SPECIAL ANALYTICAL SERVICES

When EPA regions request analysis that does not fall under RAS statements of work, the Sample Management Office subcontracts with labs for special analytical services. The SAS solicitation and award process includes the following steps: (1) the Sample Management Office generates a weekly list of RAS labs eligible for SAS subcontracts; (2) regions specify the type of SAS work needed, including the method of analysis, number of samples, and quality measures; (3) the Sample Management Office solicits selected eligible labs for individual SAS requests; and (4) the Sample Management Office awards SAS subcontracts to labs on the basis of low bid price.

The Sample Management Office generates a weekly list of "SAS eligible" labs using the following criteria: (1) current RAS lab; (2) adequate lab capacity; (3) timeliness (the lab is not currently late in submitting RAS or SAS data); (4) acceptable RAS performance evaluation scores; and (5) no serious laboratory problems that have caused the project officer to stop sending samples. Non-RAS labs may be solicited if the Sample Management Office identifies fewer than five eligible RAS labs or if eligible RAS labs cannot do a particular type of analysis.

Sample Management Office procedures state that, whenever possible, at least five labs are to be solicited for SAS subcontracts to ensure adequate competition. If five or more labs are identified on the weekly "SAS eligible" list, the Sample Management Office proceeds with the solicitation. The solicitation may occur by telephone or in writing, depending on the size and complexity of the subcontract. If fewer than five eligible labs are identified, some of the above criteria may be waived in order to ensure adequate competition. For example, labs that have been late in analyzing samples may be solicited. If non-RAS labs are to be solicited, the Sample Management Office prefers labs that have previously participated in the CLP and labs with contracts for other EPA programs. The regional office requesting the SAS work can also recommend labs, but the final decision on SAS subcontract awards is made by the Sample Management Office. If, after taking these alternative actions, only one or two eligible labs are identified, procedures require that the contracting officer and project officer be notified before the solicitation proceeds.

In a May 1987 review of SAS subcontract awards, EPA's Procurement and Contracts Management Division reported that in the 54 SAS cases reviewed, 5 labs were usually solicited for SAS subcontracts and 2 or 3 bids were received. Although the Division found that the Sample Management Office awarded SAS subcontracts to the lowest bidders, the Division recommended that it increase competition, especially for large SAS subcontracts. In response to the review, the Sample Management Office plans to solicit all eligible labs for each SAS subcontract over $100,000 and to

SECTION 4

HOW ARE LABORATORY ANALYTICAL RESULTS REVIEWED?

CLP analytical results are reviewed for two purposes: EPA regions review data packages for usability, and the Sample Management Office reviews data packages for contract compliance. CLP labs provide copies of data packages concurrently to the Sample Management Office and the EPA region requesting the sample analyses. The region may perform its review for data usability at the same time that the Sample Management Office is screening the data for contract compliance. If a lab submits new or revised data in response to contract compliance screening, the data are sent concurrently to the EPA region and the Sample Management Office.

REGIONS REVIEW DATA TO DETERMINE THEIR USABILITY

Contract labs submit analytical results to EPA regions for review by chemists. The regional reviewers provide an assessment of the data and their usability to the ultimate users--EPA regional Superfund staff and Superfund contractors. Regional reviewers may identify problems with part or all of a data package. The regional review is intended to communicate to data users, who may not be chemists, any limitations they should consider in using data to make decisions about hazardous waste sites.

Problems usually affect only part of a data package, with some data items still being usable. For example, a reviewer may conclude that the user can rely on the lab's identification of a particular substance detected in a sample but not on the concentration levels reported by the lab. Regional review officials told us that it is unusual for a region to reject an entire data package.

The usability of analytical results can be affected by several factors. According to the quality assurance officer, some data problems result from the nature of the samples. For example, if a sample is oily, the oil may interfere with analysis. In other cases, an initial analysis of a sample batch may indicate that a different analytical method is needed or a substance not covered by the standard contract requirements is present. In such cases, the region may initiate a request for special analytical services. Other data problems are due to contract labs' making computation errors or not following required procedures.

The Sample Management Office notifies labs of any problems identified during contract compliance screening, and the lab has 10 calendar days to respond and correct the data package. Labs may submit data forms that were missing, resubmit data with corrections, or provide explanations. Screening results and lab responses are also sent to the EPA region that requested the data. Regional personnel have stated that contract compliance screening was beneficial to them in providing more complete data packages, according to a review of contract compliance screening performed by Arthur Young and Company.

Problems identified during the screening process are often corrected by the laboratory. Rates of completeness and compliance for sample analyses are higher following lab response to screening than when data packages are initially submitted. This is shown in table 4.1, which covers the periods for which contract compliance screening has been linked to payment determination, beginning in October 1986 for organic data packages and in June 1987 for inorganic data packages.

Table 4.1: Completeness and Compliance Rates as Determined by Contract Compliance Screening

	Upon initial screening (percent)	After lab response (percent)
Organic data packages (10/86 through 12/87)		
Samples complete	56	95
Samples substantially compliant	64	82
Inorganic data packages (6/87 through 11/87)[a]		
Samples complete	39	95
Samples substantially compliant	50	91

[a]Because the Sample Management Office introduced a new screening protocol in December 1987 for inorganic data packages, the screening results for the month of December are not included. The Sample Management Office estimates that it will take several months for CLP labs to adjust to the new protocol.

