

GAO

Report to the Ranking Minority Member,
Committee on Commerce, House of
Representatives

May 1995

NUCLEAR FACILITY CLEANUP

Centralized
Contracting of
Laboratory Analysis
Would Produce
Budgetary Savings



**Resources, Community, and
Economic Development Division**

B-260566

May 8, 1995

The Honorable John D. Dingell
Ranking Minority Member
Committee on Commerce
House of Representatives

Dear Mr. Dingell:

Environmental cleanup is a costly effort that the nation is now undertaking, involving federal agencies as well as private industry. The Department of Energy (DOE), tasked with cleaning up the massive contamination resulting from more than 50 years of production at its nuclear weapons facilities, estimates that this cleanup will cost at least \$300 billion (and perhaps as much as \$1 trillion) and take more than 30 years to complete. The laboratory analysis (of soil and water, for example) necessary to assess the kind and level of contamination at these facilities is expected to cost at least \$15 billion, according to DOE's estimates. DOE's approach to such analysis is decentralized; that is, the contractors that primarily manage and operate the Department's facilities independently obtain such laboratory analysis either through commercial laboratories or contractor-operated laboratories. In contrast, the Environmental Protection Agency (EPA), which oversees the cleanup of Superfund sites,¹ contracts for the same types of analysis² on a centralized basis.

Concerned about the budgetary impact of the large expenditures for DOE's laboratory analysis, you asked us to (1) compare the average prices that DOE and EPA pay to commercial laboratories for the same types of analysis and determine whether the two agencies' different contracting approaches affect these prices, (2) identify whether DOE's decentralized approach has resulted in any administrative inefficiencies, and (3) discuss any key changes DOE is making in its contracting for laboratory analysis. We analyzed the prices paid by four DOE contractors that accounted for 68 percent of DOE's costs for laboratory analysis in fiscal year 1994.³ Appendix I provides more detail on our analysis of these prices.

¹The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, authorized the creation of a funding mechanism—a "Superfund"—to pay for the cleanup of contaminated sites. The term Superfund has also been used to refer to the program and the sites that will be cleaned up under the act.

²EPA has developed specific procedures to be followed for organic and inorganic analyses under its Superfund program. DOE's contractors also use these procedures.

³DOE has 15 major facilities operated by contractors. We analyzed the prices paid at DOE's facilities at Fernald, Ohio; Hanford, Washington; Rocky Flats, Colorado; and Oak Ridge, Tennessee.

Results in Brief

DOE paid substantially higher prices than EPA for the same types of laboratory analysis at commercial laboratories. For example, DOE's price for inorganic chemical analysis averaged \$358, about 223 percent more than EPA's price of \$111. If DOE had obtained the same prices as EPA did under a centralized approach, it would have saved \$247 per analysis, on average. While we believe that savings could be achieved through centralization, the amount of savings is difficult to estimate for several reasons. For example, DOE does not know the number of analyses it performs since it only recently started to collect this information. Additionally, DOE does not know the extent to which its prices are affected by the potential for radioactivity in the samples. However, DOE's most recent sampling statistics, for fiscal year 1994, show that 85 percent of the organic and inorganic samples were not radioactive.

Because of multiple contract awards and contract management activities, DOE's decentralized approach results in numerous inefficiencies. For example, EPA conducts two procurements, one for the organic analysis and one for the inorganic analysis commonly used for Superfund sites. In contrast, more than 40 different DOE contractor organizations⁴ procured organic and inorganic analyses in fiscal year 1994. For each of these procurements, the contractors are required to perform numerous duplicate administrative tasks, such as soliciting bids, ensuring that the laboratories can do the analysis, and awarding contracts. For example, in 1995, DOE's Inspector General reported that the Department's contractors performed 103 duplicate and redundant quality assurance evaluations at 38 commercial laboratories.

DOE's annual operating plan for 1994 outlines 17 initiatives designed to improve many phases of its laboratory analysis program. For example, to reduce the number of duplicate quality assurance evaluations, DOE is considering using a third-party organization to qualify commercial laboratories for contracts. However, DOE does not plan to change its decentralized approach.

