

**OSWER PBMS
IMPLEMENTATION PLAN**

**October 9, 1998
(revision 1)**

**A Cooperative Effort Among:
OSW, OERR, OUST, TIO,
FFRRO, and CEPPO**

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	1
INTRODUCTION	3
PBMS DEFINITIONS & GUIDING PRINCIPLES	3
PBMS BENEFITS	4
PBMS GOALS	4
OSWER'S PBMS CHALLENGE	5
OSWER TRAINING INITIATIVE	6
OFFICE-SPECIFIC PBMS VICTORIES AND GOALS	8
I. PBMS IMPLEMENTATION AT OSW	9
A. OSW PBMS Victories	10
B. What Needs to be Done by OSW -- Generically	13
C. What Needs to be Done by OSW -- Specifically	14
D. Additional Activities That Have Been Initiated Since the 2/20/98 PBMS Implementation Plan Was Adopted	20
II. PBMS IMPLEMENTATION AT OERR	22
A. OERR PBMS Victories	22
B. What Needs to be Done by OERR/ERT -- Generically	23
C. What Needs to be Done by OERR/ERT -- Specifically	24
D. Additional Activities That Have Been Initiated Since the 2/20/98 PBMS Implementation Plan Was Adopted	32
III. PBMS IMPLEMENTATION AT OUST	33
A. OUST PBMS Victories	33
B. What Needs to be Done by OUST -- Generically	34
C. What Needs to be Done by OUST -- Specifically	34
IV. PBMS IMPLEMENTATION AT TIO	35
A. TIO PBMS Victories	35
B. What Needs to be Done by TIO -- Generically	38
C. What Needs to be Done by TIO -- Specifically	39
V. PBMS IMPLEMENTATION AT FFRRO	49
A. FFRRO PBMS Victories	49
B. What Needs to be Done by FFRRO -- Generically	49
C. What Needs to be Done by FFRRO -- Specifically	51

TABLE OF CONTENTS (CONT.)

	<u>Page</u>
VI. PBMS IMPLEMENTATION AT CEPPO	51
A. CEPPO PBMS Victories	51
B. What Needs to be Done by CEPPO -- Generically	51
C. What Needs to be Done by CEPPO -- Specifically	52

EXECUTIVE SUMMARY OF OSWER PBMS IMPLEMENTATION PLAN

The Environmental Protection Agency (EPA) is actively working to implement the President's program for reinventing government and reforming regulatory policy. As a part of these efforts, EPA is working to implement, to the extent feasible, a Performance-Based Measurement System (PBMS) for environmental monitoring in all of its media program offices. As a result, EPA intends that PBMS provide flexibility in conducting required environmental monitoring, expedite the use of new technologies, and result in less costly approaches to conducting required monitoring. Congress and the regulated public have also expressed support for such changes. EPA's Environmental Monitoring Management Council (EMMC), developed a working definition of PBMS and identified guiding principles for EPA to follow. The EMMC then tasked Agency offices, including the Office of Solid Waste and Emergency Response (OSWER), with developing a plan to implement PBMS on a program-specific basis. This document is a result of efforts by the OSWER PBMS Implementation Team in response to this task. Based on this plan, OSWER projects that PBMS will be fully implemented at OSWER by September 30, 1998.

The OSWER Team began development of the implementation plan by using the EMMC's PBMS definition and guiding principles to identify PBMS implementation goals for OSWER. As part of the development process, the OSWER Team also determined to what extent OSWER was already implementing these PBMS principles. The various program offices were asked to identify and describe any projects or tasks that have been completed or are on-going which address the PBMS goals. The Team called the recently completed projects "PBMS victories". The following represent a few of the identified OSWER PBMS victories:

- Promulgation or planned promulgation of new method flexibility language in guidance documents (i.e. SW-846) and *Federal Register* notices.
- Use of information request services or on-line information sources to help educate the public about method flexibility.
- Use of national meetings and symposia as a means to educate the public about method flexibility and regulatory intent.
- Use of training courses and workshops to inform the public and regulators on method flexibility.
- Publication of guidance documents for the public that incorporate a performance-based approach.

The Team also identified barriers or obstacles to the OSWER PBMS goals. Some of these barriers include: misconceptions by both the regulated community and regulators that they could only use promulgated SW-846 methods for RCRA related monitoring and that these methods are intended to be prescriptive with no inherent flexibility, misconceptions by both the regulated community and regulators that the CLP methods are the only methods that can be used for Superfund analyses, and some Federal and State regulations require prescriptive use of RCRA monitoring methods and some regulatory entities prefer that approach.

Based on the PBMS goals and the obstacles, the Team then identified the OSWER implementation needs. The Team identified the need for increased training programs, more

written guidance, and better communication tools to eliminate misconceptions, promote PBMS, and facilitate its implementation. In addition, the review of new Federal regulations and the revision of existing Federal regulations with PBMS in mind needs to be an integral part of the implementation process. The promotion of new and innovative technologies in a manner consistent with PBMS is also essential. Finally, the commitment of additional resources is necessary to implement the plan.

The various program offices within OSWER were asked to include specific information (e.g. regarding milestones, time lines, and resources) about planned and on-going projects. This project information was used to develop a Gantt Chart (Exhibit 1) for OSWER's PBMS related projects. A summary of the estimated extramural dollars and FTEs was also developed (Exhibit 2).

In summary, the development of the OSWER PBMS Implementation Plan revealed that OSWER already is, fundamentally, a PBMS driven program office with many examples of PBMS victories showing its understanding and commitment to the PBMS effort. The development also uncovered the need for additional resources to train affected parties, provide assistance to affected parties, remove barriers, and revise guidance documents. To address these needs, OSWER has initiated specific projects to implement PBMS and the Implementation Plan provides a coordinated, AAship-wide strategy and time line for meeting the DAA's PBMS directive. However, for the plan to be successful, a commitment of additional resources will be necessary.

INTRODUCTION

The Environmental Protection Agency (EPA) is actively working to implement the President's program for reinventing government and reforming regulatory policy. As part of this program, EPA has been working at breaking down barriers to using new monitoring techniques. One barrier is the requirement to use specific measurement methods or technologies in complying with some of the Agency's regulations. EPA's Environmental Monitoring Management Council (EMMC), members of the regulated community, and Congress agree that EPA needs to change the way it specifies monitoring requirements in regulations and permits. There is broad acceptance for Agency-wide use of a nonprescriptive performance-based measurement system (PBMS).

This document, developed by the Office of Solid Waste and Emergency Response (OSWER), presents OSWER's goals and recognized challenges regarding PBMS implementation, and describes OSWER's plans for PBMS implementation. It is the result of a cooperative effort between representatives of various offices or other entities within OSWER. These representatives were members of the OSWER PBMS Implementation Team and periodically met to discuss and develop the contents of this plan.

OSWER projects that PBMS will be fully implemented at OSWER by September 30, 1998.

WORKGROUP PBMS DEFINITION AND GUIDING PRINCIPLES

The EMMC PBMS workgroup defines PBMS as *"a set of processes wherein the data quality needs, mandates or limitations of a program or project are specified, and serve as criteria for selecting appropriate methods to meet those needs in a cost-effective manner."* PBMS conveys "what" needs to be accomplished, but not prescriptively "how" to do it. Under a performance-based approach, EPA would specify questions to be answered by monitoring, the decisions to be supported by the data, the level of uncertainty acceptable for making the decisions, and the documentation to be generated to support the PBMS approach in the monitoring program. Data producers will show that their proposed methods meet the specific performance criteria. The criteria may be published in regulations or in technical guidance documents, depending on the individual program.

The EMMC PBMS workgroup also identified the following as their guiding principles:

1. Achieve EPA consensus on a clear set of goals for a performance-based system to select appropriate measurement methods, and present those goals to all stakeholders.
2. Encourage creative approaches to identifying and eliminating, where possible, all obstacles to achieving the goals of the PBMS, including regulations and statutes that inhibit full expression of the concept and the lack of availability of appropriate reference materials.
3. Identify those specific situations, e.g., method-defined parameters, where neither the selection of alternative methods nor the modification of Agency methods is appropriate.

4. Provide specific guidance to assist auditors in reviewing entities that operate under the PBMS, including how to accept or reject methods or method-derived data based upon a comparison with performance criteria.

PBMS BENEFITS

The PBMS approach will provide many benefits to both regulators and the regulated community, including:

- Flexibility in method selection.
- Expedited approval of new and emerging technologies to meet mandated monitoring requirements.
- Development and use of cost-effective methods that meet program requirements and their associated performance criteria.

Thus, the Agency intends that PBMS provide the regulated community with flexibility in conducting required environmental monitoring, expedite the use of new and innovative technologies, and result in a less costly approach to conducting required monitoring. In addition, under PBMS, the use of currently required methods would still be allowed.

PBMS GOALS

The OSWER PBMS Implementation Team identified the following goals of PBMS:

1. Provide a simple straightforward way for laboratories to respond to specific measurement needs with reliable, cost-effective, methods.
2. Emphasize project-specific method performance needs rather than specific technologies to avoid costly measurement overkill.
3. Encourage the use of professional judgement in modifying or developing alternatives to established Agency methods.
4. Provide a consistent way to express method performance criteria that is independent of the type of method or technology.
5. Provide clients with a means to articulate measurement needs in qualitative and quantitative terms, and encourage them to do so.
6. Foster new technology development and continuous improvement in measurement methodology, for example, by providing qualitative and quantitative targets for identified measurement gaps to method developers and other researchers.
7. Encourage feedback of successes as well as failures to expand and disseminate our knowledge of new or modified approaches and the performance of those approaches under real-world conditions.
8. Apply to all Agency measurement and monitoring activities, but recognize that there are situations, e.g., method-defined parameters like the oil and grease

method of the water program and the hazardous waste characteristics of the solid waste program, where neither the selection of alternative methods nor the modification of Agency methods is suggested, as either could yield different, unreliable, and unacceptable data.

OSWER's PBMS CHALLENGE

Before identifying the actions necessary within OSWER to meet the goals of PBMS, the Implementation Team identified situations contrary to those goals. The Team then identified the appropriate actions for the mitigation of these problems. The following problems were identified:

1. A common misconception exists among both the regulated community and some regulators that only promulgated SW-846 methods can be used for all monitoring applications under the Resource Conservation and Recovery Act (RCRA), which is not correct. (SW-846, entitled "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", is the methods manual for the RCRA Program.) An SW-846 method must be used only if the regulation specifies the method as required. Otherwise, any appropriate method can be used. However, the misconception prevents the use of non-promulgated methods for RCRA applications, when such methods are actually appropriate and may be used when complying with most Federal RCRA regulations.
2. A misconception exists that CLP methods are the only methods that can be used for Superfund analyses. CLP methods are very rigid because they are not always adaptable to a particular analytical problem. The regulated community and laboratories could benefit by applying knowledge and experience when modifying the method and thus improving the usefulness of the results.
3. Many RCRA regulations unnecessarily require the use of specific SW-846 methods or SW-846 in general. As a result, SW-846 updates must be issued under a rulemaking. This often delays the availability of needed new or revised methods due to bottlenecks in the regulatory process.
4. State regulations sometimes require prescriptive use of monitoring methods, and some regulatory entities prefer that approach.
5. Communications with OGC and NEIC are needed regarding the PBMS within the context of the regulations to facilitate PBMS implementation and to ensure that OSWER's PBMS implementation proposals do not impair the enforceability of the programs it administers.