EPA regions that will use the SAS data review them to determine their usability, using the SAS statements of work as criteria for the review. If regional review identifies problems with SAS data, the region notifies the Sample Management Office, which discusses the issue with the laboratory and may direct the lab to provide additional data.

TOOLS AVAILABLE TO DEAL WITH POOR PERFORMANCE

In addition to payment reductions for poor lab performance, EPA responses to poor performance can range from situations in which project officers, deputy project officers, and labs work together in an informal way to resolve problems to contractual actions, including contract termination.

Noncontractual Actions

The usual response to poor performance is to have the project officer, a deputy project officer, and the lab work together informally to resolve lab problems. When poor performance is discovered, the project officer or deputy project officer discusses the problem with the lab by telephone and frequently asks the lab to respond in writing as to what corrective actions are being taken. Poor performance includes failing quarterly performance evaluation scores, late or faulty analysis, and problems revealed by an on-site lab evaluation, such as a shortage of staff or equipment. If necessary, they schedule an on-site visit in order to work directly with the lab in resolving problems.

If a problem persists, the project officer can take the more serious action of placing the lab "on hold." A lab placed on hold does not receive additional samples to analyze until it resolves the problem. According to one contracting officer, placing a lab on hold is a serious action because a lab loses money when it is not analyzing samples, and since a hold may harm the lab's reputation, its future business may be negatively affected.

According to a November 1986 memo from the CLP national program manager, the project officer should place a lab on hold if it fails the quarterly performance evaluation test and require it to analyze a second, different test sample. If the lab performs unacceptably on the second test sample, the project officer should recommend contractual action. However, we did not determine how often project officers placed labs on hold for unacceptable performance evaluation scores.

Contractual Actions

When performance problems reach the point where EPA considers the possibility of terminating the contract, EPA's Procurement and Contracts Management Division pursues contractual actions. For instance, if a lab has been placed on hold and has since failed to resolve problems identified by the project officer, the contracting officer can initiate contractual action, including cure and show cause notices and, as a last resort, contract termination. Both cure and show cause notices outline the problem and warn of contract termination if the problem is not resolved. A cure notice requires a lab to cure the problem within a stated time period or

SCOPE AND METHODOLOGY

Our review of the Contract Laboratory Program was performed primarily at EPA headquarters in Washington, D.C.; at EPA Region II (New York); and at the offices of Viar and Company (Alexandria, Virginia), a contractor responsible for many management functions for the lab program. We also visited EPA Region I (Boston), Region III (Philadelphia), and the EPA Environmental Monitoring Systems Laboratory (Las Vegas, Nevada). It was agreed with EPA officials that these three regions would give us a representative view of similarities and differences among regional office operations and approaches. Our review was performed from June 1987 through January 1988.

Our work was primarily limited to determining how the program is carried out in terms of (1) the selection of laboratories for program participation, (2) the processing of samples for laboratory analysis, and (3) EPA's evaluation of laboratory performance and compliance with contractual requirements. As requested, we did not assess the effectiveness of EPA's efforts to ensure data quality and contract compliance, to monitor laboratory performance, and to take action in cases of poor performance.

To obtain information on program operations, we interviewed EPA officials in the Analytical Operations Branch of the Hazardous Site Evaluation Division, the Procurement and Contracts Management Division, and the Environmental Monitoring Systems Laboratory. We reviewed the contracts' statements of work, Contract Laboratory Program user's guide, documents describing quality assurance activities, selected project officer files on laboratories, reports on payments to contract labs, and other relevant documents. We obtained and analyzed records pertaining to bidding, evaluation, and contract award for five recent Invitations for Bid. We also interviewed officials of Viar and Company and reviewed their procedures for contract compliance screening and awards for special analytical services subcontracts. In EPA Regions I, II, and III, we interviewed EPA Superfund program staff and regional laboratory staff involved in reviewing analytical results and monitoring contract labs. In addition, we reviewed guidelines for regional review, policy statements, and other relevant documents.

EPA REGIONAL STAFF

FUNCTION: Perform liaison between Superfund contractors and other CLP organizations, review data packages for usability, and assist project officers

-- Deputy project officers--assist project officers in monitoring lab performance

-- Data reviewers--review data packages for usability

-- Regional sample control centers--process requests from Superfund contractors for analysis

-- Superfund staff--approve sampling plans and use analytical results in making decisions about Superfund sites

SUPERFUND CONTRACTORS

FUNCTION: Conduct site inspections, remedial investigations, and feasibility studies and incorporate analytical results into reports for EPA

-- Request sample analyses to determine the presence and concentration of toxic substances at hazardous waste sites

-- Inspect sites and design remedies

CONTRACT LABS

FUNCTION: Analyze samples and prepare data packages of results as specified in CLP contracts and subcontracts

-- Provide routine analytical services for organic, inorganic, and dioxin samples

-- Provide special analytical services

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MAJOR CONTRIBUTORS TO THIS FACT SHEET

RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION, WASHINGTON, D.C.

