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River Protection Project Waste Feed Delivery Program Technical Performance Measurement Assessment Plan

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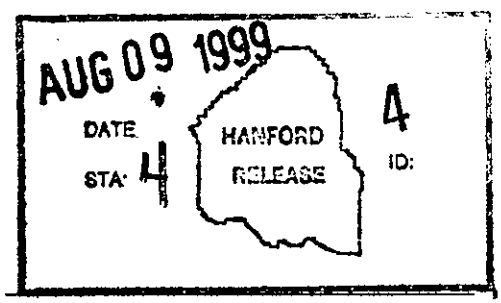
Abstract:
This plan establishes a formal technical performance-monitoring program. Technical performance is assessed by establishing requirements based performance goals at the beginning of a program and routinely evaluating progress in meeting these goals at predetermined milestones throughout the project life cycle.



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RIVER PROTECTION PROJECT WASTE FEED DELIVERY PROGRAM TECHNICAL PERFORMANCE MEASUREMENT ASSESSMENT PLAN

June 1999

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CONTENTS

LIST OF FIGURES

LIST OF TERMS

AGA	Alternatives Generation and Analysis
DST	Double-shell tank
HLW	High-level waste
LAW	Low-activity waste
O&M	Operations and Maintenance
RAM	Reliability, Availability, Maintainability
RPP	River Protection Project
SE	Systems engineering
T&E	Test and evaluation
TBR	To be refined
TPM	Technical Performance Measurement
TWRS	Tank Waste Remediation System
TWRSO&UP	Tank Waste Remediation System Operation and Utilization Plan
WFD	Waste Feed Delivery

RIVER PROTECTION PROJECT WASTE FEED DELIVERY PROGRAM TECHNICAL PERFORMANCE MEASUREMENT ASSESSMENT PLAN

1.0 INTRODUCTION

Successful program management requires control of three basic program elements: cost, schedule, and technical performance. Technical performance may be viewed as distinct from cost and schedule. However, changes in technical performance will impact cost and schedule.

Formal programs exist within the Waste Feed Delivery (WFD) Program for monitoring cost and schedule performance. This plan establishes a formal technical performance-monitoring program. Technical performance monitoring using the Technical Performance Measurement (TPM) approach supports a positive control system.