Given the above, the PBMS Implementation Team recognized the need for training programs, written guidance, and communications to eliminate misconceptions, promote PBMS, and facilitate its implementation. Training, guidance and communication tools might:

- Educate affected parties regarding the allowed flexibility in modifying existing methods or in using alternative methods to achieve data quality needs.
- Provide assistance to regulatory entities on how to write rules utilizing PBMS language and principles when these rules contain a measurement component.

- Provide assistance to program offices in clarifying their existing PBMS policies, e.g., most Superfund analyses can be run using non-CLP methods.
- Remove barriers caused by misconceptions and expedite the use of new and innovative techniques.
- Help prevent unnecessary and excessive analyses during regulation compliance by encouraging method use flexibility and the use of PBMS.
- Promote the asking of the “right” questions by the regulated community and regulators during monitoring activities.

Finally, the PBMS Implementation Team recognized the need to remove any existing regulatory barriers to implementing a PBMS program, including:

- The revision of existing regulations to remove required uses of SW-846 methods when such requirements are not necessary (i.e., the methods are not required for method-defined parameters).
- The prevention of any future regulatory development which unnecessarily requires the use of SW-846 methods. This will be facilitated by the aforementioned training and education and through pro-active involvement in the development of rules to ensure that PBMS is implemented. OSWER will also, where appropriate, follow the EMMC QA Panel’s “Regulatory Notification Process -- Proposed System to Foster Increased Involvement” (currently in draft form).
- The revision of some regulations to include the performance criteria necessary for successful PBMS implementation.

OSWER believes that the above actions are representative of and will promote the goals and benefits of PBMS.

OSWER TRAINING INITIATIVE PROPOSED TO ENABLE EASE OF PBMS IMPLEMENTATION

In response to the identified training and education needs, OSWER has developed general training goals for use by interested parties. Using these goals, OSWER intends to provide a series of modules related to PBMS that can be assembled in a manner that is tailored for a particular audience’s needs. Modules will also have versions of varying complexity and detail to accommodate needed levels of understanding for different audiences. The following summarizes the types of training modules, the expected audiences, and the intended mode of training:

Types of modules:

- A. Understanding of the concepts of PBMS and why it is important to open the door to flexibility in environmental data collection measurement methods. Some of those concepts are:
 - PBMS definition
 - DQO process and outputs
 - QAPPs/SAPs - purpose, content, why we need them

- Reference methods - when these are relevant to PBMS
 - What we mean by Method Quality Objectives (MQOs)
- B. Regulatory aspects that may affect a PBMS approach
- C. Basics of Quality Assurance (QA) and Quality Control (QC)
- What kinds of QC procedures may be appropriate for controlling performance and for describing performance (data quality) that would likely be relevant for most measurement methods that might be encountered in a PBMS approach
 - How to use QC information to understand the adequacy of data developed under a PBMS approach
 - QA oversight tools for PBMS
- D. Options for achieving PBMS
- Selection from a list of methods with performance information (including the “reference method” approach)
 - Develop MQOs that evolve from the DQO process (to include all error sources)
- E. Writing data acceptance criteria that are not method/technology based and making expectations clear and measurable. This should be part of a project QAPP.
- Example master forms for documenting the QAPP requirements (target analytes, MQOs, QC documentation, etc.) and forms that could possibly be used as part of an Analytical Request will be provided.
- F. Data evaluation against MQOs/defined acceptance criteria. This should enable ease of data quality assessment (DQA) that may follow a data validation process.
- G. Determination of laboratory capability prior to and during data collection
- Onsite audits and other tools for determining a laboratory’s ability to use a PBMS approach
 - PE samples
- H. Guidance on how a laboratory needs to present its proposal for PBMS and demonstrate the adequacy of the approach.
- This could include example reporting forms (and/or electronic data distribution [EDD]) indicating what should be reported - including results and QC documentation.
- I. Determining adequacy of the method prior to allowing/continuing its use.
- Checklist for method performance demonstration

- PE samples - matrix specific

Expected Audiences:

Program and project managers, regulators (State, Regional, other), those designing project data collection activities (DQO team, QAPP/SAP designers), data validators and DQA team, regulated community, Federal facilities, PRPs, data users (e.g., risk assessors and statisticians), laboratory personnel implementing a PBMS approach (and writing laboratory project plans).

Intended Mode of Training:

A “train the trainer” approach wherein EPA HQ (OERR and OSW) will provide training to EPA Regions. The Regions will then take over the responsibility of sharing their expertise with other audiences.

OFFICE-SPECIFIC PBMS VICTORIES AND GOALS

In the chapters to follow, each office of OSWER identifies recent activities which served to promote and implement PBMS (“victories”) and PBMS-related activities which remain to be completed or implemented (“goals”). The following OSWER offices provided this information: the Office of Solid Waste (OSW), the Office of Emergency and Remedial Response (OERR), the Office of Underground Storage Tanks (OUST), the Technology Innovation Office (TIO), the Federal Facilities Restoration and Reuse Office (FFRRO), and the Chemical Emergency Preparedness and Prevention Office (CEPPO). Some of the offices identified in parenthesis which of the Implementation Team’s PBMS goals (listed above) are met by an activity.

I. PBMS IMPLEMENTATION AT OSW

The Office of Solid Waste (OSW) develops guidelines and standards for the management of hazardous, municipal, and industrial solid wastes under the RCRA program; and furnishes technical assistance in solid waste activities. The PBMS-related responsibilities of the Office of Solid Waste are particularly critical to the success of PBMS implementation given that OSW is responsible for the maintenance of SW-846, the methods manual for the RCRA program. OSW also plays a vital role in implementing the hazardous waste management and contaminated site cleanup programs under RCRA. Historically, OSW has always allowed flexibility in method selection and comes closest to implementing the PBMS for the RCRA Program. Simply stated, the RCRA Program typically requires that the analyst demonstrate the ability to determine the analytes of concern in the matrix(ices) of concern at the concentration level of concern at the appropriate confidence level -- an approach which OSW considers to be a first step towards a PBMS approach. The following paragraphs provide specifics regarding most of OSW's victories and goals within the context of PBMS implementation. In summary, OSW is taking the following actions to implement PBMS:

- Removing the mandatory use of SW-846 methods from the RCRA regulations for applications other than method-defined parameters.
- Establishing data quality/performance requirements for RCRA-required monitoring and including the requirements in RCRA regulations on a case-by case basis, to assist regulators and the regulated community in method selection for specific applications.
- Codifying (along with the Regions and other offices as necessary) the required QA and documentation
- Incorporating the PBMS philosophy into new regulations.
- Developing new sampling and testing methodologies which are compatible with the PBMS approach and encouraging their use.
- Encouraging State and local governments, whose regulations often require preapproved, prescriptive testing procedures, to modify their regulations so that the regulated community can take full advantage of the flexibility provided by PBMS.
- Working with EMMC to foster Agency-wide adoption of PBMS.
- Fostering the education of the regulated community and regulators regarding the inherent flexibility of SW-846 methods and application of the PBMS approach during RCRA-related monitoring.

OSWER is well on its way to removing the mandatory uses of SW-846 methods (we have prepared a proposal and it is undergoing OGC review) and establishing DQOs for our various regulations (we have written criteria in the Comparable Fuels Rule as a pilot regulation). While much more needs to be done to fully specify additional PBMS programs in RCRA, this document is a plan for implementation and not an exhaustive statement of approaches or solutions. We plan to fully articulate what is needed for any specific RCRA PBMS initiative that we implement in the future, but we are not able to put those details in the plan at this stage because they have not been fully worked out yet.

A. OSW PBMS Victories

The following paragraphs provide a listing and description of past or ongoing OSW PBMS victories.

1. Promulgation of Update III to SW-846

Update III represents the latest update to SW-846 which continues to promote method selection flexibility and the use of reliable, cost effective methods (PBMS goals 1 and 6) for RCRA-related sampling and analysis. SW-846 functions primarily as a guidance document setting forth acceptable, although not required, methods to be implemented by the user, as appropriate, in responding to RCRA-related sampling and analysis requirements. Although method flexibility has long been allowed within the RCRA program, misconceptions still exist among the regulated community and some regulators that SW-846 methods must only be used exactly as presented in SW-846 for all RCRA applications. Therefore, as part of Update III, OSW added language to the Disclaimer and Chapter Two (Sec. 2.1) to dispel this misconception and clarify the flexibility in method use and selection inherent to SW-846 (PBMS goals 2, 3 and 5). Copies of these documents are included in the appendix to this plan. Based on public and regulatory need, OSW will continue to update SW-846 by providing new technologies and revised existing technologies and promote cost-effective and reliable analyses. OSW will also continue to use SW-846 updates as a means to clarify analytical flexibility within RCRA and thus promote PBMS.

2. MICE Hotline

The Methods Information Communication Exchange (MICE) Service, or "Hotline", provides answers to questions and takes comments via the telephone, fax, or E-mail, regarding SW-846. Through the MICE service, chemists, ground-water specialists, and sampling experts experienced in and knowledgeable in SW-846 procedures are directly and easily available to the public and regulators involved in RCRA-related monitoring. The MICE Service also assists in the proper application of SW-846 methods, from a regulatory and PBMS view point, by educating the public regarding inherent method flexibility and clarifying whether a method is actually "required" by a particular regulation. The MICE Service also documents existing misconceptions or issues regarding SW-846 method flexibility, and thus serves as the beginning step to problem identification and resolution. As OSW implements other PBMS-related actions, the MICE Service will continue to serve an educational and informational purpose.

3. Waste Testing and Quality Assurance (WTQA) Symposium

The OSW annually co-sponsors the WTQA symposium, which was held this year (1997) on July 6-9 at the Marriott Crystal Gateway in Arlington, Virginia. As part of its efforts to increase the role of the scientific community in the RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) monitoring programs, EPA joined in a partnership with the American Chemical Society to sponsor the WTQA symposium. The symposium was initiated in 1985 as part of EPA's efforts to foster a partnership among the Agency, the regulated community, the public, State regulatory agencies, and other members of the RCRA and CERCLA monitoring community. WTQA has three goals: (1) to serve as a forum for all interested parties to work together to solve RCRA and CERCLA environmental monitoring and waste characterization problems in a cost-effective manner, (2) to give State regulatory agencies and the public timely information about EPA activities that might affect their programs, and (3) to permit the members of the monitoring community an opportunity to exchange information and experiences in using both existing and new monitoring methods and approaches -- which has

promoted all of OSWER's PBMS goals years before Agency-wide interest in PBMS implementation. Thus, the WTQA symposium has always served as an effective means to educate the public and regulators regarding the inherent flexibility of SW-846 methods and to foster new technology development. It has also always served as an effective forum for feedback regarding successes and failures during monitoring and to disseminate knowledge regarding new and modified approaches and their performance in the real-world. In particular, this year's symposium focussed on implementing PBMS, and its impact on the regulated community and testing laboratories. Attendees learned about the newest laboratory methods associated with environmental monitoring and quality assurance/quality control (QA/QC), and how the changes taking place in EPA's measurements program will affect their operations.