Background

DOE is undertaking the cleanup of contaminants that were dumped or leaked into the soil and water at its facilities during more than 50 years of nuclear weapons production. According to a recent DOE estimate, this contamination is spread over 7,000 sites at 15 major facilities and more than 100 smaller facilities across the nation. Under the Superfund

⁴Some contractors made separate procurements for the different program organizations within their firms.

program, EPA also is engaged in an expansive cleanup of some of the same contaminants at the nation's worst nonfederal sites, except that EPA does not face the same potential for radioactivity that DOE does at its facilities. Both agencies perform laboratory analysis on samples of soil and water taken from polluted sites to determine the type and level of contamination. Contaminants include (1) organic chemicals such as benzene and fluorene, (2) inorganic chemicals such as arsenic and mercury, and (3) radiochemicals.⁵

DOE Pays Higher Prices Than EPA

DOE pays substantially higher prices than EPA for the same types of laboratory analysis at commercial laboratories. Furthermore, the four DOE contractors we reviewed sometimes contracted with the same commercial laboratories used by EPA. Yet EPA paid an average of \$111 for inorganic analysis, while DOE's four contractors paid an average of \$358, or 223 percent more.⁶ Likewise, EPA paid an average of \$786 for organic analysis, while DOE's contractors paid \$1,099, or 40 percent more. In addition, as shown in table 1, the average price paid by the four contractors at each of the facilities was higher than the average price paid by EPA. Appendix I provides a more detailed comparison.

Table 1: Average Prices Paid by DOE and EPA for Organic and Inorganic Analyses

Facility	Average price	Percent above EPA's price	Average price	Percent above EPA's price
EPA	\$786	^a	\$111	^a
Rocky Flats	952	21	296	167
Hanford	1,026	31	329	196
Oak Ridge	1,178	50	358	223
Fernald	1,238	58	447	303
Average for DOE's contractors	\$1,099	40	\$358	223

^aNot applicable

⁵Some organic and inorganic substances also may be contaminated with radioactivity. In addition, DOE specifically analyzes for radiochemicals such as plutonium and uranium.

⁶For the Oak Ridge facility, the average prices included both those paid by the contractor and those paid by its subcontractors, which were procuring the same analyses.

DOE's Decentralized Contracting Results in Higher Prices

DOE's decentralized approach of allowing contractors to independently procure laboratory analysis results in higher prices than the prices EPA pays for the same analysis. EPA basically conducts one central procurement for the organic analysis and one for the inorganic analysis commonly used at its Superfund sites. In contrast, at least 40 DOE contractor organizations independently contract with commercial laboratories for laboratory analysis.

Lower prices can generally be achieved through the consolidated procurement of common-use items. The General Services Administration, for example, the federal agency tasked with economically and efficiently procuring property and services for most government agencies, combines the common needs of several federal agencies into a centralized procurement. In contrast, decentralized procurement of common-use items results in higher prices because this approach dilutes an agency's overall buying power.

Officials involved in laboratory analysis issues at major commercial laboratories and representatives from two industry associations generally agreed that DOE's decentralized contracting approach contributed to the higher prices the agency paid. They stated that if DOE centralized its procurement for commonly used analyses, the prices could be reduced. They also cited other advantages of a centralized approach. They said, for example, that bids for laboratory analysis vary according to the number of samples to be analyzed and the contractor's ability to provide a steady flow of samples to keep a laboratory operating efficiently. In their view, one of the reasons that DOE paid higher prices was the uncertain and irregular flow of samples from over 40 different DOE contractor organizations, in contrast to a steadier flow of samples from EPA. By consolidating samples, centralized procurement is more likely to result in a continuous flow of samples.

It is difficult to quantify the overall savings resulting from a centralized approach on the basis of the differences between the average prices paid by EPA and DOE because DOE has only recently started collecting data on the number of analyses performed for the Department by commercial laboratories, and those data are not yet complete or precise. Commercial laboratory officials also told us that while savings could occur, some of DOE's samples, unlike EPA's typical samples, may be radioactive and require screening and special handling, increasing the price of the analysis. However, DOE's most recent sampling statistics, for fiscal year 1994, show that 85 percent of the organic and inorganic samples were not radioactive.