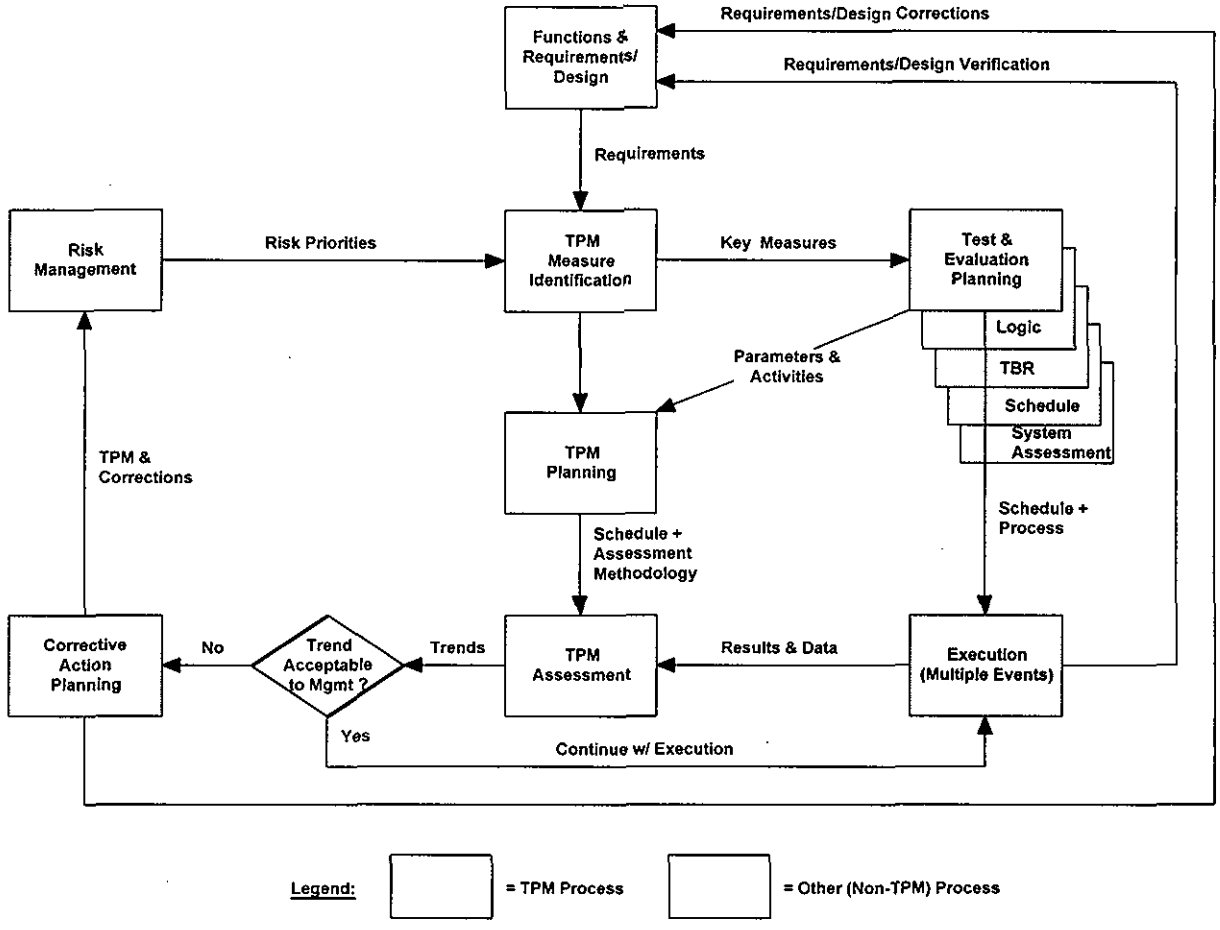
Technical performance is assessed by establishing requirements based performance goals at the beginning of a program and routinely evaluating progress in meeting these goals at predetermined milestones throughout the program life cycle. Selected TPM assessment parameters serve as indicators of the eventual success of the program in meeting established technical performance goals. This periodic review process allows early detection of technical problems, facilitates the timely development of corrective actions, and minimizes cost and schedule impacts by measuring technical performance.

TPM implementation is an integral part of the River Protection Project (RPP) systems engineering (SE) approach as defined in the *Tank Waste Remediation System Systems Engineering Management Plan* (Peck 1998). It is tied to the Test & Evaluation (T&E) and Risk Management disciplines within SE, the WFD functions and requirements specification, and system assessment, as shown in Figure 1. TPM parameter determinations will provide core performance indicators to be used in RPP T&E planning activities to assess the evolving capability of program and project level technical baselines to meet established functional requirements to accomplish the program mission. These core performance indicators will be a subset of the performance requirements identified in the specifications and used in T&E planning. T&E activities provide data for evaluation of performance against the technical performance measures. Similarly, TPM activities provide inputs for technical risk management planning and assessment, while input from the risk management process is used in determining criticality in the TPM parameter selection process. These relationships provide a cyclic flow of data between RPP TPM, T&E, and Risk Management for the life of the program.

WFD TPM development is currently in the "TPM Measure Identification" portion of the TPM Flow as shown in Figure 1. The purpose for releasing this initial plan is to provide an overview and framework for TPM development, and to establish management's core performance indicators for WFD Program success, as input into the T&E planning process.

Once the WFD T&E Plan has been developed and integrated with the Level 1 Logic, this TPM Plan will be revised to further develop the WFD TPM process. This eventual development is discussed in Section 4.0.

Figure 1. Technical Performance Measurement Flow.



1.1 TECHNICAL PERFORMANCE MEASUREMENT OBJECTIVE

TPM provides a means of assessing the maturity and ability of a system to meet technical performance requirements during pre-conceptual, conceptual, design, and construction phases of its lifecycle. It provides program and project managers with visibility into whether the delivered system will actually meet its technical performance requirements.

The TPM approach relies on existing and planned T&E and system assessment activities to provide data for trending. The TPM process serves as a focal point for consolidating and assessing data gathered from throughout the program. This provides management with a concise and timely summary of technical performance at discrete intervals.

