upgrade Primacy Lab for HAA5s, Chlorite, and Bromide	2,291.0	336.0	2,291.0	-	-	2,291.0
Notification of Required Monitoring	2.0	2.0	1.0	2.0	-	0.2
Issue/Monitor Compliance Schedule	80.0	18.1	80.0	300.0	-	80.0
Activity Category 8: Enforcement (Start-Up)						
Violation Letters	2.0	2.0	2.0	4.0	2.0	2.0
Activity Category 9: Compliance Assistance (Recurring)						
Enforcement Support: Ongoing Technical Assistance	840.0	1,820.0	**350.0**	840.0	**4,700.0**	832.0
Staff Training (Ongoing)	40.0	16.0	**80.0**	20.0	**80.0**	5.3
Enforcement Support: Lab Certification	840.0	-	**192.0**	840.0	**840.0**	840.0
Enforcement Support: Compliance Follow-Up	840.0	1,820.0	**350.0**	1,000.0	**1,680.0**	2,080.0
Activity Category 11: Monitoring (Recurring)						
SDWIS Reporting	840.0	128.0	**110.0**	840.0	**840.0**	520.0
Data Entry (ground)	1.0	-	**1.0**	1.0	**1.0**	3.0
Data Entry (surface)	9.0	-	**9.0**	4.0	**9.0**	12.0
Activity Category 13: Other Recurring						
Coordination With EPA	840.0	336.0	**40.0**	500.0	840.0	840.0
Clerical	504.0-840.0	504.0	**34.5**	500.0	1,344.0	624.0
Supervision	504.0-1,680.0	672.0	**208.0**	1,680.0	1,344.0	832.0

Notes:

- "-" in a cell indicates that the state did not report a cost for this activity.
- The **dark green-shaded and white text** values are those where the Time to Complete Activities factor was found to contribute materially; that is, where (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference, (3) the contribution from line items estimated by states and EPA exceeds 20%, and (4) the Time to Complete Activities factor was found to contribute materially (more than 20%) to the cost difference.

Several observations may be drawn from Table 7-6:

- Few consistent trends are apparent among the differences in EPA-based estimates and the state-reported values for the Time Required to Complete Activities.
- Nevada, which reported a total cost estimate that was materially lower than the EPA-based total cost estimate, generally reported lower estimates for Time Required to Complete Activities compared to the EPA-based estimates.
- For Oklahoma, where Category 9, Compliance Assistance (Recurring) and Category 11, Monitoring (Recurring) were both identified as material sources of difference between the total EPA-based estimate and the total cost estimate reported by the state, the state estimate for Time Required to Complete Activities was substantially higher for Category 9, but was the same as the EPA-based estimate for Category 11.

7.5 Analysis of Activity Categories for Which Only States Estimated Costs

As described above in Section 7.3, Comparison of EPA-Based and State Estimates – Total Costs and Costs by Broad Category, no more than two states reported costs in any of the three activity categories that EPA did not account for in its analysis. Table 7-7 summarizes the instances in which states reported costs in categories that EPA did not account for its analysis; it also shows that none of these instances have a material cost effect.

Table 7-7: Activity Categories for Which Only States Estimated Costs

Activity Category	Kansas	Nevada	New Jersey	Oklahoma	South Carolina
Start-Up Activities					
1. Tracking EPA's Rulemaking Process					
3. Designing Implementation Plan			✓	✓	
Recurring Activities					
9. Compliance Assistance				✓	
12. Enforcement				✓	✓

Notes:

- "✓" indicates that the state reported costs in this activity category.
- "✓" indicates those instances in which the cost effect is "material" which means that (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), and (2) the activity category contributes at least a 20 percent share of this total difference.

Several observations may be drawn from Table 7-7:

- None of the categories for which states estimated costs had a material impact on the estimated cost differences.
- Less than half the states reported performing activities in individual categories that EPA did not account for in its analysis.

8 Analyzing State Costs for Administering the Particulate Matter 2.5 Regulation

8.1 Analytic Overview and Key Findings

8.1.1 Analytic Overview

In this chapter, we compare the states' estimates of the costs of administering the 1997 Particulate Matter 2.5 (PM 2.5) Rule with costs estimated by Abt Associates for the regulation using EPA's methodology. Key steps in this comparison, also illustrated in Exhibit 8-1, include:

- Assigning EPA's nationwide cost estimates into the Abt Associates analytic framework and apportioning them to the individual case study states to derive the EPA-based cost estimates. The Abt Associates analytic framework and our apportionment procedures are described in Chapter 5 and the appendixes.
- Comparing the total EPA-based cost estimates with the costs reported by case study states for administering the PM 2.5 regulation. In particular, we assessed the extent to which differences occur in:
  - Those activity categories for which EPA estimated costs and
  - Those categories for which EPA did not estimate costs but for which some states reported costs.

  Given the uncertainties associated with our cost estimates and those provided by the states, we determined with EPA that we would focus primarily on those total differences that are substantial; that is, exceeding ±25 percent.
- Assessing the contribution of the individual activity categories to the total difference. Where it was apparent that there were substantial differences in the cost estimates, we adopted an approach to focus the analysis on the activity categories that had the greatest influence on the estimated differences. Recognizing the limitations of the data, we focused our analysis on those activity categories that accounted for at least 20 percent of the total cost difference. This rule helps identify the activity categories that are worthy of closer review, with the goal of providing insight into how EPA might improve its estimation of the costs to states for administering environmental regulations.
- Within those activity categories for which EPA estimated costs, assessing the extent to which states agreed that they incurred costs for these activities. We then analyzed the factors that would contribute to the cost differences, including the time to complete an activity, personnel costs, and the number of activities (e.g., number of permitting events).
- For those activity categories for which EPA did *not* estimate costs, but for which some states reported costs, identifying which of these categories are most important. We made this determination based on the frequency with which states reported costs and the contribution of these categories to the total difference between the EPA-based and state estimates.

Table 8-1 summarizes the total EPA-based and state costs estimate for the PM 2.5 Rule. Our key findings from this analysis are summarized below.

Exhibit 8-1: Developing, Organizing, and Analyzing EPA-Based and State Estimates

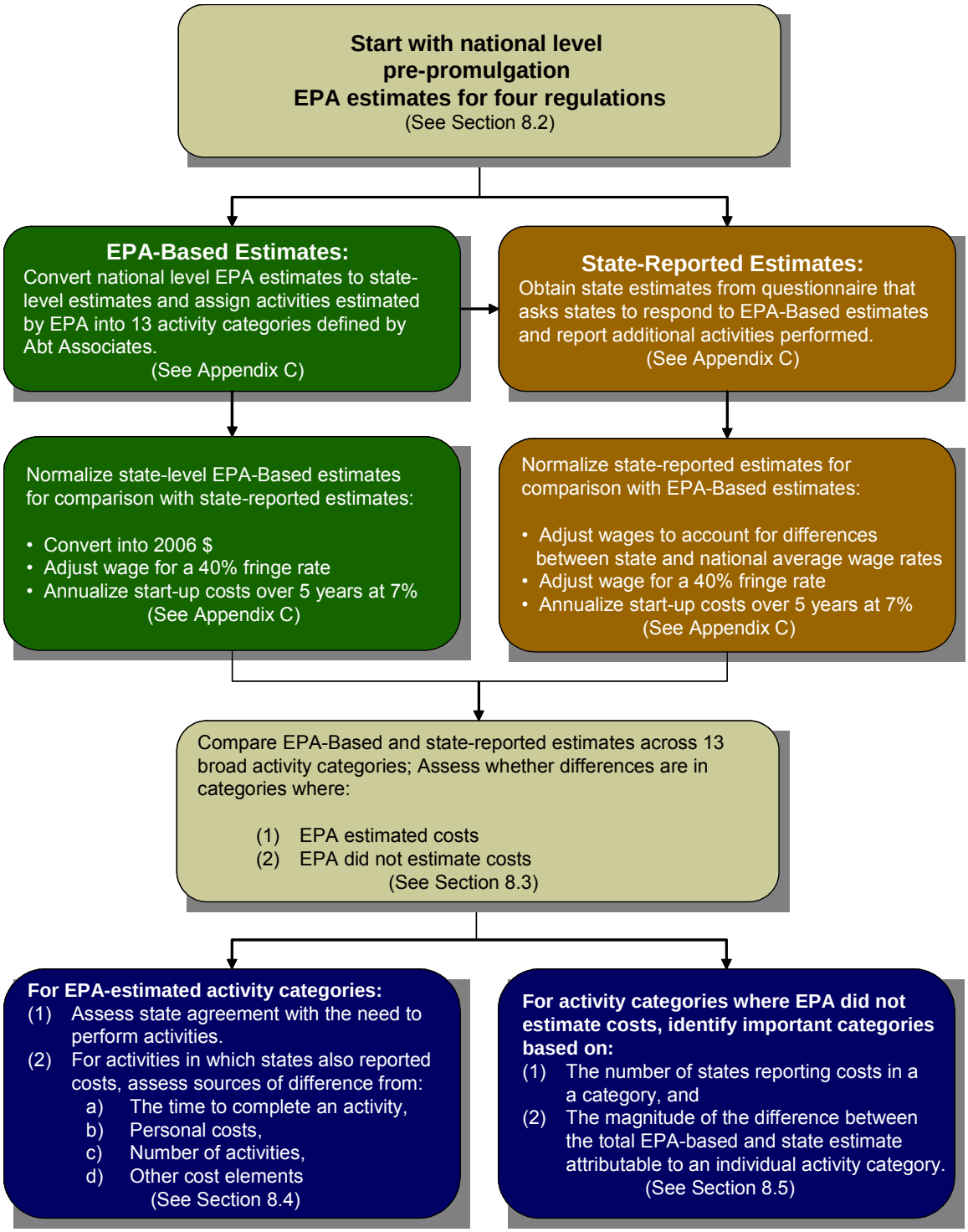


Table 8-1: Summary of Total EPA-Based and Case Study State Cost Estimates for the PM 2.5 Regulation

($000, 2006$)	Kansas	Oklahoma	South Carolina	Virginia
Total EPA-Based Estimate	$139	$211	$351	$274
Total State Estimate	$121	$687	$84	$576
Total Difference (State Estimate – EPA-Based Estimate)	($18)	$476	($266)	$301
Total Percent Difference	-13%	225%	-76%	110%

Notes:

- States with shaded values are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 8.1.1; that is, the EPA/state total cost difference is substantial (i.e., greater than ±25%).
- The large difference noted for Oklahoma results primarily from monitoring costs. EPA provided state grants to pay for PM2.5 monitoring, which were funded by Congress at levels higher than what EPA estimated would be needed as part of its regulatory development process. The observed difference between Oklahoma's reported monitoring costs and the EPA-based estimate may substantially reflect the larger grant amount that the state received from EPA.