Recognizing these constraints, we developed two estimates that show possible savings over 30 years, ranging from about \$0.49 billion to about \$1.26 billion. The difference in the two estimates depends on the extent of radioactive samples. To develop the estimate of \$0.49 billion in savings, we assumed that, under centralized procurement, DOE would obtain the equivalent of the prices paid at Rocky Flats because (1) they were the lowest prices paid at the DOE facilities we reviewed and (2) as at other DOE facilities, the samples are potentially radioactive, which would add to the cost of analysis. This estimate, therefore, assumes that the total difference between the prices paid by EPA and by the Rocky Flats contractor is caused by the potential for radioactivity and that, under centralized procurement, DOE could only match the prices paid by the Rocky Flats contractor and not the lower prices paid by EPA. The estimate of \$1.26 billion uses EPA's average prices as a baseline. This estimate shows the potential savings arising from centralized procurement because that is the approach EPA uses. However, this estimate does not reflect the cost effect of the potential for radioactivity in DOE's samples, since EPA's samples are not typically radioactive. (App. I explains the assumptions and calculations for these estimates.)

DOE's Decentralized Contracting Results in Administrative Inefficiencies

Under DOE's decentralized approach, the Department's contractors duplicate many of their efforts in both awarding and managing contracts, especially as a result of redundant quality assurance evaluations at the commercial laboratories. In addition, when contractors try to decide whether to have analyses performed at commercial laboratories or perform them in the DOE laboratories they operate, they may not select the most efficient use of DOE's resources because they do not know their true costs of doing the analysis in the DOE laboratories. Ultimately, DOE pays the costs of these inefficiencies in higher payments to contractors and in duplicate oversight of contractors.

Inefficiencies result from the decentralized awarding of contracts. For any organization, including DOE and EPA, this process requires the same basic functions, such as soliciting bids, ensuring that the commercial laboratories can perform the analysis, and making the award. EPA basically conducts two procurements to meet its needs over a 3-year period—one for commonly used organic analysis and the other for commonly used inorganic analysis. EPA thus performs the related functions only once for each analysis. In contrast, DOE repeats these functions over and over again because its contractors award their own contracts covering their needs for varying time periods. DOE's current contracts have resulted from at least 45

procurements for organic analysis, 43 procurements for inorganic analysis, and 38 procurements for radiochemical analysis. In some cases, duplication occurs within a single contractor's organization. For example, at one facility, the contractor and two of its subcontractors conducted three separate procurements for the same kind of analysis.

Further inefficiency results because the contracts for laboratory analysis allow DOE's contractors to conduct quality assurance evaluations of the commercial laboratories' work. Because DOE's decentralized approach results in many individual contracts, DOE's contractors award contracts to the same commercial laboratories and then conduct numerous evaluations of them. In a 1995 draft report, DOE's Inspector General stated that the contractors performed 103 duplicate and redundant quality assurance evaluations on 38 commercial laboratories during 1993 and 1994. At one commercial laboratory, 11 redundant evaluations were performed by nine different DOE contractors.⁷ According to the commercial laboratories included in the Inspector General's review, the evaluations frequently required a substantial investment of their staff's time and disrupted their operations.

Decisions made by DOE's contractors in determining whether to have the analysis performed in the DOE laboratories they operate or in commercial laboratories may result in an inefficient use of DOE's resources. Although DOE's procurement regulation requires contractors to consider cost as a significant factor in deciding whether the work should be done in a contractor-operated laboratory or at a commercial laboratory, contractors may consider other factors in making their decisions. The DOE officials responsible for the program told us that the contractors do not comprehensively and completely account for the costs of the laboratories they operate. Furthermore, even when the contractors use such data to compare costs, they may not make the most cost-effective decisions. For example, DOE's Inspector General, using costs developed for the Rocky Flats laboratory by the facility's contractor, reported that the contractor was using its laboratory even though commercial laboratories were 44 percent less costly.⁸

⁷Audit of the Department of Energy's Commercial Laboratory Quality Assurance Evaluation Program, draft report, to be issued in the spring of 1995.

⁸Audit of Effectiveness and Efficiency of the Rocky Flats Analytical Services Program (CR-B-95-01, Nov. 3, 1994).

DOE Is Making Some Improvements but Is Not Centralizing Its Contracting

While DOE is not currently planning to centralize its contracting for laboratory analysis, it does plan to take actions it believes will improve the current system. DOE's annual operating plan for 1994 outlines 17 initiatives designed to improve many phases of its laboratory analysis program. Three of these 17 initiatives, as well as another action taken in response to a recommendation made by DOE's Inspector General, directly relate to the issues of price and inefficiency discussed in this report. Generally, however, these initiatives are likely to have only limited effects. They will not realize the cost savings possible as a result of centralized procurement, nor will they completely eliminate the inefficiencies of decentralization, except concerning the duplication of quality assurance audits. These four actions follow.