1.2 SCOPE

This plan applies to all RPP WFD Program activities. It will identify TPM related activities that must be included in WFD program planning and management to establish and track the technical performance of the program. In addition, this plan will address how the results of WFD activities will be used to provide information for further WFD TPM planning. TPM implementation is a phased development activity as shown in Figure 1 and described in Section 4.

1.3 PURPOSE

The purpose of this TPM assessment plan is to identify TPM activities to be applied to the WFD program. The plan is intended to communicate selected measures to monitor and control technical performance. It describes the following:

- Specific measures for WFD
- Events used to evaluate measures
- Outstanding actions required to implement TPM.

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2.0 TECHNICAL PERFORMANCE MEASUREMENT IMPLEMENTATION

As an evolving program, WFD will base TPM implementation on its current technical requirements. This plan will be revised as the technical and programmatic aspects of the WFD program mature and are refined, as discussed in Section 4.0.

2.1 SUMMARY OF TECHNICAL PERFORMANCE MEASUREMENT PROCESSES

2.1.1 Initial Technical Performance Measurement Implementation Process

An initial top level set of technical performance measures have been established based on the consensus opinion of WFD management, and in accordance with *Tank Waste Remediation System Administration*, Volume IV, Engineering, Section 2.4, Technical Performance Measurement Procedure (Gibson and Hamm 1997). Initial quantification of these measures was derived from the existing *System Specification for the Double-Shell Tank (DST) System* (Grenard et al. 1998), and from the *Tank Waste Remediation System Operations and Utilization Plan* (TWRSO&UP) (Kirkbride et al. 1997).

2.1.2 Technical Performance Measurement Plan Updates

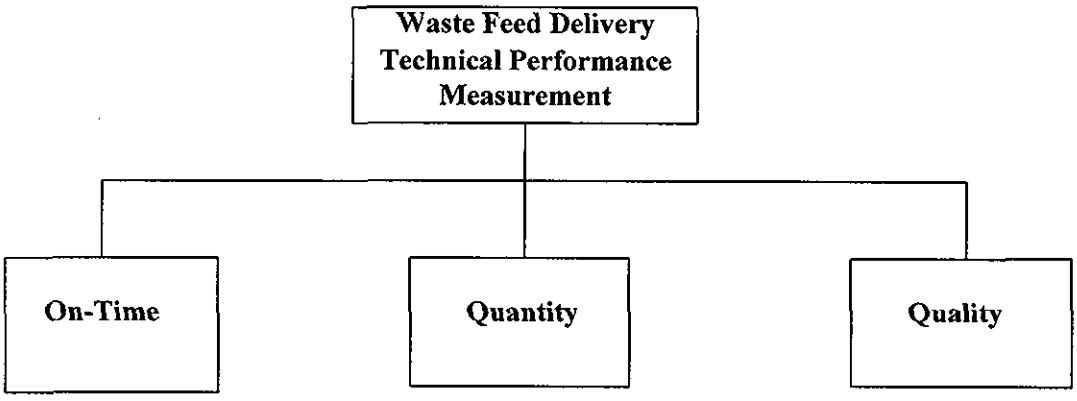
This plan will be revised throughout the life of the WFD program to reflect progress and changes in the program. It will be updated following completion of the Baseline update in FY 1999. Subsequent revisions will be initiated through periodic plan assessments as described in Section 3.2.

2.2 TECHNICAL PERFORMANCE MEASUREMENT SELECTION AND DEVELOPMENT

2.2.1 Key Measures Selected

The WFD Program mission is to deliver low-activity waste (LAW) and high-level (HLW) waste feed to a Privatization Contractor for processing. This includes evaluating and modifying or upgrading systems to accomplish the program mission. The key measures for assessing success in accomplishing the program's mission are to make feed deliveries to the Privatization Contractor that are on time, in adequate quantities, and that meet composition specifications, as shown in Figure 2. WFD TPM assessments will focus on measuring confidence that the program will be able to meet the delivery requirements. Separate TPM parameters will be developed and monitored for HLW and LAW.