8.1.2 Key Findings

Overall Cost Relationships

- Four case study states, Kansas, Oklahoma, South Carolina, and Virginia, provided cost information for the PM 2.5 Rule.[1]
- Two case study states reported costs for the regulation that substantially exceed (by more than 25 percent) the EPA-based estimates.
- One state reported costs that are substantially lower (by more than 25 percent) than the EPA-based estimate.
- One state reported costs that are approximately equal to the EPA-based estimate (within ±25 percent), given the uncertainties in estimating state-level costs from the EPA regulatory analysis and in states' reporting of their costs for rule administration.

Cost Relationships by Activity Category

- EPA estimated costs in 5 of the 13 activity categories (two start-up activity categories and three recurring activity categories). States generally agreed that they need to perform activities in these categories, although only two of the states reported activities in Category 9, Compliance Assistance (Recurring).
- In addition, at least one state indicated that it incurred costs in each of the remaining eight activity categories, except for Category 8, Enforcement (Start-Up). All four states agreed that they needed to perform activities in Category 7, Monitoring (Start-Up). However, states showed little consistency in indicating that they needed to perform activities in the remaining six activity categories.
- All of the material differences between the EPA-based estimates and the state estimates are attributable to activities in Category 11, Monitoring (Recurring), where a material difference is: (1) the total cost difference exceeds ±25 percent for the state, and (2) the

[1] A fifth state, Nevada, also provided cost estimates. However, that state's reported estimates included some costs associated with its entire air program, rather than costs that were specific to PM 2.5. We followed up with Nevada, but they were unable to provide us with revised numbers. As a result, we could not include Nevada's estimates in our analysis.

contribution of the activity category to the total difference is at least 20 percent of the total difference.

  - This is no surprise given that recurring monitoring costs accounted for between 92 and 99 percent of the total EPA-based cost estimates for the four case study states; they also accounted for between 86 and 89 percent of the total state cost estimates for Kansas, Oklahoma, and Virginia, but only 30 percent of total state-reported costs for South Carolina.
  - The largest cost difference is noted for Oklahoma. Although Oklahoma reported PM 2.5 monitoring costs that are higher than the RIA-based estimate, the state also indicated that these monitoring costs were funded by its PM 2.5 monitoring grant. EPA provided state grants to pay for PM2.5 monitoring, which were funded by Congress at levels higher than what EPA estimated would be needed as part of its regulatory development process. The observed difference between Oklahoma's reported monitoring costs and the EPA-based estimate may substantially reflect the larger grant amount that the state received from EPA. In this analysis, all four of the case study states received a federal grant for PM2.5 monitoring that was larger than the monitoring cost originally estimated in the RIA, but this difference is greater for Oklahoma than for the other states.

- In the activity categories for which only states estimated costs, no categories meet our definition of a source of material cost difference.
- Category 7, Monitoring (Start-Up), is notable since all four states reported costs in this category. While EPA's original analysis did not allow for start-up monitoring activities, subsequent analyses by EPA did account for start-up monitoring activities. Specifically, EPA's subsequent Information Collection Request (ICR) Supporting Statement Analyses, which are used to determine the level of grant funding provided to states for monitoring activities, did account for start-up monitoring activities.

In the following sections, we present our analysis and provide a more detailed discussion of the results underlying these key findings. Our discussion is organized as follows:

- Section 8.2, Overview of the Particulate Matter 2.5 Rule and EPA's Cost Estimates, provides an overview of the PM 2.5 regulation and reviews EPA's estimates of costs to state governments for administering the regulation.
- Section 0, The activities for which EPA estimated costs fall into 5 of the 13 activity categories outlined in Chapter 5. EPA further estimated that states would incur costs for 16 specific "line item" activities across these five categories, as follows:
- **Activity Category 1: Tracking EPA's Rulemaking Progress**
  - Interpret Rule
- **Activity Category 3: Designing Implementation Plan**
  - Revise State Implementation Plan
- **Activity Category 9: Compliance Assistance (Recurring)**
  - Develop Guidance Documents
  - Public Hearings
  - Review/Revise Compliance Plans

  - Evaluate Strategies for Conformity
  - Prepare/Review Progress Reports
- **Activity Category 11: Monitoring (Recurring)**
  - Non-Grant Funded Monitoring Activities
    - Evaluate/Improve Inventories
    - Data Gathering and Assembly
    - Run Model
    - Evaluate and Interpret Monitoring Results
  - Grant Funded Monitoring Activities
- **Activity Category 13: Other (Recurring)**
  - Develop Regional Implementation Plans
  - Recordkeeping
  - Identify Alternative Control Strategies
  - Participate in PM Regional Groups
- Comparing EPA-Based and State Estimates – Total Costs and Costs by Broad Category, compares the EPA-based and state estimates in terms of total difference and by the 13 activity categories, as outlined in Chapter 5.
- Section 8.4, Analysis of EPA-Estimated Activity Categories, examines more closely those activity categories for which EPA estimated costs.
- Section 8.5, Analysis of Activity Categories for Which Only States Estimated Costs, examines those activity categories for which EPA did not estimate costs, but in which one or more states reported incurring costs.

Appendix C provides more detailed information on each participating state's cost estimates and comparison of those estimates, on an item-by-item basis, with the EPA-based estimates.

8.2 Overview of the Particulate Matter 2.5 Rule and EPA's Cost Estimates

Table 8-2 summarizes the cost estimates presented in the Regulatory Impact Analysis (RIA) for the Particulate Matter National Ambient Air Quality Standards (NAAQS) Rule (U.S. EPA 1998e). In the RIA, administrative costs are classified as either one-time (start-up) or recurring costs. One-time administrative costs are associated with interpreting and understanding the requirements of the rule as well as revising state implementation plans. Recurring costs involve monitoring, data gathering and running of models, plan development and review, compliance assistance, and recordkeeping.

The costs and scope estimated by the analysis differ between non-attainment and attainment area states. Any state with a non-attainment area is designated as a non-attainment state. EPA designates an area as non-attainment if it has violated the fine particle standards over a 3-year period, or if relevant information indicates that it contributes to violations in a nearby area. EPA may also designate an area as attainment/unclassifiable, if (1) monitored air quality data show

that the area has not violated the fine particle standards over a 3-year period, or if (2) there is not enough information to determine the air quality in the area.

The PM 2.5 RIA also accounted for 490,000 hours and $19 million in recurring monitoring costs that would be incurred by states, but paid for by EPA. EPA ICR #409.14 is cited as the source for these estimates; however, we were unable to obtain a copy of the original ICR.[2] Not having the original ICR made it difficult to develop state-level estimates for these costs, because we lacked any documentation about how EPA developed these estimates. Without the original ICR, we relied on two sources of information to deduce the methodology behind the figures cited in the RIA: (1) a more recent version of the supporting statement for a renewal of this ICR (EPA ICR #409.16), and (2) the 2005 Section 103 grant allocation, by state, which allocates funds to states in the amount estimated by the ICR.

The $19 million divided by 490,000 hours is about $39, which is about the same as the $40 state fully loaded labor rate reported in the RIA (1990$). Therefore, we presume that the $19 million figure cited in the RIA does not include any non-labor costs. It should be noted, however, that the more recent ICR does include non-labor costs and equipment/contractor costs that account for more than half of the total costs. Thus, it appears that there were major revisions to the ICR methodology between the version cited in the RIA and the more recent version. It is also important to point out that the more recent ICR supporting statements, on which grant funds related to the PM 2.5 rule are actually based, do account for non-labor costs. However, the baseline for this analysis is the original RIA-based estimate of these costs, not the actual grant amounts that EPA provided to states. As such, it would not be appropriate to use the results in this study to draw conclusions about whether or not grant levels are adequate.

The ICR indicated that the labor cost estimates were based on the *Guidance for Estimating Ambient Air Monitoring Costs for Criteria Pollutants and Selected Air Toxic Pollutants* (U.S. EPA 1993); this document listed a load factor of 2.5, and indicated that this load factor accounts for both fringe and overhead. Thus, as described in Chapter 5, we adjusted the $19 million by 2.5/1.4, so labor costs include a 40 percent fringe rate and exclude overhead costs. We also adjusted the estimate to 2006$ from 1990$ using the U.S. Bureau of Labor Statistics Consumer Price Index. These adjustments to inflate the estimate to 2006$ and exclude overhead costs result in a national estimate of $16.7 million. We used the share of the national 2005 grant allocation received by each state to estimate each case study state's share of this $16.7 million.

[2] We contacted EPA's Office of Air Quality Planning and Standards, but they were unable to find the original ICR given that the analyses had been updated over time.