J. Kevin Donohue, Group Director
Ralph J. Domenick, Evaluator-In-Charge
Rachel J. Hesselink, Evaluator
Sharon J. Tracey, Evaluator
Molly MacLeod, Reports Analyst
Tajuana Leach, Secretary

NEW YORK REGIONAL OFFICE, NEW YORK, N.Y.

Kenneth V. Greaney, Evaluator
Evelyn Nieves-Norrington, Evaluator

(089386)

ORGANIZATIONS AND FUNCTIONS OF THE CONTRACT LABORATORY PROGRAM

EPA HEADQUARTERS

FUNCTION: Manages, coordinates, and oversees the CLP

-- Contracting officers (Procurement and Contracts Management Division)--write, award, and oversee contracts

-- Project officers (Analytical Operations Branch)--oversee lab performance and approve payments for data packages

-- Project officer for the Sample Management Office (Analytical Operations Branch)--oversees operations of the Sample Management Office

SAMPLE MANAGEMENT OFFICE

FUNCTION: Manages CLP day-to-day

-- Schedules samples to labs

-- Reviews data packages for completeness and compliance with the contract's data and quality control requirements, called contract compliance screening

-- Recommends payment based on the results of screening

-- Subcontracts for special analytical services

-- Maintains databases and performs other management functions

EPA ENVIRONMENTAL MONITORING SYSTEMS LAB/LAS VEGAS

FUNCTION: Provides quality assurance and quality control

-- Prepares and evaluates performance evaluation samples

-- Participates in on-site lab evaluations

-- Performs quality assurance audits

face contract termination. A show cause notice gives a lab an opportunity to present any facts relevant to determining whether failure to perform was without fault or negligence on the contract lab's part, in order to make a termination decision. The choice as to which notice is sent depends upon the particular circumstances, such as the time remaining in the contract. In addition, a show cause notice may be sent if a lab does not respond to a cure notice.

If a lab did not correct the problem after receiving a cure and/or show cause notice, the final step would be contract termination by default by EPA's Terminations, Claims, and Appeals Unit. If EPA has met the contract's 10 percent minimum, no financial settlement is necessary; if the minimum has not been met, this unit can negotiate an equitable settlement. According to the contracting officers we interviewed, approximately seven contractual actions (cure or show cause notices) have been issued per year to CLP labs, and no CLP lab has ever been terminated by default.

SECTION 5

HOW DOES EPA ASSESS LABORATORY PERFORMANCE, AND WHAT TOOLS ARE AVAILABLE TO EPA TO DEAL WITH POOR PERFORMANCE?

OVERSIGHT OF LABORATORY PERFORMANCE

EPA relies on several measures of laboratory performance to assess the quality of analytical work submitted by CLP labs: quarterly performance evaluation tests; contract compliance screening of data packages; annual on-site lab evaluations; and occasional, randomly selected data audits. Quarterly, EPA's Las Vegas lab sends test samples to CLP labs for analysis. EPA evaluates the results of labs' analyses to assess their technical performance. Contract compliance screening, performed on data packages by the Sample Management Office, evaluates how well the lab has complied with the contract. This office also produces monthly and quarterly screening reports that provide summary information on how well each lab is complying with the contract as compared with other CLP labs. On-site lab evaluations, conducted by an EPA team annually as well as before a lab is initially awarded a contract, are used to evaluate the adequacy of lab equipment, staff, and lab procedures. Periodically, EPA's Las Vegas lab randomly selects CLP data packages and conducts a quality assurance audit on each. These in-depth data audits may identify problems that have been overlooked during contract compliance screening and regional data review.

The results of these performance measures are communicated to project officers at EPA headquarters. Project officers collect information on lab performance and use performance information to identify and respond to problems. As of January 1988, a total of 5 project officers were monitoring between 8 and 30 CLP labs each. For example, 1 project officer oversees 20 organic labs spread across several EPA regions. At the time of our review, EPA was developing trend reports to aid project officers in identifying performance problems over time.

EPA has assigned a deputy project officer in each region to assist the project officers in identifying performance problems. Project officers have other responsibilities in addition to monitoring performance (such as developing contractual language and participating in contract administration) and are not present in the regions. Deputy project officers monitor the day-to-day performance of labs located in their regions. They concentrate on technical questions and problems that arise in analyzing specific cases of samples. They also use the results of regional data package reviews to identify problems.

Contract Compliance Screening Affects Payment Recommendations

The Sample Management Office uses the results of contract compliance screening to recommend the payment amount for each data package, thus linking payment to the degree of contract compliance. The payment recommendations take into consideration responses made by labs to screening results. EPA project officers overseeing the contract labs review payment recommendations and approve the final payment amounts.

Payment recommendations follow formulas based on the number and types of problems. Problems with data packages are classified as major incompleteness, minor incompleteness, major noncompliance, or minor noncompliance. For instance, failing to perform or performing inadequate initial instrument calibration would be classed as a major noncompliance. Payment recommendations may also be affected by the timeliness of the data package in relation to contractual deadlines, with payment adjustments made for early and late submissions.

The Sample Management Office has standard operating procedures for computing payment recommendations. Analytical Operations Branch officials told us that these procedures have been approved by their branch and the contracting officer. For example, procedures in use at the time of our review stated that if a lab corrects all deficiencies identified by screening within 10 days and the initial data package was not excessively incomplete, 100 percent payment should be recommended. If a data package was excessively incomplete when initially received and the lab corrects all the deficiencies identified by screening within 10 days, 90 percent payment should be recommended. Payment formulas establish larger deductions for major noncompliance and excessive incompleteness than for minor problems.