First, in response to the Inspector General's draft report showing duplication of effort in the contractors' quality assurance evaluations, DOE is considering the report's recommendation to authorize a third-party organization to qualify commercial laboratories for contracts. This organization would evaluate the laboratories and certify that they are able to perform the analysis. While DOE has not made its final decision, it believes that the same organization also could perform the quality assurance evaluations on the laboratories after the contracts are awarded to ensure continued quality performance. If such a plan is adopted, it could eliminate the duplicate evaluations that contractors are now conducting to qualify laboratories for contracts.

Second, in August 1994 DOE's Assistant Secretary for Environmental Management issued a policy requiring the operations offices to collect summary information on local sampling and analysis and communicate the information to headquarters so that headquarters could monitor the program. DOE program officials told us that while this effort appears limited, they hoped that it could eventually be expanded so that only one contractor at each of the agency's operations offices will procure laboratory analysis.

Third, DOE has been drafting model procurement guidance for its contractors that could incorporate standard provisions on such issues as the time allowed to analyze a sample and reduced prices when the analysis is not timely. However, as a result of the contractors' continuing disagreements among themselves and with DOE about the various provisions, this effort has stalled.

Fourth, DOE is attempting to improve the ability of its contractors to choose between having the analyses done in commercial laboratories and in their own laboratories. Among other things, DOE is developing guidance on what types of costs the contractors should allocate to their laboratories and to commercial laboratories in making this decision. Although such guidance can help, the costs that DOE will ask the contractors to use will reflect the inefficiencies and higher costs of decentralized procurement.

Conclusions

Unlike EPA, which consolidates its total requirements for commonly used analyses, DOE dilutes its massive buying power by procuring its commonly used analyses on a piecemeal basis through its contractors. The results of DOE's contracting approach are higher prices and unnecessary costs resulting from duplication of the contractors' efforts. Without centralizing its laboratory analysis procurements, DOE will not realize the cost benefits resulting from its massive buying power.

Recommendations

To realize the cost savings inherent in centrally procured laboratory analysis and to eliminate other related inefficiencies resulting from decentralization, we recommend that the Secretary of Energy centralize the procurement of its commonly used laboratory analyses for environmental contaminants in the cleanup of its nuclear facilities. In doing so, the Secretary should also identify and eliminate the contractor resources that will no longer be needed under a central procurement system.

Agency Comments

As requested, we did not obtain written agency comments on a draft of this report. However, we discussed the factual information in the report with the Deputy Assistant Secretary for Compliance and Program Coordination in DOE's Office of Environmental Management; the Director, Analytical Services Division, Office of Environmental Management; and the Director, Contract Reform Project Office. These officials generally agreed with the facts presented and provided additional comments. They noted that DOE's contractors have historically resisted change but that this resistance is diminishing and may not be a major impediment to implementing a centralized system for procuring laboratory analysis within DOE. They did state that centralization is contrary to DOE's current efforts to decentralize many functions but said that decentralization is less important than achieving cost savings. Finally, these officials explained that their original cost estimate of \$15 billion for laboratory analysis may

be reduced in the future if plans to improve the current sampling process succeed in reducing the program's costs. However, at this time these officials could not estimate the cost more accurately.

We conducted our review from May 1994 through March 1995 in accordance with generally accepted government auditing standards. Details of our scope and methodology are presented in appendix I.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will provide copies to the Secretary of Energy; the Director, Office of Management and Budget; the House Committee on Government Reform and Oversight; the Senate Committee on Governmental Affairs; the House and Senate Committees on Appropriations; and other interested parties. We will also make copies available to others upon request.

If you have any questions about this report, please call me at (202) 512-3841. Major contributors to this report are listed in appendix II.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is fluid and cursive, with the first name "Victor" and last name "Rezendes" clearly distinguishable.