Table 8-2: EPA Estimate of State Administrative Costs for the Particulate Matter 2.5 Rule: All States with Permitting Authority

Description	Time Requirement (hours)	Labor Costs (hourly wage plus fringe, 2006$)	Non-Labor Costs	Number of Activities	Total Hour Requirement	Total Costs ($000, 2006$)
Start-Up Activities						
1. Tracking EPA's Rulemaking Progress	No costs estimated in this category.					
Interpret Rule (attain.)	10.5	$39	$0	26	273	$10,647
Interpret Rule (non-attain.)	30.5	$39	$0	25	763	$29,738
2. Obtaining Additional Delegated Authority	No costs estimated in this category.					
3. Designing Implementation Plan						
Revise SIP (attain.)	0.0	$39	$0	26	0	$0
Revise SIP (non-attain.)	100.5	$39	$0	25	2,513	$97,988
4. General Start-Up Activities	No costs estimated in this category.					
5. Compliance Assistance	No costs estimated in this category.					
6. Permit Administration	No costs estimated in this category.					
7. Monitoring	No costs estimated in this category.					
8. Enforcement	No costs estimated in this category.					
Total Start-Up Costs						*$138,372*
Total Annualized Start-Up Costs[a]						*$31,540*
Recurring Activities						
9. Compliance Assistance						
Develop Guidance Documents (attain.)	0.0	$39	$0	26	0	$0
Develop Guidance Documents (non-attain.)	30.5	$39	$0	25	763	$29,738
Public Hearings (attain.)	0.0	$39	$0	26	0	$0
Public Hearings (non-attain.)	100.5	$39	$0	25	2,513	$97,988
Review/Revise Compliance Plans (attain.)	0.0	$39	$0	26	0	$0
Review/Revise Compliance Plans (non-attain.)	100.5	$39	$0	25	2,513	$97,988
Evaluate Strategies for Conformity (attain.)	10.5	$39	$0	26	273	$10,647
Evaluate Strategies for Conformity (non-attain.)	30.5	$39	$0	25	763	$29,738
Prepare/Review Progress Reports (attain.)	10.5	$39	$0	26	273	$10,647
Prepare/Review Progress Reports (non-attain.)	30.5	$39	$0	25	763	$29,738
10. Permit Administration						
11. Monitoring						
Non-Grant Funded Monitoring (attain.)	42.0	$39	$0	26	1,092	$42,588
Non-Grant Funded Monitoring (non-attain.)	192.0	$39	$0	25	4,800	$187,200
Grant Funded Monitoring Activities	490,000	$34	$0	1	490,000	$16,660,000
12. Enforcement	No costs estimated in this category.					
13. Other						
Develop Regional Implem. Plans (attain.)	0.0	$39	$0	26	0	$0
Develop Regional Implem. Plans (non-attain.)	30.5	$39	$0	25	763	$29,738
Recordkeeping (attain.)	10.5	$39	$0	26	273	$10,647
Recordkeeping (non-attain.)	30.5	$39	$0	25	763	$29,738
Identify Alternative Control Strat. (attain.)	0.0	$39	$0	26	0	$0
Identify Alternative Control Strat. (non-attain.)	100.5	$39	$0	25	2513	$97,988
Participate in PM Regional Groups (attain.)	30.5	$39	$0	26	793	$30,927
Participate in PM Regional Groups (non-attain.)	100.5	$39	$0	25	2513	$97,988
Total Recurring Costs						*$17,493,294*
Total Annualized Costs[a]						***$17,524,833***

Source: U.S. EPA 1999e and Abt Associates calculations.

[a] One-time costs are annualized over a 5-year period assuming a 7 percent discount rate.

The activities for which EPA estimated costs fall into 5 of the 13 activity categories outlined in Chapter 5. EPA further estimated that states would incur costs for 16 specific "line item" activities across these five categories, as follows:

- **Activity Category 1: Tracking EPA's Rulemaking Progress**
  - Interpret Rule
- **Activity Category 3: Designing Implementation Plan**
  - Revise State Implementation Plan
- **Activity Category 9: Compliance Assistance (Recurring)**
  - Develop Guidance Documents
  - Public Hearings
  - Review/Revise Compliance Plans
  - Evaluate Strategies for Conformity
  - Prepare/Review Progress Reports
- **Activity Category 11: Monitoring (Recurring)**
  - Non-Grant Funded Monitoring Activities
    - Evaluate/Improve Inventories
    - Data Gathering and Assembly
    - Run Model
    - Evaluate and Interpret Monitoring Results
  - Grant Funded Monitoring Activities
- **Activity Category 13: Other (Recurring)**
  - Develop Regional Implementation Plans
  - Recordkeeping
  - Identify Alternative Control Strategies
  - Participate in PM Regional Groups

8.3 Comparing EPA-Based and State Estimates – Total Costs and Costs by Broad Category

We received cost estimates for administering the Particulate Matter 2.5 Rule from four of the six states participating in the project. Table 8-3 summarizes overall cost information for the PM 2.5 regulation, including the total dollar values of costs for each of the four states and the EPA-based estimates, and the breakout of these costs by the individual activity categories. Table 8-4 reports the percentage share contribution by each activity category to the total cost difference. Review of these tables provides several observations about the case study state and EPA-based estimates of the costs for administering the PM 2.5 regulation.

Table 8-3: Summary of EPA-Based and State Estimated Costs for the Particulate Matter 2.5 Rule

Activity Category		Kansas	Oklahoma	South Carolina	Virginia
All Activities ($000, 2006)					
Total Costs	*EPA-Based Estimate*	*$139*	*$211*	*$351*	*$274*
	State Estimate	*$121*	*$687*	*$84*	*$576*
	Difference (State - EPA)	*($18)*	*$476*	*($266)*	*$301*
	Percentage Difference	*-13%*	*225%*	*-76%*	*110%*
Start-Up Activities ($000, 2006)					
1. Tracking EPA's rulemaking process	EPA-Based Estimate	$0	$0	$0	$0
	State Estimate	$0	$1	$8	$2
	Difference (State - EPA)	$0	$1	$8	$1
2. Obtaining additional delegated authority	EPA-Based Estimate	-	-	-	-
	State Estimate	-	-	$4	$1
	Difference (State - EPA)	-	-	$4	$1
3. Designing implementation plan	EPA-Based Estimate	-	-	-	$1
	State Estimate	-	$1	$23	$23
	Difference (State - EPA)	-	$1	$23	$22
4. General start-up activities	EPA-Based Estimate	-	-	-	-
	State Estimate	$0	-	-	-
	Difference (State - EPA)	$0	-	-	-
5. Compliance assistance	EPA-Based Estimate	-	-	-	-
	State Estimate	$0	-	$6	$1
	Difference (State - EPA)	$0	-	$6	$1
6. Permit administration	EPA-Based Estimate	-	-	-	-
	State Estimate	$0	-	-	$0
	Difference (State - EPA)	$0	-	-	$0
7. Monitoring	EPA-Based Estimate	-	-	-	-
	State Estimate	$5	$64	$19	$26
	Difference (State - EPA)	$5	$64	$19	$26
8. Enforcement	EPA-Based Estimate	-	-	-	-
	State Estimate	-	-	-	-
	Difference (State - EPA)	-	-	-	-
All Start-Up Activities	*EPA-Based Estimate*	*$0*	*$0*	*$0*	*$1*
	State Estimate	*$5*	*$66*	*$59*	*$52*
	Difference (State - EPA)	*$5*	*$66*	*$59*	*$51*
Recurring Activities ($000, 2006)					
9. Compliance assistance	EPA-Based Estimate	$1	$1	$1	$11
	State Estimate	$1	-	-	$13
	Difference (State - EPA)	$0	($1)	($1)	$1
10. Permit administration	EPA-Based Estimate	-	-	-	-
	State Estimate	$3	-	-	-
	Difference (State - EPA)	$3	-	-	-
11. Monitoring	EPA-Based Estimate	$136	$209	$348	$251
	State Estimate	$104	$614	$25	$507
	Difference (State - EPA)	($32)	$405	($323)	$256
12. Enforcement	EPA-Based Estimate	-	-	-	-
	State Estimate	$3	-	-	-
	Difference (State - EPA)	$3	-	-	-
13. Other Recurring Activities	EPA-Based Estimate	$2	$2	$2	$10
	State Estimate	$6	$7	-	$3
	Difference (State - EPA)	$4	$6	($2)	($7)
All Recurring Activities	*EPA-Based Estimate*	*$139*	*$211*	*$351*	*$273*
	State Estimate	*$116*	*$621*	*$25*	*$523*
	Difference (State - EPA)	*($23)*	*$410*	*($325)*	*$250*

Notes:

- "-" indicates no cost was estimated. $0s indicate values with magnitudes smaller than $500.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.

Table 8-4: Percent Contribution to Cost Differences by Activity Category

Activity Category	Kansas	Oklahoma	South Carolina	Virginia
State Estimate Minus EPA Estimate ($000, 2006)				
All Activities	($18)	$476	($266)	$301
Percentage Difference, Total (State vs. EPA)	-13%	225%	-76%	110%
Start-Up Activities (Percentage Contribution to Difference)				
1. Tracking EPA's rulemaking process	0%	0%	3%	0%
2. Obtaining additional delegated authority	-	-	1%	0%
3. Designing implementation plan	-	0%	9%	7%
4. General start-up activities	0%	-	-	-
5. Compliance assistance	0%	-	2%	0%
6. Permit administration	0%	-	-	0%
7. Monitoring	26%	13%	7%	9%
8. Enforcement	-	-	-	-
All Start-Up Activities	28%	14%	22%	17%
Recurring Activities (Percentage Contribution to Difference)				
9. Compliance assistance	2%	0%	0%	0%
10. Permit administration	14%	-	-	-
11. Monitoring	-180%	85%	-121%	85%
12. Enforcement	14%	-	-	-
13. Other Recurring Activities	22%	1%	-1%	-2%
All Recurring Activities	-128%	86%	-122%	83%
All Activities	**-100%**	**100%**	**-100%**	**100%**

Notes:

- Percentages are calculated as the share of the total difference between the EPA and state estimates occurring in the indicated activity category. Shares by activity category sum to either +100 percent or -100 percent. Shares sum to +100 percent for states in which the state-reported costs exceeds the EPA-based estimate. Shares sum to -100 percent for states in which the EPA-based estimate exceeds the state-reported costs.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.
- **Dark grey and white text** items are those for which the cost effect is material because (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), and (2) the activity category contributes at least a 20% share of this total difference. These items are of most interest for understanding the character of differences between the state and EPA-based estimates for this regulation.

8.3.1 Total Cost Difference

As shown in Table 8-3 and Table 8-4, the relationship between the state and EPA-based cost estimates varies substantially:

- Two states (Oklahoma and Virginia) reported costs that substantially exceed (by more than 25 percent) the EPA-based estimates.
- One state (South Carolina) reported costs substantially lower (by more than 25 percent) than the EPA-based estimate. It is worth noting that most of the costs reported by South Carolina were start-up costs, which are annualized over 5 years with a 7 percent discount rate. Thus, during the initial years of implementation the EPA-based estimates and state estimates are more in line, while the annualized cost estimates appear substantially different.
- One state (Kansas) reported costs that are approximately equal to the EPA-based estimate (within ±25 percent).