Since payments for organic data have been linked to screening (October 1986 through December 1987), the average payment recommendation has been 93 percent. For inorganic data screened from June 1987 through November 1987, the average payment recommended was 88 percent.

Review of SAS Data

The Sample Management Office's review of SAS data is usually limited to ensuring that required data are submitted for every sample and substance specified. However, for SAS work that is similar to RAS requirements, such as RAS analysis performed under a faster turnaround time, the Sample Management Office does contract compliance screening of the RAS portion of the data. Since SAS work is done under subcontracts to the Sample Management Office, the Office determines the amount that will be paid for each SAS data package and makes payments to labs.

THE SAMPLE MANAGEMENT OFFICE REVIEWS DATA FOR CONTRACT COMPLIANCE

Contract compliance screening, performed by the Sample Management Office, is the review of data packages to determine their completeness and compliance with the contract's data and quality control requirements. The objectives of contract compliance screening are to (1) identify and resolve problems with data packages in a timely manner and (2) serve as a basis for recommending amount of payment. The authority for such screening is based on a contract clause that incorporates a provision of the federal acquisition regulations (48 CFR 52.246-4), which states that the government may inspect deliverables and reduce prices paid to reflect the value of the services.

Contract compliance screening is currently performed on all data packages delivered under the standard RAS contracts for organics, volatile organics, and inorganics, according to EPA and Sample Management Office officials. In fiscal year 1987, these types of analyses represented approximately 70 percent of the estimated cost for CLP Superfund analyses. The procedure is a recent one, as EPA began using screening results in determining payment amounts in October 1986 for organic data packages and in June 1987 for inorganic data packages. Contract compliance screening and payment recommendations based on screening for volatile organics data packages began in September 1987, when data packages under the new volatile organics contracts were first submitted. Because of the low volume of sampling under the dioxin RAS contracts and the diversity of SAS work, it has not been considered practical to develop a standardized review process for either the dioxin or the SAS data packages. The Sample Management Office checks all SAS packages to see that the required data have been submitted for each sample and chemical check requested, but regions are primarily responsible for reviewing SAS data.

Contract Compliance Screening Identifies Problems

To determine the completeness of data packages, Sample Management Office screening staff check for missing information and incomplete forms. To determine if quality control requirements were met, screening staff use work sheets based on contractual quality requirements to review data for each sample analyzed. (Each data package may cover as many as 20 samples.) For example, screeners check the date the lab received the sample and the date it was analyzed to ensure that the time specified in the statement of work was not exceeded. Screeners also check, for example, the lab's report on the calibration of instruments, which the statement of work requires each lab to perform before beginning analysis and periodically thereafter. According to the project officer for the Sample Management Office contract, screeners also spot-check the numerical calculations performed by the lab.

solicit more than the minimum of five labs for smaller SAS subcontracts whenever possible. According to the program manager of operations for the Sample Management Office, soliciting all eligible labs for each subcontract is often impossible due to the time required to provide identical information to each solicited lab and the need to meet deadlines for subcontract awards.

The contracting officer reviews and approves in advance all SAS subcontract awards for more than $25,000. In fiscal year 1987, 19 percent of the SAS subcontracts were over $25,000. Smaller subcontracts are awarded by the Sample Management Office without advance approval, and the project officer reviews a weekly report of SAS subcontract awards. The Sample Management Office pays the labs' invoices for SAS services and submits monthly vouchers to EPA for all its services, including the SAS subcontracts.

A number of bidding labs did not qualify for an RAS contract award because they failed the pre-award performance evaluation test. In total, 28 percent of the bidding labs failed the pre-award test (the failure rate ranged from 17 percent to 57 percent). According to one contracting officer, the high failure rate for pre-award tests is not surprising because labs are often not familiar with the extensive data packages and quality assurance measures required by EPA.

EPA had many more qualified labs bidding than it needed to fill the available bid lots. Of the analytically qualified labs (those labs that received an acceptable performance evaluation score), only 26 percent were awarded an RAS contract (the percent awarded ranged from 16 percent to 62 percent). According to one contracting officer, the CLP is attractive to labs because receiving a CLP contract award is good for a lab's commercial business: EPA contracts are considered by some labs and their commercial clients as a type of certification. The results of our analysis of recent contract awards are summarized in table 3.1.

Table 3.1: Analysis of Five Recent Invitations for Bid (IFB)

Invitation for bid number	No. of bidding labs	Minimum acceptable PE[a] score	No. labs with passing PE score	Percent labs with passing PE score	No. of contract awards	Percent labs with passing PE score awarded contract
WA-87-J001	30	72	13	43	8	62
WA-87-J002	58	72	44	76	11	25
WA-87-J003	25	72	19	76	3	16
WA-87-J004	30	81	21	70	6	29
WA-87-J005	48	81	40	83	8	20
Total	191[b]		137[b]	72	36[c]	26
Average	38		27		7	

[a]Performance evaluation.

[b]Numbers include double counting of some labs because the same lab may have bid under more than one IFB.