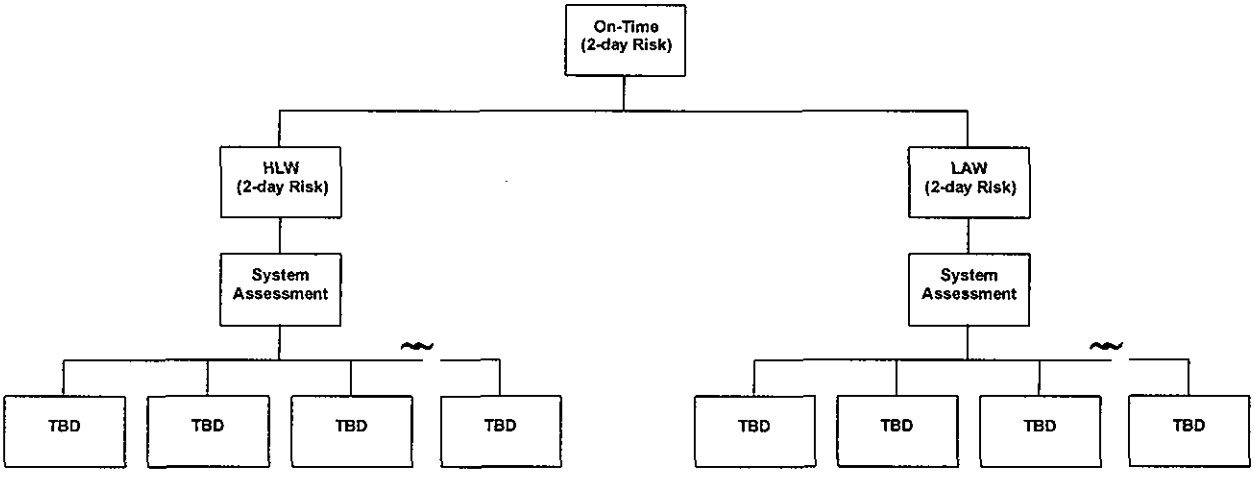
Figure 2. Waste Feed Delivery Technical Performance Measurement Hierarchy.



2.2.1.1 On-Time Deliveries. The On-Time Delivery performance measure will assess progress in meeting the Level 1 DST Specification's two-day (to be refined [TBR]) risk per batch requirement. This risk per batch requirement states that delivery of any batch will not be impacted by more than two days, for any reason.

Development of On-Time Delivery performance parameters will be based on the Operations and Maintenance (O&M) Concept, including O&M Risk Assessments, Reliability, Availability and Maintainability (RAM) Analyses, and T&E Planning. When issued, the O&M Concept will provide a basis for further identifying and developing HLW and LAW performance measures for delivering feed on time, as shown in Figure 3.

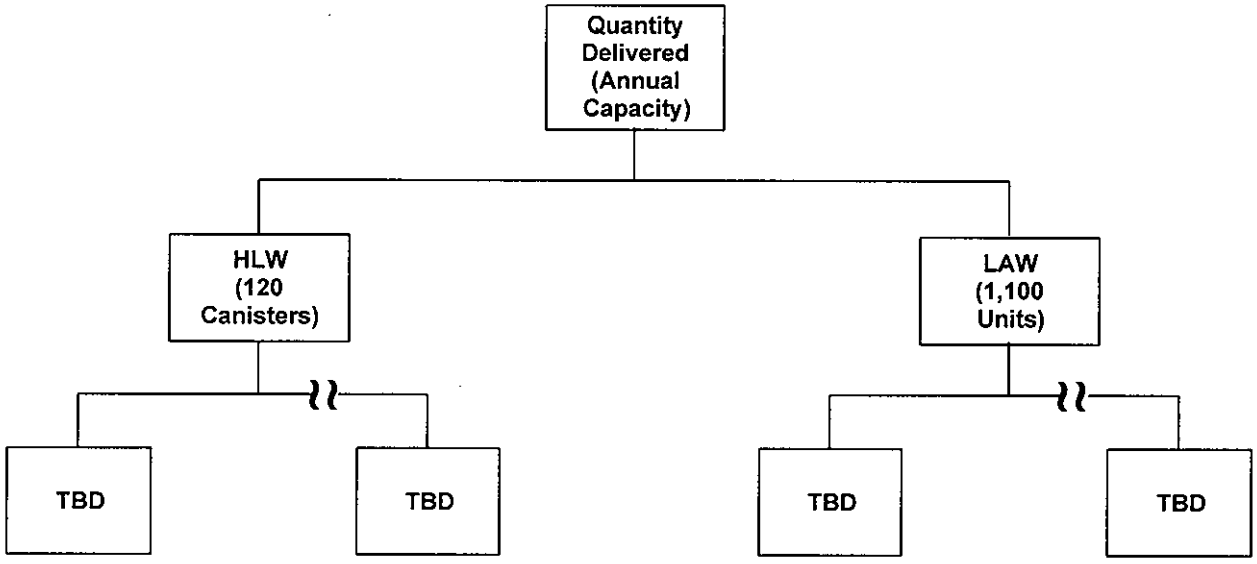
Figure 3. Sample Waste Feed Delivery On-Time Delivery Technical Performance Measurement.