8.3.2 Costs by Activity Category

EPA estimated costs in five administrative activity categories for the PM 2.5 Rule:

- Two start-up categories: Category 1, Tracking EPA's Rulemaking Progress, and Category 3, Designing Implementation Plan.

- Three recurring categories: Category 9, Compliance Assistance; Category 11, Monitoring; and Category 13, Other.

States generally agreed that they need to perform activities in these categories, although only two states reported recurring compliance assistance activities. All of the material differences between the EPA-based estimates and the state estimates are attributable to recurring monitoring activities. This is no surprise given that recurring monitoring costs accounted for between 92 and 99 percent of the total EPA-based cost estimates for four case study states; they also accounted for between 86 and 89 percent of the total state cost estimates for Kansas, Oklahoma, and Virginia, but only 30 percent of total state-reported costs for South Carolina. Note that 97.0 to 99.5 percent of the EPA-based estimates for state recurring monitoring costs were paid for by EPA grants.

In the activity categories for which only states estimated costs, no categories meet our definition of a source of material cost difference. Category 7, Monitoring (Start-Up), is notable since all four states reported costs in this category. While EPA's original analysis did not allow for start-up monitoring activities, subsequent analyses by EPA did account for start-up monitoring activities. Specifically, EPA's subsequent ICR Supporting Statement Analyses, which are used to determine the level of grant funding provided to states for monitoring activities, did account for start-up monitoring activities.

8.4 Analysis of EPA-Estimated Activity Categories

As described above, EPA estimated costs for the PM 2.5 Rule for five activity categories: Category 1, Tracking EPA's Rulemaking Progress; Category 3, Designing Implementation Plan; Category 9, Compliance Assistance; Category 11, Monitoring; and Category 13, Other. However, EPA assumed that only states with PM 2.5 non-attainment areas would incur costs associated with Category 3, Designing Implementation Plan. In some instances, states did not report performing activities in a category estimated by EPA. Oklahoma and South Carolina did not report any recurring compliance assistance activities (Category 9), and South Carolina did not report any other recurring activities (Category 13).[3] Regardless, the cost effect of these few exceptions is trivial, accounting for less than 1 percent of the total cost difference in these two states. Thus, across the four case study states, there is general agreement that the EPA-estimated activities are needed for administering the PM 2.5 Rule.

As discussed in the preceding section, some of the cost differences in the categories in which EPA estimated costs are substantial and contribute to a material difference in total cost between the state and EPA-based estimates. Given the overall importance of the differences in the EPA-estimated categories, we performed a more detailed analysis to identify the factors that account for most of the cost differences. First, we looked within the EPA-estimated activity categories and divided the specific activity line-items into four groups:

- **Line-Item Activities Estimated Only by States**
- **Line-Item Activities Estimated Only by EPA**
- **Line-Item Activity Burdens Assumed to be Zero for Attainment States.** In EPA's analysis certain activities were assumed to only be performed by states with non-

[3] It is worth noting that South Carolina returned its estimated costs for the PM 2.5 Rule without using our questionnaire format, so the state may have accounted for the costs of these activities under another category.

attainment areas. However, some states without non-attainment areas reported performing these activities. Note that was only a small source of difference between the EPA-based estimates and the state estimates.

- **Line-Item Activities Estimated by States and EPA.** Within these activities we assessed the extent to which cost differences in these categories result from the individual components underlying the EPA-based and state cost estimates:
  - The length of time to complete each activity.
  - The unit cost of labor (hourly wage plus fringe allowance) for performing the activity.
  - The number of activities—either for start-up activities or the estimated number of activities performed annually for recurring activities.
  - The non-labor costs reported for the activity.

To assess the separate contributions from these underlying cost components, we recalculated the EPA-based cost values in each category by replacing, one at a time, the EPA-based values with the state-provided values for the underlying cost components. For states that estimated higher costs than the EPA-based estimates, we calculated a positive share contribution from each of the one-at-a-time changes that contributed toward that positive effect. For states that estimated lower costs than the EPA-based estimates, we calculated a negative share contribution from each of the one-at-a-time changes that contributed toward that negative effect. Note that for the PM 2.5 Rule EPA did not estimate costs on a per-activity basis; instead, costs were estimated on a per-state basis, so the Number of Activities factor is not considered for the PM 2.5 Rule. As a result, for the PM 2.5 Rule, the Time to Complete Activities is really a total labor burden estimate.

Table 8-5 summarizes the contributions of each factor to the difference between state and EPA-based estimates in the EPA-estimated categories for each state.

Several observations may be drawn from Table 8-5:

- Within the EPA-estimated activities, the differences between the EPA-based estimates and the state estimates were found primarily in those Line Items Estimated by States and EPA – specifically, recurring monitoring activities.
  - There is little consistency across the states in terms of which of the three relevant cost components are important sources of difference.
  - For South Carolina and Virginia, the Time to Complete Activities component was the most important source of difference within the Line-Items Estimated by States and EPA.
  - The Non-Labor Costs component was an important source of difference in two states – Oklahoma and Virginia. It is worth noting that while EPA's original analysis did not account for non-labor costs, subsequent analyses by EPA did account for non-labor costs. Specifically, EPA's subsequent ICR Supporting Statement Analyses, which are used to determine the level of grant funding provided to states for monitoring activities, do account for non-labor costs.
- For Kansas, which did not report estimates that are materially different from the EPA-based estimates (i.e., exceeding ±25 percent), the Time to Complete Activities was the most important factor.

Table 8-5: Sources of Cost Difference in EPA-Estimated Categories				
	Kansas	Oklahoma	South Carolina	Virginia
Sources of Difference for Activities in EPA-Estimated Categories[1]				
Line Items Estimated by States and EPA	*-102%*	*100%*	*-107%*	*100%*
Line Items Estimated by States Only	2%	0%	4%	2%
Line Items Estimated by EPA Only	0%	0%	-1%	-2%
Line Items Assumed Zero by EPA	0%	0%	4%	0%
Total Change	**-100%**	**100%**	**-100%**	**100%**
Contribution of Components to Differences in Activities Estimated by States and EPA[2]				
Time to Complete Activities	-93%	2%	**-100%**	**56%**
Unit Labor Costs	-7%	10%	—	—
Number of Activities	n.a.	n.a.	n.a.	n.a.
Non-Labor Costs	—	88%	0%	44%
Total Change	**-100%**	**100%**	**-100%**	**100%**

Notes:

[1] Percentages indicate the share of total cost difference in the EPA-estimated activity categories contributed by each of the four underlying calculation factors. Shares sum to either +100 percent or -100 percent. Shares sum to +100 percent for states in which the state-reported costs in the EPA-estimated categories exceeds the EPA-based estimate. Shares sum to -100 percent for states in which the EPA-based estimate exceeds the state-reported costs in the EPA-estimated categories.

[2] For those specific activities estimated by both EPA and the states, the sources of difference can be examined more closely. Here we evaluate the sources of these differences attributable to the estimates components: (1) length of time to complete each activity, (2) unit cost of labor, (3) number of activities, or (4) non-labor costs. Where states reported higher costs for these activities, the share contributions of each component of the costs that contributed toward this positive effect are shown as positive numbers. Where states reported lower costs for these activities, the share contributions of each component of the costs that contributed toward this negative effect are shown as negative numbers.

- A "—" indicates that a cost component contributed toward the opposite direction of the aggregate effect.
- States with light blue shading are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 8.1.1; that is, (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference.
- The **dark green-shaded and white text** values are those in states with light blue shading where: (1) the contribution from line items estimated by states and EPA exceeds 20%, and (2) the Time to Complete Activities factor was found to contribute materially (more than 20%) to the cost difference.

We looked more closely at states' reported time requirements in comparison to the EPA estimates for the specific activities in each category (see Table 8-6). In this table, the **dark green-shaded and white text** values are those for which the contribution to total cost difference from the EPA-estimated activity categories is material, and the Time to Complete Activities factor was found to contribute materially to the cost.

Several observations may be drawn from Table 8-6:

- In general, estimated time differences for activities in Category 11, Monitoring (Recurring), are substantial numerically and can also contribute materially to the total cost difference between the state and EPA-based cost estimates.
  - The two states with total estimates of costs that were higher than the EPA-based estimates reported more hours associated with recurring monitoring activities; however, Oklahoma reported only slightly more hours than the EPA-based estimate.
  - Likewise, the two states reporting lower total cost estimates reported fewer hours associated with recurring monitoring activities.

Table 8-6: EPA and State Estimates of Time Required to Complete Activities in the EPA-Estimated Activity Categories

(Hours per Activity)	EPA-Min	EPA-Attain.	EPA-Non-Attain.	EPA-Max	Kansas (Attain.)	Oklahoma (Attain.)	South Carolina (Attain.)	Virginia (Non-Attain.)
Activity Category 1: Tracking EPA's Rulemaking Progress (Start-up)								
Interpret Rule	1.0	10.5	30.5	40.0	10.0	26.0	434.5	40.0
Activity Category 3: Designing Implementation Plan (Start-up)								
Revise SIPS	-	-	100.5	160.0	-	80.0	825.0	1,040.0
Activity Category 10: Permit Administration (Recurring)								
Develop Guidance Documents	-	-	30.5	40.0	-	-	-	40.0
Public Hearings	-	-	100.5	160.0	-	-	-	100.5
Review/Revise Compliance Plans	-	-	100.5	160.0	-	-	-	100.5
Evaluate Strategies for Conformity	1.0	10.5	30.5	40.0	10.5	-	-	30.0
Prepare and Review Progress Reports	1.0	10.5	30.5	40.0	10.5	-	-	30.0
Activity Category 11: Monitoring (Recurring)								
All Monitoring Activities	3,822	6,057	7,365	10,274	3,046	6,203	**360**	**11,924**
Activity Category 13: Other (Recurring)								
Develop Regional Implementation Plans	-	-	30.5	40.0	-	-	-	-
Recordkeeping	-	10.5	30.5	40.0	96.0	150.0	-	-
Identify Alternative Control Strategies	1.0	-	100.5	160.0	-	-	-	-
Participate in PM Regional Groups	1.0	30.5	100.5	160.0	30.5	30.5	-	100.5

Notes:

- EPA-Min is EPA's lower-bound estimate for states without any non-attainment; EPA-Attain. is EPA's estimate for the average state without non-attainment; EPA-Non-Attain. is EPA's estimate for the average state with non-attainment; EPA-Max is EPA's upper-bound estimate for states with any non-attainment.
- For monitoring, time requirement estimates are specific to each individual state, for the min and max are the estimates for Kansas and South Carolina, respectively.
- "-" in a cell indicates that the state did not report a cost for this activity.
- The **dark green-shaded and white text** values are those where the Time to Complete Activities factor was found to contribute materially; that is, where (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference, (3) the contribution from line items estimated by states and EPA exceeds 20%, and (4) the Time to Complete Activities factor was found to contribute materially (more than 20%) to the cost difference.