[c]The 36 contracts were awarded to 30 different labs (i.e., 1 lab was awarded 3 contracts under 3 different IFBs, and 4 other labs were awarded 2 contracts each under 2 different IFBs).

SECTION 3

HOW ARE LABORATORIES SELECTED FOR THE CLP?

ROUTINE ANALYTICAL SERVICES

EPA's contract award process for routine analytical services is designed to ensure technical competence of laboratories and price competition. EPA's criteria for determining RAS contract awards are (1) acceptable analysis of a pre-award test sample, called a performance evaluation sample, to assess technical capability, (2) low bid price, and (3) an acceptable on-site lab evaluation.

Selection of RAS Laboratories

EPA's Procurement and Contracts Management Division initiates the bidding process by advertising the RAS contract and sending Invitations for Bid to interested labs. Contracting officers write the contractual language based on the latest federal acquisition regulations. The Analytical Operations Branch staff writes the technical section of the contract, the statement of work.

Labs request a performance evaluation sample package, analyze it, and send the results to EPA's Environmental Monitoring Systems Laboratory in Las Vegas. This lab scores the test sample analyses and sends the results to the Analytical Operations Branch. For each test sample, EPA's Las Vegas lab and Analytical Operations Branch decide on the minimum acceptable score. In the organic contract data we analyzed, the minimum acceptable score ranged from 72 percent to 81 percent. The minimum acceptable score for each test sample varies because each sample is different, and some samples are more difficult to analyze. If 81 percent is the minimum acceptable score for a particular test sample, it makes no difference in terms of contract awards whether a lab scores 81 percent or 100 percent. EPA would consider all labs with scores equal to or above 81 percent to have demonstrated technical competence.

(such as distilled water) is analyzed to ensure that laboratory contaminants are not reflected in analytical results. Another example of a quality control measure is the periodic calibration of instruments, to demonstrate that instruments are capable of producing acceptable quantitative data. In addition to the identity and quantity of the hazardous substances found in each sample, labs are also required to provide the results of the quality control measures, such as calibration checks, which document satisfactory maintenance and adjustment of instruments on a day-to-day basis.

SPECIAL ANALYTICAL SERVICES

For analytical needs not covered by RAS contracts, the CLP provides EPA with an ability to obtain special analytical services (SAS). Each SAS analysis is a separate subcontract between a private lab and the Sample Management Office. Examples of SAS are fast-turnaround analyses, analyses requiring lower detection limits than RAS methods provide, analyses of substances not covered by the RAS contracts, and analyses of air or fish tissue samples that are not covered by RAS contracts.

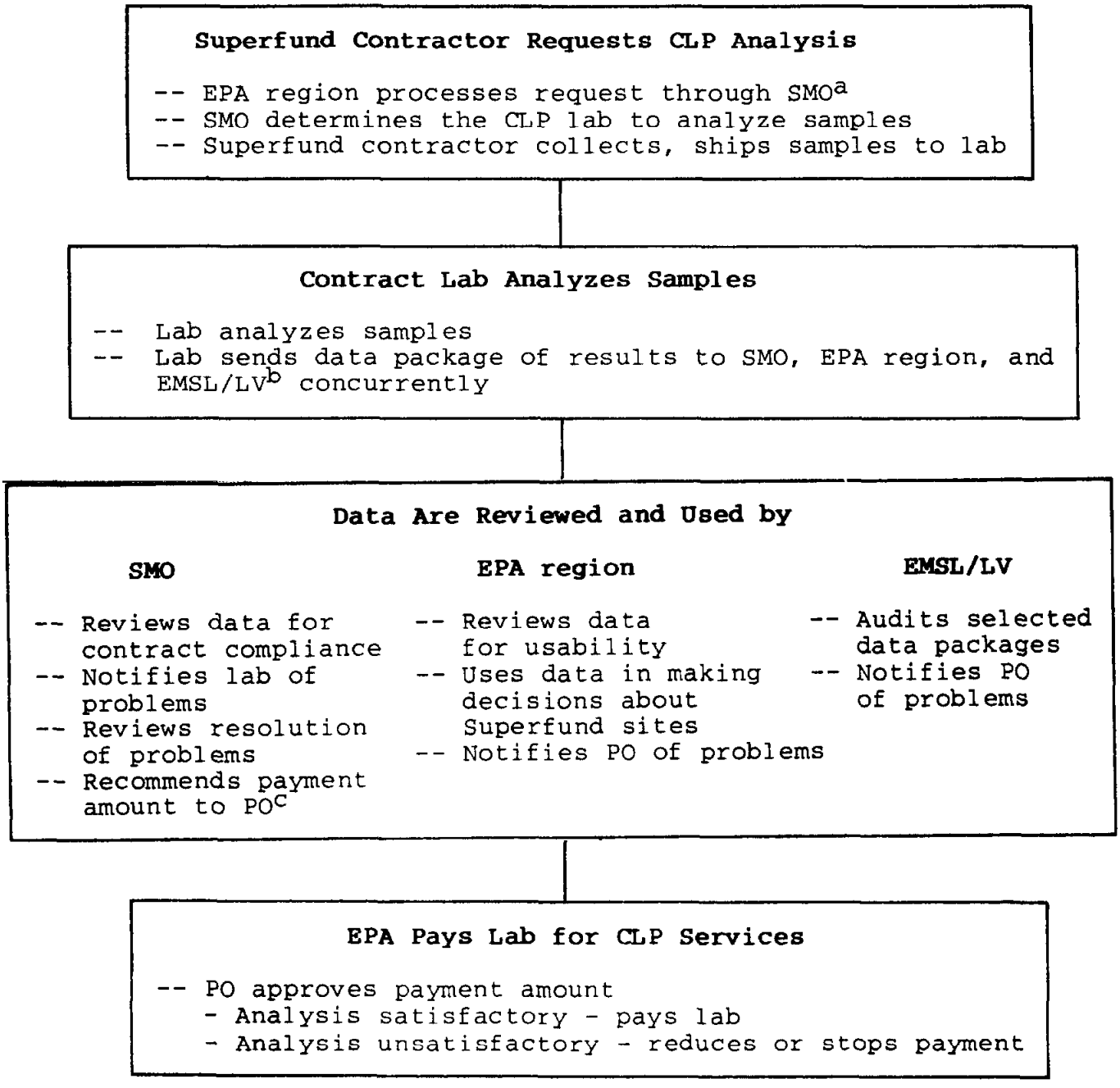
EPA regions request SAS work based on particular needs at each Superfund site and are responsible for specifying the analytical method to be used and quality control measures to be followed. The Sample Management Office writes the SAS subcontract based on the region's request.