4. Articles for environmental magazines

OSW staff frequently contribute articles to environmental magazines regarding SW-846 and other topics related to monitoring in support of RCRA regulations. Typically, the articles on monitoring topics serve to educate and inform the public regarding new analytical or sampling methodologies, SW-846 and the regulatory process, the inherent flexibility of SW-846 methods, and the status of various updates to SW-846. Recently, OSW used such articles as an opportunity to promote PBMS and to educate the public regarding its implementation. For example, a recent article in "Environmental Lab" by two staff members of the Methods Team of OSW included two PBMS-related sections entitled "Method Flexibility and the Performance-Based Measurement System (PBMS)" and "Method Flexibility and PBMS Initiatives". This information was included to help dispel misconceptions by regulators and the regulated community regarding SW-846 flexibility and to clarify OSW's policy on method flexibility and PBMS.

5. Training courses (e.g., "Analytical Strategy for the RCRA Program: a Performance-Based Approach")

As part of another effort to help dispel misconceptions, OSW provides training courses regarding monitoring under the RCRA program. Of particular note is the training course entitled "Analytical Strategy for the RCRA Program: A Performance-Based Approach". This course, given to Regional and symposium (e.g., WTQA) audiences, has the specific goal of clarifying the monitoring flexibility allowed by SW-846 methods and the RCRA regulations, and to promote and explain PBMS. Basically, the training course explains: (1) the regulatory aspects of RCRA analyses and its true analytical policy; (2) the role of SW-846, its organization and method format, and its correct application for RCRA-related monitoring; and (3) the factors to be considered in the selection of appropriate analytical methods, especially within the context of a PBMS approach.

6. Piloting the PBMS Process with the Comparable Fuel Exclusion of the Combustion Rule

On April 19, 1996, the Agency proposed standards for hazardous waste combustors. The rule, among other topics, included provisions for the exclusion of comparable fuels from RCRA.

EPA's goal was to develop a comparable fuel specification which is of use to the regulated community but assures that an excluded waste is similar in composition to commercially available fuel and poses no greater risk than burning fossil fuel. The Agency developed a comparable fuel specification, based on the level of hazardous and other constituents normally found in fossil fuels. For this approach, EPA set a comparable fuel specification such that concentrations of hazardous constituents in the comparable fuel could be no greater than the concentration of hazardous constituents naturally occurring in commercial fossil fuels. Thus, EPA expects that the comparable fuel will pose no greater risk when burned than a fossil fuel and at the same time will be physically

comparable to a fossil fuel, leading to the conclusion that these materials are products, not wastes.

In the proposed rule, the Agency required use of SW-846 during the sampling and analysis of comparable fuels for the exclusion demonstration. The final rule, published in the Federal Register on June 19, 1998 (63 FR 33781), did not require the use of SW-846 methods and instead sets performance-based criteria. This PBMS-compatible approach allows comparable fuel generators to use any reliable analytical method to demonstrate that no constituent of concern is present at concentrations above the exclusion levels. The comparable fuels exclusion measurement criteria will serve as a pilot for the PBMS approach.

As further explained below, OSW will continue to provide support in the development of performance-based criteria and PBMS-compatible use of SW-846 in other rulemaking efforts, such as for the Hazardous Waste Identification Rule (HWIR).

7. On-line and CD-ROM Versions of SW-846 and OSW Methods Team Home Page

OSW is continuing its efforts to forge ahead with producing documents in electronic form so that the public can have easier access to them. In addition to producing Version 2.0 of SW-846 on CD-ROM, OSW has recently made available an Internet version of the manual. The URL address is as follows: <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>.

The On-line version contains all the text, figures and tables found on the CD-ROM and hard copy promulgated versions of the manual, (i.e., all of the SW-846 methods through Update III), as well as the proposed Update IVA methods. In order to make it easier to find a method, the page is laid out by method number (e.g., 3000 series, 8000 series, etc.), rather than by the table of contents. In addition, all of the methods are retrievable in the Portable Document Format (PDF) using the latest version of Adobe Acrobat Reader. We hope to update the SW-846 On-line page as soon as new method updates become available.

In addition to the SW-846 On-line page, you can click a button and return to the main OSW Methods Team Home Page (<http://www.epa.gov/epaoswer/hazwaste/test/index.htm>). This page describes who the OSW Methods Team is, how to order CD-ROM and hard copies of SW-846, how to contact the MICE service and view answers to frequently asked SW-846 questions, how to view the program and register for the WTQA Symposium, how to get one of your methods into SW-846 by following OSW's Method Development and Approval Process, and what a Performance-Based Measurement System (PBMS) is. There are also sections on What's New and Information Resources, including other program office method hotline numbers.

Version 2.0 of the SW-846 CD-ROM, which is available from NTIS, includes all methods through Update III. The CD uses Adobe Acrobat as the search engine and users can search by the chemical and common name of an analyte of interest, its CAS number, the number of the method, the analytical technique, or a variety of keywords. In addition to the PDF files, the CD also contains the WordPerfect files which allows you to cut and paste methods and chapters to make your own SOPs. You can also print the material including the diagrams and figures from either the PDF files or the WordPerfect files. The system is compatible with both Windows and Macintosh operating systems and is available in both single user and LAN forms. The proposed Update IV methods will be issued as a separate CD-ROM and will include both Updates IVA and IVB.

B. What Needs to be Done by OSW -- Generically

In general, OSW needs to facilitate PBMS implementation by: (1) continuing to educate and train affected parties, (2) assuring consistency with PBMS in new RCRA Federal regulations, and (3) revising existing RCRA Federal regulations for consistency with PBMS and to remove regulation-caused obstacles to PBMS. OSW will review regulations to determine which ones mandate use of a particular method or other measurement technology and determine the approach for implementing changes to make the regulations more compatible with PBMS. In addition, OSW will make sure that the currently recognized method defined parameters be identified to the public and be subject to public comment. OSWER plans to address the method defined parameter issue in the notice to remove the requirements to use SW-846 methods from certain RCRA regulations (i.e., the “methods reinvention reg”). OSW must also work with OERR to implement PBMS.

Regarding future OSWER regulations, OSW will review any to-be-published new or revised regulation that mentions SW-846 to assure consistency with office-wide application of the PBMS approach. OSW monitoring specialists (e.g., the Methods Team) will also provide support in the development of performance criteria, as needed, for new monitoring regulations.

OSW will also continue to review new and innovative technologies for inclusion in SW-846 and continue to update SW-846 (method and chapter revisions) in a manner which is consistent with and promotes the PBMS approach.

PBMS Implementation Obstacles Faced by OSW

Existing misconceptions by both the regulated community and regulators regarding the application of SW-846 methods to RCRA regulations is one significant obstacle faced by OSW. For example, some States do not recognize that other methods besides those in SW-846 can be used for RCRA compliance. OSW plans to mitigate this obstacle through education (see below) and revisions to the Federal RCRA regulations whereby other methods are explicitly allowed.

Some RCRA regulations lack the performance criteria, confidence intervals, or data quality requirements necessary for successful application of PBMS. OSW will work with writers of RCRA regulations in the development of measurement and data quality criteria. The performance criteria will be specified, and data producers can show that their methods meet those criteria. As noted above, OSW has already done this for the comparable fuels final rule, and will be doing this for the HWIR-waste rulemaking.

OSW also needs to communicate with OGC and NEIC regarding the PBMS-related role of SW-846 within the context of the RCRA regulations to help ensure enforcement in a manner which is consistent with regulatory intent from a PBMS standpoint.

In order to adequately validate the methods that they use, the regulated community will need to be able to obtain reference materials whose combination of matrix and analyte pose a challenge to the method that mirrors that of the samples that are being analyzed. For the RCRA and CERCLA programs, such materials are not now available in a wide enough variety to serve the programs' needs. While reference materials may not be available for every RCRA or CERCLA analysis, QC checks such as matrix spikes, matrix spike duplicates and method of standard addition can accurately demonstrate the performance (precision and bias) of any analytical method.

The Agency has recently initiated a cooperative effort with the National Institute of Standards and Technology (NIST) to develop a private sector based reference materials program.

This program, was initiated a few months ago and is being pilot tested using the needs of the Clean Water Act and Safe Drinking Water Act programs managed by the Office of Water and OECA. OSW will need to see the results before we can determine whether this approach would be suitable for OSWER to use.

PBMS Training, Education, and Guidance Development Goals

Both the regulated community and the States need education and training regarding implementation of PBMS during the use of SW-846 methods for RCRA-related compliance. Many States require the use of SW-846 methods, which is often not necessary. In general, OSW needs to educate and train affected parties to assure the most effective and consistent implementation of PBMS.

At a minimum, OSW will continue to educate affected parties by offering training courses (e.g., “Analytical Strategy for the RCRA Program: a Performance-Based Approach”) on application of the PBMS approach for RCRA-related measurements. Other, more focused, courses may be required to educate parties, including the States, on the evaluation of measurement data from a PBMS standpoint. OSW will also continue to use the Internet and the OSWER home page, “Monitoring Science in the RCRA Program”, to inform users of what OSW is doing regarding PBMS, and will continue to educate the public via professional articles (e.g., within “Environmental Lab” and presentations (e.g., at the annual WTQA symposium). OSW will also develop Fact Sheets on PBMS for use by both the public and the regulators. OSW will introduce regulatory actions related to PBMS through public meetings and workshops as part of the related rulemaking.

C. What Needs to be Done by OSW -- Specifically

OSW has implemented or plans to implement the following specific projects to promote and establish PBMS on an office-wide basis:

1. Removal from the RCRA regulations certain requirements to use SW-846 methods.
2. Revision of SW-846 Chapter Nine (Sampling Guidance)
3. Revisions to Appendix VIII (of Part 261 of the RCRA regulations)

The following pages describe each project and provide specifics regarding project timelines.

OFFICE: Office of Solid Waste (OSW)

DIVISION: Economics, Methods and Risk Analysis Division (EMRAD)

TITLE OF SPECIFIC PROJECT OR REGULATION: Remove Requirements to Use SW-846 Methods from the RCRA Regulations (the "Methods Reinvention Reg")

DESCRIPTION:

The Methods Team of EPA's Office of Solid Waste (OSW) is responsible for developing new analytical methods, sampling and waste handling protocols, and Quality Assurance/Quality Control (QA/QC) methodologies. Once the new procedures are developed, OSW publishes them as Updates or revisions to SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", which is the methods manual for the RCRA Program. Some RCRA-related regulations include the required use of certain analytical and test methods found in SW-846.