- Although some estimates of time difference in the start-up categories are large numerically, they are of low importance in the total cost estimates.
  - These activities occur only once (at start-up) instead of being performed repeatedly during the recurring activities phase of rule administration.
  - For South Carolina, our conversations with state agency personnel indicated that the higher start-up costs were incurred because the state was designated with an "unclassifiable" area (i.e., it was neither an attainment nor a non-attainment area).

8.5 Analysis of Activity Categories for Which Only States Estimated Costs

As described above in Section 0, The activities for which EPA estimated costs fall into 5 of the 13 activity categories outlined in Chapter 5. EPA further estimated that states would incur costs for 16 specific "line item" activities across these five categories, as follows:

- **Activity Category 1: Tracking EPA's Rulemaking Progress**
  - Interpret Rule
- **Activity Category 3: Designing Implementation Plan**
  - Revise State Implementation Plan

- **Activity Category 9: Compliance Assistance (Recurring)**
  - Develop Guidance Documents
  - Public Hearings
  - Review/Revise Compliance Plans
  - Evaluate Strategies for Conformity
  - Prepare/Review Progress Reports
- **Activity Category 11: Monitoring (Recurring)**
  - Non-Grant Funded Monitoring Activities
    - Evaluate/Improve Inventories
    - Data Gathering and Assembly
    - Run Model
    - Evaluate and Interpret Monitoring Results
  - Grant Funded Monitoring Activities
- **Activity Category 13: Other (Recurring)**
  - Develop Regional Implementation Plans
  - Recordkeeping
  - Identify Alternative Control Strategies
  - Participate in PM Regional Groups

Comparing EPA-Based and State Estimates – Total Costs and Costs by Broad Category, at least one state reported costs in seven of the eight activity categories that EPA did not account for in its analysis; Category 8, Enforcement (Start-Up), was the exception. Table 8-7 summarizes the instances in which states reported costs in categories that EPA did not account for its analysis; it also shows that none of these instances have a material cost effect.

Table 8-7: Activity Categories for Which Only States Estimated Costs

Activity Category	Kansas	Oklahoma	South Carolina	Virginia
Start-Up Activities				
2. Obtaining additional delegated authority			✓	✓
4. General start-up activities	✓			
5. Compliance assistance	✓		✓	✓
6. Permit administration	✓			✓
7. Monitoring	✓	✓	✓	✓
Recurring Activities				
10. Permit administration	✓			
12. Enforcement	✓			

Notes:
- "✓" indicates that the state reported costs in this activity category.
- "✓" indicates those instances in which the cost effect is material; that is, (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference.
- No state reported activities in Category 8, Enforcement (Start-Up)

Several observations may be drawn from Table 8-7:

- None of the categories for which states estimated costs had a material impact on the estimated cost differences.
- Category 7, Monitoring (Start-Up), is the only activity category for which all four states reported costs. It should be noted that while EPA's original analysis did not allow for start-up monitoring activities, subsequent analyses by EPA did account for start-up monitoring activities. Specifically, EPA's subsequent ICR Supporting Statement Analyses, which are used to determine the level of grant funding provided to states for monitoring activities, did account for start-up monitoring activities.
- Category 5, Compliance Assistance (Start-Up), is the only other activity category for which EPA did not estimate costs and more than half of the states reported costs.

9 Analyzing State Costs for Administering the RCRA Organic Air Emission Standards (Subpart CC) Rule

9.1 Analytic Overview and Key Findings

9.1.1 Analytic Overview

In this chapter, we compare the costs of administering the RCRA Organic Air Emission Standards (Subpart CC) Rule provided by our case study states with costs estimated by Abt Associates for the regulation using EPA's methodology. Key steps in this comparison, also illustrated in Exhibit 9-1, include:

- Assigning EPA's nationwide cost estimates into the Abt Associates analytic framework and apportioning them to the individual case study states to derive the EPA-based cost estimates. The Abt Associates analytic framework and our apportionment procedures are described in Chapter 5 and the appendixes.
- Comparing the total EPA-based cost estimates with the costs reported by case study states for administering the Subpart CC regulation. In particular, we assessed the extent to which differences occur in:
  - Those activity categories for which EPA estimated costs and
  - Those categories for which EPA did not estimate costs but for which some states reported costs.

  Given the uncertainties associated with our cost estimates and those provided by the states, we determined with EPA that we would focus primarily on those total differences that are substantial; that is, exceeding ±25 percent.
- Assessing the contribution of the individual activity categories to the total difference. Where it was apparent that there were substantial differences in the cost estimates, we adopted an approach to focus the analysis on the activity categories that had the greatest influence on the estimated differences. Recognizing the limitations of the data, we focused our analysis on those activity categories that accounted for at least 20 percent of the total cost difference. This rule helps identify the activity categories that are worthy of closer review, with the goal of providing insight into how EPA might improve its estimation of the costs to states for administering environmental regulations.
- Within those activity categories for which EPA estimated costs, assessing the extent to which states agreed that they incurred costs for these activities. We then analyzed the factors that would contribute to the cost differences, including the time to complete an activity, personnel costs, and the number of activities (e.g., number of permitting events).
- For those activity categories for which EPA did *not* estimate costs, but for which some states reported costs, identifying which of these categories are most important. We made this determination based on the frequency with which states reported costs and the contribution of these categories to the total difference between the EPA-based and state estimates.

Table 9-1 summarizes the total EPA-based and state costs estimate for the Subpart CC Rule. Our key findings from this analysis are summarized below.

Exhibit 9-1: Developing, Organizing, and Analyzing EPA-Based and State Estimates

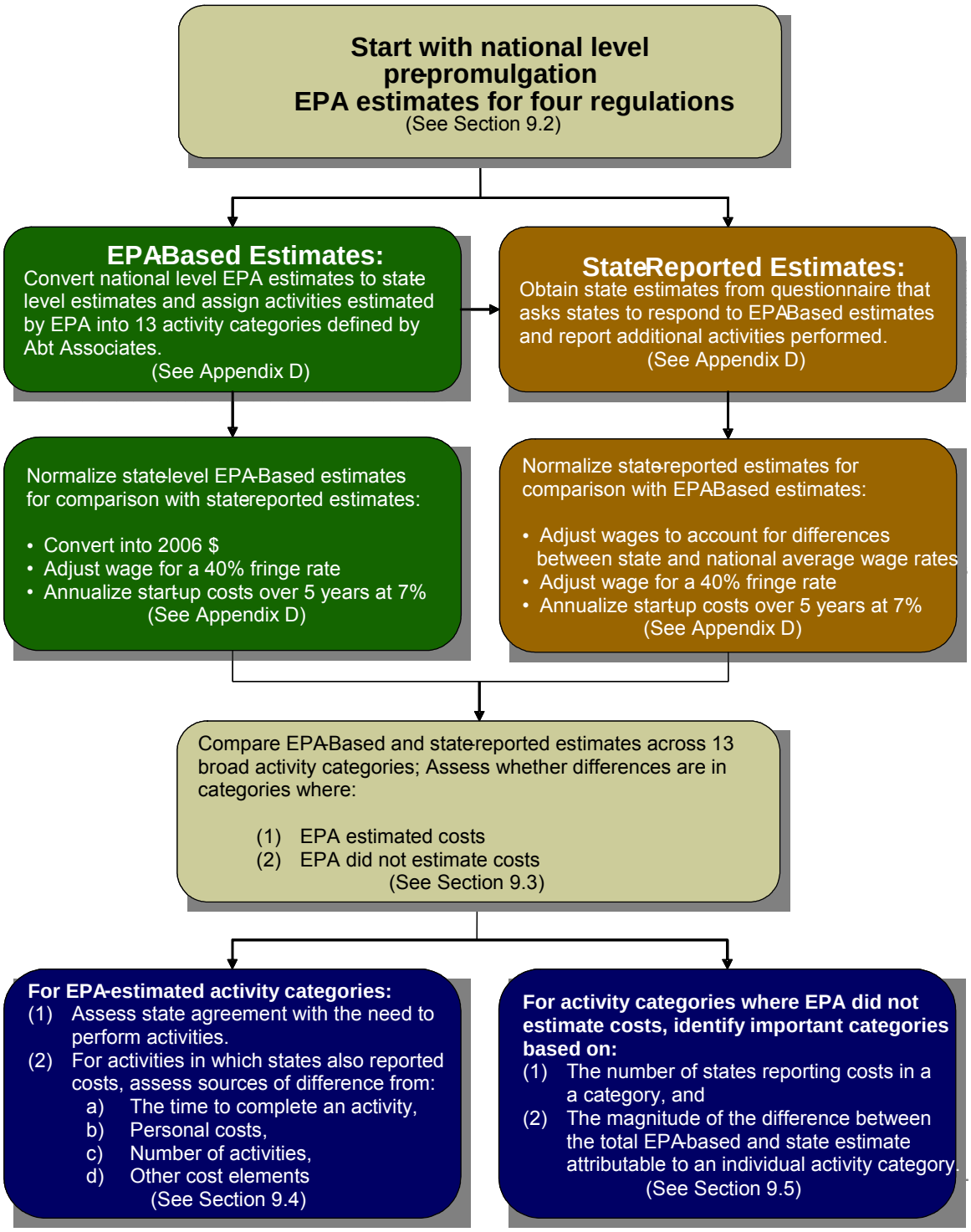


Table 9-1: Summary of EPA-Based and Case Study State Cost Estimates for Subpart CC Rule

($000, 2006$)	Nevada	Oklahoma	South Carolina	Virginia
Total EPA Estimate	$9.3	$20.9	$46.3	$31.4
Total State Estimate	$7.6	$92.9	$141.1	$2.7
Total Difference (State Estimate – EPA-Based Estimate)	-$1.6	$72.0	$94.8	-$28.8
Total Percent Difference	-18%	344%	205%	-92%

Notes:
- States with shaded values are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 9.1.1; that is, the EPA/state total cost difference is substantial (i.e., greater than ±25%).