From the start of the program in fiscal year 1980 through December 31, 1987, a total of 93 labs have had, at some time, an RAS contract. Of the 93 labs having RAS contracts, 70 also did special analyses. During this same period, 18 labs not having an RAS contract did some SAS Superfund analyses. These 18 labs accounted for approximately 13 percent of the estimated cost incurred for SAS analyses over this period, while labs having RAS contracts accounted for the remaining 87 percent. As both RAS and SAS analyses are part of the CLP, EPA considers labs doing either type of analysis to be CLP participants.

COST OF CLP ANALYSES

From the start of the program in fiscal year 1980 through December 31, 1987, EPA estimated that it cost $142.6 million for Superfund analyses by CLP labs. This figure reflects both RAS and SAS analyses for the Superfund program. Other program costs, such as EPA staff time spent in program management and data package review, are not included. According to EPA estimates, RAS analyses cost approximately $103.4 million and SAS analyses cost approximately $39.2 million. These cost estimates are based on Sample Management Office reports of obligations because these are the figures that were readily available for the various types of analyses performed under the CLP.

Figure 1.1: How CLP Analyses Are Processed



[a]Sample Management Office.

[b]Environmental Monitoring Systems Laboratory/Las Vegas.

[c]Project officer -- An EPA headquarters official who monitors CLP labs.

SECTION 1

DESCRIPTION OF THE CONTRACT LABORATORY PROGRAM

The Superfund program began in 1980, with the passage of the Comprehensive Environmental Response, Compensation, and Liability Act, and continues under the Superfund Amendments and Reauthorization Act of 1986. These acts provided for federal authority to respond to releases and threatened releases of hazardous substances that may endanger public health, public welfare, or the environment and provided for funds to clean up uncontrolled hazardous waste sites. Before a Superfund site cleanup can be implemented, site inspections and remedial investigations are carried out to determine what hazardous substances are present and in what concentrations. During these preliminary phases, numerous soil and water samples are taken to determine the location, nature, and concentration of hazardous substances.

The Environmental Protection Agency's (EPA) Contract Laboratory Program (CLP) was established in fiscal year 1980. CLP labs analyze most of the samples taken during pre-cleanup investigations. The purpose of the program is to provide standard analytical services for a high volume of samples that are of acceptable quality and cost effective. The program has grown over the years. In fiscal year 1987, CLP labs analyzed over 92,000 samples from Superfund sites. Contract labs analyzed approximately 68,000 Superfund samples in fiscal year 1985, and only about 22,000 Superfund samples in fiscal years 1980, 1981, and 1982 combined. The CLP provides for two general types of analysis: (1) routine standardized analysis performed under fixed-price contracts for an indefinite quantity of samples (routine analytical services, or RAS) and (2) specialized analysis as requested by EPA regions (special analytical services, or SAS).

CLP analytical results support EPA enforcement activities and help determine the severity of site contamination and whether a site should be placed on the National Priorities List. The National Priorities List designates the nation's worst-known sites contaminated with hazardous substances. Only sites included on this list are eligible for long-term remedial action under the Superfund program. For sites on the list, CLP analytical results help in designing remedial actions.

Many organizational elements are involved in providing and using CLP services, including officials at EPA headquarters and regional offices, EPA's Environmental Monitoring Systems Laboratory/Las Vegas, CLP labs, and Superfund contractors (who conduct site inspections, remedial investigations, and feasibility studies preceding cleanup activities). Superfund contractors request CLP services through EPA regional officials. The regional

Contents

There are four types of routine analytical services--organic, volatile organic, inorganic, and dioxin analyses. These services are delivered by private laboratories under contract to EPA. Laboratories are awarded contracts to perform routine analytical services on the basis of a passing performance evaluation test score, an acceptable on-site evaluation, and low bid price. Special analytical services are analyses not covered by the routine analytical service contracts. These special services are subcontracted for by Viar and Company, which is under contract to EPA to provide day-to-day management services for the Contract Laboratory Program. Viar and Company selects the laboratories for special analytical services based on their capability, previous satisfactory performance, and low price.