The Agency is interested in identifying and removing those regulatory citations which unnecessarily require the use of SW-846 methods. By removing the requirement to use SW-846 in certain regulations (e.g., combustion and delisting), it will be easier for the regulated community to comply given the allowed use of "any reliable method". This approach is consistent with the OSWER PBMS goals, especially goals 2, 3, and 6.

Some of the regulatory requirements specify certain SW-846 methods to determine method defined parameters (e.g., toxicity characteristic) and thus cannot be changed (PBMS goal 8). However, other regulations (e.g., delisting, BIF, and trial burn regulations) simply state that SW-846 in general must be used for compliance. OSW plans to change the language in these regulations to allow flexibility in method selection, whereby the language will be replaced with "SW-846 or other appropriate methodology". This change will not only promote PBMS, but will also remove the need to promulgate every SW-846 update as a rule, and thus save resources and time. Removal of those regulatory requirements will also encourage the timely incorporation of new and innovative technologies into the RCRA methods program.

TIME LINE AND OUTPUTS

Overall Project Start and Completion Dates: 5/97 - 12/99

Relevant Milestones*		
Milestone	Output/Accomplishment	Completion Date
On-line search of RCRA regulations for "SW-846"	Identification of all RCRA regulations which mention the use of SW-846.	May 1997 (updated periodically)
Categorized list of SW-846 regulatory citations	The sorting of all SW-846 citations into several categories (e.g., identification of which involve mandatory "method defined parameters", of others which involve mandatory uses, and of ones which are guidance). This information will be used in determining whether and how the regulatory citations will be revised.	July 1997
OGC input	OGC concurrence regarding OSW's interpretation of which citations involve mandatory applications of SW-846.	Sept. 1997- Sept. 1998
Briefings with affected program contacts and Regional offices	Identification and resolution of any program-specific concerns or obstacles. Education of all affected Agency parties.	Oct. - Nov. 1998
Publication of Proposed Rule	Formal proposal to revise certain regulations whereby the use of SW-846 is no longer mandatory, opportunity for public comment on the revisions.	Dec. 1998
Publication of Final Rule	Promulgation of revisions to the regulations. SW-846 will be more often used as guidance (most updates will not require a formal rulemaking) and regulatory obstacles to PBMS will be removed.	Dec. 1999

* May be revised at a future date to include public meetings.

OFFICE: Office of Solid Waste (OSW)

DIVISION: Economics, Methods and Risk Analysis Division (EMRAD)

TITLE OF SPECIFIC PROJECT OR REGULATION: Revision of SW-846 Chapters Nine and Ten

DESCRIPTION:

Chapters Nine and Ten of SW-846 address the development and implementation of scientifically credible sampling plans for characterizing solid waste. Chapter Nine considers the requirements of the overall sampling plan and Chapter Ten deals with specific sampling techniques for different sampling scenarios. These chapters were published in 1986 and have not been adequately updated to address the increase in knowledge on sampling. The chapters need to better account for the wide range of sample diversity encountered in the RCRA Program.

The purpose of this project is to update Chapters Nine and Ten into user friendly, scientifically sound, statistically correct, legally enforceable, cost-effective documents which also foster and incorporate flexibility and delineate the principles to be considered in a performance-based sampling plan. Updated guidance from the American Society for Testing and Materials (ASTM) will be included. The completed chapters will be published and their availability announced in the Federal Register.

TIME LINE AND OUTPUTS:

Overall Project Start and Completion Dates: 7/98 - 9/99

Relevant Milestones		
Milestone	Output/Accomplishment	Completion Date
Draft of revised chapters	Incorporation of new sampling technologies and the PBMS approach	July 1998
Workgroup review of chapters	Input regarding adequacy and completeness of revisions	March 1999
Final revised chapters	Final incorporation of new sampling technologies and the PBMS approach	August 1999
Publication of Notice of Availability	Revised chapters available to the public	Sept. 1999

OFFICE: Office of Solid Waste (OSW)

DIVISION: Economics, Methods and Risk Analysis Division (EMRAD)

TITLE OF SPECIFIC PROJECT OR REGULATION: Revisions to Appendix VIII

DESCRIPTION:

Appendix VIII of 40 CFR Part 261 is a list of approximately 480 hazardous constituents regulated under Subpart C of the Resource Conservation and Recovery Act (RCRA). EPA is revising Appendix VIII in order to minimize many of the inappropriate uses of this list that have historically occurred. Such misuses have often lead to unnecessary and costly analytical efforts by the regulated community. EPA will begin by breaking Appendix VIII into categories of constituents, based on chemical functionality and other considerations, and in developing a tiered approach to analyses. Each constituent on Appendix VIII will be evaluated to determine if it fits into an EPA-designated subgroup and if it can be reasonably expected to be present or absent in a variety of environmental media or waste matrices. In addition, a study will be undertaken to evaluate the toxicity and related environmental risks of the constituents for use in determining whether the constituents should remain in the appendix.

The constituents recommended for removal from Appendix VIII will include those that would not reasonably be expected to exist in the specific medium of interest, based on stability in the environment or other medium-specific conditions. In addition such constituents will also include those for which analytical methods or standards do not exist, or which were historically produced under such limited circumstances that they do not represent a significant regulatory concern, or which do not represent a significant environmental risk. The removal of constituents and other appropriate revisions to Appendix VIII will be proposed in the Federal Register, public comments will be addressed, and the revisions will be finalized.

Timeline and Outputs:

Overall Project Start and Completion Dates: 5/97 - 12/99 (projected)

Relevant Milestones		
Milestone	Output/Accomplishment	Completion Date
Comprehensive study of all 400+ Appendix VIII constituents	Initial identification of constituents to propose for removal from Appendix VIII, and identification of other needed revisions.	May 1997 - June 98
Peer/intra-office review of study, and briefings with affected parties	Identification of technical or programmatic concerns, report revisions	July 1998- Oct. 1998
Development and Publication of Proposed Rule	Formal proposal to revise Appendix VIII	Dec. 1998 - (May be later, depending on testing of model of reformatted appendix)
Addressing of public comments	Revisions to proposed changes as necessary	Summer 1999
Development and Publication of Final Rule	Promulgation of revisions to Appendix VIII	Fall/Winter 1999

D. Additional Activities That Have Been Initiated Since the 2/20/98 PBMS Implementation Plan Was Adopted

Cleanup 2000

The RCRA Corrective Action program addresses risk reduction activities and final cleanup at more than 5000 facilities that treat, store, or dispose of hazardous wastes and have the potential for actual environmental contamination. The intent of the Corrective Action is to address cleanup of facilities that have ongoing waste management activities. This program is analogous to the CERCLA (Superfund) Program, which more routinely addresses abandoned contaminated sites. The program is delegated in 33 states, and we anticipate several more states to receive delegation by the year 2000. As the name suggests, CLEANUP 2000 is a forward-looking effort aimed at achieving real improvements in the speed, effectiveness, and efficiency of the Corrective Action Program. CLEANUP 2000 consists of numerous interrelated efforts that include a major training program, the HWIR Media & Post Closure Final Rules, and much needed technical and program guidances. These efforts, aimed at advancing the Corrective Action program, are similar in concept to the Superfund Administrative Reforms implemented over the past several years. These efforts can be grouped under the following key objectives: 1. Promote faster cleanups by focusing program on environmental results, not process, with emphasis on prompt controls at high priority facilities. 2. Empower and enhance role of State partners in implementing Corrective Action Program. 3. Enhance public involvement with site-specific cleanup actions, including significant interim measures. 4. Promote innovative yet practical approaches to improve the pace and efficiency of investigations and cleanup actions. 5. Improve national public awareness of program accomplishments. An example of an anticipated major program impact will be stem from the "Remedial Action Plans" contained in the HWIR Media Final Rule. These plans, which are streamlined RCRA permits for wastes from cleanups, will not require facility-wide corrective action (as has been the case in the past). A second example comes from the upcoming Training which will emphasize the responsibility of regulators as "uncertainty managers" as opposed to "uncertainty eliminators." CLEANUP 2000 is also about how we communicate our successes so we all get credit for gains we've already made, the improvements that are in the works currently, and ultimately, the success of what we will achieve over the next several years. Through CLEANUP 2000 we hope to fundamentally shift the RCRA Corrective Action Program toward a "results-driven" implementation. Greater stakeholder involvement and suggestions on how to improve our program are other important benefits we hope to achieve. Currently a brief "fact sheet" is near finalization and we anticipate it will be widely distributed in the very near future. We intend to use a Federal Register Notice, Press Releases, and the Corrective Action website to get the announcement out about CLEANUP 2000. Why the name "CLEANUP 2000"? Because we intend for the discrete efforts and tools to be in place by December 31, 2000. We hope CLEANUP 2000 becomes the RCRA Corrective Action flag that will unite all stakeholders (HQ, Regions, States, Private, Public, Political, etc.) in a charge to capitalize on what we've already accomplished, make meaningful improvements; and, ensure all interested parties are aware of the those improvements.

Corrective Action Training Initiative

OSW has begun implementing a new training initiative for the RCRA Corrective Action program. The primary emphasis of the initiative is to provide and instruct participants on key principles and tools designed to achieve results that protect public health and environment more effectively, efficiently, and more promptly. Although the initiative emphasizes RCRA Corrective Action, the vast majority of the materials are applicable to environmental cleanup actions under any federal (e.g., Superfund) or state authority. The first phase of the initiative, which will start

January 1999, involves holding a 3-day workshop in all 10 EPA regions for EPA and State regulators. The workshop is being designed to be highly interactive and will provide specific tools (e.g., form letters, decision making flow charts, uncertainty management matrices, etc.) that participants will be able to begin using their first day back in the office. Extensive lists of references will be provided with instructions on how to actually get them. The second phase of the initiative involves making the training modules from the workshop available on EPA's RCRA Corrective Action WEB page (www.epa.gov/correctiveaction) for all interested stakeholders to use. Information pertaining to each module is currently available by clicking on the Bridge to Corrective Action Results. By spring 1999, the active learning experience will be launched.

PBMS Regulatory Support

The pilot PBMS Comparable Fuels Rule was promulgated in the Federal Register on June 19, 1998 (63 FR 33781); methods team is currently working on establishing a guidance for how to comply with the rule; in addition, the methods team provided PBMS language for the final HWC MACT rule.

II. PBMS IMPLEMENTATION AT OERR

The Office of Emergency and Remedial Response (OERR) provides policy, guidance, and direction for the Agency's Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and its reauthorization as defined in the Superfund Amendments and Reauthorization Act of 1986 (SARA). The Office develops and implements a program to clean up abandoned hazardous waste sites and to respond to emergencies and accidental releases of contaminants.

A. OERR PBMS Victories

A general description of past and current initiatives of OERR that indicate an OERR PBMS philosophy has existed for several years follows:

1. **Use of Field or Screening-Type Methods**

Over the past 10 years, OERR has encouraged the use of Field Methods for sample analyses when data quality and documentation needs can be justified as "less than definitive." Efforts included the publication of two OERR AOB documents containing "screening" methods and field methods, along with performance information and personal contacts related to those methods. OERR's Emergency Response Team and several Regions also have used Field Methods effectively when data needs permitted.