9.1.2 Key Findings

Overall Cost Relationships

- Four case study states, Nevada, Oklahoma, South Carolina, and Virginia, provided cost information for the Subpart CC regulation. Kansas does not have delegated authority for this rule and therefore does not incur administrative costs associated with this rule. Key New Jersey staff members were unable to participate due to time constraints.
- In general, our analysis and findings for the Subpart CC rule are limited in comparison to those presented for the other regulations. This results from relying on an EPA Information Collection Request (ICR) instead of a more comprehensive Unfunded Mandates Reform Act (UMRA) analysis as the basis for comparing EPA and state estimates. Since the scope of an ICR is limited to paperwork-related burdens, and the state-reported estimates were not limited to paperwork-related costs, there was a difference between the scope of the ICR analysis and the scope of the costs that states were asked to report in this analysis. In addition, both EPA and the case study states assess the Subpart CC rule as being less burdensome than the other regulations, with fewer cost categories being included in the analysis for this regulation.
- Overall, the comparison of state and EPA-based estimates for the Subpart CC rule shows little consistency in patterns across states and cost categories. As shown in Table 9-1, participating states' reported costs are not consistently greater than or less than the EPA-based estimates.
- Enforcement and litigation-related costs appear to be an important source of difference between the EPA-based and state estimates.
  - One state, Oklahoma, reported costs substantially greater than the EPA-based estimate, but this difference largely arises from Oklahoma's reporting of costs for enforcement and litigation-related activities. The prediction and occurrence of costs for these activities is subject to greater uncertainty than for other costs (e.g., permit processing). As a result, Oklahoma's higher costs for these activities probably fall within a range of what might reasonably occur for a few states. Thus, the occurrence of higher costs for enforcement and litigation-related activities should not be viewed as a systematic underestimation by EPA of costs for these activities.
  - Another state, Virginia, reported costs substantially lower than the EPA-based estimate, and this difference also largely arises from Virginia's reporting of fewer costs for enforcement and litigation-related activities. In this case, Virginia incurred substantially lower enforcement and litigation-related costs than the EPA-based

estimated values. This supports our hypothesis that the prediction and occurrence of costs for these activities is subject to greater uncertainty than for other costs (e.g., permit processing). Thus, Virginia's lower costs for these activities probably fall within a range of what might reasonably occur for a few states, and the occurrence of lower costs for enforcement and litigation-related activities should not be viewed as a systematic overestimation by EPA of costs for these activities.

Cost Relationships by Activity Category

EPA estimated costs in two administrative activity categories for the Subpart CC rule:

- Category 10, Permit Administration (Recurring), and
- Category 12, Enforcement (Recurring).

It is important to emphasize that an ICR Supporting Statement was the basis for the RCRA Subpart CC comparison. Since the scope of an ICR is limited to paperwork-related burdens, and the state-reported estimates were not limited to paperwork-related costs, there was a difference between the scope of the ICR analysis and the scope of the costs that states were asked to report in this analysis.

- One state, South Carolina, reported costs in two start-up activities that contributed to a material cost difference between the state and the EPA estimate: Category 3, Designing Implementation Plan, and Category 8, Enforcement (Start-Up). As discussed above, start-up costs such as these could be considered beyond the scope of the ICR that was the basis for the EPA-based estimates. A material difference is defined as follows: (1) the EPA/state total cost difference is substantial (i.e., greater than ±25 percent) and (2) the activity category contributes at least a 20 percent share of this total difference.
- Two states, Oklahoma and Virginia, reported materially different costs in Category 12, Enforcement (Recurring) – higher in Oklahoma's case, and lower in Virginia's case. As discussed earlier, the prediction and occurrence of costs for these activities is subject to greater uncertainty than for other costs (e.g., permit processing). As a result, Oklahoma's and Virginia's costs for these activities probably fall within a range of what might reasonably occur for a few states.

In the following sections, we present our analysis and provide a more detailed discussion of the results underlying these key findings. Our discussion is organized as follows:

- Section 9.2, Overview of the Subpart CC Rule and EPA's Cost Estimates, provides an overview of the Subpart CC regulation and reviews EPA's estimates of costs to state governments for administering the regulation.
- Section 9.3, Comparison of EPA-Based and State Estimates: Total Costs and Costs by Broad Category, compares the EPA-based and state estimates in terms of total difference and by the 13 activity categories, as outlined in Chapter 5.
- Section 9.4, Analysis of EPA-Estimated Activity Categories, examines more closely those activity categories for which EPA estimated costs.
- Section 9.5, Analysis of Activity Categories for Which Only States Estimated Costs, examines those activity categories for which EPA did not estimate costs, but in which one or more states reported incurring costs.

Appendix D provides more detailed information on each state's cost estimates and comparison of those estimates, on an item-by-item basis, with the EPA-based estimates.

9.2 Overview of the Subpart CC Rule and EPA's Cost Estimates

In 1994, EPA promulgated air standards to reduce organic emissions from hazardous waste treatment, storage, and disposal facilities and hazardous waste generators. Since this rule was promulgated before the Unfunded Mandates Reform Act of 1995, EPA was not required to specifically address state administrative costs associated with this rule in an Economic Analysis. Although EPA did not estimate costs for all administrative tasks associated with the rule, the Agency did submit an ICR analysis detailing the information collection burden. For our analysis, the EPA-estimated costs are based on the information collection burden estimates in the SF-83 Supporting Statement (original ICR and Renewal) for the Air Emission Standards for Tanks, Surface Impoundments, and Containers Rule.

Two key issues arise when comparing information collection costs from the ICR with the state-reported administrative costs:

- The purpose of an ICR is to estimate the burden resulting from information collection requirements (e.g., recordkeeping and paperwork) and not to capture all possible administrative activities that could accompany a regulation. As a result, the ICR-based estimates used in this analysis do not include all of the administrative activities that might reasonably have been accounted for in an administrative cost analysis. By contrast, states were asked to provide cost estimates for the full range of administrative activities for the regulation. Thus, the analysis of this regulation in limited because there was a difference between the scope of the ICR analysis and the scope of the costs that states were asked to report.
- In the ICR, EPA reports burden estimates as a total number of hours per year. Some states, though, reported both the Time to Complete Activities and the Number of Activities. For consistency, this analysis adjusts all the state estimates reported in this manner to a total number of hours for one annual activity (i.e., the Number of Activities is set to one, and the Time to Complete Activities is adjusted accordingly to reflect the total number of hours reported by the states). This adjustment allows the state responses to be compared with the EPA estimates. Where this adjustment is made, the difference in the time requirement reflects a difference in the annual time requirement rather than the per-activity time requirement.

These activities fall into 2 of the 13 activity categories outlined in Chapter 5. EPA further estimated that states would incur costs for 12 specific "line item" activities across the following two categories:

- **Activity Category 10: Permit Administration (Recurring)**
  - Review of exceedance reports, technical hours
  - Control device exceedance reports, technical hours
  - Time required to prepare notification reports, technical hours
  - Management hours associated with permit administration
  - Clerical hours associated with permit administration
- **Activity Category 12: Enforcement (Recurring)**
  - Time required for compliance inspections; selecting sites and reviewing permits
  - Time required for compliance inspections; traveling to and from sites
  - Time required for on-site inspections
  - Preparing inspection reports
  - Preparing notices of non-compliance

- Time required for follow-up enforcement activities
- Legal hours associated with litigation activities

Table 9-2 summarizes the national-level cost estimates for the Subpart CC rule within our cost activity framework. We applied the adjustments outlined in Chapter 5 to convert these national values to state-level values for the specific states included in this analysis. Appendix D provides these "converted" values for each of the case study states.

Table 9-2: EPA Estimate of State Administrative Costs for the Subpart CC Rule: All States with Permitting Authority

Description	Time Burden (hours)	Labor Costs (hourly wage plus fringe, 2006$)	Non-Labor Costs	Number of Activities	Total Hour Burden	Total Costs (thousands, 2006$)
Start-Up Activities						
1. Tracking EPA's Rulemaking Progress	No costs estimated in this category.					
2. Obtaining Additional Delegated Authority	No costs estimated in this category.					
3. Designing Implementation Plan	No costs estimated in this category.					
4. General Start-Up Activities	No costs estimated in this category.					
5. Compliance Assistance	No costs estimated in this category.					
6. Permit Administration	No costs estimated in this category.					
7. Monitoring	No costs estimated in this category.					
8. Enforcement	No costs estimated in this category.					
Total Start-Up Costs					*0*	*$0*
Total Annualized Start-Up Costs						*$0*
Recurring Activities						
9. Compliance Assistance	No costs estimated in this category.					
10. Permit Administration						
Review Waste Exceedance Reports: Technical Hours	4	$31	$0	62	248	$8
Control Device Exceedance Reports: Technical Hours	4	$31	$0	31	124	$4
Notification Reports: Technical Hours	1	$31	$0	1,868	1,868	$58
Management Hours	112	$42	$0	1	112	$5
Clerical Hours	224	$17	$0	1	224	$4
11. Monitoring	No costs estimated in this category.					
12. Enforcement	No costs estimated in this category.					
Compliance Inspections: Select Site and Review Permit: Enforcement Hours	8	$30	$0	520	4,160	$148
Compliance Inspections: Travel to and from site: Enforcement Hours	8	$30	$315	520	4,160	$289
On-Site Inspection: Enforcement Hours	8	$30	$0	520	4,160	$125
Prepare Inspection Report: Enforcement Hours	16	$30	$0	520	8,320	$250
Notice of Non-Compliance: Enforcement Hours	160	$30	$0	52	8,320	$250
Follow-up enforcement: Enforcement Hours	40	$30	$315	52	2,080	$79
Litigation: Legal Hours	2,080	$55	$0	10	20,800	$1,144
13. Other	No costs estimated in this category.					
Total Recurring Costs					*54,576*	*$2,362*
Total Annualized Costs[a]						***$2,362***

Source: U.S. EPA 1999e and Abt Associates calculations.