The contracts specify the methods of sample preparation and analysis to be used and quality control measures to be followed. The laboratory analytical results are reviewed by EPA regions for data usability and by EPA's management contractor to determine their compliance with contractual requirements. In fiscal year 1987, EPA began using contract compliance screening results in determining payments to labs for routine organic, volatile organic, and inorganic analyses. EPA periodically tests the technical capabilities of labs and conducts on-site laboratory evaluations, which it uses to monitor lab performance. Poor performance can result in the laboratory's not being sent additional samples to analyze until it demonstrates that it has corrected the problem.

The Contract Laboratory Program has grown since it was first established in fiscal year 1980, as the number of samples from Superfund sites has increased. In the first 3 years of the program (fiscal years 1980 through 1982), contract labs analyzed about 22,000 Superfund samples at an estimated cost of $7.6 million. In comparison, in fiscal year 1987, the contract labs analyzed over 92,000 Superfund samples at an estimated cost of $37.4 million. From the start of the program through the first quarter of fiscal year 1988, Superfund analytical services provided by contract labs cost an estimated $143 million.

Our review of the Contract Laboratory Program was performed at EPA headquarters in Washington, D.C., EPA Region I (Boston), Region II (New York), and Region III

United States General Accounting Office

GAO

Fact Sheet for the Committee on Environment and Public Works, U.S. Senate

March 1988

SUPERFUND

Overview of EPA's Contract Laboratory Program

GAO/RCED-88-109FS

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-230502

March 30, 1988

The Honorable Quentin N. Burdick, Chairman
The Honorable Robert T. Stafford,
Ranking Minority Member
Committee on Environment and Public Works
United States Senate

You asked us to provide information on the Environmental Protection Agency's (EPA) Contract Laboratory Program, which provides laboratory analytical support for the Superfund program. The Superfund program provides federal authority to respond to releases and threatened releases of hazardous substances that may endanger public health, public welfare, or the environment and provides funds to clean up uncontrolled hazardous waste sites. In November 1987, we briefed your office on the results of our work. We also agreed to present the results of our work in a fact sheet that provides an overview of the Contract Laboratory Program and addresses the following questions:

-- What types of services does the program provide, and how are they provided?

-- How are laboratories selected for the program?

-- How are laboratory analytical results reviewed?

-- How does EPA assess laboratory performance, and what tools are available to EPA to deal with poor performance?

Answers to these questions are summarized below; sections 2 through 5 of this fact sheet provide more detailed information.

The Contract Laboratory Program (CLP) provides for laboratory analysis of soil, water, and other substances taken from Superfund sites to determine what toxic substances are present and in what concentration. The program provides two general types of analytical support--routine analytical services and specialized analytical services.

(Philadelphia). Our review was performed from June 1987 through January 1988. Further information about the scope and methodology of our work is in appendix I.

We discussed the matters in this fact sheet with responsible EPA officials. They generally agreed with its contents, and their comments are incorporated where appropriate.

We are sending copies of this fact sheet to the Administrator, EPA, and other interested parties and will make it available to others upon request. If you would like further information on this fact sheet, please call me on (202) 275-5489.

Major contributors to this fact sheet are listed in appendix III.

Hugh J. Wessinger
Senior Associate Director

ABBREVIATIONS

CLP	Contract Laboratory Program
EMSL/LV	Environmental Monitoring Systems Laboratory/Las Vegas
EPA	Environmental Protection Agency
GAO	General Accounting Office
IFB	Invitation for Bid
PE	performance evaluation
PO	project officer
RAS	routine analytical services
RCED	Resources, Community, and Economic Development Division
SAS	special analytical services
SMO	Sample Management Office

officials and Superfund contractors review analytical results and use the data to make decisions regarding Superfund sites. EPA headquarters officials in the Analytical Operations Branch of the Hazardous Site Evaluation Division manage the CLP with day-to-day management assistance from the Sample Management Office, run by Viar and Company, a private management company under contract to EPA. Contracting officers in the headquarters Procurement and Contracts Management Division oversee contract bidding and award and have authority to take contractual actions if a lab does not comply with contract terms. EPA's Environmental Monitoring Systems Laboratory performs quality assurance functions. Figure 1.1 shows how CLP analyses are processed, from the original request by the Superfund contractor to final payment to the lab. Appendix II describes the functions performed by each of these organizations.

SECTION 2

WHAT TYPES OF ANALYTICAL SERVICES DOES THE CLP PROVIDE, AND HOW ARE THEY PROVIDED?

ROUTINE ANALYTICAL SERVICES

Through the CLP, EPA contracts with private laboratories for four types of routine analytical services--organic, volatile organic, inorganic, and dioxin analyses. Each type is contracted for separately. RAS contracts are awarded for a specified period of time (usually 30 months), an indefinite quantity of samples up to a ceiling (100 samples per month, for example), and a fixed price per sample as bid by the contract lab.

As of January 11, 1988, 81 laboratories had contracts for providing routine analytical services. The types of RAS services and numbers of labs are detailed in table 2.1.