Region I's development of "Immunoassay (IA) Guidelines for Planning Environmental Projects" is an outstanding example of Regional initiatives where an innovative technology is being fostered, with the intent of reducing time and costs while improving environmental monitoring and remediation activities. According to the Region I document, "IA can provide real-time field analysis of a wide variety of environmental parameters at a fraction of the cost and time of conventional full protocol laboratory analyses." (PBMS goals 2, 3, and 6)

2. **Region VII Environmental Collection and Analysis Program or "RECAP"**

Even more important was the opening of the door to a new way of doing business when a cooperative effort between the Analytical Operations Branch (now the Analytical Operations Center) and EPA Region VII resulted in the RECAP contract for analytical services largely used by Region VII, along with its ESAT team (in-house laboratory) and the Contract Laboratory Program (CLP). RECAP was the National Pilot Contract for obtaining a full range of analytical services using a contract mechanism that emphasized Regional control and introduced a "turnkey" contract concept. This contract allowed for laboratory flexibility on how to meet project goals. Region VII can demonstrate the value of their approach, describing it as "cost-appropriate," which included not only analytical services but broad field activities as well. The success of the first RECAP pilot contract has led to a Region VII decision to place a RECAP 2 contract. (PBMS goals 1, 2, 3, and 6)

3. **Superfund DQO Guidance**

When OERR (Superfund) published its draft "Data Quality Objective Process for Superfund- Interim Final" (EPA 540-R-93-071), September 1993, it provided the needed link to facilitate transition to an overall OERR PBMS-driven analytical approach. The Superfund DQO

Guidance (flowing from the Agency's DQO guidance, "Guidance for the Data Quality Objective Process - EPA QA/G-4, Final, September, 1994) has established a series of Quality Assurance objectives and identified relevant elements required to support each objective. While this is not PBMS in its purest form, it is at least a start in making project personnel aware that it is appropriate to consider a specific data need prior to choosing an analytical method/service for obtaining sample analyses results. It defines only two categories of data ("screening" and "definitive"), both of which lend themselves to a PBMS approach. (PBMS goals 2, 3, 4, 5, and 6)

4. OERR Reorganization

The recent reorganization of Superfund, with a focus on Regional management of projects to a greater degree, also fosters the use of a broader spectrum of analytical methods/services, which was strengthened by the transfer of "Special Analytical Services" from the Headquarters SMO/CLASS contracts to the Regions. As projects become more site-specific (or shifted mainly to PRP or Federal Facilities oversight), the need for tailored services (as opposed to the limited list of traditional CLP services) has increased.

B. What Needs to be Done by OERR/ERT -- Generically

While OERR has many examples where data users have decreased their use of the CLP, there is little evidence that DQOs for a project have been developed, with the selection of methods/documentation flowing from the DQO outputs. Sampling and Analysis Plans and or Quality Assurance Project Plans, which document the outcome of the DQO process, should contain method quality objectives (MQOs) that provide the acceptance criteria a laboratory needs to understand in order to identify what method(s) and Quality Control procedures/criteria will meet the defined need. Identification of MQOs should take into consideration the magnitude of other-than-analytical error prior to formalizing the MQOs - that is, trade-offs between numbers of samples and method performance (e.g., precision and bias) to arrive at the most cost effective scenario of sampling and analyses that results in data meeting the limits on error.

Examples of how Superfund has demonstrated willingness to use alternative methods/services to CLP (e.g., field methods/screening methods for some purposes) are numerous; however, the alternative methods have generally been prescribed by data users rather than the actual specifications for acceptable data. An example of a truer PBMS approach would be for a data user to define what a measurement method must be demonstrated to accomplish - e.g., selectivity, sensitivity, precision, bias, what potential interferences must be accommodated, what quality and type of documentation it must contain. The laboratory would have the flexibility to use any measurement technology that could be demonstrated to produce the data quality specified.

For PBMS to become a reality in its pure form at OERR, there are many activities that must begin, many of which should be initiated in concert with OERR's sister Office, OSW (and other EPA Offices). In summary:

- OERR must educate and train affected parties in its interpretation of PBMS implementation and in new procedures that result from a PBMS approach.
- OERR should look at ARARs and, in concert with other Agency programs, identify situations when a particular method is mandatory (as in the first action of OSW's plan) - and follow suit as other programs change regulations to include PBMS.

- OERR should look into how it contracts for analytical services and revise policy and procedures to accommodate PBMS. This does not mean that some capacity for the traditional CLP approach need not be maintained - as that need will likely always exist to some degree.
- OERR must develop guidance on how to translate DQO outputs into realistic MQOs - including the citation of reference methods when it is the most appropriate description of need.
- An approach for the evaluation of laboratories using PBMS should be defined and relevant “checklists” developed, as a starting point.
- Electronic data delivery should be addressed in that an open, flexible EDD format should be used (such as the Department of Energy’s DEEMS) that is independent of the analytical method.
- OERR should develop a new approach to data validation that looks at data in the context of how it meets the project DQOs and identified MQOs . This is different, for the most part, from the current prevailing process used by the EPA Regions where “Functional Guidelines” look at data primarily from the standpoint of contract criteria adherence by a specific technology/method. In addition to looking at data only in the context of its use, looking at how much data need to be validated (e.g., % of project data) and yet assure that they meet project uncertainty goals, should be pursued. Some EPA Regions have initiated more innovative data validation programs.
- OERR should pilot one or more projects in a Region or Regions that embrace the PBMS concept, making sure that adequate documentation is developed to show benefits of a PBMS approach versus using prescribed methods (CLP or other).

PBMS Implementation Obstacles Faced by OERR

Since OERR has been encouraging the use of onsite measurements for many years and has justified the use of quality of different levels based on data use in its DQO guidance, few obstacles are anticipated in acceptance of the idea of PBMS as it relates to selection of a method from a series of options that contain performance information (i.e., reflecting the analytical error in such terms as precision and bias and confidence intervals). However, PBMS adoption in its broadest possible interpretation (providing qualitative and quantitative performance criteria that are not technology-dependent) will be difficult, since there is little or no experience in translation of DQO outputs to MQOs.

PBMS Training, Education, and Guidance Development Goals

Initially, OERR will develop guidance as described below in numbers 1 and 3 under section C, “What Needs to be Done by OERR --Specifically.”

C. What Needs to be Done by OERR/ERT - Specifically

While all of the items listed in section “B” above need to be done, OERR has chosen the following five projects to help promote and establish PBMS on an office-wide basis (items 1, 2, and 3 should build on the Region VII experience with RECAP):

1. Develop guidance for the Regions on the PBMS approach, emphasizing the benefits of adoption of this approach and providing step-by-step procedures on how to implement the approach. "Buy-in" from the Regions - at least a few of them to start - will be critical to successful PBMS implementation. The guidance can be used by other interested parties.
2. Identify one or more Regions to pilot PBMS concepts to learn where the problems will occur and to develop solutions to those problems. Selection of the Region(s) should be based on Regional interest in PBMS and demonstrated sophistication in the DQO or a similar planning process.
3. Provide hands-on training in the development of MQOs flowing from the DQOs, to lead to the development of the QAPP with the acceptance criteria for method performance. Since this is a new approach for anyone defining analytical methods to be used for a project (rather than citing the specific methods to be used), the process will likely need to emerge from pilot projects involving interested Regions. The role that the sampling design plays in meeting project requirements must be emphasized and its effect on MQOs understood.
4. Lead and track Regional efforts to develop Regional PBMS Implementation Plans
5. If the Contracts 2000 Work Group makes a decision to continue procurement of analytical services under centralized Headquarters contracts (like the CLP contracts), it should design more flexibility into the SOWs to allow for alternate methods and QC to accommodate broader analytical needs. In addition, regardless of whether Contracts 2000 decides on central contracting specifically for analytical services, an array of analytical services should be designed to allow for various contractual options for meeting analytical needs. One or more of the sources of analytical services should emphasize the use of PBMS through contracts that allow the contractor to identify the means to meet project goals. In addition, the same, or different, contracts could provide for the "traditional" services to be used when they are appropriate in lieu of PBMS. The analytical services program design could be either for national Superfund use or for Regional implementation/use - or both. Decisions on contracts would be the responsibility of the Contracts 2000 workgroup.

The following pages describe each project and provide specifics regarding project time lines. The milestone dates are tentative and will be finalized in work planning sessions in October 1998.

OFFICE: Office of Emergency and Remedial Response (OERR)

TITLE OF SPECIFIC PROJECT OR REGULATION: Development of PBMS Guidance for Defining Sample Measurement Needs

DESCRIPTION:

Traditionally, most analytical work performed for Superfund was obtained through the Contract Laboratory Program (CLP) contracts, Special Analytical Services (funds now provided directly to the Regions), and the Regional Environmental Services Assistance Teams (ESAT). Generally, through all of these mechanisms, the methods of analyses/measurement were EPA “standard” methods including rigorous quality control and extensive documentation. There was little thought to actually identifying acceptance criteria for data based on the purpose of the data and allowing data generators to propose how best to meet the need. In the past, the funding for these three contractual mechanisms for obtaining sample analyses came from Headquarters and Superfund dollars helped to continue proliferation of this practice.

The prevailing attitude about analytical services and a prescriptive approach was right for the times when Superfund came into being, as often, little was known about site contamination. Also, there was an emphasis on the need to not only apply the best EPA method to the problem, but to document all that had been done relative to that sample because of the eventuality of litigation.

At this point in time, the Superfund pipeline does not contain many of those sites with unknown problems, but rather those for which characterization is complete, problems of contamination are known, and often they have been taken over by PRPs. That combination of circumstances encourages the use of a planning process (e.g., DQO) that looks toward the end use of the data prior to design of the sampling plan and scheme for analysis/measurement of samples. In order to encourage the use of PBMS (and the DQO process), it is important to assure that EPA (and State) personnel that are responsible for making Superfund decisions and contractors providing assistance, designing QAPPs and SAPs, reviewing and validating data, and PRPs (including Federal Facilities) understand the basic concepts of PBMS, its benefits, and how to implement the approach.

TIME LINE AND OUTPUTS:

Overall Project Start and Completion Dates: 5/98-10/98.