[a] One-time costs are annualized over a 5-year period assuming a 7 percent discount rate.

9.3 Comparison of EPA-Based and State Estimates: Total Costs and Costs by Broad Category

We received cost estimates for administering the Subpart CC rule from four of the case study states. Table 9-3 summarizes overall cost information for the Subpart CC rule, including the total dollar values of costs for each of the four states and the EPA-based estimates, and the breakout of these costs by the individual activity categories. Table 9-4 reports the percentage share contribution by each activity category to the total cost difference.

Table 9-3: Summary of EPA-Based and State Estimated Costs for the Subpart CC Rule

Activity Category		Nevada	Oklahoma	South Carolina	Virginia
All Activities ($000, 2006)					
Total Costs	*EPA-Based Estimate*	*$9*	*$21*	*$46*	*$31*
	State Estimate	*$8*	*$93*	*$141*	*$3*
	Difference (State - EPA)	*($2)*	*$72*	*$95*	*($29)*
	Percentage Difference	*(18%)*	*344%*	*205%*	*(92%)*
Start-Up Activities ($000, 2006)					
1. Tracking EPA's rulemaking process	EPA-Based Estimate	-	-	-	-
	State Estimate	$0	$0	$0	-
	Difference (State - EPA)	$0	$0	$0	-
2. Obtaining additional delegated authority	EPA-Based Estimate	-	-	-	-
	State Estimate	$0	-	$12	-
	Difference (State - EPA)	$0	-	$12	-
3. Designing implementation plan	EPA-Based Estimate	-	-	-	-
	State Estimate	-	-	$23	-
	Difference (State - EPA)	-	-	$23	-
4. General start-up activities	EPA-Based Estimate	-	-	-	-
	State Estimate	$1	-	$7	$0
	Difference (State - EPA)	$1	-	$7	$0
5. Compliance assistance	EPA-Based Estimate	-	-	-	-
	State Estimate	-	-	$1	$0
	Difference (State - EPA)	-	-	$1	$0
6. Permit administration	EPA-Based Estimate	-	-	-	-
	State Estimate	-	$4	$2	$0
	Difference (State - EPA)	-	$4	$2	$0
7. Monitoring	EPA-Based Estimate	-	-	-	-
	State Estimate	-	-	$7	-
	Difference (State - EPA)	-	-	$7	-
8. Enforcement	EPA-Based Estimate	-	-	-	-
	State Estimate	-	$0	$40	-
	Difference (State - EPA)	-	$0	$40	-
All Start-Up Activities	*EPA-Based Estimate*	*$0*	*$0*	*$0*	*$0*
	State Estimate	*$1*	*$5*	*$92*	*$1*
	Difference (State - EPA)	*$1*	*$5*	*$92*	*$1*
Recurring Activities ($000, 2006)					
9. Compliance assistance	EPA-Based Estimate	-	-	-	-
	State Estimate	$1	$0	-	-
	Difference (State - EPA)	$1	$0	-	-
10. Permit administration	EPA-Based Estimate	$0	$1	$1	$1
	State Estimate	$0	$4	$2	$1
	Difference (State - EPA)	$0	$4	$0	($0)
11. Monitoring	EPA-Based Estimate	-	-	-	-
	State Estimate	-	-	$1	-
	Difference (State - EPA)	-	-	$1	-
12. Enforcement	EPA-Based Estimate	$9	$20	$45	$30
	State Estimate	$6	$76	$47	$1
	Difference (State - EPA)	($3)	$56	$2	($29)
13. Other Recurring Activities	EPA-Based Estimate	-	-	-	-
	State Estimate	-	$8	-	-
	Difference (State - EPA)	-	$8	-	-
All Recurring Activities	*EPA-Based Estimate*	*$9*	*$21*	*$46*	*$31*
	State Estimate	*$7*	*$88*	*$49*	*$2*
	Difference (State - EPA)	*($3)*	*$67*	*$3*	*($30)*

Notes:
- "-" indicates no cost was estimated. $0s indicate values with magnitudes smaller than $500.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.

Table 9-4: Percent Contribution to Cost Differences by Activity Category

Activity Category	Nevada	Oklahoma	South Carolina	Virginia
State Estimate Minus EPA Estimate ($000, 2006)				
All Activities	($2)	$72	$95	($29)
Percentage Difference, Total (State vs. EPA)	-18%	344%	205%	-92%
Start-Up Activities (Percentage Contribution to Difference)				
1. Tracking EPA's rulemaking process	14%	1%	0%	-
2. Obtaining additional delegated authority	3%	-	13%	-
3. Designing implementation plan	-	-	24%	-
4. General start-up activities	41%	-	8%	1%
5. Compliance assistance	-	-	1%	1%
6. Permit administration	-	5%	2%	1%
7. Monitoring	-	-	7%	-
8. Enforcement	-	0%	42%	-
All Start-Up Activities	58%	6%	97%	3%
Recurring Activities (Percentage Contribution to Difference)				
9. Compliance assistance	39%	0%	-	-
10. Permit administration	6%	5%	0%	-1%
11. Monitoring	-	-	1%	-
12. Enforcement	-203%	78%	2%	-101%
13. Other Recurring Activities	-	11%	-	-
All Recurring Activities	*-158%*	*94%*	*3%*	*-103%*
All Activities	**-100%**	**100%**	**100%**	**-100%**

Notes:

- Percentages are calculated as the share of the total difference between the EPA and state estimates occurring in the indicated activity category. Shares by activity category sum to either +100 percent or -100 percent. Shares sum to +100 percent for states in which the state-reported costs exceeds the EPA-based estimate. Shares sum to -100 percent for states in which the EPA-based estimate exceeds the state-reported costs.
- **Boxed/grey-shaded** activity categories are those for which EPA estimated costs for this regulation.
- **Dark grey and white text** items are those for which the cost effect is material because (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the activity category contributes at least a 20% share of this total difference. These items are of most interest for understanding the character of differences between the state and EPA-based estimates for this regulation.

9.3.1 Total Cost Difference

As shown in Table 9-3 and Table 9-4, the relationship between the state and EPA-based estimates varies across the states:

- In general, our analysis and findings for the Subpart CC rule are limited in comparison to those presented for the other regulations. This results from relying on an EPA ICR instead of a more comprehensive UMRA analysis as the basis for comparing EPA and state estimates. Since the scope of an ICR is limited to paperwork-related burdens, and the state-reported estimates were not limited to paperwork-related costs, there was a difference between the scope of the ICR analysis and the scope of the costs that states were asked to report in this analysis. In addition, both EPA and the case study states assess the Subpart CC rule as being less burdensome than the other regulations, with fewer cost categories being included in the analysis for this regulation.
- Overall, the comparison of state and EPA-based estimates for the Subpart CC rule shows little consistency in patterns across states and cost categories. As shown in Table 9-1, participating states' reported costs are not consistently greater than or less than the EPA-based estimates.
- Enforcement and litigation-related costs appear to be an important source of difference between the EPA-based and state estimates.
  - One state, Oklahoma, reported costs substantially greater than the EPA-based estimate, but this difference largely arises from Oklahoma's reporting of costs for enforcement and litigation-related activities. The prediction and occurrence of costs

for these activities is subject to greater uncertainty than for other costs (e.g., permit processing). As a result, Oklahoma's higher costs for these activities probably fall within a range of what might reasonably occur for a few states. Thus, the occurrence of higher costs for enforcement and litigation-related activities should not be viewed as a systematic underestimation by EPA of costs for these activities.

– Another state, Virginia, reported costs substantially lower than the EPA-based estimate, and this difference also largely arises from Virginia's reporting of fewer costs for enforcement and litigation-related activities. In this case, Virginia incurred substantially lower enforcement and litigation-related costs than the EPA-based estimated values. This supports our contention that the prediction and occurrence of costs for these activities is subject to greater uncertainty than for other costs (e.g., permit processing). Thus, Virginia's lower costs for these activities probably fall within a range of what might reasonably occur for a few states, and the occurrence of lower costs for enforcement and litigation-related activities should not be viewed as a systematic overestimation by EPA of costs for these activities.

9.3.2 Costs by Activity Category

EPA estimated costs in three administrative activity categories for the Subpart CC rule:

- Category 10 – Recurring Permit Administration, and
- Category 12 – Recurring Enforcement

It is important to emphasize that an ICR Supporting Statement was the basis for the RCRA Subpart CC comparison. Since the scope of an ICR is limited to paperwork-related burdens, and the state-reported estimates were not limited to paperwork-related costs, there was a difference between the scope of the ICR analysis and the scope of the costs that states were asked to report in this analysis.

All four states agreed that they need to perform these activity categories. In each of the remaining 11 activity categories, for which EPA did not estimate costs, at least one state indicated that it incurred costs. However, for none of these remaining categories did all states indicate that they would need to perform the activity and incur costs.

As shown in Table 9-4, the cost differences at the level of the state and activity category are material in only a few instances based on (1) the total cost difference for the state being substantial (i.e., greater than ±25 percent) and (2) the activity category contributing at least a 20 percent share of this total difference for the state:

- South Carolina reported costs in two start-up activities that contributed to a material cost difference between the state and the EPA estimate: Category 3, Designing Implementation Plan, and Category 8, Enforcement (Start-Up). As discussed above, start-up costs such as these could be considered beyond the scope of the ICR that was the basis for the EPA-based estimates.
- Oklahoma and Virginia reported materially different costs in Category 11, Enforcement (Recurring) – higher in Oklahoma's case, and lower in Virginia's case. As discussed earlier, the prediction and occurrence of costs for these activities is subject to greater uncertainty than for other costs (e.g., permit processing). As a result, Oklahoma's and Virginia's costs for these activities probably fall within a range of what might reasonably occur for a few states.