2.2.1.2 Delivery Quantities. Delivery Quantity performance measurement will be assessed as the confidence of meeting the required annual feed delivery rates of 1,100 units of LAW and enough HLW feed to fill 120 canisters. These required quantities were established in the Level 1 DST Specification and in the British Nuclear Fuels Limited (BNFL) Privatization Contract (RL 1996). They represent current anticipated delivery requirements, and are subject to change, as changes may occur in the BNFL contract.

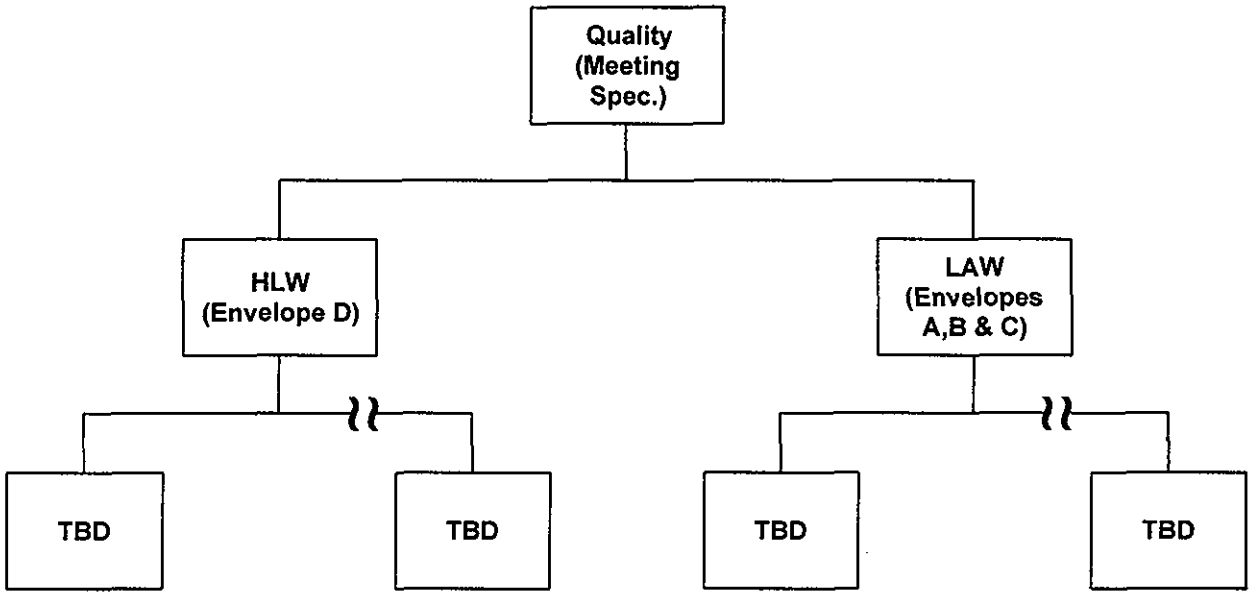
Development of Delivery Quantity performance parameters will be based on planned T&E, Logic, TBR, Schedule and System Assessment activities as shown in Figure 1. These activities are designed to determine the ability of existing equipment to deliver required quantities, and to determine product availability by determining the physical and chemical characteristics of tank contents, as shown in Figure 4.

Figure 4. Sample Waste Feed Delivery Quantity Technical Performance Measurement.