Relevant Milestones		
Milestone	Output/Accomplishment	Completion Date*
Identify audience(s) for the guidance(s), propose the scope (with the help of the affected parties - audience), and develop an outline	Affected parties (e.g., those who must implement PBMS or use the data) help shape the guidance to be what is needed; a clear outline for review prior to writing the guidance. This is like a statement of requirements.	May 31, 1998
Establish working group for writing the guidance (may involve some contractor work assignments), and make writing assignments	Action items articulated and responsibilities and authorities defined.	May 31, 1998
Draft Guidance distributed for review to appropriate EPA (and other - e.g., Federal Facilities).	A document to use to start training modules and to assure that needs are being met.	August 1998
Finalize and distribute the PBMS Guidance	Guidance available for Regions.	October 1998

*Tentative

OFFICE: Office of Emergency and Remedial Response (OERR)

TITLE OF SPECIFIC PROJECT OR REGULATION: Regional Pilot for Implementation of a PBMS Approach

DESCRIPTION:

See project description for "Development of PBMS Guidance for Defining Sample Measurement Needs"

TIME LINE AND OUTPUTS:

Overall Project Start and Completion Dates: 5/98-10/99

Relevant Milestones		
Milestone	Output/Accomplishment	Completion Date*
Development of expectations for the pilot. Evaluate RECAP's success to aid in design.	Articulation of the need/requirement for the Regions' use in accepting a role as a pilot Region. Determine if the Region 7 RECAP already meets the requirements of a pilot.	May 1998
Survey Regions for appropriate pilot(s) site and select.	Identification of responsibility for pilot.	May 1998
Regional plan developed and provided to Superfund for review and comment and acceptance.	Agreement on what is expected.	August 1998
Regional implementation of pilot, draft report, and final report.	Documentation of problems and benefits of PBMS.	October 1999

*Tentative

OFFICE: Office of Emergency and Remedial Response (OERR)

TITLE OF SPECIFIC PROJECT OR REGULATION: Training in Development of MQOs and Other Training Modules.

DESCRIPTION:

Superfund has traditionally used a more prescriptive approach to sample analyses. Frequently, resources may not be available to support the need for technical expertise that will prevail under a DQO process leading to PBMS and MQOs that need to be specified. As a tool to help implementors, training in how to transform outputs of the DQO process into acceptance criteria for analytical data must be developed. The role that the sampling plan (types and numbers of samples as well as representative sampling points) plays in determining the MQOs must be clear. As the MQO development training module is developed, additional training modules relevant to implementation of PBMS will also be developed.

TIME LINE AND OUTPUTS:

Overall Project Start and Completion Dates: 9/97-12/98

Relevant Milestones		
Milestones	Output/Accomplishment	Completion Date*
Enlist ORD/QAD support	Obtains Agency expertise in the DQO process and intent - lending integrity to the task.	September 1997
Definition of needs/ requirements - contractor support required.	Assurance of completeness of training.	May 1998
Draft training outline and summary of expected benefit/value of each element.	Assures not wasting time on items with little or no value.	July 1998
Develop training modules and distribute as a draft to Regions, etc. for review and comment.	Assures on the right track.	September 1998
Finalize training modules.	Needed for implementation	November 1998
Start training.	Some trained personnel ready to go forward with PBMS.	December 1998

*Tentative

OFFICE: Office of Emergency and Remedial Response (OERR)

TITLE OF SPECIFIC PROJECT OR REGULATION: Development by Regions of PBMS Implementation Plans

DESCRIPTION:

As guidance and training are provided, the Regions will be asked to develop their own Regional plans for implementing a PBMS approach and will be tracked according to their plans.

TIME LINE AND OUTPUTS:

Overall Project Start and Completion Dates: 7/98-9/98

Relevant Milestones		
Milestones	Output/Accomplishment	Completion Date*
Headquarters Request to Regions for implementation plans, with guidance for their development.	Responsibilities and expectations for Regions are articulated.	July 1998
Development of Regional Implementation Plans - using the Headquarter's guidance	A schedule for when the Superfund Program will be nationally and actively working towards a PBMS approach.	September 1998

*Tentative

OFFICE: Office of Emergency and Remedial Response

TITLE OF SPECIFIC PROJECT OR REGULATION: Design of an Array of Analytical Services Emphasizing a PBMS approach. (Traditional services may still have to be provided to be available when needed.)

DESCRIPTION:

See project descriptions for "Development of PBMS Guidance for Defining Sample Measurement Needs" and "Regional Pilot for Implementation of a PBMS Approach"

TIME LINE AND OUTPUTS:

Overall Project Start and Completion Dates: 6/98-2/99

Relevant Milestones		
Milestone	Output/Accomplishment	Completion Date*
Development of relevant work group to design array (could be led by AOC)	Assures that an appropriate and diverse group defines needed set of services and how to divide them between traditional needs and a PBMS approach.	June 1998
Determination of whether to have a national program, Regional only, or both. (Under cognizance of the Contracts 2000 group)	Helps design of procurement types.	Completion expected in early 1998.
Initial design and draft SOW(s)	Review product to assure most needs are covered.	July 1998
Model procurement packages developed	Helps Regions implement PBMS concepts in contracts	November 1998
Distribution of model to support contractors, PRPs, etc., to share OERR perspective on how to implement PBMS.	Reaching out to other potential users.	December 1998
CBD announcements for RFPs (or combined IFB/RFPs)	Start the procurement process.	February 1999

*Tentative

D. Additional Activities That Have Been Initiated Since the 2/20/98 PBMS Implementation Plan Was Adopted

ERT-Edison, NJ continues to use PBMS. Recently ERTC purchased field portable Hapsite GC/MS for monitoring VOC s in the field. The methods are being developed to perform air analysis for various organic compounds. The ERTC is planning to use Hapsite GC/MS in the field during early 1999.

III. PBMS IMPLEMENTATION AT OUST

The Office of Underground Storage Tanks (OUST) develops guidelines and standards for, and provides technical assistance on, underground storage tanks. The main contribution of OUST toward the implementation of PBMS at OSWER includes outreach and educational activities promoting the use of field analytical methods instead of more conventional EPA-approved methods during the monitoring of underground storage tanks. These activities are described below

A. OUST PBMS Victories

The following paragraphs provide a listing and description of past or ongoing OUST PBMS victories.

1. Site Assessment Manual

OUST has published a site assessment manual and distributed over 7,000 copies to Federal and State UST/LUST regulators. The manual includes a chapter on field analytical methods for petroleum hydrocarbons. For each applicable method, the chapter discusses the operating principles, describes the method of analysis, and outlines the method capabilities and limitations. In this way the reader learns when each method is appropriate. This activity relates to PBMS in that it promotes the use of appropriate field analytical methods, rather than requiring use of a specific EPA-approved method. (PBMS goals 2, 3, 5, 6 and 7)

2. Site Assessment Workshops

OUST has organized and conducted several site assessment workshops with State regulators. The workshops promote the use of field analytical methods. One workshop was conducted in Chicago by the Region 5 UST section, April 4-6, 1995, for Region 5 States. Another workshop was conducted in San Antonio, Texas, September 16-18, 1996 for Region 6 and 7 States. These workshops provided States an opportunity to learn about field methods for analysis of petroleum hydrocarbons and when the methods are appropriate. (PBMS goals 2, 3, 5, and 7)

3. National Conferences

Field analytical methods are commonly promoted during OUST's national conferences. During the past three conferences separate sessions were devoted to site assessment issues, including field analytical methods. These national conferences occur every year in March and are typically attended by over 300 State and Federal UST/LUST regulators. Each of these sections in the past three years has encouraged the use of field analytical methods for petroleum hydrocarbons and discouraged the belief that only EPA-approved methods should be used to collect data at LUST sites. (PBMS goals 2, 3, 5, 6, and 7)

4. State Fund Administrator Conferences

OUST has organized site assessment sessions at State fund administrator conferences (yearly conferences for the managers of State agencies that pay for remediation at LUST sites). As with the national conference, these sessions encouraged the use of field analytical methods for petroleum hydrocarbons and discouraged the belief that only EPA-approved methods should be used to collect data at LUST sites. (PBMS goals 2, 3, 5, 6, and 7)

5. Field Methods Manual

In 1990, OUST published and distributed to State and Federal UST/LUST regulators a manual on field analytical methods entitled "Field Measurements: Dependable Data When You Need It." This manual provided regulators with descriptions of field analytical methods (e.g., Draeger tubes, the Hanby colorimetric test kits, field gas chromatographs) that could be used to collect more data, more quickly at LUST sites. (PBMS goals 2, 3, 5, and 7)

B. What Needs to be Done by OUST -- Generically

In general, OUST needs to facilitate PBMS implementation by continuing to promote PBMS through the various outreach activities undertaken in the past, including sessions at the national conference, State fund administrator conferences, and workshops. The specifics of these activities cannot be described at this time because they will be developed in cooperation with State UST programs when requested.

OUST will also work with OSW in developing fact sheets on PBMS and distributing them to the LUST regulating community. OUST can also place this fact sheet and other relevant information on our home page.

In order to adequately validate the methods that they use, the regulated community will need to be able to obtain reference materials whose combination of matrix and analyte pose a challenge to the method that mirrors that of the samples that are being analyzed. For the RCRA and CERCLA programs, such materials are not now available in a wide enough variety to serve the programs' needs. While reference materials may not be available for every RCRA or CERCLA analysis, QC checks such as matrix spikes, matrix spike duplicates and method of standard addition can accurately demonstrate the performance (precision and bias) of any analytical method.

The Agency has recently initiated a cooperative effort with the National Institute of Standards and Technology (NIST) to develop a private sector based reference materials program. This program, was initiated a few months ago and is being pilot tested using the needs of the Clean Water Act and Safe Drinking Water Act programs managed by the Office of Water and OECA. OSW will need to see the results before we can determine whether this approach would be suitable for OSWER to use.

C. What Needs to be Done by OUST -- Specifically

As noted above, OUST cannot specify project-specific information (i.e., project titles, descriptions, timelines or outputs) or the resources that will be needed for the above general activities at this time. OUST will dedicate 0.1 FTE to educating States about PBMS through the various trainings and presentations. OUST expects to spend \$40,000 on specific workshops in FY 98. An additional \$5,000 may be spent on invitational travel for experts to give presentations at national conferences and meetings.

IV. PBMS IMPLEMENTATION AT TIO

The Technology Innovation Office (TIO) promotes the use of innovative technologies for the monitoring and evaluation of contaminated soil and groundwater; a mission which in itself embodies PBMS goals.

A. TIO PBMS Victories

The following paragraphs provide a listing and description of past or ongoing TIO PBMS victories.