Victor S. Rezendes
Director, Energy and
Science Issues

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Abbreviations

DOE	Department of Energy
EPA	Environmental Protection Agency
GAO	General Accounting Office

Scope and Methodology

We conducted our review of the prices paid for analysis by contractors at the Department of Energy's (DOE) facilities at Fernald, Ohio; Hanford, Washington; Rocky Flats, Colorado; and Oak Ridge, Tennessee because they accounted for 68 percent of DOE's costs for commercial laboratory analysis in fiscal year 1994. Additionally, we interviewed the Director and staff of DOE's Analytical Services Division and reviewed related documents. We reviewed the Environmental Protection Agency's (EPA) contracts in Research Triangle Park, North Carolina, and interviewed the Chief and staff of the Analytical Operations Branch of EPA's Contract Laboratory Program in Arlington, Virginia. Finally, we reviewed reports by DOE's Inspector General on the laboratory analysis program. To obtain industry's view of DOE's contracting approach, we discussed our review with four commercial laboratories that had contracts with DOE's contractors; two of these laboratories also had current contracts with EPA. We also talked with officials involved with laboratory analysis issues at two industry associations—the International Association of Environmental Testing Laboratories and the Association of Independent Scientific, Engineering and Testing Firms.

Comparison of Prices Paid by DOE and EPA

To compare the average prices that DOE and EPA paid for the same analyses of organic and inorganic contaminants, we used the prices that were in effect during the first 9 months of 1994. Our universe of prices included, for EPA, 35 contract prices for organic analysis and 19 contract prices for inorganic analysis and, for DOE's contractors, 33 contract prices for organic analysis and 36 contract prices for inorganic analysis. We used this procedure because averaging prices over a period of time provides a more realistic average price since doing so reduces the impact of any one price. We also reviewed the contract documents that EPA and DOE's contractors used and discussed their provisions with the Chief and staff of EPA's Analytical Operations Branch of the Contract Laboratory Program and with officials in the contractors' program and contracting offices.

The organic analysis includes three separate analyses—for volatile organic compounds, semivolatile organic compounds, and pesticides/polychlorinated biphenyls. EPA procured these three analyses together in one procurement and paid one overall price. DOE's contractors, on the other hand, procured these three analyses separately. To compare the prices paid by the two agencies, we added the prices of the three separate analyses to obtain the price DOE paid for the complete analysis. We discussed this procedure with commercial laboratories, which agreed that this comparison was acceptable and valid.

EPA's procurements of organic and inorganic analyses each included only one price for the analysis of contaminants in a water or soil solution, referred to as the matrix. DOE's contractors paid separate prices for analyses in soil and water matrixes. Therefore, to compare DOE's prices with EPA's, we had to calculate an overall average price using the prices for the two matrixes. To do this, we identified the prices for each matrix and developed a weighted average for the overall average price for organic and inorganic analyses. For example, if a facility's contractor paid six prices for analysis of contaminants in soil and seven prices for analysis of contaminants in water, we added the total of all 13 prices and divided by 13 to obtain the weighted average price at that facility. Table I.1 shows the average prices paid by the contractors for organic analysis in water and soil matrixes and the weighted average price for organic analysis. Table I.2 shows the same information for inorganic analysis.

Table I.1: Average Prices Paid by DOE for Organic Analysis in Soil and Water Matrixes

DOE facility	Average price in soil matrix	Average price in water matrix	Weighted average
Fernald	\$1,279	\$1,197	\$1,238
Hanford	1,080	973	1,026
Rocky Flats ^a	930	971	952
Oak Ridge	1,214	1,143	1,178

^a The average price paid for analysis in a soil matrix was lower than the average price paid for analysis in a water matrix because one laboratory had a high contract price analysis in water but no contract for analysis in soil.

Table I.2: Average Prices Paid by DOE for Inorganic Analysis in Soil and Water Matrixes

DOE facility	Average price in soil matrix	Average price in water matrix	Weighted average
Fernald	\$468	\$426	\$447
Hanford	334	325	329
Rocky Flats	296	296	296
Oak Ridge	373	343	358

To determine the causes of the differences in the prices paid by the contractors, we identified the commercial laboratories that had contracts for analysis with each of the four contractors we reviewed. Table I.3 shows the average prices paid for organic and inorganic analyses at the same four laboratories by the contractors at Hanford, Oak Ridge, and Fernald. The average price paid by the Rocky Flats contractor includes the prices at only two of the four laboratories since only these two had contracts with Rocky Flats.