2.2.1.3 Delivery Quality. Delivery Quality performance measurement will be assessed as the confidence of meeting waste feed envelope specifications. These required envelope specifications were established in the Level 1 DST Specification and Performance Requirements for the DST System. Development of Delivery Quality performance parameters will be based on the planned T&E, Logic, TBR, Schedule and System Assessment activities shown in Figure 1, intended to determine product availability by determining the physical and chemical characteristics of tank contents, as shown in Figure 4.

Figure 5. Sample Waste Feed Delivery Quality Technical Performance Measurement.



2.2.2 Milestones Related to Performance Achievement

Activities identified to date that will support parameter development include the following:

Milestone	Due	Supports
TWRSO&UP Update	5/99	On-Time, Quantity & Quality
WFD Tank Selection AGA Update	5/99	On-Time, Quantity & Quality
O&M Concept Delivery	8/99	On Time & Quantity
Updated RAM Analysis	8/99	On-Time & Quantity
O&M Risk Assessment	9/99	On-Time & Quantity
241-C-104 Rheology Testing	10/99	Quantity & Quality
241-AZ-102 Rheology Testing	1st Qtr 2000	Quantity & Quality
Mixer Pump Performance Test	1st Qtr 2000	Quantity & Quality
TWRSO&UP Update	5/00	On-Time, Quantity & Quality

These will be developed further, as described in Section 4.

2.2.3 Technical Performance Measure Reviews and Report Planning

TPM reviews will be held for assessing TPMs, as shown in Figure 1. These "TPM Assessments" are used to develop parameter trends plotted against technical performance planned profiles, as described in Section 3.1. They will be scheduled to coincide with milestones, as they are determined by further TPM planning. TPM reviews feed the management review process, and further will serve as a forum for exchanging TPM findings with organizations responsible for system verification and testing, risk management, and decision management.

It should be noted that the findings of milestone products serve as input data for reviewing, analyzing, and trending technical performance. They also provide the basis for further developing and refining of this TPM plan, by identifying elements for analysis, by developing additional performance measures, and by identifying additional reviews and analyses to support the TPM effort.

2.2.4 List of Available Verification Documentation

TBD.

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3.0 TECHNICAL PERFORMANCE MEASUREMENT MONITORING

3.1 TECHNICAL PERFORMANCE PLANNED PROFILES

Technical performance planned profiles are graphical plots of anticipated performance over the time planned for program development. They are predictions made at the start of the development process, based on projected system performance plans. As system development progresses, the profiles are revised to reflect changes in requirements, design, etc. At each evaluation point (milestone) described above, achieved to date performance is plotted against the predicted forecast for each TPM. The profiles and backup documentation form the basis for system effectiveness and summary reports, and are used as management tools at technical reviews. WFD Program planned profiles will be developed in fiscal year 2000. Planned profiles will be delivered for the key measures described in Section 2.2.1.

3.2 ASSESSMENT REVIEWS

Periodic reviews will be held to determine the need for revision to this plan, to meet the evolving needs of the WFD program. They will be scheduled to coincide with design reviews and other program planning milestones.

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4.0 WASTE FEED DELIVERY TECHNICAL PERFORMANCE MEASUREMENT PATH FORWARD

4.1 PATH FORWARD PLAN

WFD TPM planning is in its initial stages. This plan completes the initial "TPM Measure Identification" step in the TPM flow shown in Figure 1. Key measures from this step will be provided to other planning activities that will provide the necessary activity and parameter information to facilitate further "TPM Planning" and the implementation of "TPM Assessment" activities.

This initial TPM Analysis Plan provides the basic framework for planning WFD TPM activities. TPM planning will be updated based on the technical and programmatic changes that may result from the completion of the FY 1999 Baseline update, and on the WFD program's completion of T&E planning, Logic, TBR, Schedule and System Assessment activities. Completion of these tasks will facilitate further TPM planning by allowing WFD to do the following:

- Resolve the TBDs included in this plan.
- Define specific TPM parameters for the WFD key measures of On-Time, Delivery Quantity and Delivery Quality.
- Determine the activities and milestones for TPM reviews.
- Develop summary level profiles for key TPM measures.
- Perform periodic technical reviews to assess system development.
- Perform periodic assessments to revise and update this plan, to maintain its consistency with WFD program development.

4.2 LESSONS LEARNED AND PLAN UPDATES

None to date.

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