1. **The ETV Consortium for Site Characterization Technology (CSCT)**

As a pilot under Environmental Technology Verification (ETV) Program, the Consortium was established to increase the application of innovative site characterization by providing a mechanism for the EPA verification of the performance of the technologies. The CSCT seeks to (1) identify, demonstrate, evaluate, verify and transfer information about innovative and alternative monitoring, measurement, and site characterization technologies to developers, users, and regulators; and (2) define and demonstrate a process for verifying the performance of innovative site characterization technologies

The Consortium employs a third-party verification organization (DOE National Laboratory) to develop demonstration plans, conduct the evaluations, and write the final reports. Based on the assessment of the needs of users, the Consortium annually solicits available vendors, selects appropriate technologies, and fields performance evaluations. Technologies are selected based on their applicability to the identified category of need, their maturity (commercially ready, full-scale field units), and the willingness of the vendors to participate. After the field evaluation, the Consortium produces reports on each technology accompanied by a verification statement signed by the Director of EPA's National Exposure Research Laboratory. Of the 12 technologies field tested in 1995, verification statements and evaluation reports by the CSCT are available as follows:

1. Cone Penetrometer/Laser Induced Fluorescence (2 technologies)
Verification Statements, signed 2/10/97, available on home pages
Evaluation Reports
2. Field Portable X-Ray Fluorescence (5 technologies)
Verification Statements, signature pending
Evaluation Reports
3. Field Portable Gas Chromatography/Mass Spectrometry (3 technologies)
Verification Statements, signature pending
Evaluation Reports

(PBMS goals 1, 6, 8)

2. **Status Report on Field Analytical and Characterization Technologies**

TIO is now reviewing the final draft of this report which compiles data collected from the Regions on past applications of innovative field technologies such as XRF, LIF, and immunoassay techniques. The report establishes baseline information on approximately 100 sites at which

innovative characterization technologies have been used to date. The report can be used to show project managers where the technologies have been employed before and to give them a point of contact for each application who may be able to answer questions and concerns about the technologies. (PBMS goals 2, 3, 6, 7)

3. EPA/Navy Field Analytical and Sampling Technology Screening Matrices and Reference Guide

The U.S. Navy and the U.S. EPA are in the process of developing a technology screening matrix for field analytical and sampling technologies modeled after the Air Force/EPA treatment technologies matrix developed in 1993. It is intended to provide, in a poster format, comparative screening information on analytical and sampling technologies. The goal of the matrix is to ensure that project managers and site stakeholders are aware of the full-range of technology options available to them to assess and characterize contamination at their sites (PBMS goals 2, 5, 6, 8).

4. Site Assessment and Characterization Processes -- Case Studies

EPA and the Federal Remediation Technologies Round table (FRTR) are coordinating efforts to begin fully documenting the application of expedited site assessment/characterization processes and the implementation of field analytical and innovative sampling technologies. (PBMS goals 6, 8)

5. Field-Based Characterization Technology Workshop

TIO has developed a training course as part of the curriculum of the CERCLA Education Center to train EPA project managers on the technologies involved in the assessment and characterization of hazardous waste sites. The primary focus is the description of innovative field methods and their applicability to site clean-up programs and it will include a number of "hands-on" exercises to acquaint participants with the operation of the technologies. (PBMS goals 2, 3, 6)

6. Expedited Site Characterization Guidance/Presumptive Characterizations

TIO is working with the Superfund and RCRA corrective action programs to provide guidance to EPA staff on the use of expedited processes and the applicability of expedited site characterization and field technologies to the waste programs. This effort will include a compilation and analysis of the various processes currently being employed by other organizations (DOE SAFER, Argonne's "Quicksite," ASTM's standard on expedited site characterization, etc.). (PBMS goals 1, 2, 5, 8)

7. Brownfields

The Brownfields program seeks to promote the economic redevelopment of abandoned industrial sites. The challenge of Brownfields programs is to quickly address environmental issues and advance sites towards viable, economic uses. The ability to expeditiously determine the presence and extent of contamination are features of field analytical and innovative sampling and monitoring technologies that could potentially make them very attractive for use at Brownfields sites.

Two Brownfields information resources initiatives are underway to promote the use of these technologies in Brownfields programs. First, TIO has developed the "*Road Map to Understanding Innovative Technology Options for Brownfields Investigation and Cleanup*" to help

Brownfields site decision makers, many of whom do not have extensive experience in hazardous waste site assessment and cleanup, to understand the innovative technology options available to them for characterization and cleanup. It shows these stakeholders, as they move through the clean-up process what technology options are relevant and the issues they must consider. The Road Map is linked to an accompanying "*Tool Kit of Information Resources for Brownfields Investigation and Cleanup*" which describes the information resources developed by EPA to support innovative characterization and clean-up technologies. The Tool Kit contains resources to describe the technologies more fully, once a stakeholder has determined an option to be applicable to their situation. Both emphasize field characterization options that may be available to support Brownfields assessments (PBMS goals 1, 2, 5, 8).

8. The Vendor Field Analytical and Characterization Technologies System (FACTS) Database

Vendor FACTS is a searchable, electronic database of field analytical and characterization technologies. Information on specific technology applications and performance (as provided by the vendors) can be searched by media, contaminants, technologies, vendors, etc., to determine appropriate technologies and their availability for a specific site need. Version 2.0 contains information on 129 analytical, sampling, geophysical, and extraction technologies. (PBMS goal 6)

9. Public Events

The Consortium has participated in the Association of State and Territorial Solid Waste Management Officials' "1997 CERCLA Innovative Technology Workshop" in Long Beach, California, August 18-20, 1997. Site characterization and remediation technology vendors have been invited to exhibit their technologies during this workshop to introduce State CERCLA managers to the policy implications and technical considerations needed to determine innovative technology acceptance. At this workshop, State staff will have the opportunity to examine technologies of participating vendors.

The "Environmental Clean Up Technologies Conference - Midwest Marketplace", July 22-23, 1997, include the ETV on the agenda as well as the Site Characterization exhibit booth in the exhibit area. This conference objective is to provide information on business opportunities for environmental clean up and site characterization technologies at the State and Federal levels, the private sector, and international markets. (PBMS goal 6)

10. Internet Sites

The Hazardous Waste Clean-up Information (CLU-IN) world wide web site provides information on innovative treatment and site characterization technologies to the hazardous waste remediation community. The site offers a variety of information and services to Federal and State personnel, consulting engineers, technology developers and vendors, remediation contractors, researchers, community groups, and individual citizens.

TechDirect is another on-line information service that highlights new publications and events of interest to site remediation and site assessment professionals. Subscribers will receive periodic E-mail messages describing the availability of publications and information on upcoming events.

B. What Needs to be Done by TIO -- Generically

In general, TIO needs to continue to promote PBMS in its office through the actions described below.

1. Fulfill the need for independent evaluation of monitoring and site characterization technology performance (PBMS goals 1, 6, 8)

The field of environmental monitoring and site characterization technology is evolving rapidly. However, few true innovations in monitoring and site characterization are making it into routine use at sites across the nation. Many hurdles and pitfalls exist along the path to commercializing environmental technologies. Obstacles include: problems convincing regulators and potential customers that the product can meet its claims; lack of credible performance data and access to unbiased third parties to evaluate the data; and difficulty in identifying places where the technology can be tested.

Many of the hurdles for innovative technologies are linked. Customers will not buy a new technology until the regulators say it is approved for use. Investors will not invest until a clear market for the product is defined and the product can achieve some sort of regulatory acceptance. The regulator will not allow its use until convinced by credible performance data that the product can meet its performance objectives. Achieving success in persuading customers and regulators across the country is a repetitive, time consuming effort.

The Consortium for Site Characterization Technology will continue to fulfill the need for independent evaluation by bringing together the interests of Federal and State regulators, Federal technology evaluation and verification organizations, and potential end users of these technologies to facilitate independent verification of technology performance.

2. Foster communication exchanges between technology users (PBMS goals 2, 3, 6, 7)

TIO will continue to collect information from RPMs and OSCs in the Regions on the performance of site characterization technologies used in the field. In addition to performance data on a technology used at a site, an EPA site manager is identified as the point of contact to answer questions or exchange information on technologies used. Information collected will be published in the annual Status Report on Field Analytical and Characterization Technologies. The first report will be published around September 1997.

3. Provide reference source for comparison between competing technologies (PBMS goals 2, 5, 6, 8)

TIO is finalizing "The Field Sampling and Analysis Technologies Matrix and Reference Guide" which serves as an initial screening tool to site managers and provides much needed comparison between competing technologies.

4. Document the application of expedited site assessment (PBMS goals 6, 8)

TIO will perform case studies on certain technologies to foster new technology development and technology acceptance by RPMs and OSCs. A case study on rapid site investigation activities conducted at New Orleans Brownfields sites is being developed by TIO to support the field-based characterization workshop. This case study will document the use of field

technologies at the New Orleans sites and provide information on costs, performance, advantages, limitations, etc. of using field technologies and an expedited approach.

5. Training (PBMS goals 2, 3, 6)

TIO is training site managers across the Regions on technologies to assess and characterize hazardous waste sites. TIO will use training objectives identified by the workgroup to develop additional courses to facilitate the implementation of the PBMS concept across the Agency.

6. Provide guidance on the use of expedited site characterization technologies (PBMS goals 1, 2, 5, 8)

TIO will continue to work with the Superfund and RCRA corrective action programs to provide guidance on the use of these technologies. In addition, TIO will continue to work on developing "presumptive" site characterizations for four common site types. By developing templates for characterizing sites common to the Superfund, RCRA Corrective Action, and Brownfields programs, the project seeks to increase EPA understanding and acceptance of field technologies by showing where reliable field methods can best be employed.

7. Information resource for Brownfield sites (PBMS goals 1, 2, 5, 8)

TIO is working on documents to identify the range of technology options available to Brownfields stakeholders and to describe EPA information resources available to help better understand the options. The "Road Map to Understanding Innovative Technology Options for Brownfields Investigation and Cleanup" is now to government employees free of charge from NCEPI and to the private sector at cost from NTIS. The "Tool Kit of Information Resources for Brownfields Investigation and Cleanup" should be available by the end of August.

8. Database on site characterization technologies (PBMS goal 6)

TIO will continue to collect the latest vendor information on new technologies for site characterization and disseminate such information to site managers. Version 2 of the Vendor Facts database was released early this year and listed 129 field portable technologies

C. What Needs to be Done by TIO -- Specifically

TIO has or will continue to implement the projects listed above. TIO will also work on projects or initiatives identified by the workgroup and falling within TIO's mission to support the development and implementation of the PBMS concept across the Agency. Specific project reports, as of July 22, 1997 are listed below, each are described in the pages to follow.

1. CSCT Evaluation Reports/Verification Statements
2. Upcoming Verification Projects
3. Promoting State Acceptance - CSCT Collaboration with the Interstate Regulatory Cooperation (ITRC) Work Group
4. Promoting Regional Acceptance - The EPA Regional Network of Site Characterization Contacts
5. Public Events
6. Encyclopedia of State Use of Innovative Site Characterization Technologies: *A compilation of innovative site characterization technologies*

7. Field-Based Site Characterization Technology Training Course
8. Expedited Site Characterization Guidance/Presumptive Characterizations

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: CSCT Evaluation Reports/Verification Statements

DESCRIPTION:

The Consortium employs a third-party verification organization (DOE National Laboratory) to develop demonstration plans, conduct the evaluations, and write the final reports. Based on the assessment of the needs of users, the Consortium annually solicits available vendors, selects appropriate technologies, and fields performance evaluations. Technologies are selected based on their applicability to the identified category of need, their maturity (commercially ready, full-scale field units), and the willingness of the vendors to participate. After the field evaluation, the Consortium produces reports on each technology accompanied by a verification statement signed by the Director of EPA's National Exposure Research Laboratory.

TIMELINE AND OUTPUTS:

On-going. A number of demonstration reports are in different phases of review and evaluation.