Table I.3: Comparison of Average Prices for the Same Analyses Paid to the Same Commercial Laboratories by DOE's Contractors

DOE facility	Organic analysis	Inorganic analysis
Rocky Flats	\$843	\$211
Hanford	994	322
Oak Ridge	1,179	434
Fernald	1,262	425

We reviewed the four facilities' contracts to identify reasons for the variations in price. Although actual differences in the facilities' contracts caused by decentralization could account for some of the price differences, we could not segregate any one cause that significantly affected the price from the effect on price of other factors. Additionally, any such differences would not occur in a centralized contract since all of the facilities would use the same contract.

Estimate of Potential Savings

To show potential savings, we prepared two estimates that show possible savings over 30 years, ranging from about \$0.49 billion to about \$1.26 billion. We developed this range of savings because EPA's prices, obtained through centralized procurement, do not reflect the costs resulting from potential radioactivity in the samples. On the other hand, DOE's prices reflect the potential for such radioactivity but were obtained through decentralized procurement. Our estimates therefore, make several assumptions to give a general idea of potential savings. First, to develop the estimate of \$0.49 billion in savings, we assumed that, under centralized procurement, DOE would pay the equivalent of the prices paid by the Rocky Flats contractor, because these were the lowest of the prices paid at the DOE facilities we reviewed and because the samples at Rocky Flats, as at other DOE facilities, are potentially radioactive. This estimate therefore assumes that the total difference between the prices paid by EPA and by the Rocky Flats contractor is caused by the potential for radioactivity and that under centralized procurement, DOE could only match the prices paid at Rocky Flats. We believe our assumptions make this a conservative estimate that reflects the low end of potential savings. Second, to develop the estimate of \$1.26 billion in savings, we assumed that DOE could obtain the same prices that EPA obtained. While this estimate uses prices obtained through centralized procurement, it does not consider any effect due to the potential for radioactivity in DOE's samples. Since this estimate does not consider the potential effect of radioactivity, we believe it reflects the high end of potential savings.

Our first estimate is based on the difference between the prices paid at Rocky Flats and those paid at the other facilities. We began with DOE's estimate that at least \$15 billion will be spent on laboratory analysis and administrative costs over 30 years. Since the contractor at Rocky Flats paid the lowest prices and we are using them as our baseline, we eliminated the costs associated with laboratory analysis at Rocky Flats from the \$15 billion. To do this, we deducted the costs at Rocky Flats—which amounted to 13 percent of the total expenditures for analysis for 1994—from the \$15 billion. This resulted in an estimated cost for the remaining facilities of \$13.05 billion. As shown in table I.4, we then multiplied the \$13.05 billion by the amount that DOE's contractors awarded to commercial laboratories during fiscal year 1994 (65 percent of the total expenditures for analysis) to show that about \$8.48 billion eventually may be associated with the laboratory analysis performed by commercial laboratories. DOE estimates that 31 percent of all the commercial laboratory costs are allocated solely to analysis; the remainder is spent on such things as the DOE contractors' costs of managing the procurement of laboratory analysis, shipping samples to the laboratories, and providing assurance that the laboratory's analysis is valid. According to our estimate, 31 percent of \$8.48 billion, or \$2.63 billion, will be spent on laboratory analysis. Of the \$2.63 billion, DOE estimates that 31 percent (or \$0.82 billion) will be spent for organic analysis of various kinds, 33 percent (or \$0.87 billion) for inorganic analysis of various kinds, and 36 percent (or \$0.95 billion) for radiochemical analysis. Assuming that contractors at the other DOE facilities could obtain the same prices as Rocky Flats' contractor, DOE could save 22 percent on its inorganic analysis and 17 percent on its organic analysis. These saving rates would result in a potential savings of about \$0.14 billion for organic analysis and about \$0.19 billion for inorganic analysis. If we applied the smaller savings associated with organic analysis—17 percent—to the \$0.95 billion for radiochemical analysis, the additional potential savings would be \$0.16 billion. The total potential savings for all of the analyses would then amount to \$0.49 billion over 30 years. This estimate of savings assumes that there will be no offsetting costs due to the termination of any laboratory contracts.