9.4 Analysis of EPA-Estimated Activity Categories

As described above, EPA estimated costs for the Subpart CC rule for two activity categories: Category 10, Permit Administration (Recurring), and Category 12, Enforcement (Recurring). All four states agreed that performing activities in these categories was necessary for administering this rule. It should be noted, however, that not all states reported performing all of the specific activities for which EPA estimated costs within each activity category. Nevertheless, there is general agreement across the four states that the EPA-estimated activities are needed for administering the Subpart CC rule.

As discussed in the preceding section, some of the cost differences in the categories in which EPA estimated costs are substantial and contribute to a material difference in total cost between the state and EPA-based estimates. Given the overall importance of the differences in the EPA-estimated categories, we performed a more detailed analysis to identify the factors that account for most of the cost differences. First, we looked within the EPA-estimated activity categories and divided the specific activity line items into three groups:

- **Line-Item Activities Estimated Only by States**
- **Line-Item Activities Estimated Only by EPA, and**
- **Line-Item Activities Estimated by States and EPA.** Within these activities we assessed the extent to which cost differences in these categories result from the individual components underlying the EPA-based and state cost estimates:
  - The length of time to complete each activity.
  - The unit cost of labor (hourly wage plus fringe allowance) for performing the activity.
  - The number of activities—either for start-up activities or the estimated number of activities performed annually for recurring activities.
  - The non-labor costs reported for the activity.

To assess the separate contributions from these underlying cost components, we recalculated the EPA-based cost values in each category by replacing, one at a time, the EPA-based values with the state-provided values for the underlying cost components. For states that estimated higher costs than the EPA-based estimates, we calculated a positive share contribution from each of the one-at-a-time changes that contributed toward that positive effect. For states that estimated lower costs than the EPA-based estimates, we calculated a negative share contribution from each of the one-at-a-time changes that contributed toward that negative effect.

Table 9-5 summarizes the contributions of each factor to the difference between state and EPA-based estimates in the EPA-estimated categories for each state.

Table 9-5: Sources of Cost Difference in EPA-Estimated Categories

	Nevada	Oklahoma	South Carolina	Virginia
Sources of Difference for Activities in EPA-Estimated Categories[1]				
Line Items Estimated by States and EPA	41%	94%	-741%	-40%
Line Items Estimated by States Only	0%	6%	841%	0%
Line Items Estimated by EPA Only	-141%	0%	0%	-60%
Total Change	**-100%**	**100%**	**100%**	**-100%**
Contribution of Components to Differences in Activities Estimated by States and EPA[2]				
Time to Complete Activities	—	**92%**	-92%	**-34%**
Unit Labor Costs	100%	8%	—	-3%
Number of Activities	0%	—	—	-48%
Non-Labor Costs	0%	—	-8%	-15%
Total Change	**100%**	**100%**	**-100%**	**-100%**

Notes:

[1] Percentages indicate the share of total cost difference in the EPA-estimated activity categories contributed by each of the four underlying calculation factors. Shares sum to either +100 percent or -100 percent. Shares sum to +100 percent for states in which the state-reported costs in the EPA-estimated categories exceeds the EPA-based estimate. Shares sum to -100 percent for states in which the EPA-based estimate exceeds the state-reported costs in the EPA-estimated categories.

[2] For those specific activities estimated by both EPA and the states, the sources of difference can be examined more closely. Here we evaluate the sources of these differences attributable to the estimates components: (1) length of time to complete each activity, (2) unit cost of labor, (3) number of activities, or (4) non-labor costs. Where states reported higher costs for these activities, the share contributions of each component of the costs that contributed toward this positive effect are shown as positive numbers. Where states reported lower costs for these activities, the share contributions of each component of the costs that contributed toward this negative effect are shown as negative numbers.

- A "—" indicates that a cost component contributed toward the opposite direction of the aggregate effect.
- States with light blue shading are those in which the contribution to total cost difference from the EPA-estimated activity categories is material as described in Section 9.1; that is, (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%) and (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference.
- The **dark green-shaded and white text** values are those in states with light blue shading where: (1) the contribution from line items estimated by states and EPA exceeds 20%, and (2) the Time to Complete Activities factor was found to contribute materially (more than 20%) to the cost difference.

Several observations may be drawn from Table 9-5:

- Line Items Estimated by States and EPA were material factors (contributing more than 20 percent) in the two states (Oklahoma and Virginia) with material differences in EPA-Estimated Activity Categories (light blue shading).
- The Time to Complete Activities reported by Oklahoma and Virginia was a material factor (contributing more than 20 percent) in the differences in the state estimates and the EPA-based estimates for the Line Items Estimated by States and EPA. Oklahoma reported higher values, and Virginia reported lower values.
- For Virginia, the Number of Activities reported was a material factor (contributing more than 20 percent) in the difference in the state estimates and the EPA-based estimates for the Line Items Estimated by States and EPA. Although this cost factor appears substantial for this state, we assign less significance to this finding because of the method that we used to allocate the total EPA activity counts to each of the case study states. As such, the state-level values we calculated are subject to a higher degree of error.

We looked more closely at states' reported time requirements in comparison to the EPA estimates for the specific activities in each category (see Table 9-6). In this table, the **dark green-shaded and white text** values are those for which the contribution to total cost difference from the EPA-estimated activity categories is material, and the Time to Complete Activities factor was found to contribute materially to the cost.

Table 9-6: EPA and State Estimates of Time Required to Complete Activities in the EPA-Estimated Activity Categories

(Hours per Activity)	EPA	Nevada	Oklahoma	South Carolina	Virginia
Activity Category 10: Permit Administration (Recurring)					
Waste Exceedance Reports	4.0	4.0	4.0	4.0	4.0
Control Device Exceedance Reports	4.0	4.0	4.0	4.0	4.0
Notification Reports	1.0	1.0	1.0	1.0	1.0
Management Hours	1.0	0.5	2.0	8.0	2.0
Clerical Hours	2.0	1.0	2.0	4.0	3.0
Activity Category 12: Enforcement (Recurring)					
Select Site and Review Permit	9.2	8.0	**8.0**	0.5	**4.0**
Travel to and from Site	8.0	8.0	**2.0**	6.0	**6.0**
On-Site Inspection	8.0	8.0	**8.0**	2.0	**4.0**
Prepare Inspection Report	16.0	16.0	**16.0**	16.0	**4.0**
Notice of Non-Compliance	64.0	32.0	**30.0**	80.0	**-**
Follow-up Enforcement	16.0	8.0	**120.0**	20.0	**-**
Litigation	208.0	-	**1,000.0**	120.0	**-**

Notes:
- "-" in a cell indicates that the state did not report a cost for this activity.
- The **dark green-shaded and white text** values are those where the Time to Complete Activities factor was found to contribute materially; that is, where (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), (2) the EPA-estimated activity categories contribute at least a 20% share of this total difference, (3) the contribution from line items estimated by states and EPA exceeds 20%, and (4) the Time to Complete Activities factor was found to contribute materially (more than 20%) to the cost difference.

The following observations may be drawn from Table 9-6:

- Closer review of the Oklahoma cost information indicates that the large difference from the EPA-based estimate is due to litigation activities. While EPA did incorporate time related to litigation, the amount of time will be an overestimate for some states and an underestimate for others. It is difficult to predict, and thus cost well for an individual state, the occurrence of litigation. It is plausible that Oklahoma may be one of the few states in which any material litigation concerning the regulation occurred, but we are unable to comment further on this topic given the scope of our study.
- Similarly, but to the opposite effect, Virginia's cost information indicates that the large difference from the EPA-based estimate is also related to noncompliance and litigation activities. In Virginia's case, the state has not experienced any costs related to noncompliance or litigation.

9.5 Analysis of Activity Categories for Which Only States Estimated Costs

Table 9-7, following page, summarizes the instances in which states reported costs in categories that EPA did not account for in its analysis. The table highlights those activities for which the cost effect is material.

Table 9-7: Activity Categories for Which Only States Estimated Costs

Activity Category	Nevada	Oklahoma	South Carolina	Virginia
Start-Up Activities				
1. Tracking EPA's Rulemaking Process	✓	✓	✓	
2. Obtaining Additional Delegated Authority	✓		✓	
3. Designing implementation plan			✓	
4. General start-up activities	✓		✓	
5. Compliance Assistance			✓	
6. Permit Administration		✓	✓	✓
7. Monitoring			✓	
8. Enforcement		✓	✓	
Recurring Activities				
9. Compliance Assistance	✓	✓		
11. Monitoring			✓	
13. Other Recurring Activities		✓		

Notes:
- "✓" indicates that the state reported costs in this activity category.
- "✓" indicates those instances in which the cost effect is material, which means that (1) the EPA/state total cost difference is substantial (i.e., greater than ±25%), and (2) the activity category contributes at least a 20 percent share of this total difference.

As reported in Table 9-7, all states reported costs in some activities that EPA did not account for in its analysis. However, we did not see any consistent trends in terms of individual cost activities that EPA did not include in its costing:

- Three of the four states (75 percent) reported costs omitted by EPA in only 2 of the 13 activity categories: Category 1, Tracking EPA's Rulemaking Process, and Category 6, Permit Administration (Start-Up).
- In all of the remaining omitted cost activities, no more than two states (50 percent) reported EPA-omitted costs.
- South Carolina reported costs in two start-up activities that contributed to a material cost difference between the state and the EPA estimate: Category 3, Designing Implementation Plan, and Category 8, Enforcement (Start-Up). As discussed above, Start-Up costs such as these could be considered beyond the scope of the ICR that was the basis for the EPA-based estimates.

Table 9-8 lists the specific activities cited by states in the activities categories EPA did not estimate costs, but states reported performing activities that were a material source of difference between the EPA-based and the state estimate.

Table 9-8: Activities Cited by Case Study States That Were Omitted by EPA

Category	State	Cited Activities
3. Designing Implementation Plan (Start-Up)		
	Oklahoma	▪ Annual revisions of DEQ rules to incorporate by reference the federal hazardous waste regulations.
	South Carolina	▪ Met with stakeholders and/or responded to stakeholder concerns regarding this rule.
8. Enforcement (Start-Up)		
	Oklahoma	▪ Estimate of time spent reviewing new federal regulations, reviewing current inspection checklists, updating checklists as needed, revising procedures as needed, etc.
	South Carolina	▪ Established new procedures for enforcing the new regulation.