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: Upcoming Verification Projects

DESCRIPTION:

The second cycle of demonstrations began with the soil and soil gas sampling events held in early June. Dates for "Visitors' Days" held in conjunction with the field events are shown below:

- | | |
|---|--|
| 1. Sampling technologies (soil and soil gas)
(completed) | June 5, 1997, Albert City, IA

June 12, 1997, Commerce City, CO
(completed)
Report - First draft under development |
| 2. Analytical technologies for measuring
PCBs in soil, water and sediments | July 24, 1997, Oak Ridge, TN (completed)
Report - First draft under development |
| 3. In-situ (well-head) monitoring | September 18, 1997, Savannah River, SC
Sept 25, 1997, McClellan AFB, CA |
| 4. Sampling design software | December 8-12, 1997 |
| 5. Field Extraction | Dates and locations to be determined |
| 6. Sampling technologies (groundwater) | Dates and locations to be determined |

All Consortium stakeholders are invited to participate in the visitor's days events.

TIMELINE AND OUTPUTS:

On-going

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: Promoting State Acceptance - CSCT Collaboration with the Interstate Regulatory Cooperation (ITRC) Work Group

DESCRIPTION:

The CSCT works with the Accelerated Characterization Subgroup of the ITRC. At the general meeting held June 2, 1997, in Virginia, the CSCT provided a schedule of "input" points for State participation. Based on interaction over the next 3 months, the ITRC will determine the need for continued involvement. Nine States have agreed to participate in the Subgroup to track the CSCT process. Four States (MA, LA, MD, NJ) participated in the July PCB analysis visitor's day demonstration. Several will participate in well head monitoring. States are awaiting completion of soil / soil gas reports for review.

TIMELINE AND OUTPUTS:

On-going

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: Promoting Regional Acceptance - The EPA Regional Network of Site Characterization Contacts

DESCRIPTION:

This group was formed within the Regional Waste Division and lab services to raise awareness of the Environmental Technology Verification (ETV) and the Consortium for Site Characterization Technology (CSCT) program and outputs. Regional network conference calls are held on a bi-monthly basis and face-to-face meetings are planned on an annual to semi-annual basis. A number of issues have been identified by Network members, including the need for: concise information for distribution; recognition by Regional management; alternatives to SW-846 for QA/QC; and a proposal for a site characterization "Forum."

TIMELINE AND OUTPUTS:

See DESCRIPTION above

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: Public Events

DESCRIPTION:

The "Environmental Clean Up Technologies Conference - South Central Marketplace", November 13-14, 1997, includes the ETV on the agenda as well as the Site Characterization exhibit booth in the exhibit area. This conference objective is to provide information on business opportunities for environmental clean up and site characterization technologies at the State and Federal levels, the private sector, and international markets.

TIMELINE AND OUTPUTS:

See date above.

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: Encyclopedia of State Use of Innovative Site Characterization Technologies: *A compilation of innovative site characterization technologies*

DESCRIPTION:

This encyclopedia is an electronic report/database on analytical technologies, organized by contaminant and media to serve as "front end" descriptive information on technologies. It is useful as an initial screening tool to identify technologies suitable to characterize a contaminated site. It is intended to tie together a number of existing or planned information tools including the EPA/Navy Technology matrix, the Vendor FACTS database, and the Field Analytical and Characterization Technologies status report.

TIMELINE AND OUTPUTS:

The basic structure has been completed and TIO will work throughout FY 1998 to develop the electronic database for use on the CLU-IN web site

OFFICE: Technology Innovation Office

TITLE OF SPECIFIC PROJECT OR REGULATION: Field-Based Site Characterization
Technology Training Course

DESCRIPTION:

As part of EPA's CERCLA Education Center program, this course provides a description and hands-on experience on innovative site assessment, characterization and analytical technologies. A short version of the course was conducted during the ASTSWMO conference in Long Beach (see "Public Events" above).

TIMELINE AND OUTPUTS:

Two more deliveries are budgeted for 1997

OFFICE: Technology Innovation Office/OERR

TITLE OF SPECIFIC PROJECT OR REGULATION: Expedited Site Characterization Guidance/Presumptive Characterizations

DESCRIPTION:

EPA will begin developing “presumptive” site characterization templates for four common site types. The project is currently in the data collection phase--compiling current activities by Federal agencies, commercial entities, academia. After analyzing the collected data, templates will be developed. The data collection and analysis phase should be completed by the end of the summer. The goal is to support the development of better guidance for regional staff on the use of expedited site characterization technologies and practices.

TIMELINE AND OUTPUTS:

The initial inventory of expedited processes is completed and work is underway to develop a general template. This template will guide the development of the specific site guides. Work will be on-going throughout FY 1997 and 1998.

V. PBMS IMPLEMENTATION AT FFRRO

The Federal Facilities Restoration and Reuse Office (FFRRO) works with the Regions, DOD, and DOE on Federal facility issues. FFRRO's mission is to facilitate faster, more effective, and less costly cleanup and reuse of Federal facilities. FFRRO issued guidance and policy and coordinates information exchange regarding Federal facilities among HQ and all the Regions.

A. FFRRO PBMS Victories

The following paragraphs provide a listing and description of past or ongoing FFRRO PBMS victories.

1. Best Practices Information

In response to the OIG audit on Laboratory Data Quality Oversight at Federal Facility Superfund Sites, FFRRO has solicited from the EPA Regions, DOD, and DOE best practice information concerning data quality activities. The Regions have submitted their best practice information. The information from DOD and DOE was due in August, 1997. FFRRO expects that some of the best practices will reflect the flexibility basic to PBMS.

This best practice information will be compiled into a report to be distributed to EPA, DOD, and DOE. This will help expand and disseminate knowledge of the successful approaches under real world conditions.

2. Environmental Restoration Training Course (working with DOE)

EPA and DOE jointly sponsored the Environmental Training course which was taught at several DOE sites. The course emphasized the DQO process, the observational approach, and project-specific method performance needs rather than specific technologies to avoid costly measurement overkill.

3. FFRRO QMP

The QMP is in draft form and is under review at QAD. The final QMP will promote the use of PBMS, where applicable.

B. What Needs to be Done by FFRRO -- Generically

In general, FFRRO needs to facilitate PBMS implementation by:

1. Assuring that PBMS principles are considered and promoted when working with DOD and DOE, especially with respect to responses to IG audit on Laboratory Data Quality Oversight.
2. Implementing the new QMP.

The FFRRO staff will have to be educated as to the provisions of the QMP when it is finalized and accepted by ORD. As part of that education process, the concepts and applications of PBMS will be promoted to the staff.

C. What Needs to be Done by FFRRO -- Specifically

The following page describes a project FFRRO has implemented to promote and establish PBMS on an office-wide basis.

OFFICE: Federal Facility Restoration and Reuse Office (FFRRO)

TITLE OF SPECIFIC PROJECT OR REGULATION: Incorporate PBMS Principles into the Implementation of Response to IG Audit on Laboratory Data Quality at Federal Facilities.

DESCRIPTION:

FFRRO works with the Regions, DOD, and DOE on Federal facility issues. FFRRO's mission is to facilitate faster, more effective, and less costly cleanup and reuse of Federal facilities. Toward this end, FFRRO issues guidance and policy. FFRRO coordinates information exchange among HQ and all the Regions.

In June 1997, EPA HQ responded to the IG audit report titled Laboratory Data Quality at Federal Facility Superfund Sites. OSWER responded to 12 recommendations. At this point, FFRRO has the lead on implementing the response to the audit. The response includes working with other EPA offices, DOD, and DOE on establishing minimum quality assurance systems the Federal facilities should have in place when generating environmental data.

TIMELINE AND OUTPUTS:

Overall Project Start and Completion Dates: 10/98 - 12/99

Relevant Milestones		
Milestone	Description of PBMS-related Output/Accomplishment	Est. Completion or Achievement Date
Compile Best Practice information from Regions, DOD, and DOE	List of Best Practices concerning Federal facility data quality - some of which emphasize PBMS	October 1998
Framework for QA requirements	Coordinate with EPA HQ, Regions, DOD, and DOE on developing QA procedures	April - December 1999

VI. PBMS IMPLEMENTATION AT CEPPO

A. CEPPO PBMS VICTORIES

The following paragraphs provide a listing and description of past or ongoing CEPPO PBMS victories.

1. Integrated Contingency Plan (“One Plan”) Guidance

The National Response Team (NRT) has developed this “one plan” guidance as a result of recommendations in the December 1993 NRT Report to Congress: *A Review of Federal Authorities of Hazardous Materials Accident Safety*. The five agencies that signed the one plan guidance include EPA, the Coast Guard, OSHA, the Office of Pipeline Safety of DOT, and Minerals Management Services in the Department of the Interior. “One Plan” guidance provides a mechanism for consolidating multiple facility response plans required by various regulations into one functional emergency response plan or integrated contingency plan (ICP). The one-plan approach will minimize duplication of effort and unnecessary paperwork burden for the regulated community. The one plan guidance was published in the Federal Register on June 5, 1996 (61 FR 28643).

2. Risk Management Program Regulations

Section 112(r) of the Clean Air Act Amendments of 1990 requires EPA to publish rules and guidance for chemical accident prevention. These rules must include requirements for sources to develop and implement risk management programs that incorporate three elements: a hazard assessment, a prevention program and an emergency response program. These programs are to be summarized in a risk management plan (RMP) that will be made available to State and local government agencies and the public. CEPPO chose to have a performance-based regulation set the measure of the risk management program. The Risk Management Program regulations were published in the Federal Register on June 20, 1996 (61 FR 31668).

3. General Duty Clause

Section 112(r)(1) of the amended Clean Air Act outlines the general duty for the owner and operator of a stationary source “in the same manner and to the same extent as” the general duty provision under the Occupational Safety and Health Act to identify hazards which may result from accidental releases using appropriate hazard assessment techniques, to design and maintain a safe facility, and to minimize the consequences of accidental releases which do occur. The clause applies to any facility, of any size, that handles any extremely hazardous substance, regardless of the quantity on site. EPA has chosen not to write regulations for this clause, to instead use industry standards as the performance measure for this clause.

B. What Needs to be Done by CEPPO -- Generically

CEPPO needs to implement the measurements (ICP, RMP etc.) in a manner that ensures quality performance. Also, CEPPO needs to reply to the regulated community’s requests for more specific guidance on how to comply with the measurement. CEPPO also needs to do an up-front identification of which programs/analyses lend themselves to PBMS, and which ones do not, as has been done in some media programs.

C. What Needs to be Done by CEPPO -- Specifically

CEPPO has implemented or plans to implement the following specific projects to promote and establish PBMS on an office-wide basis:

Section 112(r)(7)(B) of the Clean Air Amendments of 1990 requires EPA to develop guidance documents, including model risk management plans, to assist stationary sources in the development of risk management programs. To date, three guidance documents have been published: "RMP Offsite Consequence Analysis Guidance"; "Model Risk Management Program and Plan for Ammonia Refrigeration" and "Risk Management Plan Data Elements". CEPPO will revise and update these guidance from time to time as stakeholders and will proceed in implementing the Risk Management Program regulations.