Table I.4: Calculation of Potential Savings, With Prices Paid at Rocky Flats as a Baseline

Dollars in billions		
Factor	Calculations	Cost
Estimated 30-year cost excluding Rocky Flats	^a	\$13.05 ^b
Percentage of costs at commercial laboratories	65% x \$13.05 billion =	\$8.48
Percentage of costs for sample analysis (less overhead)	31% x \$8.48 billion =	\$2.63
Percentage of costs for		
organic analysis	31% x \$2.63 billion =	\$0.82
inorganic analysis	33% x \$2.63 billion =	\$0.87
radiochemical analysis	36% x \$2.63 billion =	\$0.95
Difference between prices at Rocky Flats and at other facilities for		
inorganic analysis	22% x \$0.87 billion =	\$0.19
organic analysis	17% x \$0.82 billion =	\$0.14
Applied savings for radiochemical analysis	17% x \$0.95 billion =	\$0.16
Total estimated savings		\$0.49

^a Not applicable.

^b In nominal dollars.

Our second estimate is based on differences between the average prices paid by DOE and EPA. Although this comparison would more closely show the potential savings that could be obtained through centralization, it does not consider the effects of potential radioactivity in the samples on DOE's prices. We believe this estimate shows the high end of potential savings. We began with DOE's estimate that at least \$15 billion will be spent on laboratory analysis and administrative costs over 30 years. As shown in table I.5, we then multiplied the \$15 billion by the amount that DOE's contractors awarded to commercial laboratories during fiscal year 1994 (65 percent of the total expenditures for analysis) to show that about \$9.75 billion eventually may be associated with the laboratory analysis performed by commercial laboratories. Thirty-one percent of \$9.75 billion, or \$3.02 billion, will be spent on laboratory analysis. Of the \$3.02 billion, DOE estimates that 31 percent (or \$0.94 billion) will be spent for organic analysis of various kinds, 33 percent (or \$1 billion) for inorganic analysis of various kinds, and 36 percent (or \$1.09 billion) for radiochemical analysis. Assuming that DOE could obtain the same prices as EPA, DOE could save 69 percent on its inorganic analysis and 28 percent on its organic analysis. At these rates, the potential savings would be about \$0.26 billion

for organic analysis and about \$0.69 billion on inorganic analysis. If we applied the smaller savings associated with organic analysis—28 percent—to the \$1.09 billion for radiochemical analysis, the additional potential savings would be \$0.31 billion. The total potential savings for all of the analyses would then amount to \$1.26 billion over 30 years. As in our first estimate, this estimate assumes that there will be no offsetting costs due to the termination of any laboratory contracts.

Table I.5: Calculation of Potential Savings, With Prices Paid by EPA as a Baseline

Dollars in billions		
Factor	Calculations	Cost
Estimated 30-year cost	^a	\$15.00 ^b
Percentage of costs with commercial laboratories	65% x \$15 billion =	\$9.75
Percentage of costs for sample analysis (less overhead)	31% x \$9.75 billion =	\$3.02
Percentage of costs for		
organic analysis	31% x \$3.02 billion =	\$0.94
inorganic analysis	33% x \$3.02 billion =	\$1.00
radiochemical analysis	36% x \$3.02 billion =	\$1.09
Difference between DOE's and EPA's costs for		
inorganic analysis	69% x \$1.00 billion =	\$0.69
organic analysis	28% x \$0.94 billion =	\$0.26
Applied savings for radiochemical analysis	28% x \$1.09 billion =	\$0.31
Total estimated savings		\$1.26

^aNot applicable.

^bDOE's estimate (in nominal dollars).

We could not estimate the savings that would result from reducing the duplication and inefficiencies resulting from DOE's decentralized contracting approach.

Evaluation of DOE's Inefficiencies and Assessment of DOE's Efforts to Improve

To evaluate the inefficiencies of DOE's contracting approach caused by duplication of effort, we discussed the contracting function with contractors at the Department's Fernald, Hanford, Los Alamos, Oak Ridge, and Rocky Flats facilities. Additionally, to get a better idea of the number of contractors that had contracts for laboratory analysis, we surveyed all other DOE contractors that the Department believed might have had contracts for laboratory analysis.

To identify DOE's actions to improve its program, we reviewed documents describing these improvement efforts and evaluated their potential to lower the prices DOE pays for laboratory analysis and to reduce its inefficiencies. We also discussed these efforts with the Director and staff of DOE's Analytical Services Division.

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