Table 2.1: Number of Labs by Type of RAS Analysis

Type of RAS analysis	Number of labs[a]
Organic	56
Volatile organic	12
Inorganic	24
Dioxin	5

[a]Figures add to more than 81 because some labs had contracts for more than one type of analysis.

Under the organic analysis contract, labs test soil and water samples to identify and quantify 126 organic compounds specified by EPA. In addition, labs are required to tentatively identify and estimate the quantity of up to 30 additional organic compounds, if present. EPA also has a standard contract for volatile organic analysis, which requires labs to identify and quantify 34 volatile compounds (a subset of the 126 compounds covered by the organic contract). Under the inorganic analysis contract, labs analyze water and soil samples to identify and quantify 23 metals and cyanide. Under the dioxin analysis contracts, labs identify and quantify the dioxin concentrations found in water and soil samples.

EPA's contracts for RAS services specify the methods of sample preparation and analysis to be used and numerous quality control measures to be followed. The deadline for submitting analytical results ranges from 14 to 40 days after receiving samples, depending on the type of analysis. According to the CLP User's Guide, the CLP quality control program is designed to obtain consistent and accurate results of documented quality. For example, the contract lab is responsible for minimizing analytical problems due to contaminants in glassware and solvents; a blank

Many of the CLP labs handle a relatively small volume of samples, while several larger labs account for a substantial portion of CLP work. For instance, from fiscal year 1980 through December 31, 1987, five RAS labs accounted for approximately 39 percent of the estimated cost of RAS analysis (approximately $40 million). Four out of five of these largest RAS labs were also among the largest SAS labs, accounting for 34 percent of the estimated cost of SAS analysis during the same period (approximately $13 million). Table 2.2 summarizes obligations incurred for contract lab services, by type of analysis.

Table 2.2: Obligations Incurred for Superfund Analyses by CLP labs, Fiscal Year 1980 Through First Quarter 1988
(Dollars in thousands)

Type of analysis	1980-1982	1983[a]	1984[a]	1985	1986	1987	First quarter 1988[a,b]	Total obligations[c]	Percent of program total
RAS organic[d]	$5,246	$ 3,991	$ 9,203	$18,034	$18,485	$21,833	$ 7,532	$ 84,324	59
RAS inorganic	583	631	1,128	3,637	3,688	4,148	1,472	15,287	11
RAS dioxin[e]	0	0	638	1,679	525	686	236	3,764	3
RAS total	5,829	4,623	10,968	23,350	22,698	26,667	9,239	103,375	73
SAS	1,731	7,156	4,327	4,732	6,738	10,714	3,780	39,178	27
Total	$7,560	$11,779	$15,295	$28,082	$29,436	$37,381	$13,019	$142,553	100

[a]Columns do not total due to rounding.

[b]October 1, 1987 through December 31, 1987.

[c]All figures are based on Sample Management Office reports of obligations incurred during the fiscal year.

[d]This includes both organic and volatile organic analyses.

[e]RAS dioxin contracts were first awarded during fiscal year 1984. Prior to that time, dioxin analyses were handled through SAS subcontracts.

The steps in contract award are as follows:

-- Labs submit their bids in terms of price per sample.[1] The contracting officer ranks the bids from lowest price offered to highest price and schedules on-site visits to those labs that submit the most competitive bid prices and pass the pre-award performance evaluation test.

-- A review team conducts an on-site lab evaluation to determine the number of bid lots, or sample volume, each lab can be expected to handle. The team includes a contracting officer, a project officer, a deputy project officer, and a representative from EPA's Las Vegas lab. The review team evaluates the adequacy of the lab's equipment and instrumentation, storage space, laboratory personnel, and recordkeeping.

-- Contracts are awarded to those labs that receive acceptable performance evaluation test scores, bid the lowest prices, and have acceptable on-site review results. The contracts are fixed-price per sample, indefinite quantity, and indefinite delivery schedule. Labs are guaranteed 10 percent of the total contracted sample number.

Analysis of Recent RAS Invitations for Bid

In five Invitations for Bid we analyzed, EPA followed its criteria of acceptable pre-award performance evaluation score and low bid price. These Invitations for Bid were issued during fiscal year 1987. In total, 191 labs bid for contracts, 137 labs had acceptable test sample scores, and 36 contracts were awarded, as detailed in table 3.1. The 36 contracts were awarded for routine organic analysis. All labs with a performance evaluation score equal to or higher than the minimum acceptable score were considered for contract award. Contracts were awarded to those labs bidding the lowest prices. Of the labs with competitive prices and passing scores, only one lab received an unacceptable on-site lab evaluation and therefore was not awarded a contract. An average of 38 labs bid for each Invitation for Bid (the number of bidding labs ranged from 25 to 58). Seven labs, on average, were awarded contracts for each Invitation for Bid (the number of labs awarded contracts ranged from 3 to 11).

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[1]There are three basic bid types based on lab size or capacity: (1) small business set-asides, (2) open bids (open to all labs), and (3) large bids. Each bid type is further defined by the type of CLP analysis. For example, labs bidding for the small business set-asides and open bids for organics would analyze up to 30 samples per month; labs bidding for large organic bids would analyze up to 100 samples per month.